DMEA Form 9
Rev. 6/57

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration

OFFICIAL DOCKET FILE — Idm-E NO. I — DMEA NO. 432

Application
- [ ] Denied
- [ ] Withdrawn

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

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

Folder No. 1:

Left Side

- [x] Royalty Audits
- [x] Certification of Discovery
- [x] Closing Letter
- [x] Cost Audits
- [ ] Termination Notice or Agreement
- [ ] Recision Notice
- [ ] Assignment of Contract
- [x] Contract Amendments
- [x] Contract with all exhibits and annexes
- [x] Owner's Consent to Lien and Subordination Agreement
- [ ] Application and attachments - none

Right Side

- [x] Project summary (final)
- [x] Work Completed analysis (final)
- All other material filed in chronological order including the following reports if checked:
- [ ] Field Team Semi-Annual Report for Certified Project
- [x] Final Field Team Report (Tab)
- [x] Operator's Final Report (Tab)
- [ ] Interim Field Team Reports
- [ ] Operator's monthly reports and all attachments
- [x] On-site Exam Report (Tab)
- [ ] Settlement Sheets
- [ ] Drill Logs

Additional Folders:

Left Side

Folders No. 2 : Reports
- [ ] Analysis of Semi-Annual Inspection Reports
- [ ] Project Summary (Interim) by DMEA Engineers

Right Side

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

Folders No. 3 : Maps (Use pocket folder or envelope)

Folders No. _____ : Settlement Sheets

Folders No. _____ : Drill Logs

Folders No. _____ : Royalty material

Reported Inactive 12/28/59

17963

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
10/5	[illegible]	500
10/6	[illegible]	140
	[illegible]	140
10/9	App'd. Sol. Off.	800
10/10	[illegible]	120
"	[illegible]	110
10/10	[illegible]	100
10/10	[illegible]	220

OCT 1 0 1961

Mr. Magnus Wulff

Northport, Washington

INTERIOR DEPT.
OCT 6 - 1961
SOLICITOR

Re: DMA-432 (Zinc)
Mines Management, Inc.
Iroquois Mine
Stevens County, Washington
Contract I-DMA-E1

Dear Mr. Wulff:

Enclosed is a self-explanatory letter of today to the Operator under the subject contract.

This correspondence relates to the Landlord's Subordination Agreement signed by you on May 1, 1951, under the Defense Minerals Administration program. The Office of Minerals Exploration is the successor agency to DMA and DMEA.

FROM SOLICITOR

OCT 9 1961

FOR SIGNATURE

Sincerely yours,

George Fumich, Jr.
Director

Enclosure

GLAult/a
10-5-61
cc to: Director's Reading File
Region I (2)
Docket
Code 500

43683

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
10/5	[illegible]	500
10/6	Dolley	140
11-6	[illegible]	140
10/9	[illegible] Asst. Sol. Off.	800
10/10	Selbridge	120
"	[illegible]	110
10/10	[illegible]	100
10/10	gad	220

OCT 1 0 1961

Mines Management, Inc.
c/o Mr. W. R. Green, President
W. 3414 Euclid Avenue
Spokane, Washington

INTERIOR DEPT.
OCT 6 - 1961
SOLICITOR

Re: IMA-432 (Zinc)
Mines Management, Inc.
Iroquois Mine
Stevens County, Washington
Contract I-IMA-E1

Gentlemen:

By the terms of the subject Exploration Project Contract, as amended, and the certification of discovery or development, dated July 16, 1952, all minerals mined or produced from May 16, 1951, to May 16, 1961, were subject to the Government's percentage royalty as set forth in said contract.

As the period during which production was subject to royalty has now expired, the Government according to its present records retains no claim or lien against the property subject to the contract or any future production therefrom. We, therefore, are closing our books and records on this contract. Your attention, however, is called to the provisions of the contract which require the Operator to keep and preserve certain records for the periods indicated.

Sincerely yours,

FROM SOLICITOR

OCT 9 1961

Director

FOR SIGNATURE

cc to: Mr. Magnus Wulff
Northport, Washington

GLAult/a
10-5-61

cc to: Director's Reading File
CA&A Division
Region I (2)
Docket
Code 500

RECEIVED
OCT 6 - 1961
ASSIST. SOLICITOR
MINERAL RESOURCES

43683

RECEIVED

DEFENSE MINERAL EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

AUG - 1 1955

REPORT OF ROYALTY REVIEW

I have reviewed the files of the Executive Officer, DMEA Field Team, Region I, N.W. District, pertaining to Contract Idm-81, Docket No. DMA-432, with:

Mines Management, Inc.
612 Chronicle Building
Spokane 8, Washington

for the purpose of determining the amount of royalties due the U.S. Government on sales of zinc from property referred to as Iroquois Mine located in Stevens County, Washington.

The exploration contract was dated May 10, 1951; the exploration was completed in January, 1952; and certification of discovery or development was issued under date of July 16, 1952. According to audit report dated March 19, 1952, prepared by Mr. Robert W. Hull, auditor, total accepted costs under the contract amounted to $24,000.00 with the Government's participation, on a 50 percent basis, being $12,000.00.

The exploration work performed under the contract consisted to 16 diamond drill holes plus 151.5 feet of crosscutting. The Semi-Annual Report of Certified Project for the period January 1 to June 30, 1955, in connection with this project indicates there has been no production since the completion of the exploration program and no activity has been observed at the mine.

This review was made in lieu of an on-site audit of the operator's accounts and records for the following reasons:

(1) Available evidence in the files does not indicate any production to date which would be subject to DMEA royalties, and

(2) The administrative cost to the Government of an on-site audit at this time would be excessive in relation to the amount of possible royalty which might be disclosed.

C. E. Fisher
C. E. Fisher, Auditor

July 26, 1955

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

Chamber

CERTIFICATION BY THE UNITED STATES OF AMERICA OF A DISCOVERY OR DEVELOPMENT UNDER AN EXPLORATION PROJECT CONTRACT

To: Mines Management, Inc.
612 Chronicle Building
Spokane 8, Washington

Pursuant to the provisions of Exploration Project Contract No. I-DMA-K1, dated May 16, 1951, (Docket No. DMA-432), hereinafter called the "contract", between you and the United States of America, hereinafter called the "Government"; to establish and fix the Government's percentage royalty on production and its lien thereon and on the mineral deposit which is the subject of the exploration project, the Government considers and therefore certifies that a discovery or development has resulted from the work from which commercial production of ore may be made, in or upon that certain property situated in the State of Washington, County of Stevens, described as follows:

Those certain mining claims known and described as "Progress", "Prosperity", "Columbia", "Black Bear", and "Brown Bear" in the Northport Mining District.

Also a tract of land described as follows: Commencing at the corner of Sections 19, 20, 29 and 30, Twp. 40 N., R. 42 E.W.M.; thence N. 89° 47' E. 523 feet along the line between said sections 20 and 29, thence N. 34° 49' W. 601 feet; thence S. 37° 38' W. 1565.7 feet; thence S. 34° 49' E. 224 feet; thence S. 51° 41' W. 631 feet to south line of NW¼ of NW¼ of Sec. 30, said Township and Range; thence East 1145 feet along said South boundary line to line between said Sections 29 and 30 and the southeast corner of said NW¼ of NW¼, thence North along said Section line 1320 feet to point of beginning.

Also the SW¼ of SE¼ Sec. 19, Twp. 40 N., R 42.

The Government's estimate of said discovery or development is particularly described and delimited as follows: Lead-zinc ore containing minor amounts of cadmium and other valuable metals has

been found as a result of the work done under the terms of Contract L-DMA-F1. The ore bodies occur as replacements and disseminations in limestone or dolomite.

Dated: JUL 1 6 1952

THE UNITED STATES OF AMERICA

By Frank E. Johnson
Acting Administrator, Defense
Minerals Exploration Administration

Butin
Chamber

HFKeller/bjl (7/10/52)

Copy to: Contract Adm. & Audit Div.
Field Team (2)
Finance Office
Base Metals Division
~~Docket~~
Mr. Jess Larson, DMPA
Admr. R. File
Operating Committee
Mr. F. E. Johnson
Mr. Murkland
Mr. Thayer, Rm. 5216 GSA
Mr. Hedges, Rm. 4604

DEFENSE MINERALS EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

AUDIT CERTIFICATE

I have examined the records and transactions of:

Mines Management, Inc.
Northport, Washington

432X

pertaining to Exploration Project Contract No. E-1, for the period of May 23, 1951 to February 1, 1952.

My examination was made in accordance with generally accepted standards applicable in the circumstances.

The audit disclosed the following facts in regard to amount to be paid the Contractor:

Total cost as billed by Contractor	$24,000.00
Exceptions taken by the Government	None
Total accepted cost	$24,000.00

The contract calls for a 50 percent participation of exploration expenses by the United States Government. Therefore, the amount of reimbursement to be paid the Contractor by the Government is:

TWELVE THOUSAND DOLLARS
($12,000.00)

This certificate is issued on the provision that the Executive Officer, the Administrator, or other competent official accepts the project as having otherwise met the terms of the contract.

Date: March 19, 1952

Robert M. Hull
Auditor

Omea432

AMENDMENT NO. 2

It is agreed this 20th day of September, 1951, between the United States of America, acting through the Department of the Interior, Defense Minerals Administration and Mines Management, Inc., 612 Chronicle Bldg., Spokane 8, Wash.

each acting in consideration of the agreement of the other to the terms hereinafter set forth, that the Exploration Project Contract Idm-31 of May 16, 1951 between the parties hereto be modified and amended as described in Exhibit "F", attached hereto, which, with any maps or drawings attached thereto, is made a part of this agreement. The effective date of this amendment shall be May 16, 1951.

This amendment is made by authority granted the Executive Officer, DMA Field Team, Region II in Order No. 2653 by the Acting Secretary of the Interior.

This amendment shall not be construed to increase the estimated total cost of the project, the aggregate total amount which the Government may be obligated to pay, or the percentage of costs which the Government may be obligated to pay, under the provisions of Article 13 of the contract form.

Executed in sextuplicate the day and year first above written.

MINES MANAGEMENT, INC.
(Operator)

By [signature]

The United States of America

By C. E. Weissenborn
C. E. Weissenborn, Exec. Officer
DMEA Field Team, Region II

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 28 1952

MINES MANAGEMENT, INC.
Exploration Project Contract Idm-E1

Amendment No. 2

EXHIBIT "F"

Changes and modifications

1. In paragraph 3, line 5, delete "100 shifts" and substitute "9 months."

Dma) 432

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 2 - 1952

APPROVAL

Contract dated Sept. 5 19 51, between Mines Management, Inc., 612 Chronicle Bldg., Spokane, Wash.

and Havlick Diamond Drilling Co., Spokane, Wash.

for carrying out certain specified work under the provisions of Exploration Project Contract I-DMA-51 between the United States of America and Mines Management, Inc.

is hereby approved.

This approval shall not be construed to increase the estimated total cost of the project, the aggregate total amount that the Government may pay, or the percentage of the costs that the Government may pay, under the provisions of Article 13 of the Contract form.

Dated January 7 19 52.

The United States of America

By A. E. Weissenborn
A. E. Weissenborn
Executive Officer
DMA Field Team, Region II

COPY

AGREEMENT

THIS AGREEMENT made and entered into this 5th day of DECEMBER 19 51 by and between MINES MANAGEMENT, INC. of CHRONICLE BLDG., SPOKANE, WASH. hereinafter referred to as "THE COMPANY" and HAVLICK DIAMOND DRILLING CO., INC., diamond drilling contractors, whose address is ~~1309 West Second Ave.~~ 2703 No. Pittsburg St., Spokane, Wash., hereinafter referred to as "THE CONTRACTOR".

In consideration of certain payments hereby agreed to be made by the Company, the Contractor agrees to drill Fifteen Hundred lineal feet at or near Northport, Washington and more especially known as the Iroquois Mine at drill sites to be selected by the Company, subject to the terms and conditions hereinafter set forth, provided this agreement is accepted within fifteen days of the above date.

1. LABOR AND MACHINERY: The Contractor undertakes to supply all the necessary diamonds, diamond drill machinery and men skilled in the operation thereof.

2. SIZE OR CORE AND RECOVERY: All holes under this agreement shall be drilled with standard size E.X.H. double tube core-barrel producing a core about 7/8 inches in diameter, the drill crew shall exercise every care and precaution to recover as high a percentage of core as the core-barrels used and the nature of the ground drilled will permit, and to deliver all such core to the person or persons designated by the Company, the Company shall determine the depth and angle of each hole, make provisions for the safe keeping of all cores recovered and keep such records as it may deem advisable in respect to them.

3. DEPTH OF MEASUREMENT OF HOLES AND COMPLETION THEREOF:

(a) No one hole shall exceed a depth of 300 feet; the Contractor shall use his best endeavors to complete all holes according to the wishes of the Company, but should cavaties or loose and caving material be encountered of such a nature as to prevent successful completion of any hole, the Contractor does not guarantee to drill to any certain depth, but shall drill as far as practicable under the conditions and shall be paid for such hole or holes at the rate herein specified for all footage completed.

(b) All measurements of holes shall be from the floor, the top of the casing or collar of holes.

4. DRILLING UNDER EXTRAORDINARY CONDITIONS: In the event that deeper drilling be found necessary, or drilling of concrete, drilling of extra large holes or drilling of holes not provided for in this agreement, it shall be performed at a special rate to be agreed upon between the parties hereto.

5. COMMENCEMENT AND EXECUTION OF WORK: Work under this agreement shall commence on or about the 15th day of December 19 51, with one drill~~s~~, with minimum of two shifts and shall continue with all due diligence until completed, provided always the Contractor shall not be liable for any loss or damage suffered by the Company by reason of strikes, accidents, acts of God, war, or action of the elements.

6. RATES FOR DRILLING: The Company agrees to pay for all drilling according to the following base drilling price schedules: This schedule is for any angle holes where the Mining Company supplies compressed air power.

From a depth of	0	feet to a depth of	300	feet	$5.00	per foot.
From a depth of		feet to a depth of		feet		per foot.
From a depth of		feet to a depth of		feet		per foot.
From a depth of		feet to a depth of		feet		per foot.
From a depth of		feet to a depth of		feet		per foot.
From a depth of		feet to a depth of		feet		per foot.
From a depth of		feet to a depth of		feet		per foot.
From a depth of		feet to a depth of		feet		per foot.
From a depth of		feet to a depth of		feet		per foot.
From a depth of		feet to a depth of		feet		per foot.

7. STANDPIPING, CASING AND CEMENTING OF HOLES: In the event of driving standpipe through overburden or casing being found necessary or advisable, or should cementing of any hole be deemed advisable, the Contractor shall be paid additional to the above base drilling price, in Clause Six, for such work as performed at the following schedule:

(a) STANDPIPING to be priced from a depth of xxxx to xxxx feet xxxx per foot.
STANDPIPING to be priced from a depth of xxxx to xxxx feet xxxx per foot.
STANDPIPING to be priced from a depth of xxxx to xxxx feet xxxx per foot.

(b) CASING HOLES: When it becomes necessary to put casing in any hole, the price per lineal ft. for reaming the hole shall be at the following rates:

$ 1.50 per ft. for E.X. Casing — $ 2.00 per ft. for B.X. Casing
$ 1.75 per ft. for A.X. Casing — $ 2.25 per ft. for N.X. Casing

plus a charge of $ .25 per lineal ft. for inserting and removing each line or size of casing. Casing ~~left~~ irrecoverable or in the hole at the Company's request, will be priced at cost - plus 10%.

(c) The price of cementing holes shall be $7.00 per hour for delayed time putting in cement and for drilling out cement and furnishing cement.

8. DELAYS: Delays for which the Company is responsible, the Company shall pay the Contractor $6.00 per hour, except where the Company gives the Contractor 24 hours written notice, in which event there will be no delayed-time charges.

9. SET-UPS AND WATER: The Company agrees to prepare set-ups and supply sufficient water and sufficient compressed air at the drill and to prepare necessary space to pull five feet of rods where holes do not exceed 100 feet in depth, and where holes exceed a depth of 100 feet, shall prepare enough space to pull 10 feet of rods.

10. PAYMENT: The Company hereby agrees to make payments at the rates and according to the terms hereinbefore specified, on or before the fifteenth day of each month for all footage drilled between the first and thirty-first days of the preceding month. On accounts unpaid thirty days from invoice date, interest will be charged at the rate of 10% per annum.

11. The Contractor agrees to take care of all Compensation, Taxes and Insurance on all men employed on the above work.

12. ~~The Company agrees to transport the drilling equipment from the nearest freight terminal to the mine and return to the freight terminal on completion of the contract~~.

13. ~~The Company will endeavor to provide meals and accommodations for the drill crew at prevailing rates.~~

14. ~~The Company shall furnish satisfactory evidence of ability to pay for all work completed under this agreement or the Company agrees to place in escrow a copy of this agreement with the Washington Trust Company, Spokane, Washington together with sufficient funds to cover cost of drilling under this agreement. The Contractor is to be paid for the drilling completed each month from these escrow funds upon presentation of invoices for the month, approved by the Company's official in charge of the operations.~~

SPECIAL CLAUSES

NOTICE: Any notice to be given hereunder shall be properly given if delivered in writing to the:

COMPANY'S ADDRESS AS FOLLOWS:

~~MINES MANAGEMENT, INC.~~

~~612 Chronicle Bldg., Spokane, Wash.~~

CONTRACTOR'S ADDRESS AS FOLLOWS:

HAVLICK DIAMOND DRILLING CO., INC.

~~2703 No. Pittsburg St.~~

Spokane, ~~8~~ 26, Washington

IN WITNESS WHEREOF these presents have been executed by the parties hereto the day and year first above written.

COMPANY _____

WITNESS _____

CONTRACTOR J. C. Havlick

WITNESS M. E. Eklund

PKR

AMENDMENT NO. 1

It is agreed this 13 day of November, 1951, between the United States of America, acting through the Department of the Interior, Defense Minerals Administration and Mines Management Inc., 612 Chronicle Building, Spokane 8, Washington

each acting in consideration of the agreement of the other to the terms hereinafter set forth, that the Exploration Project Contract I-DMA E1 of May 16, 1951 between the parties hereto be modified and amended as described in Exhibit "F", attached hereto, which, with any maps or drawings attached thereto, is made a part of this agreement. The effective date of this amendment shall be November 13, 1951.

This amendment is made by authority granted the Executive Officer, DMA Field Team, Region II in Order No. 2653 by the Acting Secretary of the Interior.

This amendment shall not be construed to increase the estimated total cost of the project, the aggregate total amount which the Government may be obligated to pay, or the percentage of costs which the Government may be obligated to pay, under the provisions of Article 13 of the contract form.

Executed in sextuplicate the day and year first above written.

(Operator)

By [signature]
Mines Management Inc.

The United States of America

By Glenn Reed
Glenn Reed
For: M. E. Volin,
Acting Executive Officer, DMA Field Team, Region II

DMA 432
I-DMA-E1

EXHIBIT "F"

Amendment No. 1

Beginning 10 feet back from the face of the present No. 2 crosscut, a crosscut is to be driven S. 27° W., for a distance of 150 feet. A diamond drill station is to be cut at the face of this crosscut from which two inclined diamond drill holes will be drilled to intersect the southwestern extension of the ore zone now exposed near the face of No. 2 crosscut. These holes will intersect the ore zone approximately 100 feet below the No. 2 crosscut level.

150 ft. crosscutting at $25/ft.	$3750.00
Cutting diamond drill station	200.00
300 ft. diamond drilling	2250.00
	$6200.00

One hole is to be diamond-drilled from No. 10 crosscut with vertical angle -27° in the same vertical plane as pre-existing diamond drill hole No. 19. This is to explore downward extension of ore intersected in DDH. 19.

200 ft. Diamond drilling at $7.50/ft. $1500.00

Labor and Supervision Job Classification	Maximum number on project
Miners	2

Labor for the project may be paid at shift rates or unit contracts at the discretion of the Company but rates are not to exceed standards of like work in this district. Contract rates for crosscutting are $8.00 per foot: wage rates for miners are $1.735 per hour

Docket DMA-432
Contract No. 14m-31
Mines Management, Inc. (Iroquois)
Stevens County, Washington

JUSTIFICATION FOR AMENDMENT NO. 1

The original contract allows only for diamond drilling. As a result of a negatively inclined vertical hole near the face of the No. 2 crosscut, it was found that a promising ore zone occurred here, dipping nearly 60 degrees toward the face of the crosscut. Inasmuch as there were no available locations in the mine workings from where to drill to intersect this zone at a favorable angle at different places along the strike, it was decided to drive a crosscut in such a direction that a drill station could be cut in it and from which the newly discovered ore zone could be penetrated with drill holes at a favorable angle. Information gained by drilling from this new drill station would accrue to the benefit of both the Government and the Operator as added evidence can be gained concerning the thickness, grade, and bearing of the newly discovered ore zone.

ME-[illegible]
(April 1951)

File

Docket No. DMA 432
Commodity Zinc

I-DMA-E1

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

EXPLORATION PROJECT CONTRACT [1]

It is agreed this 16 day of May, 1951, between the United States of America, acting through the Department of the Interior, Defense Minerals Administration, hereinafter called the "Government," and [2]

Mines Management, Inc.
612 Chronical Building
Spokane 8, Washington

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 Washington, County of Stevens described as follows: [3]

Those certain mining claims known and described as "Progress", "Prosperity", "Columbia", "Black Bear", and "Brown Bear" in the Northport Mining District

Also a tract of land described as follows: Commencing at the corner of Sections 19, 20, 29 and 30, Twp. 40 N., R. 42 E.W.M.; thence N. 89° 47' E. 523 feet along the line between said sections 20 and 29, thence N. 34° 49' W. 601 feet; thence S. 37° 38' W. 1565.2 feet; thence S. 34° 49' E. 224 feet; thence S. 51° 41' W. 631 feet to south line of NE¼ of NE¼ of Sec. 30, said Township and Range; thence East 1145 feet along said South boundary line to line between said Sections 29 and 30 and the southeast corner of said NE¼ of NE¼; thence North along said Section line 1320 feet to point of beginning.

Also the SE¼ of SE¼ Sec. 19, Twp. 40 N., R. 42.

properly designed to bring the project to completion within a period of [illegible] 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. Attached hereto, marked "Exhibit 'B'," is a detailed list of 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 its agreed pro-rata share of the cost. 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.* Attached hereto, marked "Exhibit 'C'," is a detailed list of operating equipment divided into categories of items to be rented, purchased, or furnished by the Operator, with the allowable rental, purchase price, or rental value, as the case may be, annexed to each. 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.

* If skilled help is available the work will be carried out on a 3 shift basis.

(File Copy)

16—64066-1

7. *Title to and disposition of prope* All facilities, buildings, fixtures, equipmen r 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.* Attached hereto, marked "Exhibit 'D'," is 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.

9. *Rehabilitation and repairs.* Attached hereto, marked "Exhibit 'E'," is a detailed schedule of existing facilities, buildings, installations, and fixtures, with a statement of the cost of any necessary rehabilitation or repairs to put into useful and operable condition, which cost shall be allowed as a cost of the project.

10. *Allowable costs of the project.* The allowable 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, 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 the 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, or any other indirect costs not expressly allowed by these regulations, 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. *Participation by the Government.* At the end of the first full calendar month after the Operator has commenced work under the project, and at the end of each succeeding calendar month, the Operator shall submit to the Government a voucher for payment with a detailed statement of work done and allowable costs (as defined in Article 10 of this agreement) incurred, in a form and with supporting data acceptable to the Government. After approving the voucher, the Government shall pay to the Operator 50 percent of the sum of such costs incurred; *Provided*, That the aggregate total of all sums paid by the Government under this agreement shall not exceed $ 12,000, which is 50 percent of the agreed estimated total cost of this project, $ 24,000.

12. *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.

13. *Progress reports.* The Operator shall provide the Government with monthly reports of progress in form and content satisfactory to the Government, and upon the completion of the project or termination of the contract 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.

14. *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 additional for each 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 property 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.

15. *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.

16. *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 triplicate the day and year first above written.

MINES MANAGEMENT, INC.
(Operator)

By [signature]
President

THE UNITED STATES OF AMERICA

By [signature]
Administrator, Defense Minerals Administration

U. S. GOVERNMENT PRINTING OFFICE 16—64066-1

Docket No. DMA-432
Commodity - Zinc

EXPLORATION PROJECT CONTRACT

EXHIBIT "A"

Exploration Project:

Drill approximately 26 Diamond Drill holes from surface and present underground workings to intercept the possible extensions of a mineralized zone above and below the present workings. (See attached map).

Approximately 2,800 feet of Diamond Drilling at an average cost of approximately $8.57 per foot (including supervision, labor, engineering, fuel, other supplies, sampling, assaying, etc.). - $24,000.00

EXHIBIT "B"

Fixtures and Improvements:

Any additional facilities, buildings and fixtures to be purchased, installed or erected by the Operator shall not be charged as a cost of the project.

EXHIBIT "C"

Operating Equipment:

Equipment rented, purchased or owned and furnished by the Operator, shall not be charged as a cost of the project.

EXHIBIT "D"

Labor and Supervision:

Labor

No.	Class	Maximum wage rate Per 8 hr. shift
1 to 3	Mechanic	$ 12.00
1 to 3	Sampler	12.00

Supervisor

No.	Class	Maximum Salary Per Month
1	Engineer	$ 375.00
1	Geologist	400.00
1	Superintendent	500.00

EXHIBIT "E"

Rehabilitation and Repairs:

The cost of any rehabilitation and repairs to put existing facilities, buildings, installations and fixtures, into useful and operable condition shall not be charged as a cost of the project.

MF-202

LANDLORD'S SUBORDINATION AGREEMENT

KNOW ALL MEN BY THESE PRESENTS:

WHEREAS, the undersigned is the owner in fee simple of that certain parcel of ground in the county of Stevens, State of Washington, described in a certain Exploration Project Contract dated May 16, 1951, between Mines Management, Inc.,

the Lessee of said property, and the United States of America;

NOW, THEREFORE, the undersigned, as Lessor of said property under lease dated May 15, 1948, does by these presents subordinate all of his right, title, and interest under the provisions of said lease to the right, title, and interest of the United States of America under the provisions of said Exploration Project Contract, and agrees that the lien and claim of the United States of America under the provisions of said contract shall be prior to the undersigned's rights to rentals or royalties under the terms of said lease; and

The undersigned further agrees that if said leasehold interest should be surrendered or if said lease should terminate at any time prior to the expiration of the rights of the United States of America under said Exploration Project Contract, the undersigned shall assume and does hereby assume all of the obligations of the Lessee under said Exploration Project Contract to make repayment to the United States of America according to the terms of said contract; and

The undersigned agrees to commit no act, nor assert any claim under judicial process or otherwise that may contravene or conflict with the prior lien and claim of the United States of America under the provisions of said Exploration Project Contract.

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

Dated this 1st day of May, 1951.

Magnus Wells

U. S. GOVERNMENT PRINTING OFFICE 940768

A S S I G N M E N T

KNOW ALL MEN BY THESE PRESENTS that W. RANDOLPH GREEN and JACQUELINE R. GREEN, husband and wife, for and in consideration of the sum of Ten ($10.00) Dollars and other valuable considerations, the receipt whereof is hereby acknowledged, have SOLD, ASSIGNED, TRANSFERRED and SET OVER and by these presents do hereby sell, assign, transfer and set over unto the MINES MANAGEMENT INC., a corporation qualified to do business in the State of Washington, its successors and assigns

> all our right, title and interest in and to the attached Lease and Option dated the 15th day of May, 1948 for the purchase of certain mining claims and property from Grace C. Wells, a widow, and Magnus Wulff, a widower, therein called Lessors, and W. Randolph Green, one of the parties hereto

and we do hereby give the said MINES MANAGEMENT INC., a corporation, its successors and assigns, full power and authority for its use and benefit but at its cost, to take all legal measures which may be proper for the complete recovery, use and enjoyment of said assigned property rights, and in our name or otherwise to prosecute and defend any and all suits in law or in equity required to enjoy the full use of all rights therein and thereto as provided in the assigned contract.

IN WITNESS WHEREOF we have hereunto set our hands and seals this 7th day of September, 1948.

W. Randolph Green (SEAL)

Jacqueline R. Green (SEAL)

STATE OF WASHINGTON)
) ss
County of Spokane)

I, Jerome C. Barline, a Notary Public in and for said county and state, do hereby certify that on this 7th day of September, 1948 personally appeared before me W. RANDOLPH GREEN and JACQUELINE R. GREEN, husband and wife, and known to me to be the individuals described in and who executed the above and foregoing instrument, and acknowledged that they signed and sealed the same as their free and voluntary act and deed for the uses and purposes therein mentioned.

Witness my hand and official seal this 7th day of September, 1948.

Jerome C. Barline
Notary Public in and for the State of Washington, residing at Spokane.
My commission expires Feb. 18, 1951

(SEAL)

LEASE AND OPTION

THIS LEASE AND OPTION Made this 15th day of May, 1948 by and between Grace C. Wells, a widow and Magnus Wulff, a widower, as parties of the first part hereinafter called the Lessors and W. Randolph Green, as party of the second part, hereinafter called the Lessee,

WITNESSETH:

That the Lessors, for and in consideration of the sum of One Dollar, and in consideration of the covenants herein contained, and the rentals hereinafter reserved by the Lessors, do hereby lease unto the Lessee for the term of one year from and after the date hereof, subject to the conditions herein contained, the following described premises, situate in Stevens County, Washington, to-wit:

Those certain mining claims known and described as "Progress", "Prosperity", "Columbia", "Black Bear", and "Brown Bear" in the Northport Mining District

Also a tract of land described as follows: Commencing at the corner of Sections 19, 20, 29 and 30, Twp. 40 N., R. 42 EWM; thence N. 89° 47' E. 523 feet along the line between said sections 20 and 29, thence N. 34° 49' W. 601 feet; thence S. 37°38' W. 1565.2 feet; thence S. 34° 49' E. 224 feet; thence S. 51° 41' W. 631 feet to south line of NE¼ of NE¼ of Sec. 30, said Township and Range; thence East 1145 feet along said South boundary line to line between said Sections 29 and 30 and the southeast corner of said NE¼ of NE¼; thence North along said Section line 1320 feet to point of beginning.

Also the SE¼ of SE¼ Sec. 19, Twp. 40 N., R. 42

and do grant and give to the Lessee during the term of this lease and no longer the first right, option and privilege of purchasing said property upon the terms and conditions hereinafter set forth.

And the Lessee does hereby agree to lease the said premises for said period, and upon the execution of this agreement, the Lessee shall have the right to enter upon said premises and property, prospect and explore for and develop the ores and minerals found thereon and therein, and to ship, sell and market all minerals and ores and metals found thereon and to erect, construct, install and operate and maintain such tunnels, drifts, stopes, mining developments and excavations, buildings, and such plants and equipment as may be useful in the development and mining of such ores and minerals, and the extracting, mining, milling and shipment thereof, and to take from said premises and use thereon such timber as may be necessary for mining operations on said premises.

And as rental for said premises, the Lessee agrees that he will pay to the Lessors ten per cent of the net smelter returns from all ores, metals, minerals and concentrates shipped from said premises during the term of this lease, such royalty of ten per cent is to be paid direct by the smelter or other purchaser of such ores, metals, minerals and concentrates direct to the Guaranty State Bank of Colville, Washington to the credit and account of the Lessors.

The term "net smelter returns" as herein used shall be construed to mean the smelter or other returns after the deduction of the treatment and transportation charges. In the event truck transportation is used, the amounts deductible as transportation charges shall be the prevailing and reasonable charges and shall not exceed in any event the rates which would be charged by railway from the nearest railway loading point to destination of shipment, and if shipments are made by railway, the cost of transportation from the mine to the railway loading station shall not be considered as deductible transportation charges.

And it is agreed by and between the parties, that in the event the Lessee desires to exercise the option to purchase said premises during the life of this lease, he shall during the life of said lease, to-wit: within one year from the date hereof, notify the Lessors thereof by written notice mailed by registered

mail to the Lessor, Magnus Wulff at Northport, Washington, or his last known address, to the Lessor Grace C. Wells at 1035 Burwell Apt. 3, Bremerton, Washington, or her last known address; and in case of such exercise of said option the purchase price of said premises shall be the sum of $30,000.00, payable as follows:

$5000.00 at the time of the exercise of said option by giving the notice aforesaid.

$5000.00 every six months thereafter until the full purchase price of $30,000.00 is paid.

And in the event of the exercise of said option and until the purchase price of said property is fully paid, the Lessee shall and he does so agree to pay to the Lessors, as royalties on all ores, minerals, metals and concentrates mined and shipped and sold from said property a royalty of ten per cent of all net smelter returns as hereinbefore defined. All royalty payments as and when received by the Lessors shall be credited to and applied by the Lessors upon the payments to be made by Lessee upon the purchase price of said property and the installments thereon to be paid as herein provided and in the order of their maturity, and all sums paid as rental prior to the exercise of said option shall be so credited on the purchase price of said property.

And it is hereby further agreed that as and when shipments of ores, minerals, metals or concentrates are made by the Lessees from said premises or sales thereof made by Lessees, a statement shall be made and furnished to the Lessors showing the amount thereof, dates shipped and sold, the consignee or purchaser, and his or its address, and the price received, and such payments of royalties hereunder shall be paid direct by the smelter or purchaser to said Bank for Lessors and be accompanied by a duplicate statement of such smelter or purchaser containing the information herein specified. This contract shall be authority to such smelter or purchaser to make such payments. All smelter returns are to be treated confidentially by parties of first part.

All payments and royalties specified herein to be paid by Lessees shall be paid to the Guaranty State Bank at Colville, Washington for the said Lessors.

And it is agreed that the Lessee shall keep true and correct books and accounts showing production, shipments, dates and receipts and that the Lessors shall have the right to inspect same at any and all reasonable times and such books and accounts shall be kept available for such purpose.

And it is further agreed that the Lessors or their representatives shall have the right of entering on and inspecting the said mining property and the operations thereon at reasonable intervals.

Lessee agrees that he will at all times keep the property properly posted stating that employees and persons furnishing materials, equipment, machinery, etc. must look to the Lessee for payment of all accounts, and that the owners of the property are not responsible for wages or any other accounts. The Lessee shall pay all labor at least once in each thirty days, and also shall pay accounts for supplies, materials, etc. promptly when due.

And the Lessee agrees to pay the State of Washington, as and when due, all Industrial Insurance and Medical Aid Contributions or charges, for workmen employed by him and all Social Security and Unemployment Compensation charges becoming due the State or Federal Governments, and shall pay during the period of the lease and option all taxes assessed or imposed upon or against said premises, but shall not pay any income taxes for parties of first part, and shall comply with all the laws and regulations of the Federal and State Governments with reference to employment of labor, wages and hours.

And it is agreed by and between the parties that all payments shall be paid to the Guaranty State Bank of Colville, Washington, (hereby appointed by the parties hereto as escrow agent), for the Lessors, and that in the event the option to purchase is exercised that then, upon the payment of the first installment of $5000.00 on the purchase price, the Lessors will execute a good and sufficient deed for said

premises and place the same in escrow with said Bank, to be delivered by it to Lessee upon full payment of the purchase price, in the manner and within the time herein limited and specified, and when said purchase price has been fully paid, the Lessors shall furnish an abstract of title showing good title in the Lessors, free of encumbrances. A copy of this agreement shall likewise be deposited in said Bank with said deed. The Lessors may at their own expense draw an abstract at this time, may deduct the cost from the next due payment.

In the event of the failure of the Lessee to comply with the terms and conditions hereof, and make payment of said purchase price as herein provided, all escrow papers shall be returned to Lessors.

And it is agreed between the parties that any machinery and equipment installed by Lessee on the property, which is not permanently affixed thereto, may be removed by the Lessee should this agreement be forfeited or terminated, but that all buildings and permanent improvements are to remain upon the property and the title thereto be vested in the Lessors, and that the Lessee may have the period of sixty days after such termination to remove his property removable hereunder.

Time is of the essence of this agreement, and in the event of the failure of the Lessee to comply with the terms of this lease, or in the event of the exercise of the option to purchase, the failure to comply with the terms of said option, and to make the payments within the time and in the manner herein specified, then the Lessors, at their option may terminate this contract, lease and option by notice thereof directed to the Lessee at his address at West 2324 Dalton Ave., Spokane, Washington, or his last known address, said notice to be given by registered mail, and to specify the defaults of Lessee and thereafter the Lessee shall have the period of 30 days to cure and correct such defaults, and in the event he fails so to do, then this lease and option shall be deemed cancelled and terminated without further notice, and all rights of Lessee thereunder terminated, and in the event of such termination and forfeiture, the Lessors shall keep and retain all sums theretofore paid, and all buildings and other permanent improvements, as rental and as damages hereby liquidated for the failure of the Lessee to comply with the terms hereof. In like manner the Lessees may relinquish this option without cost to them by giving notice in writing to the above named owners.

And it is agreed that in the event of default by Lessee in any of the terms and conditions hereof and in making payments as herein specified the remedy of the Lessors shall be forfeiture and termination of this lease and option, and they shall have no personal action against the Lessee.

The option to purchase herein granted shall be in force and effect and must be exercised as herein specified and within the term of this lease, to-wit, within one year from the date hereof.

The terms of this agreement shall extend to and inure to the benefit of the parties, their heirs, executors, administrators and assigns.

Any notices required to be given hereunder by the parties, the one to the other shall be addressed to the parties as follows:

To Lessors: Magnus Wulff, Northport, Wash.
Grace C. Wells, 1035 Burwell Apt. 3, Bremerton, Wash.
or in event of change of address to their last known address.

To Lessee: W. 2324 Dalton Ave., Spokane, Wash.
or in event of change of address to his last known address.

In Witness Whereof the parties have hereunto set their hands and seals this 15th day of May, 1948.

Magnus Wulff

Grace C. Wells
Lessors

W. Randolph Green
Lessee

STATE OF WASHINGTON)
) ss
County of Stevens)

I, J. H. Guenther, a Notary Public for said County and State do hereby certify that on this 4th day of May, 1948, personally appeared before me MAGNUS WULFF, to me known to be the individual described in and who executed the above and foregoing instrument and he acknowledged that he signed and sealed the same as his free and voluntary act and deed for the uses and purposes therein mentioned.

Witness my hand and official seal this 4th day of May, 1948.

J. H. Guenther
Notary Public in and for the
State of Washington, residing (SEAL)
at Northport.

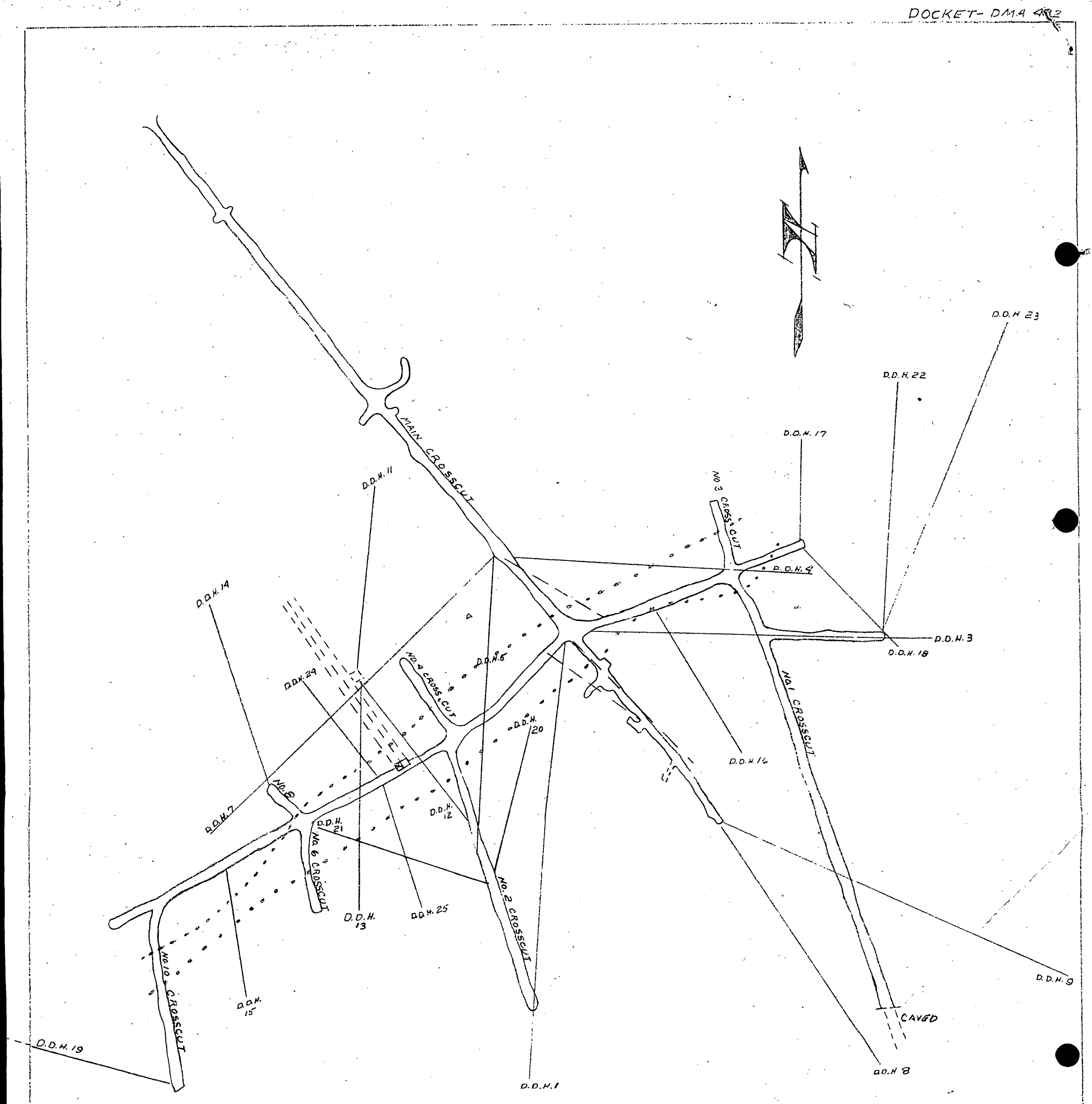
STATE OF WASHINGTON)
) ss
County of Kitsap)

I, Corinne Rosvold, a Notary Public for said County and State do hereby certify that on this 7th day of May, 1948, personally appeared before me GRACE C. WELLS, to me known to be the individual described in and who executed the above and foregoing instrument, and she acknowledged that she signed and sealed the same as her free and voluntary act and deed for the uses and purposes therein mentioned.

Witness my hand and official seal this 7th day of May, 1948.

Corinne Rosvold
Notary Public in and for the
State of Washington, residing (SEAL)
at Bremerton.

DOCKET- DM.4 4912



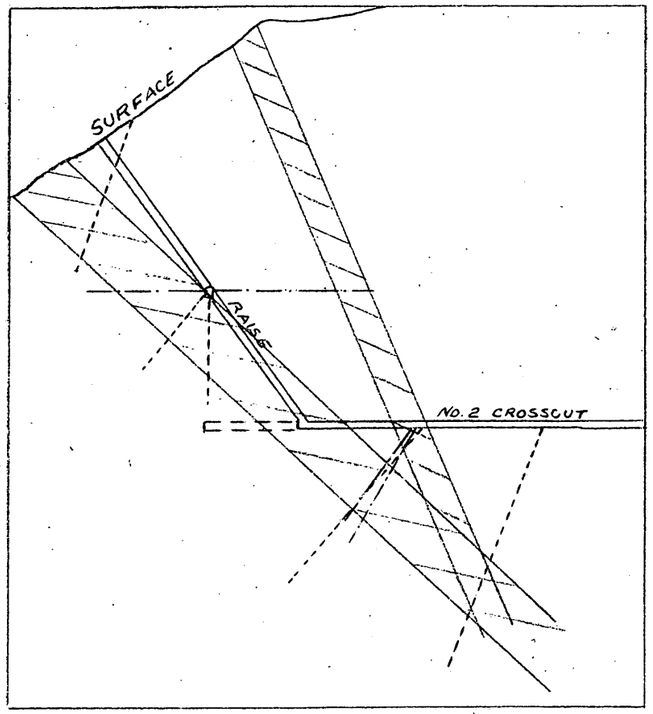
• • • • • OUTLINE OF ORE

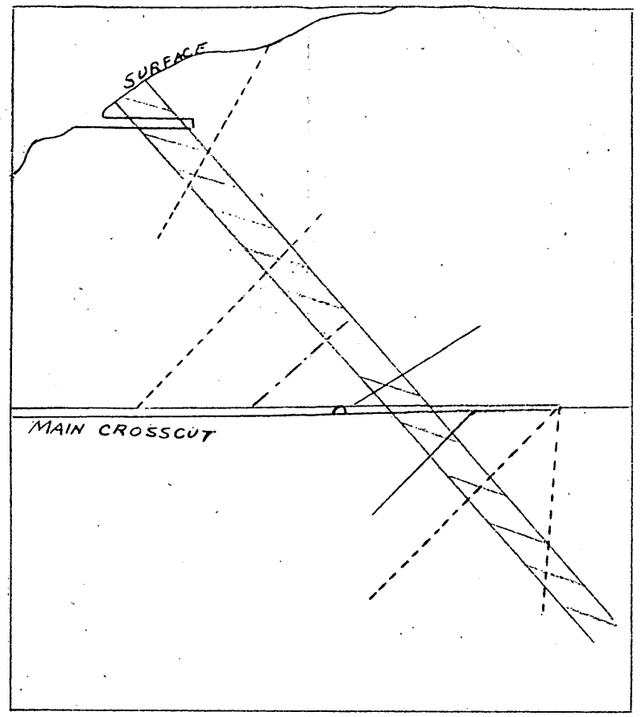
PROPOSED DRILL HOLES ARE ON SECTION MAP

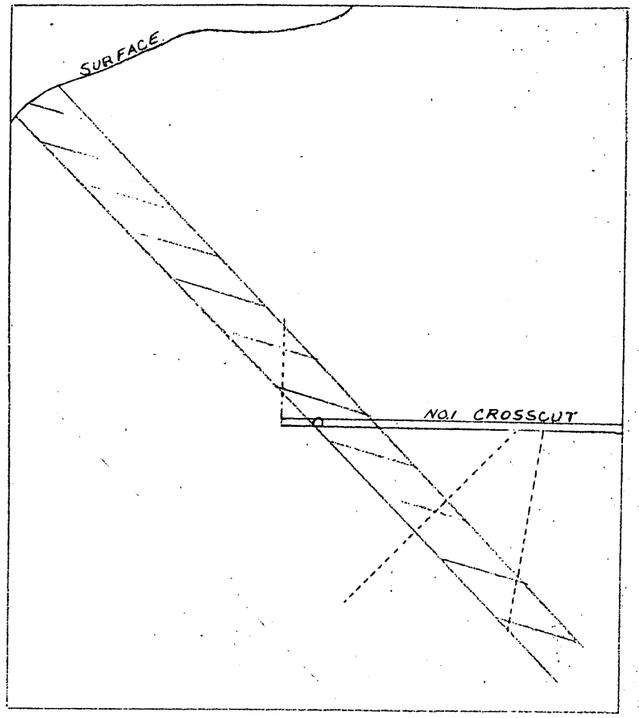
PLAN OF MAIN UNDERGROUND WORKINGS - IROQUOIS MINE, STEVENS COUNTY, WASHINGTON

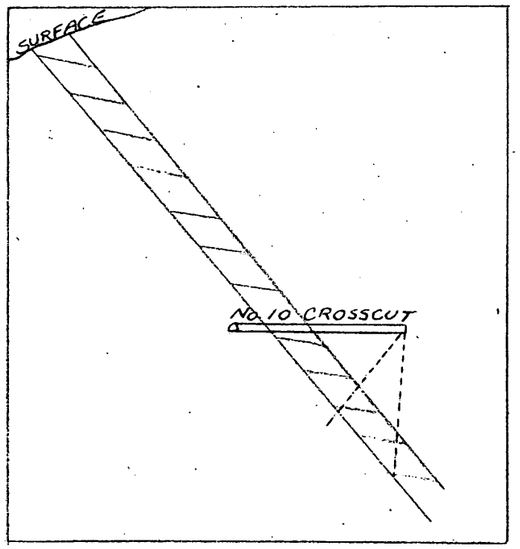
SCALE 50 0 50 100 150 200 FEET

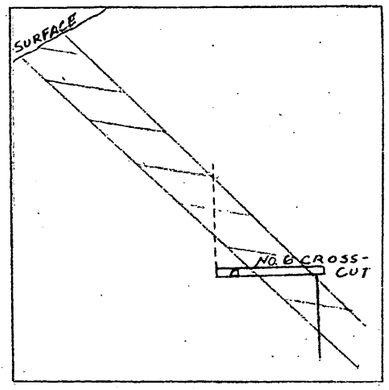
ADVANCE or TRIAL COPY
Not Yet Approved for Official Release Subject to Recall and Revision, Your Comments Are Invited
U. S. GEOLOGICAL SURVEY











EXPLANATION

—— EXISTING D.D.H. IN PLANE OF SECTION

—·— EXISTING D.D.H. NOT IN PLANE OF SECTION.

-------- PROPOSED D.D.H.

D.D.H DIAMOND DRILL HOLE

PROBABLE ORE ZONE

SECTIONS SHOWING PROPOSED EXPLORATION OF IROQUOIS MINE

SCALE 50 0 50 100 FEET

ADVANCE or TRIAL COPY
Not Yet Approved for Official Release Subject to Recall and Revision, Your Comments Are Invited
U. S. GEOLOGICAL SURVEY

Attach to Contract No 1-DMA-[illegible]

MINES MANAGEMENT, INC.

Northport, Wash.

Docket DMA No. 432, Contract No. I-DMA-[illegible]

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
JUL 16 1951

Addendum - Exhibit "D"

The following wage rates omitted from Contract No. I-DMA-[illegible], Exhibit "D" shall be considered a lawful retroactive addition to the subject contract.

Class	Maximum wage rate Per 8-hour shift
Surface labor	$11.00
Bookkeeper	11.20
Clerk	11.00

This addendum herewith is accepted by the authorized official of Mines Management, Inc., and the United States of America.

By _____
Signature of authorized official

THE UNITED STATES OF AMERICA

~~July 10, 1951~~
(Date)

By _____
Administrator, Defense Minerals Administration

500

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

December 23, 1953

Project Summary Report

By: A. G. Keating

1. DMA 432 (Lead-Zinc)
   Contract No. Idm-E1
   Iroquoise Mine
   Stevens County, Washington

   Operator: Mines Management, Inc.
   612 Chronicle Building
   Spokane 8, Washington

   Operator's Property Rights: 5/15/48 Lease and Option subject to Payments 5/15/51 $5,000.00, 11/15/51 $5,000.00 on five claims, other claims free and clear.

2. Contract MF-200 April 1951, dated 5/16/51 to be completed within 100 shifts. Work was completed January 1952.

   Work authorized:

   No additional buildings for fixtures.
   No equipment rented or purchased.

Diamond drill 26 holes from surface approximately 2,800 ft. of drilling @ $8.57 per foot (including supervision, labor, engineering, sampling and supplies).	$ 24,000.00
Total estimated cost of the project	$ 24,000.00
Government participation at 50 per cent	$ 12,000.00

Amendments

11/13/51 Amendment No. 1 Provides the following change of work:

Crosscutting 150 ft. @ $25.00 per foot	$ 3,750.00
Excavate diamond drilling station	200.00
Diamond drilling 300 ft. @ $7.50/ft.	2,250.00
	$ 6,200.00

(No increase to the estimated total cost of the project)

Work Completed 1/31/51

Diamond drilling 18 holes 3,056 ft. @ $6.75 per foot	$20,624.46
Crosscutting 151.5 ft. @ $22.28 per foot	3,375.54
	$24,000.00
Government participation 50 %	$12,000.00

3. Audit certificate issued 5/19/52 (No exceptions).

4. Certification of Discovery - issued 7/16/52.

Ore estimates - indicated and inferred.
188,962 short tons - 4.01% Zn., 1.67% Pb.
Production - none.

5. Comments:

The project was conducted in an efficient and economical manner. Operator furnished good engineering and geological reports. The project was established to find additional ore-bodies or extensions of a partially developed zinc-lead sulphide orebody by diamond drilling. It was believed that sufficient low-grade zinc-lead ore might be found to justify a benefication plant. The ore occurs as replacements in dolomitic limestone overlying slate. The work completed was successful in adding to the tonnage of expected ore reserves but the shapes and sizes of the mineable orebodies have not been fully determined. Unexpected faults were found which reduce vertical extensions of the main orebody above and below the main tunnel. It will be necessary to do additional work to more fully establish ore reserves and add to the expected tonnage to justify expenditures for a mill. In addition to more diamond drilling it will be necessary to do drifting, crosscutting and raising before actual production is started.

This property is a potential source of zinc and lead during a period of high metal prices or in a national emergency.

Keating
A. G. Keating

Audited

☒ Certified

Name Mines Management, Inc.

State Washington

WORK ANALYSIS SHEET - DMEA PROJECT

Analysis as of 11/29/54.

Incl. Voucher for January 1952.

Commodity Lead-Zinc

☒ Actual Cost

☐ Agreed Unit Costs

Docket No. DMEA-432

Idm-E No. 1

OPERATION	AUTHORIZED Units	AUTHORIZED Cost	COMPLETED Units	COMPLETED Cost	NET COST
Drifting & Crosscutting	150'	$3,750.00	151.5'	$3,375.54	$3,375.54
Raising					
Shafts					
Winzes					
Drilling (Specify) Diamond	3,400'	$20,250.00	3,056'	20,624.46	20,624.46
Surface Excavation					
Underground Excavation					
Roads and Trails					
Operating Equipment Purchased					
Surface Rehabilitation & Repairs					
Underground Rehabilitation					
New Building, Improvements, etc.					
Other (Specify)					
Totals		$24,000.00		$24,000.00	$24,000.00

Prepared by W. K. Klugesheid

71626

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION
So. 157 Howard Street
Spokane 4, Washington
October 2, 1961

OFFICIAL FILE COPY
O. M. E.
RECEIVED OCT 4 1961

DATE	INITIALS	CODE
		120
10-4		100
10/4		110
10/5		800
"	Prepared	500
		220

Memorandum

To: Chief, Division of Field Operations

From: Acting Field Officer, Region I

Subject: DMEA-432 (Zinc)
Mines Management, Inc.
Iroquois Mine
Stevens County, Washington
Contract I-DMA-E1

Your memorandum of August 14, 1961, has gone so long unanswered because of difficulty in securing accurate information.

E. A. Magill of the Bureau of Mines passed by the subject property this past summer, and although he did not make a visit, said there was no sign or rumor of any recent activity.

Many unsuccessful attempts were made to reach W. R. Green, president of the company, by phone. September 21 he returned a Request for Information form we had sent him on May 2. He states that there has been no change in ownership and that no ore has been produced since December 31, 1959. Therefore, the Annual Report we sent you September 21, 1960, is still valid without change.

D. R. MacLaren

D. R. MacLaren

Enclosure (in duplicate)

REQUEST FOR INFORMATION
FROM OPERATOR ON CERTIFIED PROJECT
AND PROJECT UNDER ROYALTY AGREEMENT

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION

OFFICE COPY
O. M. E.
RECEIVED OCT 4 1961

From: Field Officer, OME, Region I
So. 157 Howard Street
Spokane 4, Washington

Date: May 2, 1961

Concerning:
Docket No. DME-432N (Zinc) CODE
Property Iroquois Mine
Location Stevens County, Washington

W. R. Green
W. 3414 Euclid Avenue
Spokane, Washington

With the certification of the exploration project identified above, you were asked to inform our office about changes in the status of the property and production from it.

To assist you to furnish this information and to assure the accuracy of our records, we ask that you answer the questions below and return ~~one copy~~ two copies to this office with copies of any pertinent documents.

D. R. MacLaren
D. R. MacLaren
Acting Field Officer, OME, Region I

1. Since December 31, 1959, has there been a change in ownership, lease, or sublease about which the OME has not been notified? If yes, please state details of the transaction below and provide a true or signed copy of the pertinent documents. Yes ☐ No ☒

2. Since December 31, 1959, has there been any production from the property?* Yes ☐ No ☒

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

	Quantity	Value

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

Type	Quantity	Estimated Grade	Location
Ore	Tons		
Concentrates	Tons		
Other	Tons		

Submitted by:

Name W. R. Green Title President

Address Date Sept 21, 1961

MME Form 63 8-60 * Property means land subject to the contract. 79340-60

RECEIVED
SEP 22 1961
U.S.
WASH.

Final memo from
Region I

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
8/10		~~500~~
8/10	Griswold	500
8/11	Talbot	800
8/11	[illegible]	130
8/14	[illegible]	110
8-14	Turnell	100
		220
		500

AUG 1 4 1961

Memorandum

To: Acting Field Officer, Region I

From: Chief, Division of Field Operations

Subject: DMEA-432 (Zinc)
Mines Management, Inc.
Iroquois Mine
Stevens County, Washington
Contract I-DMA-81

In that the royalty termination date on the referenced contract was May 16, 1961, at your convenience will you kindly give us a brief memorandum covering it. Your last report stated there had been no production to September 21, 1960, but we should be brought up to date prior to writing a letter of release.

/s/ George C. Selfridge

(2/2)

WRGriswold/gla
8-10-61
cc to: Director's Reading File
Review Committee
Docket
Code 500

43683

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
8/11		500
		220

August 11, 1961

Memorandum to the File

From: W. R. Griswold, Chief, Division of Minerals

Subject: DMEA-432 (Zinc)
Mines Management, Inc.
Iroquois Mine
Stevens County, Washington
Contract I-DMA-E1

A small tonnage of development ore (only 151 feet of crosscutting was done) could not possibly be of any economic value with a grade of 4 percent zinc and 1.6 percent lead. Only if a large mill existed on the property could such marginal material be utilized.

WRGriswold

43683

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

1201 N. Division St.
Spokane 2, Washington
April 25, 1956

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

Re: Docket No. DMA-432 (zinc)
Mines Management, Inc.
Iroquois Mine
Stevens County, Washington
Contract No. I-DMA-El

Dear Mr. Selfridge:

In line with your letter of April 10, we have contacted Mr. W. R. Green, president, Mines Management, Inc. and he estimated that the cost of the company's 50-ton mill built near Northport, Washington, in 1952 was approximately $58,000.00.

By Field Team, Region I, NW District

A. E. Weissenborn

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

Wing G. Agnew

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

cc: USGS (2)
USBM (AD)

File Copy
Surname

500

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

APR 10 1956

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

Re: Docket No. DMA-432 (Zinc)
Mines Management, Inc.
Iroquois Mine
Stevens County, Washington
Contract No. I-DMA-81

Dear Mr. Weissenborn:

The Addendum to Semi-Annual Report of Certified Project, March 15, 1956, by M. R. Mickes (Engineer), has been received. She states:

> "During the summer of 1952 a 50-ton mill was built by the company near Northport, Washington, to make a trial of the flowsheet indicated by laboratory mill tests. Falling prices for lead and zinc discouraged erection of a large capacity mill, and no further work has been done."

As this is an investment made by the Operator as a result of the DMEA ore findings, we would appreciate it if you could obtain the complete cost of this 50-ton mill.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee (JWB)

APPROVED:

I. W. Pennington (JWB)
Member, Bureau of Mines

N. E. Nelson (JWB)
Member, Geological Survey

JWAlt/bjl (4/6/56)

Copy to: Docket
Admr. R. File
Op. Committee
Base Metals
Mr. Bishop
Mr. Riilsgaard
Chron.

R.C.R.

DEFENSE MINERALS EXPLORATION ADMINISTRATION

ROYALTY REPAYMENTS
AS OF JULY 31,1954

OPERATOR

Mines Management, Inc. (c)

CONTRACT NO.

E-1

DOCKET NO.

432

DATE OF CERTIFICATION

7/16/52

AMOUNT REPAYABLE

$12,000.00

RECEIVED DURING JULY

$ --

TOTAL RECEIVED

$ --

DATE OF LAST RECEIPT

X-

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

~~WASHINGTON 25, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 5 1953

December 31, 1952

Mr. F. E. Johnson, Chairman
Operating Committee, DMEA
Dept. of the Interior
Washington 25, D. C.

Re: Docket No. DMEA-432 (Zinc-Lead)
Iroquois Mine
Stevens County, Washington
Contract No. Idm-1

Dear Mr. Johnson:

Enclosed is data on nineteen diamond drill holes which will supplement the ~~final~~ report submitted to your office a few days ago on the above referenced property.

Sincerely yours,

Harold Kirkemo
emc

Harold Kirkemo
For: A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region II

Enclosure
cc: DMEA- Orig. & 3
USBM (2)
Kirkemo

Docket No. DMEA-432 (Zinc-Lead)
Iroquois Mine
Stevens County, Washington
Completed Contract No. Idm-1

DIAMOND DRILL HOLE DATA

Diamond Drill Hole A

From: Raise station at 138 feet above tunnel level.
Bearing: N. 35° W. Inclination: minus 45° Length: 103.0 ft.
Core recovery: 51 percent.

Inclusion (feet) From	To	Percent Zinc	Percent Lead
25	28	Tr	0.0
59	62.5	3.9	0.0
62.5	69.5	1.7	0.0
69.5	74.0	1.0	0.0
74.0	79.0	-	0.0
79.0	83.0	0.5	0.0
83.0	87.0	0.4	0.0
87.0	91.0	0.15	0.0

Diamond Drill Hole C

From: Raise station at 138 feet above tunnel level.
Bearing: Vertical. Inclination: minus 90° Length: 90.0 ft.
Core recovery: 32 percent.

Inclusion (feet) From	To	Percent Zinc	Percent Lead
31.0	33.0	1.25	0.0

Diamond Drill Hole D

From: Face of 8 XC at 34 feet north of SW drift.
Bearing: Vertical. Inclination: Plus 90° Length: 100 ft.
Core recovery: 66.1 percent

Inclusion (feet) From	To	Percent Zinc	Percent Lead
5.0	10.0	0.95	0.0
10.0	14.0	0.3	0.0
14.0	17.0	3.4	0.0
17.0	22.0	2.7	0.0
22.0	24.0	2.15	0.0
24.0	25.5	3.6	0.0

Diamond Drill Hole D (cont.)

Inclusion (feet) From	To	Percent Zinc	Percent Lead
25.5	30.0	2.6	0.0
30.0	33.0	0.4	0.0
33.0	34.0	1.95	0.0
34.0	36.0	0.5	0.0
36.0	38.0	0.9	0.0
38.0	43.0	1.7	0.0
43.0	46.0	0.85	0.0
46.0	48.0	1.0	0.0
48.0	51.0	5.2	0.0
51.0	55.0	3.0	0.0
55.0	56.0	3.4	0.0
56.0	58.0	6.5	0.0
58.0	60.0	2.75	0.0
60.0	62.0	0.4	0.0
62.0	63.5	0.2	0.0
63.5	66.5	3.6	0.0
66.5	68.5	0.8	0.0
68.5	70.0	0.1	0.0
70.0	72.0	Tr	0.0
72.0	73.5	Tr	0.0
73.5	75.0	0.2	0.0
75.0	79.0	0.25	0.0
79.0	83.0	2.0	0.0
83.0	100.0	0.0	0.0

Diamond Drill Hole E

From: Adit crosscut at 381 feet from portal.
Bearing: S. 40° E. Inclination: plus 45° Length: 300.0 ft.
Core recovery: 60 percent.

No sulfides. No samples of core were assayed.

Diamond Drill Hole G

From: Face of 3 XC at 55 feet north of NE drift.
Bearing: Vertical. Inclination: plus 90°. Length: 100.5 ft.
Core recovery: 63 percent.

Inclusion (feet) From	To	Percent Zinc	Percent Lead
8.0	13	0.2	0.0
13.0	17.0	Tr	0.0
17.0	19.0	0.0	0.0
19.0	22.0	0.0	0.0
22.0	26,5	0.65	0.0
26.5	33.0	0.00	0.0

Diamond Drill Hole G (cont.)

Inclusion (feet) From	To	Percent Zinc	Percent Lead
33.0	38.0	1.8	0.0
38.0	43.2	0.2	0.0
43.2	63.0	--	0.0
63.0	68.4	2.3	0.0
68.4	69.8	7.0	0.0

Diamond Drill Hole I

From: No. 1 XC at 202 feet SE of NE drift.
Bearing: N. 19° W. Inclination: minus 45°. Length: 250.0 ft.
Core recovery: 61.5 percent.

Inclusion (feet) From	To	Percent Zinc	Percent Lead
95.0	96.5	0.5	0.0
96.5	101.0	0.0	0.0

Diamond Drill Hole M

From: No. 2 XC at 119.0 feet SE of SW drift.
Bearing: N. 18° W. Inclination: minus 50°. Length: 220.4 ft.
Core recovery: 58.3 percent.

Inclusion (feet) From	To	Percent Zinc	Percent Lead

No sulfides.

Diamond Drill Hole N

From: No. 2 XC at 238 feet from SW drift.
Bearing: Vertical. Inclination: minus 90° Length: 102.3 ft.
Core recovery: 52.0 percent.

Inclusion (feet) From	To	Percent Zinc	Percent Lead
0	4	4.6	0.0
9.4	11	10.2	Tr
14	17	23.7	0.9
17	18.6	7.0	Tr
18.6	19.9	13.5	8.0

Diamond Drill Hole N (cont.)

Inclusions (feet) From	To	Percent Zinc	Percent Lead
28.1	29.5	14.5	Tr
29.5	34.0	0.4	0.0
34.0	35.1	Tr	0.0
42.8	44.1	0.6	0.0

Diamond Drill Hole P

From: No. 10 XC at 163 feet south of SW drift.
Bearing: N. 10° W. Inclination: minus 45° Length: 139.0 ft.
Core recovery: 36.6 percent.

No sulfides. No samples of core were assayed.

Diamond Drill Hole Q

From: No. 10 XC at 166 feet south of SW drift.
Bearing: Vertical. Inclination: minus 90° Length 124.1 ft.
Core recovery: 25.2 percent.

No sulfides. No samples of core were assayed.

Diamond Drill Hole R

From: No. 2 XC at 30 feet SE of SW drift.
Bearing: Vertical. Inclination: minus 90°. Length: 60.7 feet.
Core recovery: 64 percent.

Inclusion (feet) From	To	Percent Zinc	Percent Lead
6.0	7.1	1.1	0.0
7.1	8.3	0.6	0.0
8.3	9.1	0.4	0.0
9.1	10.6	1.4	0.0
10.6	11.8	1.8	0.0
11.8	12.8	0.2	0.0
12.8	14.0	5.0	0.0
14.0	15.0	1.05	0.0
15.0	15.8	0.50	0.0
15.8	17.8	0.10	0.0
17.8	19.0	Tr	0.0
19.0	20.9	0.25	0.0
20.9	24.5	0.15	0.0
24.5	27.2	0.55	0.0
27.2	28.4	1.15	0.0
28.4	29.4	0.30	0.0
29.4	32.3	0.30	0.0

Diamond Drill Hole R (cont.)

Inclusion (feet) From	To	Percent Zinc	Percent Lead
32.3	33.9	3.60	0.0
33.9	35.1	2.60	0.0
35.1	37.1	0.75	0.0
37.1	38.4	0.35	0.0
38.4	39.9	5.9	9.6
39.9	42.0	0.30	0.0
42.0	43.6	0.70	0.0
43.6	44.4	1.4	0.0
44.4	45.6	3.4	0.0
45.6	47.0	0.7	Tr
47.0	48.5	2.65	0.0

Diamond Drill Hole S

From: No. 1 XC at 340 feet SE of NE drift.
Bearing: N. 51° W. Inclination: minus 45° Length: 600.0 ft.
Core recovery: 31 percent.

No sulfides. No samples of core were assayed.

Diamond Drill Hole T

From: N No. 10 XC at 153 feet south of SW drift.
Bearing: N. 72½° W. Inclination: minus 25° Length: 200.0 ft.
Core recovery: 41 percent.

No sulfides. No samples of core were assayed.

Diamond Drill Hole U

From: SW drift at 38 feet SW of No. 10 XC.
Bearing: S. 67½° W. Inclination: plus 25° Length: 220.4 ft.
Core recovery: 69 percent.

Inclusion (feet) From	To	Percent Zinc	Percent Lead
32.5	33.8	2.0	0.1
33.8	36.5	0.7	0.
45.	49.0	0.9	0.1
54	56.0	1.4	0.1
85.0	88.0	7.2	0.1
88.0	93	2.3	0.1
96	100.5	2.2	0
100.5	103.2	19.4	0.1
103.2	105.6	9.1	0.1
105.6	108.8	2.6	0.0
108.8	110.5	1.7	0.0

Diamond Drill Hole U (cont.)

Inclusion (feet) From	To	Percent Zinc	Percent Lead
110.5	115.5	4.1	0.0
115.5	118.5	1.1	0.0
118.5	121.4	1.3	0.0
121.4	127.4	8.0	0.2
127.4	132.1	3.7	0.0
132.1	137.1	3.0	0.0
141.0	144.0	4.0	0.0
144	146	0.4	0.0
146.0	149.5	0.5	0.0
149.5	154.0	3.1	0.0
154.0	158.3	2.3	0.0
158.3	159.7	1.7	0.0
159.7	164.0	0.6	0.0
164.0	169.0	2.9	0.0
169.0	170.8	1.0	0.0
170.8	172.2	5.7	.1
172.2	177.2	8.5	.1
177.2	182.2	3.2	0.0
182.2	186.4	4.2	0.0
186.4	190.3	1.6	0.0
190.3	195.1	9.6	0.2
195.1	197.9	1.6	0.0
201.4	203.5	1.6	0.0
203.5	208.0	3.2	0.0
208.0	212.6	0.5	0.0
212.6	215.5	7.0	0.1

Diamond Drill Hole V

From: No. 2 XC at 380 feet south of SW drift.
Bearing: N. 40° W. Inclination: minus 45° Length: 143.4 ft.
Core recovery. 68 percent.

No sulfides. No samples of core were assayed.

Diamond Drill Hole W

From: No. 2 XC at 380 feet south of SW drift.
Bearing: N. 40° W. Inclination: Horizontal Length: 90.1 ft.
Core recovery: 68 percent.

Inclusions (feet) From	To	Percent Zinc	Percent Lead
45.5	48.9	9.40	6.21
48.9	50.9	4.75	2.40
68.5	68.7	4.85	12.5

Diamond Drill Hole W (cont.)

Inclusion (feet) From	To	Percent Zinc	Percent Lead
68.7	69.5	1.50	3.16
77.0	77.8	--	0.38
77.8	78.5	1.30	--
87.8	89.1	1.22	0.60

Diamond Drill Hole X

From: No. 2 XC at 378 feet south of SW drift.
Bearing: N. 5° W. Inclination: minus 35° Length: 87.0 ft.
Core recovery: 75 percent.

No sulfides. No samples of core were assayed.

Diamond Drill Hole Y

(This hole may not have been drilled with DMA funds)

From: No. 10 XC at 171 feet south of SW drift.
Bearing: S. 5° E. Inclination: Horizontal Length: 148 ft.
Core recovery: 61.9 percent

Inclusion (feet) From	To	Percent Zinc	Percent Lead
42.4	43.2	3.75	.8
43.2	47.2	.78	.33
47.2	49.4	5.04	1.06
49.4	51.9	1.05	.45
51.9	53.6	0.30	5.95
53.6	55.9	3.2	1.2
55.9	57.3	4.55	1.15
57.3	58.5	8.45	6.55
58.5	60.6	12.75	5.8
60.6	62.7	9.5	18.2
62.7	64.4	8.5	3.8
64.4	67.3	6.25	3.5
117.5	118.8	0.95	0.8
118.8	119.7	4.56	0.75

Diamond Drill Hole Z

(This hole may not have been drilled with DMA funds.)

From: SW drift at 45 feet SW of No. 2 XC.
Bearing: S. 30° E. Inclination: Horizontal Length: 50 ft.
Core recovery: 82.2 percent.

Inclusion (feet) From	To	Percent Zinc	Percent Lead
0	4	1.0	No assays for lead reported for Hole Z
4	5.5	1.0	
5.5	7.2	0.4	
7.2	8.9	0.8	
8.9	10.5	0.8	
10.5	13.3	1.4	
13.3	15.4	1.7	
15.4	17.7	0.9	
17.7	19.0	0.3	
19.0	21.3	1.1	
21.3	23.5	0.9	
23.5	26.0	0.9	
26.0	28.3	2.0	
28.3	30.7	0.6	
30.7	32.5	0.5	
32.5	35.5	0.2	
35.5	36.9	0.8	
36.9	39.3	0.5	
39.3	40.8	1.2	
40.8	42.9	0.2	
42.9	44.7	0.5	
44.7	47.9	1.1	
47.9	50.0	1.4	

432
~~Code 100~~
" 110
" 800 2612
" 230 4539

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

~~WASHINGTON 25, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration

Coe
12.29

December 19, 1952

Memorandum

To: Frank E. Johnson, Chairman, Operating Committee, DMEA

From: Field Team, Region II

Subject: Final report, Iroquois Mine, Stevens County, Washington, Docket No. DMA-432 (lead-zinc), Contract No. I-DMA-E1

The final summary report with maps and cross sections and a chronological summary of diamond drilling project at the Iroquois Mine, Stevens County, Washington, by Harold Kirkemo and Willard P. Puffett, respectively, are enclosed. A report by Bureau of Mines engineers has been held up pending receipt of ore reserve data from the Geological Survey, but will be completed shortly after the first of the year. This report will deal with general aspects of problems in connection with exploiting the reserves and will include an estimate of tonnage and grade of ore likely to be recovered. The economics of exploitation will not be treated in detail because information is not yet complete enough to develop a definite mining pattern.

Mines Management, Inc., the operator, originally applied for a production loan, but there was insufficient information available to favorably recommend this loan so the application was deferred in favor of the exploration project.

The exploration project described in the accompanying reports has given us much more information on the deposit; part of it encouraging and part of it discouraging. Two areas of zinc and lead mineralization have been found outside the Main ore zone. This increases the size of the target for future exploration and development and the potential reserves of the mine. Faults were found which reduce the vertical extensions of the Main ore zone above and below the tunnel level. It is possible the fault problem has been solved, but the exploration program permitted only preliminary work in the critical areas of faulting.

The ore reserves now calculated, totalling 188,962 tons averaging 4.01 percent zinc and 1.67 percent lead, are classified as indicated and inferred ore. Low diamond drill core recoveries and failure to collect representative sludge samples have a bearing on the reliability of the grade averages and in turn affect the limits of the

ore blocks based on cut-off grades as computed. Further work is necessary to fill in the gaps of missing information and better establish the reserves; such work might well result in a much more encouraging tonnage estimate and thus more amply justify the expenditures required if the mine is to be brought into production. This work would necessarily consist of drifting, crosscutting, and raising and would bridge the gap now existing between exploration work and actual mining. Concurrently with the development work, a diamond drilling program should be conducted to test the extensions of the indicated ore zones.

By DMEA Field Team, Region II

A. E. Weissenborn, Exec. Officer
(U. S. Geological Survey)

M. E. Volin, Member
(U. S. Bureau of Mines)

Enclosures

cc: USGS (SRO)
USBM
Kirkemo

432

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

~~WASHINGTON 25, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

December 17, 1952

Final F.T. Rpt.

Memorandum:

To: DMEA Field Team, Region II

From: Harold Kirkemo, Geologist, U. S. Geological Survey

Subject: Final Summary report. Docket No. DMA-432 (Lead-Zinc), Iroquois Mine, Stevens County, Washington, Contract No. I-DMA-E1.

INTRODUCTION

Lateral and vertical extensions of a zinc and lead ore deposit at the Iroquois mine, Stevens County, Washington have been tested by a diamond drilling program under terms of the first exploration contract in which the Government participated under authority of the Defense Production Act of 1950. Mines Management, Incorporated, Spokane, Washington and the Government shared equally in a program costing $24,000 to diamond drill 18 holes having a total length of 3056 feet. The program continued for 8 months beginning in May 1951 and ending in January 1952.

Mines Management originally applied for a production loan from the Government, but more knowledge of the deposit was considered necessary so the production application was deferred in favor of the exploration program.

Reports by A. E. Weissenborn, M. R. Klepper, and Willard P. Puffett, geologists, U. S. Geological Survey, and the Operator's final report by W. R. Green, are summarized in the following discussion of the project. The writer has calculated the ore reserves discussed in the conclusions and is responsible for statements regarding these reserves and their influence on the proposed recommendations.

Willard P. Puffett represented the U. S. Geological Survey for the Field Team on regular visits to the project. His able summary of the work performed on the project is appended to this final report.

Geologic, assay, and ore reserve maps and cross sections accompany the final report.

CONCLUSIONS

Information obtained from the diamond drilling program indicates a gross reserve of 188,962 tons of ore averaging 4.01 percent zinc and 1.67 percent lead. This reserve lies above and below the tunnel level, the only level in the mine, and only one ore reserve block has been tested by any vertical development other than diamond drilling. The reserve, therefore, is mainly indicated ore for which the tonnage and grade was computed from specific measurements and samples obtained from drifts, crosscuts, one raise, and the drill cores. The percentage of core recovery was too low to consider the ore reserve in the measured ore classification. It is expected, however, that ore extracted from the ore reserve blocks outlined will reasonably approximate the grade and tonnage calculated for each block.

The Operator reports a reserve of 502,000 tons of indicated ore averaging 3.88 percent combined zinc and lead. Willard P. Puffett calculated a reserve of 562,909 tons of indicated ore averaging 3.19 percent combined zinc and lead and 258,728 tons of inferred ore. The writer's estimate of ore reserve was calculated on more critical standards than the higher estimates, hence, the better grade and lower tonnage of ore. It is possible to calculate higher tonnages by including the low grade material in the ore zones. The writer arbitrarily used a minimum weighted average of 3 percent combined zinc and lead in calculating the average for any series of samples. The outside limits of any ore zone block does not include any material averaging less than 3 percent of combined zinc and lead. A few streaks of ore above this minimum grade and outside the ore reserve blocks are indicated in the drill holes, but it was felt they are isolated mineralized streaks whose continuity has not been adequately tested to date.

Before initiating the production phase at the Iroquois mine, it is recommended that further exploration be conducted. The ore reserve blocks now indicated by inadequate exploration work should be further tested for more geological information and for assay data from bulk samples by development work such as drifts, crosscuts, and raises.

Additional diamond drilling is recommended to test extensions of the ore bodies beyond the limits of the proposed development work. A minimum recovery of 75 percent of the core should be attained for this program to be of value, and sludge should be saved from all the drilling for assay purposes.

The DMA diamond drilling program revealed faults which cut off the main ore body above and below the only level in the mine. This condition limits the scope of the Operator's proposed mining method and reduces the original ore reserve estimate. There is some evidence that the faulted segments of the main ore

body may be exposed in the present workings, but conclusive proof depends upon further exploration. Continued exploration by means of development work could be planned to advantage for both purposes, exploration and development.

GEOLOGY

The mine workings expose a homoclinal sequence of slate and dolomitic limestone beds which may be overturned. The slate beds are part of the Ordovician Ledbetter slate formation and the limestone beds occur in the Cambrian Metaline limestone formation. The contact between the two formations is exposed in the tunnel, but whether it is a normal depositional feature or a fault contact is uncertain.

The ore occurs in lensy, tabular, replacement bodies in the dolomitic limestone beds about 300 feet from the contact of the Ledbetter slate and the Metaline limestone. If the beds are overturned and there is no faulting of significant magnitude, then the ore horizon developed in the Iroquois mine is about in the same relative position to the Metaline-Ledbetter contact as the productive Josephine horizon containing the zinc and lead ore bodies in the Metaline district, about ten miles to the southeast. If the beds are not overturned, then either the Metaline limestone has been faulted over the Ledbetter or the deposit lies in limestone of Ordovician age or younger overlying the Ledbetter.

The Iroquois mine ore bodies contain sphalerite, galena, pyrite, quartz, and calcite in coarsely crystalline brecciated dolomite. The ore and gangue minerals heal the brecciated zones and form irregular replacement ore bodies. The zinc and lead ore minerals have been oxidized and leached on the outcrops and irregular zones of oxidation have been noted in the tunnel and in the drill cores. Information obtained from the tunnel and the diamond drill holes shows the mineralized bands or lenses alternate with barren or very low grade material; hence, there is an echelon pattern of mineralization in the ore zones.

Three ore zones are indicated in the mine; the Main ore zone, the Southwest ore zone, and the Southeast ore zone. It is possible that only one ore horizon exists but perhaps owing to faults, three exposures of the same ore horizon are now present in the horizontal plane of the tunnel level.

The Main ore zone is crossed in the tunnel between 560 and 640 feet southeast from the portal. It trends north 50 to 60 degrees east and dips 50 to 60 degrees to the southeast and is roughly conformable to the attitude of the host dolomitic limestone beds. Drifts, crosscuts, one raise, and diamond drill holes have indicated the Main ore zone to be 880 feet long, up to 70 feet

wide and 150 feet in known vertical extent with a probability that a faulted segment of the structure continues another 300 feet to the surface but with reduced width. Several lamprophyre dikes cut the ore zone.

The Southwest ore zone is exposed in the southwest portion of the mine and was cut in diamond drill holes. Its indicated dimensions are the same as calculated for ore reserve block 6 which is 163 feet long, 12 feet wide, and 135 feet in height.

The Southeast ore zone is 160 to 200 feet south of the main ore zone. It is cut by two crosscuts, and in 5 diamond drill holes and is about 500 feet long, 3 to 8 feet wide and 75 to 100 feet in height.

DIAMOND DRILLING

Mines Management, Incorporated subcontracted the drilling of 13 diamond drill holes to the McClintock Diamond Drill Company of Spokane, Washington. The first twelve holes drilled totaled 2,190 feet from which 1,031.8 feet of core was recovered. This is a recovery percentage of 47.1 percent. Owing to inexperienced drillers and helpers there was no improvement in the percentage of core recovery during the subcontract period.

The last 4 holes drilled on the project were subcontracted to the Havlick Diamond Drilling Company, Inc. Percentage of core recovery for 520.5 feet of drilling was 57.9 percent. There was a decided improvement in the percentage of recovery as the Havlick Company continued drilling. The core recovery from the first hole was 41 percent, and from the fourth and last hole it was 75 percent. This company used drillers and helpers who had much experience drilling in the Metaline district.

All the diamond drilling was done with "Ex" bits.

The Operator split the mineralized sections of drill core and sent one-half for assay by commercial assayers and retained the other half for reference. The Field Team did not check the results of assays submitted by the Operator.

None of the diamond drill holes were surveyed for variation in bearing, and there has been no petrographic work done on the core samples. The sludges from the drill holes were not retained for assay.

Why?

ORE RESERVES

Assays of all samples obtained from the mineralized portions of the mine workings and from mineralized sections of the diamond drill cores have been posted on plan maps and sections. A minimum ore grade

average of 3 percent combined zinc and lead was assumed in the ore reserve calculation. Weighted averages for any sequence of samples meeting thisminimum grade were calculated and posted on maps and sections as line averages.

Comparison of the line averages in any given drill hole or mine working with line averages in adjacent drill holes and mine workings with reference to the geology made it possible to outline ore reserve blocks in plan and cross section. The blocks were outlined in rectangular plan, line averages were weighted to obtain the grade average for each block,-and the tonnage was calculated-assuming that 11 cubic feet of rock in place weighs one ton.

The projected limits of any block beyond an ore intercept in a drill hole or mine working depended upon the reliability of information available. If there was no information beyond the ore intercept, the block was extended only 25 feet. If adjacent workings indicated waste, the block was extended half the distance to the known waste zone. If the structure was known to be limited by a fault, the block was extended to the fault.

There are ore intercepts in mine workings and drill holes outside the ore reserve blocks, but there is not supporting evidence in the adjacent workings to justify establishment of ore reserve blocks.

The tonnage and grade of the individual ore reserve blocks is listed as follows:

Block No.	Tons	Percent Zinc	Percent Lead
1	5,093	8.76	6.27
2	2,382	9.56	6.59
3	12,920	2.52	1.14
4	13,662	5.53	3.66
5	6,000	5.44	3.83
6	24,005	3.93	1.94
7	4,455	3.25	0.70
8	23,673	4.13	0.49
9	36,218	4.19	0.51
10	20,640	2.64	1.84
11	8,727	3.88	1.04
12	31,187	3.31	1.71
Gross tons and average grade	188,962	4.011	1.669

Blocks 1, 2, 3, and 4 are included in the Southeast ore zone. Block 4 is an inferred ore reserve block as it has not been tested by any development or exploration work. Its grade was

estimated as the average of the two adjacent ore reserve blocks. Blocks 1, 2, and 3 have been cut by drill holes or crosscuts, but they should be further tested by development work.

Block 5 was outlined on evidence from one diamond drill hole. The ore intercept of 24.9 feet was long enough to indicate a mineralized structure exists here so an indicated ore reserve block was outlined.

Block 6 includes the known portion of the Southwest ore zone. The major portion of the block is premised on ore intercepts in two diamond drill holes.

Blocks 7 to 12 inclusive are included in the Main ore zone. Block 7 is based solely on diamond drill hole information, but the remaining blocks have been tested by development work and diamond drill holes. The ore reserve blocks in the Main ore zone probably reflect the general grade of ore which might be expected from the Iroquois mine.

Harold Kirkemo

Harold Kirkemo
Geologist

Enclosures 14
Dist: Orig. & 3-DMEA
USBM (2)
USGS (SRO)
Docket
Kirkemo

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

~~WASHINGTON 25, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

December 17, 1952

Memorandum

To: DMEA Field Team, Region II

From: Willard P. Puffett, Geologist, U. S. Geological Survey

Subject: Summary of work performed on diamond drilling project at the Iroquois Mine, Stevens County, Washington. Docket No. DMA-432 (Lead-Zinc), Contract No. I-DMA-E1.

Summary of Work

Originally Mine's Management, Inc., submitted an application for a production loan on their Iroquois property. The mine workings were inspected and mapped in February, 1951, by Geological Survey members of the DMA Field Team. As aresult of this inspection and additional assay data supplied by the applicant, it was believed that probably a large sized, low-grade lead-zinc ore zone existed at the Iroquois, but sufficient information as to its extensions above and below the present main level was not available on which to base a favorable recommendation concerning the production loan application. Consequently, as a result of conferences with the applicant, an application for aid to explore by diamond drilling for extensions of the ore zone was submitted.

At the time the exploration application was submitted, available information suggested that the ore zone generally striked northeast and dipped approximately 45 degrees to the southeast. Diamond-drill holes were planned to explore both above and below the main level for a zone persisting in this assumed orientation. It was believed that a total of 2800 feet of diamond-drilling from the mine workings and from the surface would be sufficient to delineate the ore-zone and explore its extension from the surface to nearly 100 feet below the present main level.

The exploration application was approved and assigned contract number Idm-E-1. Work under terms of the contract was initiated May 23, 1951. The locations of the drill holes are shown on accompanying map No. I. Holes C and D, near the faces of crosscuts No. 3 and 8 respectively, were first drilled to check extension of the zone above the level. Both of these holes intersected the ore zone. Holes A and C were then drilled to check the

Thickness of the ore zone in the footwall of the raise. Only widely scattered showings of very low grade mineralized rock were recovered in the core. Next holes I and M were drilled to check for downward extension of the ore zone beneath crosscuts No. 1 and 2 respectively. No evidence of ore was recovered in the core from either of these holes. Holes P and Q were then drilled to check downward extensions of the ore beneath crosscut No. 10. These two holes failed to intersect the ore zone.

It was apparent at this stage of the exploration project that one of two possibilities existed. Either the assumed orientation of the ore zone was not correct, or if correct, faulting had offset the ore so that holes drilled beneath the main level were not oriented correctly to intersect the mineralized area. A more critical appraisal of available data was made by both the operator and members of the Field Team. As a result it was decided to drill a hole not directly specified in the original contract. This was to be a vertical down-hole in crosscut No. 2 to check the possibility that a fairly strong fault flatly dipping to the northwest may be limiting the downward extension of the ore. A projection of this fault indicated that the proposed hole would intersect the structure at minus 48 feet. This hole, "R", intersected low-grade ore to the fault at minus 48 feet beyond which only barren rock was recovered. The hole was discontinued at minus 60.7 feet.

Hole N, a downward vertical hole near the face of crosscut No. 2 was then drilled. Assay results of samples taken of the core of this hole indicated that a high-grade zone had been intersected. The rock recovered was heavily iron-stained and exhibited definite evidences of leaching.

As a result of the positive information from holes R and N, and the negative evidence from holes I, M, P, and Q, it was believed that the ore zone intersected in Hole N was an offset segment of the main ore zone. If this was true, it would mean that there had been normal movement of the ore zone along the flat-dipping faults. Another interpretation is that the ore intersected in Hole N is part of a second separate ore zone parallel to the main zone and that the flat-dipping fault had formed only the channelway up which the mineralizing solutions migrated to form the main ore zone.

It was decided to drill a long diamond drill hole, "S", from crosscut No. 1, at minus 45-degrees to try to obtain further information as to possible offset of the major faulting in the area. If the relative movements along the faults were of the normal type, this hole would intersect the Ledbetter Slate less than 600 feet from the collar. A very narrow ore-showing was recovered from the core of this hole near 109 feet, but no other positive evidence as to ore occurrences or major offset along faults was obtained and

the hole was discontinued at 600 feet. Parenthetically it can be stated here that core recovery in this hole was very poor and it is difficult to make definite interpretations of the recovered core.

Hole E was drilled at the same time as was hole S. No ore was recovered in the core from hole E but a dike was intersected which the operator believes to have had a control on the course of mineralization near the surface. From the information obtained as a result of hole E, it is assumed the main ore zone is either not continuous to the surface or is offset toward its hangingwall by faulting which does not intersect the workings on the main level.

At this stage of the project the conclusion was arrived at by both the Operator and Field Team that further exploration should be done to test for extensions of the ore zone intersected by hole N beneath the main level near the face of No. 2 crosscut. To obtain a drill station from which to most economically and efficiently do this exploration it was necessary to crosscut at an angle from crosscut No. 2 to a position approximately midway between crosscut No. 2 and No. 10. Total length of this crosscut is 151 feet.

During the time the crosscut was being driven, holes T and U were drilled. Hole T was drilled in the same vertical plane as pre-existing hole 19, at a minus angle of 25 degrees. This was to test for deeper extensions of the ore indicated in the core of hole 19. No ore was recovered but an extensive oxidized and leached zone was indicated from 37.0 to 57.0 feet after which from 84.0 to 89.7 feet a dike remarkably similar to that exposed in the new exploratory crosscut was intersected after which only barren rock was recovered. Hole U was drilled at plus 25 degrees to test the ground beyond the face of the southwest lateral. In this face occurred two heavily iron-stained dikes around which the country rock was strongly bleached and altered. This hole was one of the most successful holes of the project insofar as intersection of ore was concerned. Nearly the entire recovered core exhibited evidences of mineralization and consequently practically the entire core was sampled for assaying.

From the drill station near the face of the new crosscut three holes were diamond drilled. Hole W is an horizontal hole which intersected a narrow mineralized zone. Hole V, in the same plane as hole W but drilled at minus 45 degrees, intersected a narrow ore zone on the assumed downward dip of that ore indicated in hole W. Hole X was then drilled at minus 35 degrees to check on lateral extension of the ore at the lower level. A narrow mineralized zone was indicated in the core recovered from this hole. All three of these holes intersected extensions of the dike exposed in the new crosscut. The ore zones indicated in these holes always occurred in the footwall area of the dike. Diamond drill hole X is 87 feet long but not all of it will apply as part of the contract as the funds for the contract were used up before the hole was finished.

Modifications of the original contract include the following:

1. Elimination of the drilling of one hole from the surface and two negatively inclined holes from the main crosscut, and one negatively inclined hole from No. 1 crosscut.

2. Driving of 151 feet of crosscut.

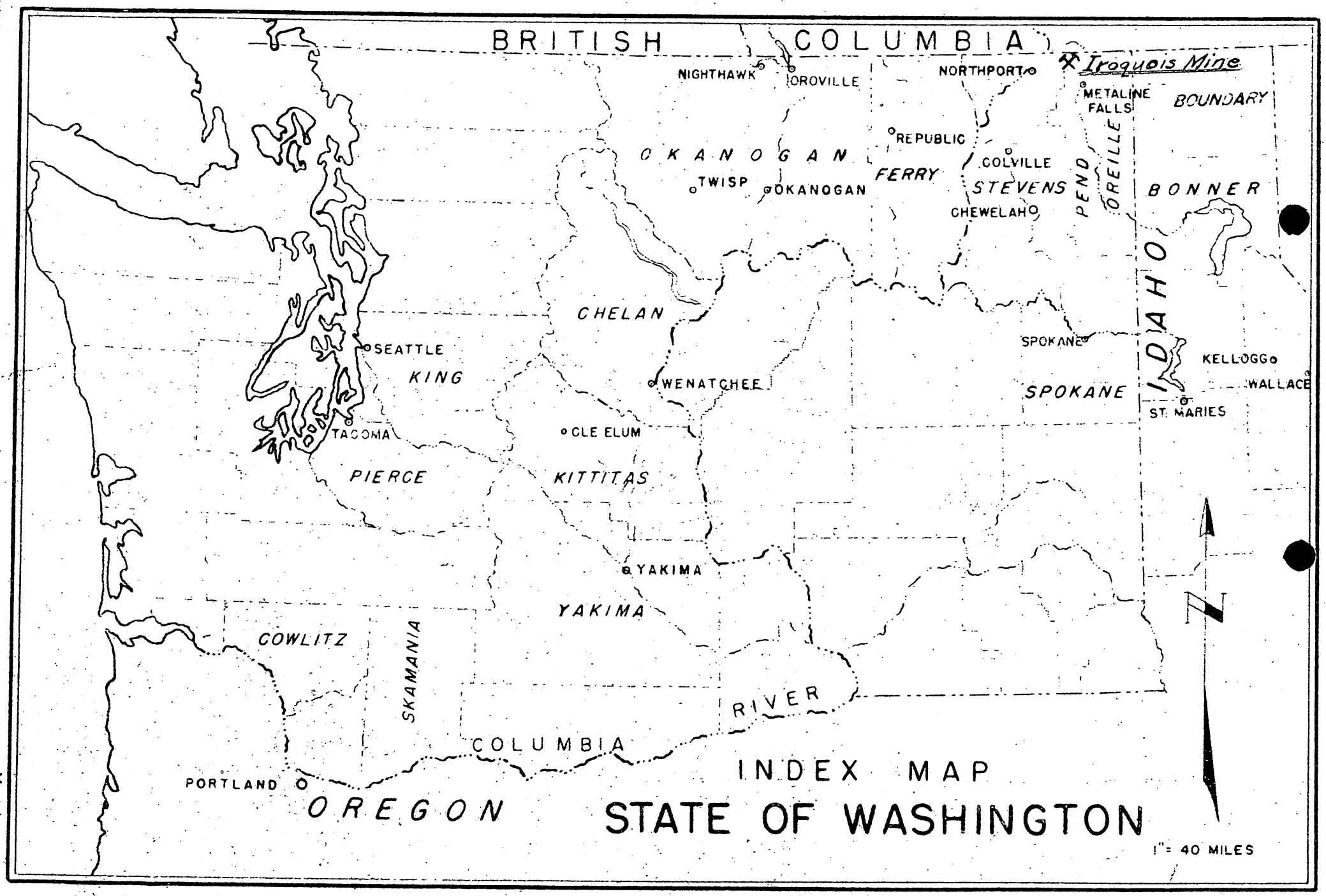
3. Drilling of holes N, R, S, T, V, W, and X.

The above work constituted the entire project participated in by the government. Subsequent to the conclusion of this work, further work has been continued by the operator. The southwest lateral has been extended to check the ore zone on the main level that was indicated by hole U. Ore is exposed in the drift to the face, a total distance of seventy feet. An horizontal hole has been drilled in the face of No. 10 crosscut at the same bearing as the crosscut. Weighted assay values in this hole from 42.2 to 67.3 feet are 9.27 percent combined lead and zinc. This ore zone can be interpreted to be an extension of that ore intersected in the new exploratory crosscut from crosscut No. 2.

Mine's Management, Incorporated, sub-contracted the diamond drilling and crosscutting that was done as part of the contract. McClintock Diamond Drill Company of Spokane, Washington drilled all the holes except T, W, V, and X. These latter holes were drilled under contract to Havlick Diamond Drilling Co., Inc. Labor for crosscutting was obtained by contracting to local laborers.

Willard P. Puffett
Geologist

Dist:
IMEA- Orig. & 3
USBM (2)
USGS (SRO)
Docket
Kirkemo



INDEX MAP
STATE OF WASHINGTON

Map 1

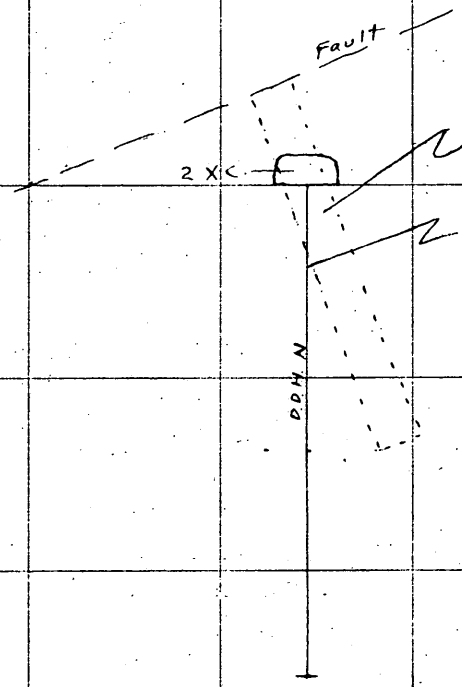
Iroquois Mine, Stevens County, Wash.

DMA Docket 432
Idm E-1

Cross Section thru Ore Reserve
Block 1
View looking N E
Scale: 1" = 40'

H. Kirkmo Dec. 1952

N 54° W.



Length		Width		Height		
90'	x	8.3'	x	75'	=	5093 tons.
11 cu. ft. per ton						

8.3' - 8.76% Zn
6.27 % Pb

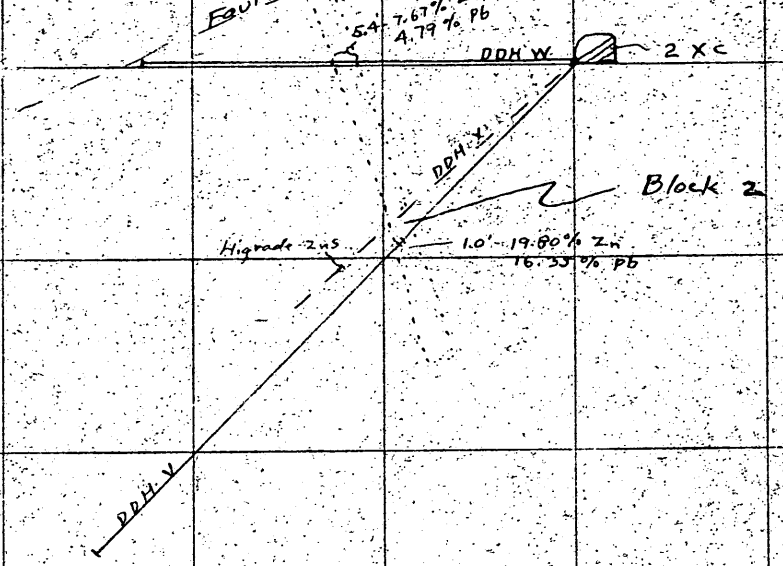
Cross Section 1

"ALBANENE" NO. 196M K&E CO., N.Y. REG. U.S. PAT. OFF.

Iroquois Mine, Stevens County, Wash. DMA Docket 432
Idm E-1

Cross section thru Ore Reserve
Block 2
View looking N.E.
Scale 1" = 40'

H. Kiokemo Dec. 1952



Length		Width		Height	
105'	x	3.2'	x	78'	= 2382 tons
11 cu. ft. per ton					

3.2' — 9.56% zinc
6.59% Lead

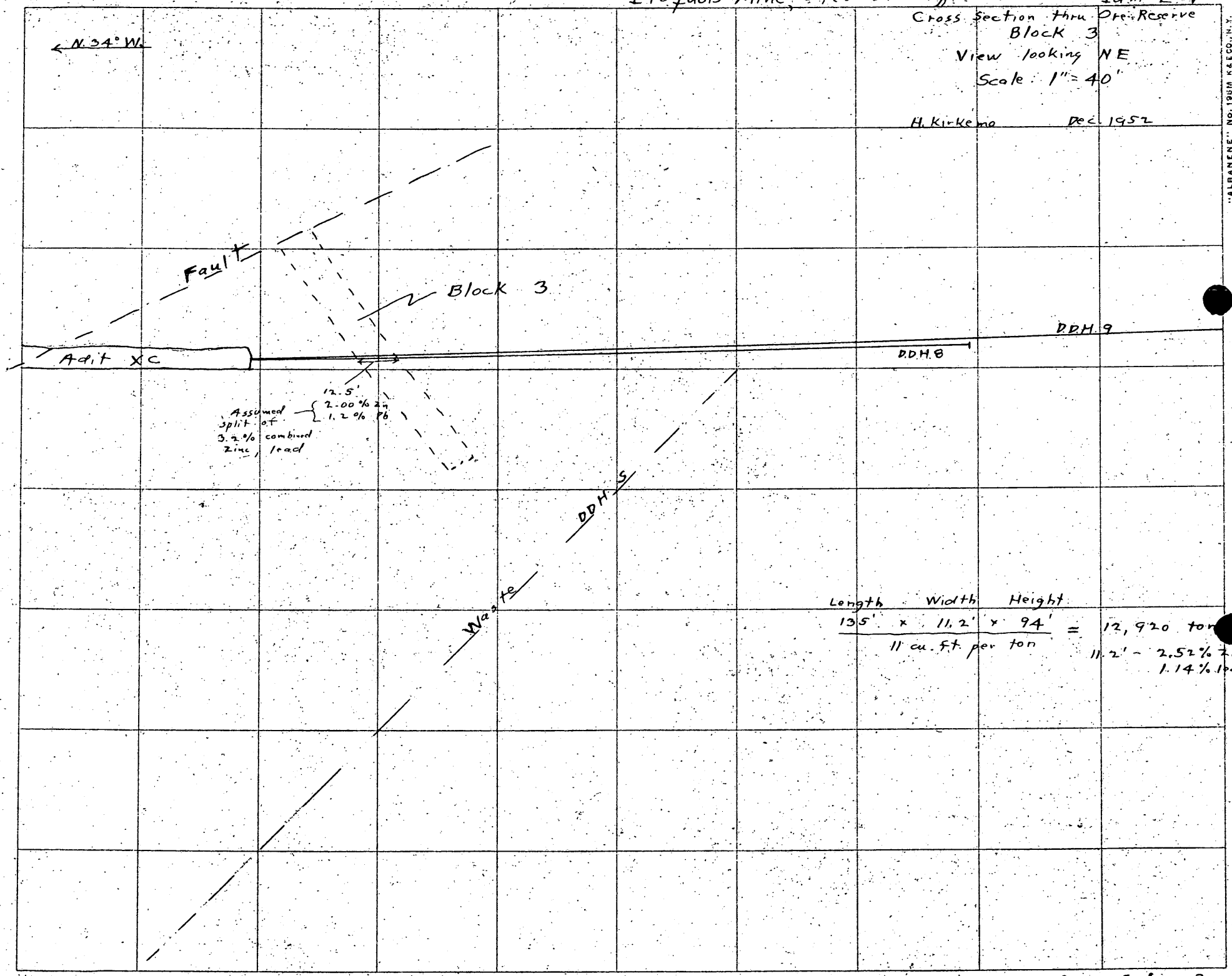
Cross section 2

Iroquois Mine, Stevens County, Wash.

DMA Docket 432
Idm E-1

Cross Section thru Ore Reserve
Block 3
View looking NE
Scale: 1" = 40'

H. Kirkemo Dec. 1952



Length Width Height
135' × 11.2' × 94' = 12,920 tons
11 cu. ft. per ton

11.2' – 2.52% Zinc
1.14% lead

Cross Section 3

"ALBANENE" NO. 1969M K&E CO., N.Y. REG. U.S. PAT. OFF.

Iroquois Mine, Stevens County, Wash.

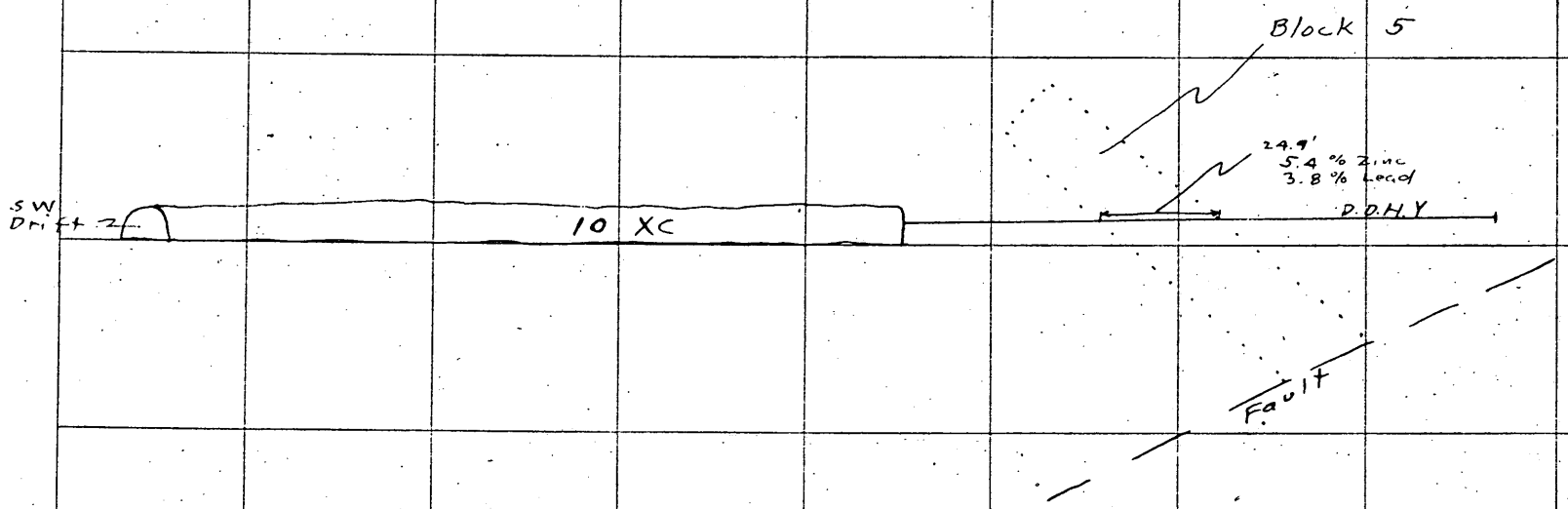
DMA Docket 432
Idm E-1

Cross Section thru Ore Reserve
Block 5
View looking N.E.
Scale: 1" = 40'

H. Kirkemo Dec. 1952

← N. 10° W.

Length		width		Height		
50'	×	16.5'	×	80'	=	6,000 tons
11 cu. ft. per ton						16.5' - 5.44% zinc 3.83% Lead



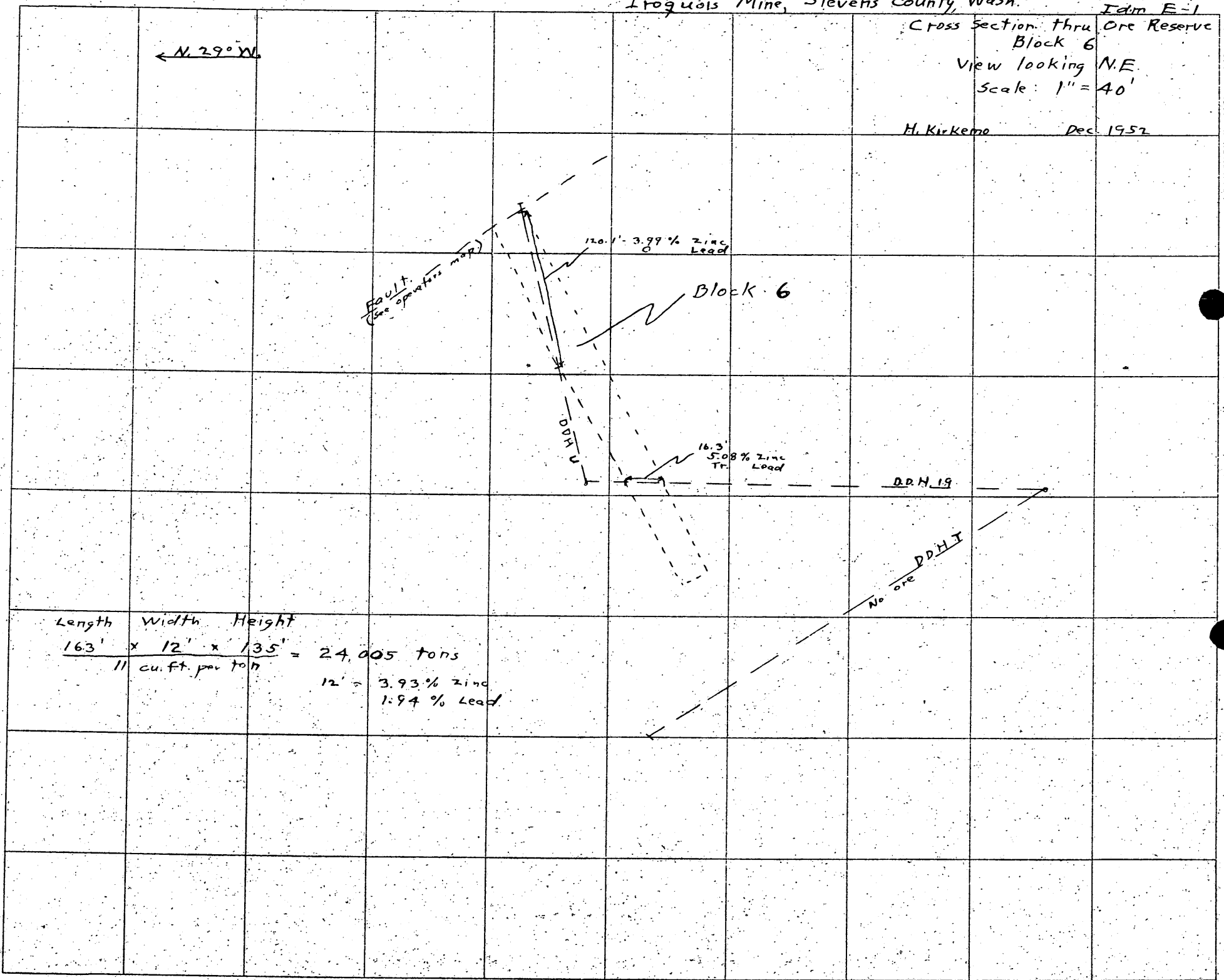
Cross Section 4

"ALBANENE" NO. 196M K&E CO., N.Y. REG. U.S. PAT. OFF.

Iroquois Mine, Stevens County, Wash. DMA Docket 432
Idm E-1

Cross Section thru Ore Reserve
Block 6
View looking N.E.
Scale: 1" = 40'

H. Kirkemo Dec 1952



Length	Width	Height	
16.3'	× 12'	× 135'	= 24,005 tons
11 cu. ft. per ton			

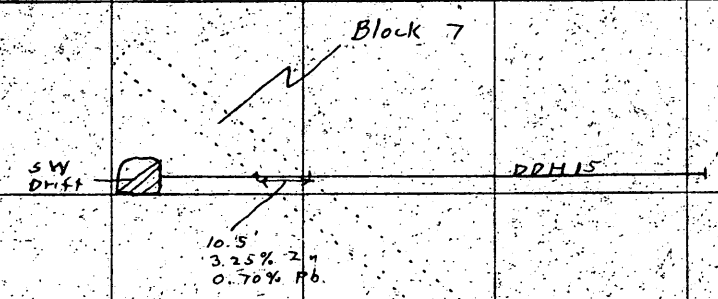
12' = 3.93 % zinc
1.94 % Lead

"ALBANENE" NO. 1989M K&E CO., N.Y. REG. U.S. PAT. OFF.

Iroquois Mine, Stevens County, Wash. DMA Docket 432
Idm E-1

Cross Section thru Ore Reserve
Block 7
View looking NE
Scale 1" = 40'

H. Kirkemo Dec 1952



Length Width Height
70' x 7' x 100' = 4455 tons
11 cu ft per ton
7' - 3.25% zinc
0.70% lead

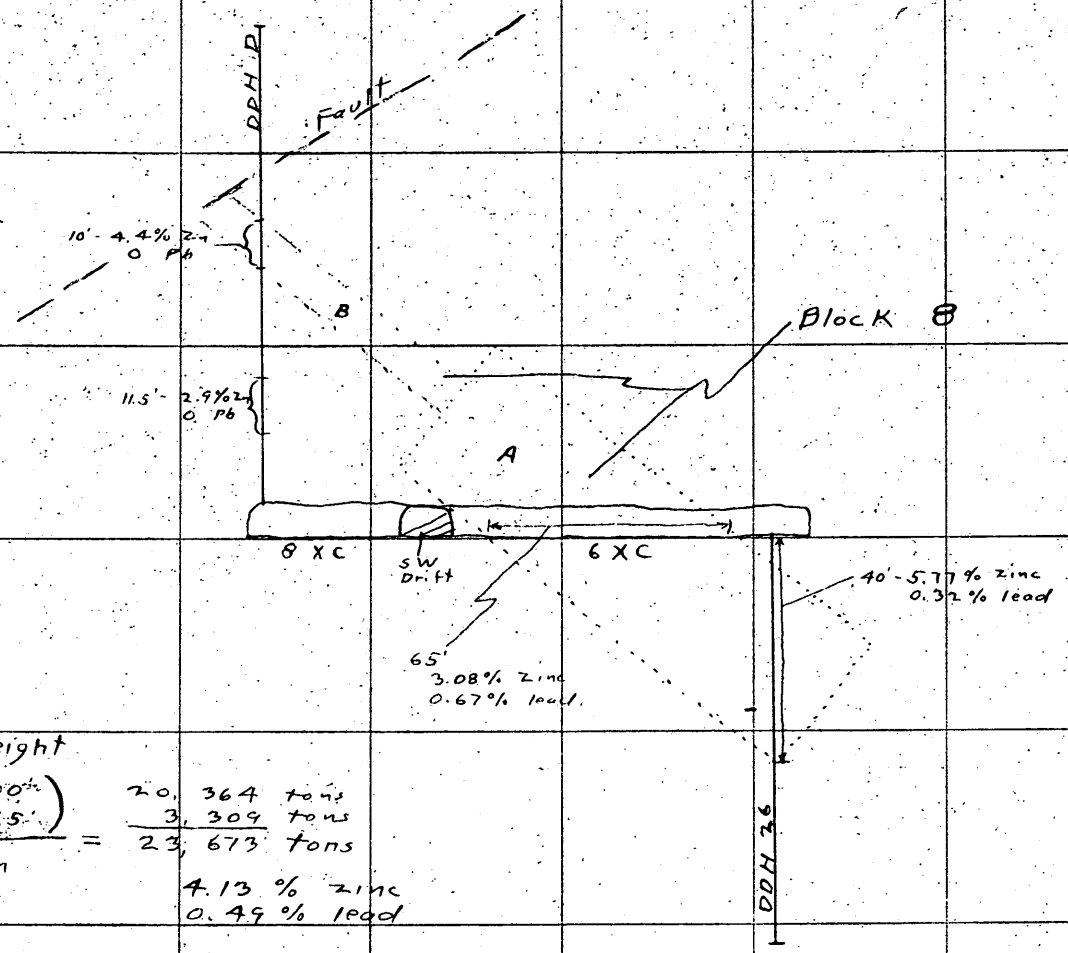
"ALBANENE" No. 186M K&E CO., N.Y. REG. U.S. PAT. OFF.

Iroquois Mine, Stevens County, Wash.

DMA Docket 437
Idm E-1

Cross Section thru Ore Reserve
Block 8
View looking N.E.
Scale: 1" = 40'

H. Kirkemo Dec. 1952



	Length	Width	Height		
A	70'	32'	100'		20,364 tons
B	70'	8'	65'		3,309 tons
				=	23,673 tons

11 cu. ft per ton

4.13 % zinc
0.49 % lead

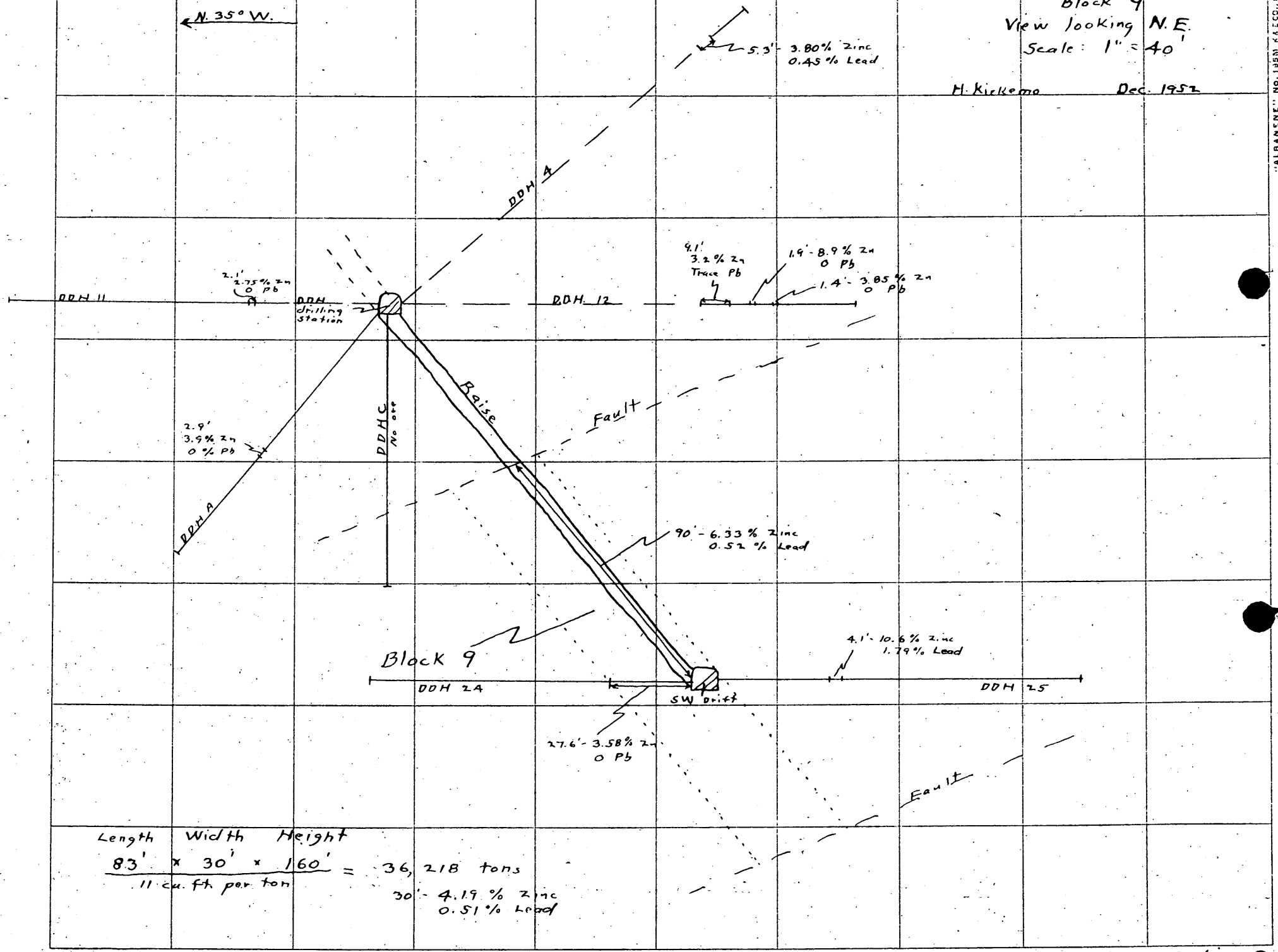
Cross section 7

"ALBANENE" NO. 166M K&E CO., N.Y. REG. U.S. PAT. OFF.

Iroquois Mine, Stevens County, Wash. DMA Docket 432
Idm E-1

Cross Section thru Ore Reserve
Block 9
View looking N.E.
Scale: 1" = 40'

H. Kickemo Dec. 1952



Length	Width	Height
83'	30'	160'

$\frac{83' \times 30' \times 160'}{11 \text{ cu. ft per ton}} = 36,218$ tons

30' - 4.19% zinc
0.51% Lead

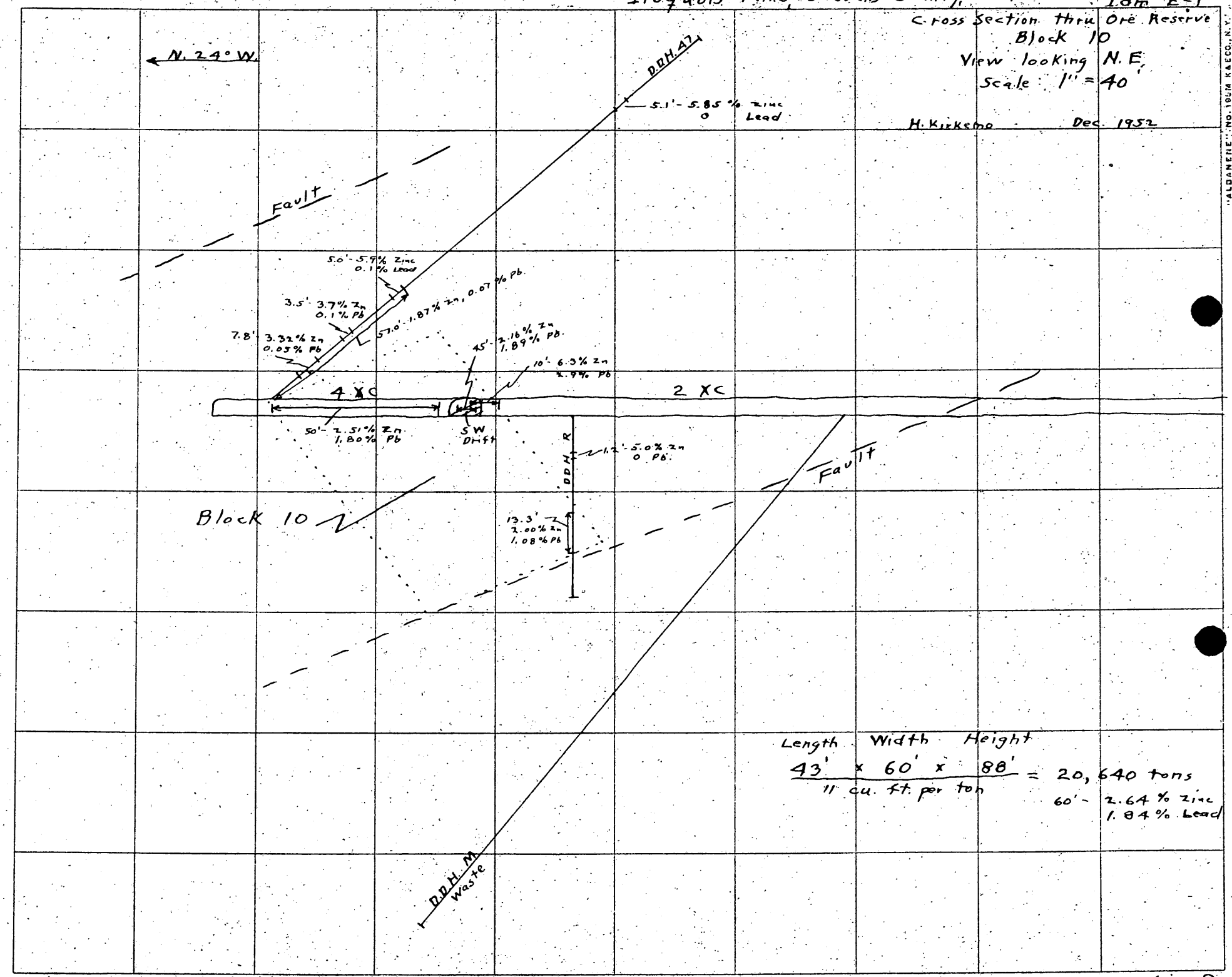
Cross Section 8

Iroquois Mine, Stevens County, Wash.

DMA Docket 432
Idm E-1

Cross Section thru Ore Reserve
Block 10
View looking N.E.
Scale: 1" = 40'

H. Kirkemo Dec. 1952



Length Width Height

$\frac{43' \times 60' \times 88'}{11 \text{ cu. ft. per ton}} = 20,640$ tons

60' - 2.64 % Zinc
1.84 % Lead

Cross Section 9

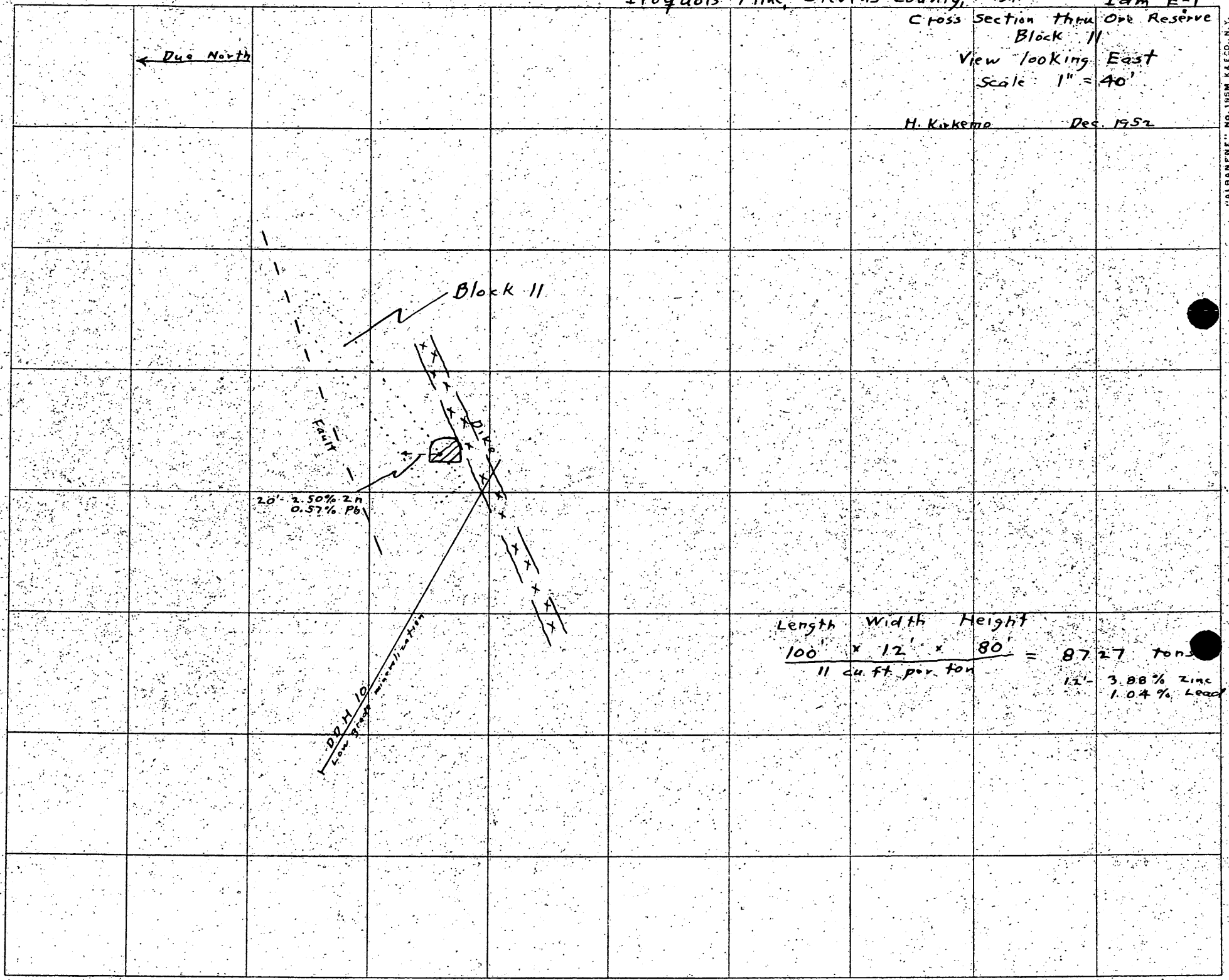
"ALBANENE" NO. 1061M K&E CO., N.Y. REG. U.S. PAT. OFF.

Iroquois Mine, Stevens County, Wash.

DMA Docket 432
Idm E-1

Cross Section thru Ore Reserve
Block 11
View looking East
Scale 1" = 40'

H. Kirkemo Dec. 1952



Length Width Height
100' x 12' x 80' = 8727 tons
11 cu. ft. per ton

12'- 3.88% Zinc
1.04% Lead

Cross Section 10

"ALBANENE" NO. 195M K&E CO., N.Y. REG. U.S. PAT. OFF.

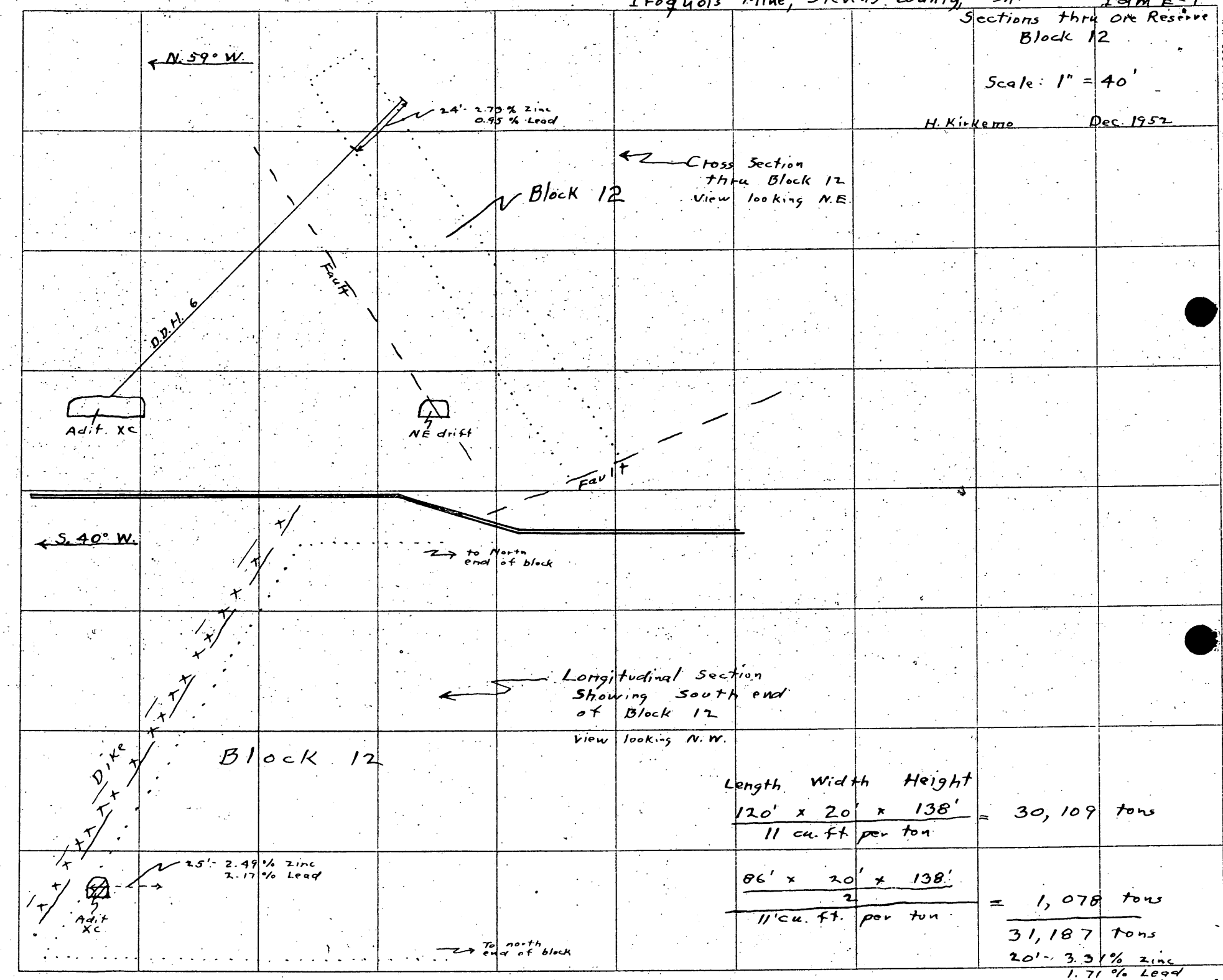
Iroquois Mine, Stevens County, Wash.

DMA Docket 432
Idm E-1

Sections thru Ore Reserve
Block 12

Scale: 1" = 40'

H. Kirkemo Dec. 1952



Length Width Height

$$\frac{120' \times 20' \times 138'}{11 \text{ cu. ft per ton}} = 30,109 \text{ tons}$$

$$\frac{\frac{86' \times 20' \times 138'}{2}}{11 \text{ cu. ft. per ton}} = 1,078 \text{ tons}$$

31,187 tons

20'- 3.31 % zinc
1.71 % Lead

Cross Section 11

"ALBANENE" NO. 165W K&E CO., N.Y. REG. U.S. PAT. OFF.

C O

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
~~WASHINGTON 25, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

Restricting
Betty

November 25, 1952

Through: DMEA Operating Committee

Mr. Jay L. Chambers, Chief
Contract Administration and Audit Div.
Department of the Interior
Defense Minerals Exploration Administration
Washington 25, D. C.

Dear Mr. Chambers:

Enclosed are the original and two copies of justifications for amendments to the below listed contracts, of which a copy of each is being sent to the Regional Finance Officer.

Contract No.	Docket No.	Operator	Amendment No.
E-1	DMA-432	Mines Management, Inc.	1
E-9	DMA-42	Taylor-Knapp Company	4
E-30	DMA-946X	Fey and Durand	3
E-81	DMA-129X	Bennett Mining Company	2
E-81	DMA-129X	Bennett Mining Company	3
E-113	DMA-1593	Ambassador Mines Corporation	1
E-115	DMA-1177X	Elkhorn Mining Company	1
E-115	DMA-1177X	Elkhorn Mining Company	4
E-117	DMA-1727X	Hughesville Silver-Lead Mining Co.	1
E-152	DMA-1635x	Silver Star-Queens Mines, Inc.	4

These attachments are being forwarded in accordance with Mr. Chambers' letter dated August 11, 1952. The remaining justifications will be forwarded at the earliest possible date.

Sincerely yours,

Thor H. Kiilsgaard
Acting Executive Officer
DMEA Field Team, Region II

Enclosures

cc: USBM (2)
Reg. Finance Officer w/encls.

Oct 30 1952

In telephone conversation with Mr. Weissenborn I requested the Field report on the discovery of Rocket DMA-432. He assured me that he would get it out shortly.

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

So. 157 Howard Street
Spokane 4, Washington

File
No answer necessary

September 8, 1952

SEP 2 1952

Mr. H. Keller
Acting Chairman, Operating Committee
Defense Minerals Exploration Administration
Department of the Interior
Washington 25, D. C.

Dear Mr. Keller:

This will acknowledge receipt of your letter dated August 29, 1952, in regard to the final estimate by the Field Team in connection with the discovery of Mines Management, Inc., under DMEA Contract Idm-E1.

We wish to advise that we will take care of this matter as soon as possible.

Sincerely,

Thor H. Kiilsgaard

Thor H. Kiilsgaard
For: A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region II

Docket

FILE COPY
SURNAME:
Das
Keating
Miller

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

AUG 29 1952

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

Re: Docket No. DMA-432 (Lead-Zinc)
Contract No. Idm-81
Mines Management Inc., Washington

Dear Mr. Weissenborn:

Recently the Lead-Zinc Branch of DMPA has made inquiry regarding the final estimate by the Field Team of the ore reserves to be calculated as a result of a discovery at the above-numbered project. They wish to be informed as to when the final estimate will be made, since applications have been submitted to them by the Operator for Government assistance provided under the jurisdiction of their Agency.

We will appreciate advice from you so that we may properly answer the inquiry.

Sincerely yours,

W. F. Keller (GB)
ACTING Chairman, Operating Committee

S.N. 8-29-52

APPROVED:

C. V. Johnson (GB)
Member, Bureau of Mines

S. M. Lemmon (GB)
Member, Geological Survey

AGKeating-mb
August 28, 1952
Copy to: Docket
Adm. Reading File
Operating Committee
Mr. Keller (2)
Mr. Keating
Mr. Bishop
Mr. McKnight
Region II

FILE COPY
SURNAME:

200

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

Mr. A. E. Weissenborn
Executive Officer
Region II
South 157 Howard Street
Spokane 8, Washington

Dear Mr. Weissenborn:

There is enclosed herewith a copy of certification of a discovery or development on the Mines Management, Inc., Contract No. I-DMA-E1, dated May 16, 1951, Docket No. DMA-432, for the Finance Office in Region II.

Sincerely yours,

ROBERT E. ADAMS

cc 7/18/52

Robert E. Adams, Chief
Operations Control & Statistics Div.
Defense Minerals Exploration
Administration

Enclosure

READams/meb
7-18-52
cc to: Adm.Reading File
Mails & Files Br.

FILE COPY

F. E. Johnson, Acting Administrator

Defense Minerals Exploration Administration

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

14X3923.970 Working Fund, DMEA

MR. A. E. WEISSENBORN
EXECUTIVE OFFICER, REGION II
DEFENSE MINERALS EXPLORATION ADMINISTRATION
SOUTH 157 HOWARD STREET
SPOKANE, WASHINGTON

JUL 17 1952

REURTEL JULY 16 DMA-432 IROQUOIS MINE CERTIFICATION BEING SENT TO MINES MANAGEMENT TODAY.

(signed) FRANK E. JOHNSON

7/17/52

FRANK E. JOHNSON
ACTING ADMINISTRATOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

FEJohnson/fw
Typed 7/17/52

cc: Admr Reading File
Mails & Files
Base Metals Division

FILE COPY
SURNAME:

500

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

JUL 17 1952

H.F.Keller
Rubin
Hofflund
Hedges
Johnson
H. F. Keller

rewritten 7/16/52

Mr. Jess Larson, Administrator
Defense Materials Procurement Agency
GSA Building
Washington 25, D. C.

Re: Docket No. DMA-432 (Lead-Zinc)
Mines Management, Inc.
Iroquois Mine, Stevens County,
Washington, Exploration Project
Contract No. I-DMA-81

Dear Mr. Larson:

I am enclosing a copy of a "Certification of Discovery" on the above referenced property.

The contract was signed May 16, 1951, the Government participating to the extent of 50% in an exploration project estimated to cost $24,000.00, Government's share $12,000.00, all of which was expended. No salvage funds from the disposal of equipment, materials, and supplies will be recovered.

The contract allowed for 26 diamond core drill holes not to exceed 2800 feet in aggregate length. The contract was amended to allow for a crosscut 151 feet in length. The exploration project was started May 23, 1951 and was completed in January 1952. A total of 18 holes were drilled having a total length of 3056 feet, and a crosscut 151 feet in length was driven to provide a station from which to diamond drill. Of the 18 holes that were drilled, 17 furnished data for calculating ore reserves.

The final report of the Operator indicates that a considerable tonnage of low grade lead-zinc ore was discovered and delineated by the diamond drilling completed under this exploration project. From the data obtained by this diamond drilling and from the sampling of the main level of the mine prior to the contract, it was possible to estimate the following ore reserves which are shown on the enclosed photostat of a map prepared by the Operator and entitled "Tonnage Estimate Map, Iroquois Mine":

Classification	Tonnage	Grade Combined Lead-Zinc
Indicated Ore	502,000	3.88
Inferred Ore	454,000	4.52

Note: Approximate ratio of zinc to lead is 3 to 1.

The final report and estimate of ore reserves by the Field Team is not yet available, but their preliminary calculations verify the magnitude of the discovery. We shall send you a copy of the aforementioned report on its receipt by this Agency.

Sincerely yours,

(signed) FRANK E. JOHNSON

Acting Administrator

Enclosure

EFKeller/mcf/mh
6/26/52

cc To: Contract Adm Audit Div.
Region IV (2)
Mr. Keller
Docket File
Adm R. File
Op. Comm.
Mr. Hodges
Mr. Thayer
Mr. Johnson
Mr. Markland
Mr. Bishop
Mr. McKnight
Extra
Chron

FILE COPY
SURNAME:
500

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

Mr. Jesse Larson, Administrator
Defense Materials Procurement Agency
DMA Building
Washington 25, D. C.

Re: Docket No. DMA 432 (Lead-Zinc)
Mines Management, Inc.
Iroquois Mine, Stevens County,
Washington, Exploration Project
Contract No. I-DMA-21.

Dear Mr. Larson:

I am enclosing a copy of a "Certification of Discovery" on the above referenced property.

The contract was signed May 16, 1951, the Government participating to the extent of 50% in an exploration project estimated to cost $24,000.00, Government's share $12,000.00, all of which was expended. No salvage funds from the disposal of equipment, materials, and supplies will be recovered.

The contract allowed for 26 diamond core drill holes not to exceed 2800 feet in aggregate length. The contract was amended to allow for a crosscut 151 feet in length. The exploration project was started May 23, 1951 and was completed in January 1952. A total of 16 holes were drilled having a total length of 3050 feet, and a crosscut 151 feet in length was driven to provide a station from which to diamond drill. Of the 16 holes that were drilled, 17 furnished data for calculating ore reserves.

The final report of the operator indicates that a considerable tonnage of low grade lead-zinc ore was discovered and delineated by the diamond drilling completed under this exploration project. From the data obtained by this diamond drilling and from the sampling of the main level of the mine prior to the contract, it was possible to estimate the following ore reserves:

Classification	Tonnage	Grade Combined Lead-Zinc
Indicated Ore	502,000	3.86
Inferred Ore	454,000	4.52

Note: Approximate ratio of zinc to lead is 3 to 1.

Enclosed is a photostat of a map prepared by the Operator, entitled "Tonnage Estimate Map, Iroquois Mine".

FILE COPY
SURNAME:

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

JUL 17 1952

Mr. W. R. Green, President
Mines Management, Inc.
612 Chronicle Building
Spokane 6, Washington

Re: Docket No. DMA-432 (Lead-Zinc)
Contract No. I-DMA-31
Iroquois Mine, Stevens County, Wash.

Dear Mr. Green:

Transmitted herewith is Certification of Discovery under Contract No. I-DMA-31 on the Iroquois Mine in Stevens County, Washington.

By the terms of the Exploration Project Contract and of the Certification, all lead, zinc, and other valuable metals from the aforesaid mine from the date of the Exploration Project Contract, are subject to the Government's percentage royalty as set forth in the contract until the sum of $12,000.00 is paid or until May 16, 1961, whichever occurs first.

Payments should be made to Mr. A. E. Weissenborn, Executive Officer, DMEA Field Team, Region II, South 157 Howard Street, Spokane 4, Washington. Checks should be payable to the Treasurer of the United States. The purchaser should be advised to deduct the royalties from the amount due on each shipment and forward check direct to the Executive Officer.

Royality payments to the Government should be accompanied by suitable evidence, such as copies of settlement sheets, showing quantity and grade of the mineral sold, the name of the purchaser, and the price and charges, certified to be correct by the purchaser.

You are requested to notify Mr. Weissenborn of any changes in ownership or production rights that might have any effect on the Government's right to its percentage royalty. Also, if production ceases at any time for any extended period, please notify Mr. Weissenborn at six-month intervals that no production has been made, when that is the case.

Sincerely yours,

(signed) FRANK E. JOHNSON

Acting Administrator

Enclosure

HFKeller/mb/mef 6/26/52
cc to: Contract Adm. Audit
Region IV(2)
Mr. Keller
Mr. Hedges
Adm. R. File
Docket
Mr. McKnight
Mr. Thayer
Op. Committee
Mr. Johnson
Mr. Bishop

59

261 WA SP /I-GS-G/

SPOKANE WASH 7-16-52 845A

FRANK E JOHNSON, CHAIRMAN OPERATING COMMITTEE

DEFENSE MINERALS EXPLORATION ADMIN

DEPT OF INTERIOR, BOM,

WA

PLEASE ADVISE IF DISCOVERY IS TO BE CERTIFIED AT MINES MANAGEMENT, IROQUOIS MINE, STEVENS COUNTY WASHINGTON, DOCKET DMA 432, CONTRACT IDM-E1. RECOMMENDATION FOR CERTIFICATION TRANSMITTED FROM THIS OFFICE APRIL 18 SIX MONTH PERIOD AFTER COMPLETION OS PROJECT ENDS JULY 31, 1952.

A E WEISSENBORN, EXEC OFFICER DMEA FIELD TEAM,

REGION II, SPOKANE

DMA 432 IDM-E1 18 31 1952

EC 850A

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUL 17 1952

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

157 So. Howard
Spokane, Wash.

May 7, 1952

MEMORANDUM

To: W. Rulon Lee, Fiscal Officer, Albany, Oregon

From: A. E. Weissenborn, Executive Officer, DMEA Field Team, Region II

Subject: Contract Idm-E1, Mines Management, Inc.

This is to advise you that all work under the subject contract has been completed to the satisfaction of the Government and that the full and final accounting of operations under contract presented by the Operator is considered acceptable by this office. A final report evaluating results of work completed under contract also has been presented and accepted as satisfactory.

Inasmuch as all requirements have been met, it is requested that the Operator's final invoice be accepted for vouchering and payment.

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

DMEA 3 Copies
USBM

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 13 1952

FILE COPY
SURNAME:

Chambers

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

April 28, 1952

Memorandum

To: Mr. C. O. Mittendorf
Acting Administrator

From: Jay L. Chambers, Chief /S/
Contract Administration and Audit Division

Attached for your information is an audit report of Mines Management, Inc., pertaining to Exploration Project Contract No. Idm-E-1.

Since this is our contract file copy, please return it.

Attachment

WCBorovies/wb
April 28, 1952

cc: Admr. Reading file
Mails & Files
Mr. Chambers

OFFICE OF THE ADMINISTRATOR

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS ADMINISTRATION

WASHINGTON 25, D. C.

So. 157 Howard Street
Spokane 4, Washington

DMEA-432 (Lead, Zinc)

April 18, 1952

APR 28 1952

Memorandum

To: F. E. Johnson, Chairman, Operating Committee, DMEA

From: Field Team, Region II

Subject: Final report on project I-DMA-El, Iroquois mine, Stevens County, Washington.

Enclosed is a final report on the exploration project at the Iroquois mine, Stevens County, Washington, carried on by Mines Management, Inc., under terms of contract I-DMA-El. This is a well-prepared and complete report in which the Operator claims that "the drilling program has been successful in increasing the tonnage available for mining and in obtaining greater assurance that the tonnage estimates are accurate. A more thorough knowledge of the ore deposit has also been obtained, and this, together with several of the holes permits the calculation of inferred ore above and below the main ore body. The drilling indicated the downward continuation of the ore body had been displaced to the southeast, and four holes drilled in accordance with these indications encountered mineralization. It is believed that this mineralization is the downward continuation of the main ore zone, although additional work may prove that a second ore zone has been encountered."

"As a result of the drilling program, it is now estimated that the property has 502,000 tons of indicated ore averaging 3.88 percent combined lead and zinc and 454,000 tons of inferred ore containing 4.52 percent combined lead-zinc. Although the assays vary considerably, it is believed that the ratio of lead to zinc is 3 to 1."

A final estimate of ore reserves by the Field Team is not yet available, but preliminary calculations indicate about the order of magnitude claimed by the Operator. A Field Team report summarizing the project and discussing the Operator's final report will be prepared and submitted as soon as possible.

The Field Team recommends that a discovery be certified, and has prepared a tentative certification which is attached herewith.

By DMEA Field Team, Region II

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

M. E. Volin, Member
(U. S. Bureau of Mines)

Enclosure-Orig & 3 cys final rept.
cc: USBM-Spokane
USGS-Spokane Regional Office
USBM-Albany

FINAL REPORT ON PROJECT I-DMA-E1 No. 432
IROQUOIS MINE
STEVENS COUNTY, WASHINGTON

Reviewed by
DMEA OPERATING COMMITTEE

5-5-52
(date)

SUMMARY: On May 16, 1951 a contract between the DMA and Mines Management, Inc. was signed. Under the terms of the contract, each party supplied funds on a 50-50 matching basis to conduct a diamond drilling program at the Iroquois Mine, which is located about three miles northeast of the town of Leadpoint in Stevens County, Washington. Mines Management, Inc. had previously applied for a production loan and had made certain estimates as to the tonnage of lead-zinc ore available in the mine. It was suggested, however, that it was desirable to do further drilling in order to obtain more detail and greater assurance of the tonnages available and, if possible, to increase the reserves by searching for extensions of the known ore deposit. The drilling program was designed to satisfy these objectives.

Actual work started May 23, 1951 and was carried on continuously until the program was completed in January, 1952. A total of 18 diamond drill holes having a total length of 3056 feet were drilled. An amendment to the original contract was made to provide for 151 feet of crosscutting in order to obtain a new diamond drill station. This crosscut, together with a 12'x12'x12' diamond drill station was also completed with project funds. Drill cores obtained were logged by the geologists from the USGS and by the company's geologist. All mineralized sections were split and samples taken were assayed by commercial assayers. A total of 162 samples have been assayed and assay sheets were sent to the DMA with the monthly progress reports.

The drilling program has been successful in increasing the tonnages available for mining and in obtaining greater assurance that the tonnage estimates are accurate. A more thorough knowledge of the geology of the ore deposit has also been obtained and this, together with several of the holes, permits the calculation of inferred ore both above and below the main ore body. The drilling

Quart. fin. Rpt

indicated that the downward continuation of the ore body had been displaced to the southeast and four holes drilled in accordance with these indications encountered mineralization. It is believed that this mineralization is the downward continuation of the main ore zone, although additional work may prove that a second ore zone has been encountered.

As a result of the drilling program it is now estimated that the property has 502,000 tons of "indicated ore" containing 3.88% combined lead-zinc and 454,000 tons of "inferred ore" containing 4.52% combined lead-zinc. Although the assays vary considerably, it is believed that the ratio of zinc to lead is three to one.

GEOLOGY: The Metaline quadrangle mapped by C. F. Park Jr. and R. S. Cannon Jr., and published in U.S.G.S. Professional Paper 202, lies about 1½ miles east of the Iroquois property. Paleozoic sediments characteristic of this quadrangle extend westward beyond its borders into the area surrounding the Iroquois. These include the Maitlen, Metaline and Ledbetter formations intruded by Lamprophyre dikes and sills and by granitic rocks from acidic to basic phases. The area is cut by a series of southwest trending faults that has produced an apparent banding of the structure in this direction. Maitlen formation lies to the southeast of the property. Metaline limestone, the host rock of the zinc and lead minerals, adjoins the Maitlen on the northwest followed in turn by the Ledbetter slate and again the Maitlen formation.

In the immediate vicinity of the mine the Metaline limestone overlies the Ledbetter slate, both having northeast strikes and southeast dips. The Ledbetter slate has been definitely identified by the fossiliferous graptolites, but no fossils have been found in the limestone to provide conclusive evidence whether it is post Ledbetter slate in an upright position or Metaline limestone in an overturned position. Certain graptolits found horizontally about 200 feet into the slate from the contact have been identified by the U.S.G.S. as occurring about 200 feet from the bottom of the Ledbetter; and principally on this evidence it is presumed that the limestone is Metaline formation in an overturned position.

The mine is opened by a southeast trending adit crosscut from valley bottom into a northeastwardly trending mountain. The first 250 feet of the adit cuts Ledbetter slate striking northeast and dipping about 45 degrees to the southeast. A fault of unknown magnitude but believed to be relatively small separates the Ledbetter from the limestone. Beyond it the limestone continues in the adit 800 feet and diamond drill hole a minimum of 800 feet more, though cut by numerous basic dikes mostly lamprophyres. The limestone in general trends and dips parallel to the Ledbetter, but locally near faults and dikes the variation is large.

The limestone locally has suffered varying intensities of alteration by replacement or recrystallization to dolomite, by silicification to jasperoid and by the development of replacement or collapse breccia.

The zinc and lead sulfide minerals appear related to faults and fractures being found partially within these openings but mostly as disseminations into the adjacent wall rock. The ore zones are irregular in shape, but in general are elongated with the strike and dip of the formation. This may, however, be the result of faulting that has similar strikes but dips at some variation.

The vicinity of the ore zone where encountered in the main adit crosscut is traversed by a basic dike trending a little north of west and dipping about 45 degrees to the south. A fault of unknown magnitude but believed to be less than 100 feet of motion follows this dike, and by cutting out and overlapping at irregular intervals has produced variable widths from 0 to 10 feet. A fault in general trending with the limestone but dipping steeply southwestward across the beds cuts this dike, and in the vicinity of the intersection a broad zone of breccia has developed made up of both dolomitic limestone and jasperoid breccia suspended in crystaline dolomite, calcite and white quartz. Part of this matrix has been mineralized by sphalerite and a little galena, and part is barren of sulfides. The main mineralization follows along the steeply dipping fault as dissemination into the wall rock and in general decreases in intensity progressively with the increased horizontal

distance from the dike.

Another ore zone has been found in echelon position west of the southwest end of this main ore zone, but to date is insufficiently developed to determine its association with structure.

Another ore zone has been encountered roughly in a parallel position to and about 200 feet horizontally southeasterly from the main ore zone. A flat angle fault about parallel with the strike of the formation but dipping about 25 to 30 degrees to the northwest has been encountered in the crosscuts between these two ore zones. Diamond drilling indicates that the main ore zone bottoms close to the dip projection of this fault, and the parallel structure tops near the up dip projection. Based upon this evidence and the position of dikes in the main adit crosscut and No. 1 crosscut containing similar dips, strikes, textures and contents, this has been assumed to be a normal fault offset of the main ore body.

Supergene alteration has taken place to varying degrees. Certain shallow pits along the surface trend contain some galena but no sphalerite was observed. However, samples of the combined galena with the immediately surrounding oxide of the gossan have assayed high in zinc.

In the adit level this alteration is prominent along certain faults and negligible along others. Some broad bands have had total removal of sulfide minerals, yet in other places sphalerite has been found in the wall rock within a few inches of strong alteration.

Supergene alteration increases in the raise from the southwest drift to the surface. The increase varies irregularly with the several faults cut, but the increase is sufficiently definite to indicate a zone near the surface too strongly altered to retain enough sulfide minerals for commercial mining.

<u>DESCRIPTION OF HOLES DRILLED</u>: The following is a description of holes drilled:

DDH-A was drilled 103 feet N 35° W -45° from raise station and encountered 2.9 feet of 3.9% zinc from 59.3 to 62.2 feet and 11.8 feet of 1.4% zinc from 62.2 to

74.0 feet. From 59.3 to 91.0 feet almost continuous disseminated mineralization was encountered.

DDH-C was drilled 90 feet vertically downward from raise station and encountered 2.0 feet of 1.25% zinc from 31 to 33 feet.

DDH-D was drilled 100 feet vertically upward from near the face of 8 crosscut 38.5 feet from survey station S5, and was almost continuously mineralized with disseminated zinc from 5.0 to 83.0 feet. In the distance of 65 feet from 5 to 70 feet this averaged 2.05% zinc. Of this 16 feet from 14 to 30 feet averaged 2.81% zinc, 12 feet from 48 to 60 feet averaged 4.1% zinc, and 3 feet from 63.5 to 66.5 feet averaged 3.6% zinc.

DDH-E was drilled 300 feet S 40° E + 45° in the adit main crosscut 381 feet from the portal. The main dike along which ore was found on the adit level was encountered from 161 to 171 feet, but no visible zinc or lead minerals were encountered throughout the hole. However, a jasperoid zone was encountered from 249 to 295 feet.

DDH-G was drilled 100.5 feet vertically upward from near the face of 3 crosscut 63 feet from the centerline of the northeast drift. This contained some low grade zinc from 8 to 43.2 feet. A good section was encountered from 63.0 to 69.8 feet that averaged 3.3% zinc.

DDH-I was drilled 239.3 feet N 19° W -45° from 1 crosscut at survey station Nx2 + 20 feet. (208 feet from the centerline of the northeast drift.) No visible zinc or lead minerals were encountered but a zone of breccia was cut from 144.3 to 160.6 feet and jasperoid from 160.6 to 190.8 followed by breccia to 203.5 feet.

DDH-M was drilled 220.4 feet N 18° W -50° from 2 crosscut at survey station S3 + 130 feet. (130 feet from centerline of southwest drift.) No visible zinc or lead was found.

DDH-N was drilled 102.3 feet vertically downward from 2 crosscut at survey station

S3 + 241 feet (241 feet from centerline of southwest drift) and encountered bands of high grade. A weighted average for the first 34 feet ran 4.42% zinc and .38% lead.

DDH-P was drilled 139.0 feet N 10° W -45° from 10 crosscut at 163 feet from the centerline of the southwest drift. No visible zinc or lead was encountered.

DDH-Q was drilled 124.1 feet vertically downward from 10 crosscut 166 feet from the centerline of the southwest drift and encountered no visible zinc or lead.

DDH-R was drilled 60.7 feet vertically downward and was almost continuously mineralized with zinc with some lead from 6. to 48.5 feet. The portions containing more than 2% zinc consisted of 12.8 to 14 feet 5% zinc, 32.3 to 35.1 feet 3.2% zinc, 38.4 to 39.9 feet 9.6% lead and 5.9% zinc, and 47.0 to 48.5 feet 2.65% zinc.

DDH-S was drilled 600 feet N 51° W -45° from 1 crosscut at survey station Nx3 plus 35 feet. (343 feet from the centerline of the northeast drift.) No visible zinc or lead was encountered.

DDH-T was drilled 200 feet N 72½° W -25° from 10 crosscut 159 feet from the centerline of the southwest drift. No visible zinc or lead was encountered. Practically all sulfide minerals had been leached and limonite filled vugs remained.

DDH-U was drilled 220.4 feet S 67½° W plus 25° from the face of the southwest drift at survey station S6 plus 40 feet. This encountered scattered disseminated zinc to 96 feet and then almost continuous disseminated zinc to 217 feet. This averaged 32.5 to 36.5 feet 1.2% zinc, 54 to 56 feet 1.4% zinc, and 85 to 215.5 feet 3.68% zinc.

DDH-V was drilled 143.4 feet N 40° W minus 45° from 2 crosscut at survey station Sx3 plus 60 feet (388 feet from centerline of the southwest drift.) This contained 1 foot of high grade zinc from 51.3 to 52.3 feet on which assay results are not yet in.

DDH-W was drilled 90.1 feet N 40° W horizontally from 2 crosscut at survey station Sx3 plus 60 feet. Assay results have not been received on this hole. A good zinc showing occurred from 45.5 to 48.9 feet, from 68.0 to 69.7 and from 77.0 to 77.8 feet.

DDH-X is incomplete being drilled N 5° W minus 35° from 2 crosscut at survey station Sx3 plus 58 feet.

COST OF PROJECT: The following tables show a breakdown of the costs by months with the costs per foot of diamond drilling and drifting, and a breakdown of the costs under various classifications.

Costs per Month

Month	Total Costs Per Month	Diamond Drilling No. of Feet	Diamond Drilling Cost Per Foot	Cross Cutting No. of Feet	Cross Cutting Cost Per Foot
May, 1951	$ 597 09	70	$ 8 53		
June, 1951	2 621 09	445	5 89		
July, 1951	3 178 47	557	5 71		
Aug. 1951	3 904 97	560	6 97		
Sept. 1951	1 953 49	247	7 90		
Oct. 1951	3 109 39	380	8 18		
Nov. 1951	3 452 60	283	6 82	59	25 82
Dec. 1951	3 076 30	214	5 72	92½	20 02
Jan. 1952	2 106 60	300	7 02		
Totals *	$24 000 00	3056	Av. 6 75	151.5	Av. 22 28

1721.50 1374.11

* Total for Diamond Drilling	$20 624 46
Total for Drifting	3 375 54
	$24 000 00

Costs Per Month by Divisions

	May 1951	June 1951	July 1951	Aug. 1951	Sept. 1951	Oct. 1951	Nov. 1951	Dec. 1951	Jan. 1952	Total	Percent of Total Cost of Project
Labor (Non-Contract)	83.19	297.68	231.00	297.00	242.00	372.60	505.94	325.30	110.00	2464.71	10.27
Engineering & Supervision	190.00	330.73	469.55	620.30	416.00	669.34	520.00	414.86	147.00	3777.78	15.74
Sampling	42.00	136.50	300.00	300.00	300.00	300.00	300.00	300.00	- -	1978.50	8.24
Assaying	- -	100.00	22.00	22.00	56.00	- -	45.00	- -	- -	245.00	1.02
Power*	- -	142.40	128.55	199.09	124.69	255.85	255.48	213.84	121.29	1441.19	6.00
Drill Contract	241.50	1519.15	1925.40	2370.38	770.95	1420.95	1033.65	665.80	1650.50	11598.28	48.33
Drift Contract	- -	- -	- -	- -	- -	- -	472.00	740.00	- -	1212.00	5.05
Supplies**	7.00	31.50	49.00	28.00	7.00	24.50	255.84	346.25	28.00	777.09	3.24
Clerical	33.40	11.20	22.20	22.20	22.20	22.20	22.20	22.20	- -	177.80	0.75
Transportation	- -	51.93	30.77	46.00	14.65	43.95	42.49	48.05	49.81	327.65	1.36
Total	597.09	2621.09	3178.47	3904.97	1953.49	3109.39	3452.60	3076.30	2106.60	24,000.00	100.00

* Power includes fuel, lubrication and repairs.

** Supplies include core boxes and powder.

CALCULATIONS: The map which accompanies this report was prepared for use in estimating the tonnage at the Iroquois Mine. The map shows the locations of the various laterals, crosscuts, diamond drill holes and the raise which are pertinent to an explanation of the estimate. Only the portion of the mineralized zone which is included in the tonnage estimates is shown. This portion of the zone is outlined by a dashed line on the map. Also outlined with a broken line is what is believed to be the downward continuation of the ore zone. This latter area is classified as "inferred ore" as is the area above the main ore block.

Two methods of calculating the "indicated ore" were used. In the first method the main zone was divided into five blocks, and a section drawn through each block. The area of the section times the length gave the volume of each block. The sum of the volumes was divided by a factor of 11 cubic feet to get the tonnage. The grade of each block was obtained by calculating the weighted average of the assays of samples taken in the openings shown on the sections. The overall grade of the "indicated ore" zone was obtained from weighting the grades of the blocks.

In the second method the area of the main ore block was obtained by use of a planimeter, and this area multiplied by the vertical height, as shown in the sections, gave the volume. The tonnage was obtained by dividing by 11 cubic feet to the ton. The grade in the second method was obtained by calculating the weighted average assay of all samples taken within the main zone.

The vertical cut-offs used were the known or projected positions of the two faults which are believed to have displaced the ore zone both above and below the main level. These faults are shown on the sections.

The results of the first method show 502,000 tons of "indicated ore" having a grade of 3.88% combined zinc and lead. The second method shows 454,000 tons having a grade of 3.76% combined zinc and lead.

It is possible to obtain higher grades by reducing the tonnage or to obtain greater tonnage by reducing the grade. However, it is believed the grade and tonnage

as shown by either of these methods approximate the maximum amount of ore that can be mined at a profit under present metal prices and cost conditions.

The following tables show the weighted averages of the individual diamond drill holes and various underground openings within the main ore zone.

DIAMOND DRILL HOLE ASSAYS

DDH No.	Feet From	Feet To	Dist.	Percent Zn & Pb
1	5.3	53.0	47.7	4.34
3	0	97.2	97.2	3.68
4	168.5	181.5	13.0	6.24
5A	95.5	150.	54.5	4.42
5B	156.5	162.5	6.0	5.22
5C	177.3	191.9	14.6	3.90
15A	15.3	31.9	16.6	2.91
15B	48.7	52.3	3.6	5.36
17A	15.8	16.9	1.1	6.80
17B	29.5	34.3	4.8	2.05
19A	146.3	155.5	9.2	3.57
19B	166.1	198.0	31.9	3.42
6	116	140	24.0	3.70
G	63	69.8	6.8	3.27
D	5	60	55.0	2.17
R	6	48.5	42.5	1.56
U	85	215.5	130.5	3.78

CHANNEL SAMPLES IN DRIFTS
CROSSCUTS & RAISE

Location	Distance	Percent Zn & Pb
Main Crosscut	65'	2.84
Crosscut #4	50'	3.95
Crosscut #6 & #8	75'	3.55
(A) NE lateral	40'	5.51
(B) NE lateral	65'	2.53
(A) SW lateral	30'	2.68
(B) SW lateral	105'	3.39
Raise	90'	6.86

Wt. Aver. of all samples 3.76% Zn & Pb

The "inferred ore" has not been sufficiently explored to permit the use of the block method of calculating the tonnage. For this reason the zone to the southeast of the main ore zone was planimeterized and this area multiplied by the vertical distances indicated by the diamond drill holes to obtain the volume. Because the surface outcrops show for a length of at least that of the main ore zone, the block above the main zone was taken as having an area equal to the main zone with a vertical distance as shown by the drill holes. The two volumes were divided by a factor of 11 cubic feet to obtain the tonnage.

The following table gives the weighted average of the samples from the various penetrations by drill holes and drifts. The weighted average of all samples in the zone have been used as the grade of the "inferred ore".

Opening	From	To	Dist.	Percent Pb & Zn
DDH #1	311.2	347.5	36.3	2.17
DDH #8	38.75	57.20	18.45	2.93
Crosscut #1	0	20	20.0	3.35
DDH W	45.5	69.7	24.2	3.48
DDH V	51.3	52.3	1.0	36.15
Crosscut #2	0	30	30.0	19.82
DDH Y	42.4	67.3	24.9	9.27
DDH N	0	29.5	29.5	7.88
Wt. Aver.			184.35	4.52

CONCLUSIONS: Based on the results obtained by the work completed at the Iroquois Mine, it is concluded:

(1) The main ore zone contains 500,000 tons of "indicated ore" having a grade of from 3.76% to 3.88% combined lead and zinc.

(2) The property contains 450,000 tons of "inferred ore" having a grade of 4.52% combined lead and zinc.

(3) The exploration carried out to date has not definitely delimited the ore zone either along the strike or in a downward direction, and further exploration and development may greatly increase the tonnages available for mining.

(4) The ore zone is of sufficient size to permit the application of large scale, low cost mining methods.

(5) The geological conditions and grades of ore are similar to certain of the ore bodies mined commercially in the neighboring Metaline district.

(6) If properly equipped it is believed that this deposit can be mined at a profit.

RECEIVED
APR 17 1952
U. S. G. S.
SPOKANE, WASH.

File

Noted - Com
good!
Possible cost of Dia.

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

March 31, 1952

Memorandum

To: Mr. C. O. Mittendorf

From: Base Metals Division

Subject: Mines Management, Inc., Docket No. DMEA 432, I-DMA-E1

The Mines Management, Inc., received the first approved and executed exploration contract with an effective date of May 16, 1951. The proposed work was to drill approximately 26 diamond drill holes from surface and present underground workings to intercept the possible extensions of a mineralized zone above and below the present workings. The drilling was to aggregate 2800 feet at an average cost of $8.57 per foot, inclusive cost.

We have examined the progress reports on the operation and present the following summary:

	Wages	Supplies	Contract	Other	Total	Units	Cost/unit
May 23-31	$348.59	$ 7.00	$ 241.50		$597.09	70'	$ 8.52
June	776.11	225.83	1519.15	$100.00	2621.09	445'	5.89
July	1022.75	208.32	1925.40	22.00	3178.47	557'	5.71
August	1239.50	273.09	2370.38	22.00	3904.97	560'	6.97
September	980.20	146.34	770.95	56.00	1953.49	247'	7.91
October	1364.14	324.30	1420.95		3109.39	380'	8.18
November	684.37	315.47	1033.65	45.00	2078.49	283'	7.34
December	403.53	261.89	665.80		1331.22	214'	6.22
					$18774.21	2756'	$6.81

Crosscutting and drill station

November	$1135.77	$238.34	$1374.11	59'	$23.29
December	1398.83	346.25	1745.08	92½'	18.87
			$3119.19	151½'	$20.59

The above costs indicate that the drilling has averaged considerably less than the estimated amount even though trouble was encountered on 2 holes requiring casing and reaming.

The results of the holes, as shown on assay logs submitted, with form MF-104, indicates that the work has been very successful. Several holes, in addition to those listed, have shown mineralization, and the logs of a number of the holes drilled have not been presented. The tabulation of six drill holes and sampling from two drifts is as follows:

	Area	Samples	High	Footage	Weighted Average, % Lead	Zinc
Hole N	0-29.5	14	23.7% Zn	29.5	-	6.31%
" Y	42.4-67.3	12	18.2% Pb	24.9	3.83	5.44%
" V	51.3-52.3	1	19.8% Zn	1.0	16.35	19.80%
" W	45.5-50.9	2	9.4% Zn	5.4	4.80	7.70%
" W	68.0-69.7	2	12.5% Pb	1.7	7.00	2.80%
" V	32.5-215.5	37	19.4% Zn	129.7	-	3.79%
Drift	0-30	6	28.3% Pb	30.0	9.78	10.04%
"	55.5-108.5	11	38.2% Pb	53.0	6.35	3.44%

The units accomplished up to the end of December indicate that the project was almost completed and while the final report of the drilling and a map indicating the location and extent are not at hand, it appears that a high grade discovery has been made. It also appears that the project has been conducted in an efficient and economical manner.

We thought you would be interested in the results of this analysis and we hope to continue this review on the other contracts in force as opportunity permits.

D. E. Moulds

D. E. Moulds

OFFICE OF THE ADMINISTRATOR

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS ADMINISTRATION

WASHINGTON 25, D. C.

So. 157 Howard Street
Spokane 4, Washington

DME 432

March 24, 1952

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA, Field Team, Region II

Subject: Transmission of Amendment to Mines Management Contract, Idm-E1.

Enclosed is an amendment to the above-mentioned contract which should have been sent to you some time ago. The reasons for the amendment are obvious.

A. E. Weissenborn

A. E. Weissenborn

Enclosures
cc: USBM, Spokane

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 28 1952

AL

FILE COPY
SURNAME:
800

Talbert (sub)

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

DMEA
432

March 13, 1952

Memorandum

AIR MAIL

TO: Mr. Robert M. Hull

FROM: E. D. Talbert

Reference is made to your letter of March 9, 1952 with which you transmit a draft of your proposed audit report on the Mines Management, Inc., Contract E-1. I have examined this draft together with what records we have here which consist merely of the contract and amendments plus the November and December Forms MF-104 and have several questions:

1. Was the performance within "100 shifts" stated as the period of the contract?

2. What is the basis and justification for charging one-third of the Superintendent's time to the project?

3. What is the justification for charging for the Geologist at "$100 a month plus $25 per actual day and expenses", when the contract provides only for salary at a maximum of $400 per month? Why was not his salary distributed on the same basis as other supervisory personnel?

4. Were wages (on shift basis) for Clerk and Bookkeeper charged only for time actually worked on project?

5. Did the assaying charges cover only samples from the project?

I am returning the draft of the report to which as you will note I have applied the "ax". Please do not take this too much to heart as both Mr. Chambers and I consider this generally a very good report, but it is more of an attempt to crystalize a format. Also, since the original will be filed with the final MF-104 it is of paramount importance that we word our statements in such a manner that the payment is indicated as proper beyond any doubt. If this is not done the GAO auditors suspicions may be unduly aroused. I am sure you can appreciate this.

Also, in your audit report the items should be covered under their proper category and not necessarily as indicated on the MF-104. For instance, the supplies used for power should be under "Supplies". The gasoline used for transportation likewise should be under "Supplies" and only the transportation costs which were paid as such should be under "Transportation".

BL

It also appears that much of what you show under "Findings" with the exception of the "General" paragraph should be under "Extent and Scope of Audit". The "Findings" ordinarily should be limited to dealing with exceptions and the condition of the records and, in this case, since no exceptions have been taken there should be a general statement that no exceptions have been taken that the costs are reasonable and proper and are within the terms of the contract. Also in this particular case you might indicate the shifts in dollar amounts which you make between the various categories of costs in order that the final MF-104 may be adjusted in the "Approved" columns.

Enclosed also is a copy of the revised format of the Audit Certificate which you should use for this and all subsequent audits unless advised of further revision.

We would appreciate being advised as to a schedule by contracts of your proposed audits with indication of the location of the books and the anticipated dates of your audit.

With regard to your suggestion that on any future contracts with Mines Management that we "spell out just what we want in the way of supporting records", I believe this can be more readily accomplished at the time the field team delivers the contract to Mines Management for signature. The representative of the field team should inform the contractor at that time as to the minimum requirements in the way of records. You can advise them in these premises.

In regard to your letter of March 3, 1952 relative to audit of Contract E-18, United Minerals Corp., you will have to do the job. Up to the present we have not placed a man in Denver. However, when we have sufficient auditors available, the practice will undoubtedly be to have the audit performed by the man located in the region where the books are maintained.

Attachments

S.N.
3-13-52

EDTalbert/wb
March 13, 1952

FILE COPY
SURNAME:

410

F L Knouse
Mittendorf

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

DEC 7 - 1951

Mr. A. E. Weissenborn
Executive Officer
Region II
South 157 Howard Street
Spokane 8, Washington

Re: Docket No. DMA 432
Mines Management, Inc.
Exploration Project Contract I-DMA-E1

Dear Mr. Weissenborn:

Your attention is called to the fact that in your letter of November 26, 1951, when you stated you were enclosing three copies of an amendment to the above-subject docket, you inadvertently enclosed four copies. Since you also informed us in the same letter that copies had been sent to the Operator and the Fiscal Officer, we assume the fourth copy is for your files, therefore, we are returning the fourth copy herewith.

Sincerely yours,

C. O. Mittendorf (fw) 12/7.

Acting Administrator

Enclosure

FLKnouse/meb
12/5/51

cc to: Adm.Reading File
Reports & Records
Mr. Mittendorf
FLKnouse
Docket

FILE COPY
SURNAME:

410

F L Knouse
Mittendorf

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

December 3, 1951

Memorandum

To: Reports and Records Section

From: Administrator

Subject: Docket No. DMA 432
Mines Management, Inc.
Exploration Project Contract I-DMA-E1

Enclosed is an original of a letter dated November 26, 1951 from Mr. A. E. Weissenborn, Executive Officer, Region II, transmitting an amendment, which is also enclosed, to the captioned Exploration Contract. Please attach the amendment to your copy of the contract.

C. O. Mittendorf (fw)

cc
12/7

Enclosures

FLKnouse/meb
cc to: Adm.Reading File
Reports & Records
Mr. Mittendorf
Field Team,Reg.II(2)
FLKnouse
Docket

DMA-432
LEAD-ZINC

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

So. 157 Howard Street
Spokane 4, Washington

November 26, 1951

Chairman, Operating Committee
Defense Minerals Exploration Administration
Department of the Interior
Washington 25, D. C.

Dear Sir:

Attached are three copies of Amendment No. 1 to Exploration Project Contract I-DMA-E1 of Mines Management, Inc.

Copies have been mailed to the Operator and the Fiscal Officer.

Sincerely yours,

A. E. Weissenborn KG

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

Enclosures
cc: U.S.B.M.

NOV 30 8 57 AM '51
DEFENSE MINERALS
ADMINISTRATION
WASHINGTON, D.C.

410

FILE COPY
SURNAME:

F. E. Johnson
Mittendorf

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

AIR MAIL

JUL 30 1951

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

Re: Docket No. DMA-432
Mines Management, Inc.
Exploration Project Contract
No. I-DMA-E1

Dear Mr. Weissenborn:

This will acknowledge receipt of your letter of July 20, 1951 enclosing copy of letter dated July 20, 1951 to you from Mines Management, Inc., and map showing proposed changes in location of two drill holes.

Your comments, with respect to the operator's request for changes in the location of the drill holes referred to, have been noted. We have no objection to the proposed changes, and you are authorized to approve them, provided that the proposed changes in the work will be done at no increased cost to the project.

You are also authorized to approve similar changes in this project that may occur in the future if you deem it expedient, provided there is no change in the amount of the work to be performed or the cost thereof.

As we previously advised you, arrangements are being made to allow the field team more discretion in the approval of changes in exploration projects and will advise you when this is done.

Sincerely yours,

C. O. Mittendorf

C. O. Mittendorf, Director
Production Expansion Division

APPROVED:
Tom Lyon

Chairman, Coordinating Committee
Lowell B. Moon
Olaf N. Rove

Member, Geological Survey
Lowell B. Moon

Member, Bureau of Mines

FEJohnson/ecl
cc to: Admr's. Reading File
Messrs. Mittendorf - Olund
Reports & Records
Lyon Moon
Rove Johnson
Koontz

Dm Docket file

FILE COPY
SURNAME:

FE Johnson
Mittendorf
Ron

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

JUL 30 1951

A.E.C.

Mr. A. E. Weissenborn
Executive Officer
DMA Field Team, Region II
South 157 Howard Street
Spokane, Washington

Re: Docket No. DMA 432
Mines Management, Inc.
Exploration Project
Contract No. Idm-EI
Amended July 19, 1951

Dear Mr. Weissenborn:

This will acknowledge receipt of your letter of July 11, 1951, concerning the captioned contract and enclosing a proposed amendment signed by the Operator in sextuplet.

As Mr. Frank Johnson of my office advised you, the Field Team should be allowed some flexibility in approving minor changes in the project and we are endeavoring to have this arrangement made. However, to avoid any delay in making payment for expenditures which you believe are proper but are not specified in the exhibits attached to the contract, Mr. Boyd has executed the amendment submitted by you.

We are enclosing two copies of the executed amendment, one of which should be given to the Operator for attachment to his copy of the contract and the other copy attached to your copy of the contract. The Washington Finance Division will forward a copy of the amendment direct to the Regional Finance Officer.

I trust this procedure will correct this situation, but if it again arises please do not hesitate to call my office.

Sincerely yours,

C. O. Mittendorf

C. O. Mittendorf, Director
Production Expansion Division

Enclosures-2

APPROVED:

Tom Lyon
Chairman, Coordinating Committee

B. Moon
Member, Bureau of Mines

Olaf N. Rove
Member, Geological Survey

FEJohnson/bjs
cc to: Adm. Reading File
Mr. Mittendorf, Mr. Olund
Mr. Rove
Mr. Moon
Mr. Herres
Mr. McKnight
Mr. Johnson
Region II (2)
Files
Chron. Copy

Mittendorf
Stu, Johnson

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
So. 157 Howard Street
Spokane 4, Washington

July 20, 1951

Memorandum

To: C. O. Mittendorf, Director, Production Expansion Division, Defense Minerals Administration

From: A. E. Weissenborn, Executive Officer, Field Team, RegionII, Defense Minerals Administration

Subject: Mines Management, I-DMA-E1, Change in drilling program

Attached is a request by Mines Management dated July 20, 1951 to change the location of two diamond drill holes as indicated on the attached map.

The request has been granted as the cost of $1,000.00 to provide a drilling station at the original site might be saved. The diamond drill hole intersections are not as good at the new location, however they will provide the information desired and it is believed that the added expense of cutting a drill station at the original site is not warranted.

A. E. Weissenborn

A. E. Weissenborn

cc: U.S.B.M., Spokane
Enclosure

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUL 2 4 1951
LANDON F. STROBEL
Executive Secretary

So. 157 Howard Street
Spokane 4, Washington

July 20, 1951

Mr. W. R. Green, President
Mines Management, Inc.
Box 178
Spokane, Washington

Re: I-DMA-E1

Dear Mr. Green:

Your request of July 20, 1951 to change the location of two drill holes to eliminate the necessity of cutting a drill station is granted.

The change in drilling location, inclination and length of new holes are shown on the attached map.

Very truly yours,

A. E. Weissenborn
Executive Officer, DMA
Field Team, Region II

cc: U.S.B.M., Spokane
C.O. Mittendorf

COPY

MINES MANAGEMENT, INC.
Suite 612 Chronicle Building Mail Address Box 178
Spokane, Washington

July 20, 1951

Mr. A. E. Weissenborn, Executive Officer
DMA, Field Team, Region 2
S. 157 Howard
Spokane, Washington

Dear Mr. Weissenborn:

The I-DMA-E1 Matching Fund program at the Iroquois Mine calls for two down holes from a point adjacent to the face of the main adit crosscut. The last 150 feet of this crosscut is a hand steel driven small (4 x 5½ feet) heading partly filled with waste rock. The cost of cleaning this and preparing a set-up to meet specifications required by the diamond drillers would probably cost in excess of $1,000.

A short raise was driven in the back of the crosscut about 75 feet from the face. This site will provide a low cost set-up from which two holes can be driven to intersect the projected ore zone at practically the same depth as the holes proposed from the face, and with less length of hole.

Please see accompanying sketch for details.

We request your authorization to make this change.

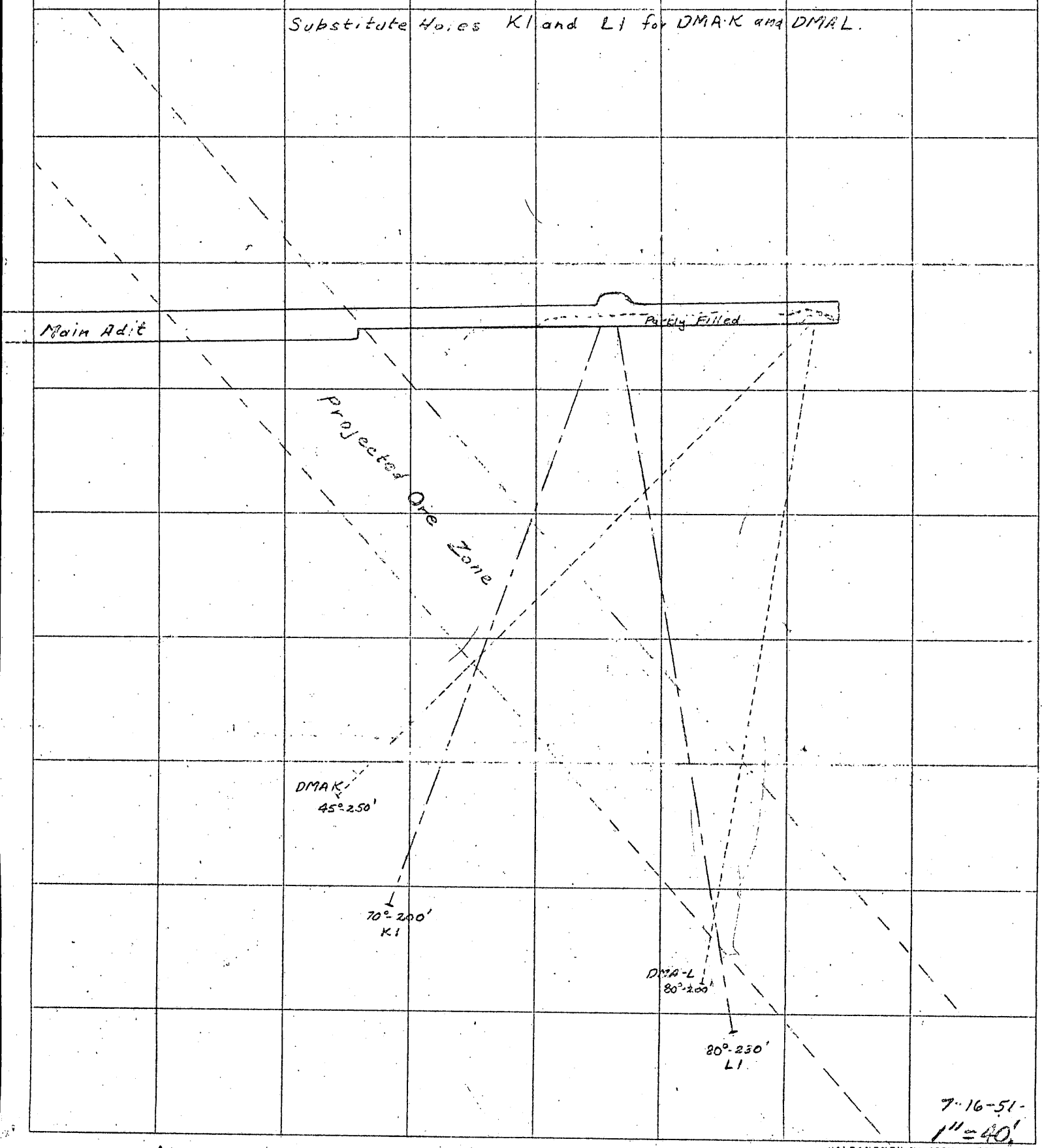
Yours very truly,

P. E. Oscarson

PEO: cl
Attch.

Proposed Change in Diamond Drill Hole Program at
Iroquois Mine, Mines Management Inc., Stevens County, Washington
Project No. I-DMA-E1

Substitute Holes K1 and L1 for DMA-K and DMA-L.



7-16-51
1" = 40'

"ALBANENE" NO. 196M K&E CO., N.Y.
REG. U.S. PAT. OFF.

FILE COPY
SURNAME:

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

July 20, 1951

Contract Service Section
General Accounting Office
Washington 25, D. C.

Re: Docket No. DMA 432
Mines Management, Inc.
Exploration Project Contract
Idm-E1
Amended July 19, 1951

Gentlemen:

Enclosed for recording in your office is the original of an amendment to the Exploration Project Contract between the operator named in the above reference and the Government of the United States.

Sincerely yours,

SIGNED

C. O. Mittendorf, Director
Production Expansion Division

Enclosure-1

FEJohnson/meh
cc to: Adm. Reading File
Mittendorf, Olund
Region II
Johnson
FILES

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

1207 N. Division
Spokane 2, Wash.

July 11, 1951

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUL 16 1951
LANDON F. STROBEL
Executive Secretary

MEMORANDUM

To : L. F. Strobel, Executive Secretary, Defense Minerals Administration, Washington 25, D. C.

From : Field Team, Region II

Subject: Exploration contract with Mines Management, Inc.
DMA-432
Contract No. I-DMA-E1

The monthly summary cost statement submitted for the first period, beginning May 23 and ending June 30, 1951, by Mines Management, Inc., for the Government's share of the subject contract includes distribution of wages and salaries for surface labor, bookkeeper, and clerk. Wage rates for these classifications were not set up in the contract, and the Fiscal Officer of Region II will approve only such items for payment as are shown in the contract.

It is requested that the enclosed addendum to the contract, signed by the official authorized to act for Mines Management, Inc., be signed by the Administrator, Defense Minerals Administration and made an attachment to Exhibit "D". When a signed copy has been returned for transmittal to the Fiscal Officer, Region II, payment for the account of the Government can be made under this contract.

For Elton T. Young Geog
A. E. Weissenborn, Exec. Officer

M E Volin
M. E. Volin, Member

Enclosure

FILE COPY
SURNAME:

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

Mailed 5/25/51

May 21, 1951

Memorandum

TO: Mr. A. E. Weisenborn, Executive Officer
DMA Field Team, Region II

FROM: C. O. Mittendorf, Director
Production Expansion Division - DMA

SUBJECT: Docket No. DMA-432 (Zinc)
Mines Management, Inc.
Exploration Project Contract

This is to acknowledge and thank you for your letter of May 16, 1951 and the enclosed maps in quadruplicate relating to the Exploration Project of Mines Management, Inc.

The maps which you enclosed in your letter furnish complete information for our purposes and are quite satisfactory for attaching to the contract. However, in order to avoid delay we previously had photostats made of the maps originally forwarded by you. Undoubtedly, by this time you have received the copies of the executed contracts and attachments mailed to you on May 17th.

C. O. Mittendorf

C. O. Mittendorf

APPROVED:

Tom Lyon
Chairman, Coordinating Committee

Lowell B. Moon
Member, Bureau of Mines

Olaf N. Rove
Member, Geological Survey

FEJohnson/bih

cc to: Messrs. COMittendorf
HEOlund
LFStrobel
Moon
Rove
Lyon
FEJohnson
FILES

FILE COPY
SURNAME:

Mittendorf

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

May 17, 1951

Mines Management, Inc.,
612 Chronical Building
Spokane 8, Washington

Re: Docket No. 432 (Zinc)
Exploration Project Contract

Gentlemen:

There is enclosed executed Exploration Project Contract No. I-DMA-E1, dated May 16, 1951 with attached Exhibits "A", "B", "C", "D" and "E", and maps.

If you have any questions in connection with the project as approved, it is suggested that you contact Mr. A. E. Weisenborn, Executive Officer, DMA Field Team, Region II, South 157 Howard Street, Spokane, Washington. In any case, please notify Mr. Weisenborn when you plan to start work on the project.

Sincerely yours,

C. O. Mittendorf, Director
Production Expansion Division

Enclosures

FEJohnson/bih

cc to: Messrs. Field Team-Region II
Mittendorf
Olund
Strobel
Lyons
Rove
Moon
G.A.O.
Finance Sec. Bureau of Mines
FEJohnson
F I L E S

DMA-432

5

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

So. 157 Howard Street
Spokane 8, Washington

May 16, 1951

Ans. 5/21/51
C. O. Mittendorf
B.B.

Mr. C. O. Mittendorf, Director
Production Expansion Division
Defense Minerals Administration
Department of the Interior
Washington 25, D. C.

Dear Mr. Mittendorf:

Enclosed are four copies each of the plan and sections of the proposed work and related present workings of the Iroquois mine which are to be attached to the contract as part of Exhibit "A" for the Exploration Project Contract of Mines Management, Iroquois Exploration Project, docket No. DMA-432, as requested in your memorandum of May 8, 1951.

The contract which we sent in with our letter of May 3, 1951, is the contract to be processed. This contract was accompanied by the Landlord's Subordination Agreement. We will not do anything with the contract you enclosed with your memorandum of May 8, 1951.

Sincerely yours,

A. E. Weissenborn

A. E. Weissenborn
Executive Officer, DMA
Field Team, Region II

Enclosures

cc: U.S. Bureau of Mines

5/21/51
7 Ej

FILE COPY
SURNAME:

Mittendorf

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

May 16, 1951

Memorandum

TO: Mr. John L. Hofflund, General Counsel, DMA

FROM: C. O. Mittendorf, Director
Production Expansion Division - DMA

SUBJECT: Docket No. DMA-432 (Zinc)
Mines Management, Inc.
612 Chronical Building
Spokane 8, Washington
Exploration Project

Attached are application of Operator and copy of Exploration Project contract with the subject Operator, together with attached Exhibits "A", "B", "C", "D" and "E", Landlord's Subordination Agreement, Lease Assignment and Option, and maps (attached to three copies only).

Please review for legal and contractual requirements and provisions. On completion of your review, please return the original and all copies of the contract and attachments, with your comments, to me for further processing.

C. O. MITTENDORF

Enclosures

FEJohnson/ bih

cc to: Messrs. Mittendorf
Olund
Strobel
FEJohnson
F I L E S

FILE COPY
SURNAME:

Mittendorf

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

May 16, 1951

Memorandum

TO: Mr. H. E. Weisenborn, Executive Officer
DMA Field Team, Region II

FROM: C. O. Mittendorf, Director
Production Expansion Division - DMA

SUBJECT: Docket No. DMA-432 (Zinc)
Mines Management, Inc.
Iroquois Exploration Project

Pursuant to our talk over the telephone on May 14, 1951, it will not be necessary to obtain the data requested in my letter of May 6, 1951. Your letter to me of the same date and enclosed data are being used to complete the Exploration Project Contract.

We will not have sufficient copies of the maps of the project for attachment to all the copies of the contract. It is assumed, however, that you retained an extra set of the maps so we will omit attaching maps to your copy of the contract. There has been no change in the project from that recommended by you.

In connection with recommended projects, in the future it will be necessary that we receive five copies of the contract signed by the Operator and five copies of all attachments, such as Exhibits "A", "B", "C", "D" and "E", Subordination Agreements and maps.

Your cooperation in this matter is greatly appreciated

C. O. Mittendorf

APPROVED:

Tom Lyon
Chairman, Coordinating Committee

Lowell B. Moon
Member, Bureau of Mines

Olaf N. Rove
Member, Geological Survey

C. O. MITTENDORF

FEJohnson/bih
cc to: Messrs. Mittendorf - Olund
Strobel
Moon
Lyon
Rove
FEJohnson - FILES

FILE COPY
SURNAME:

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

May 16, 1951

Memorandum

To: Chief, Production Expansion Division

From: General Counsel

Subject: Exploration project--Mines Management, Inc.
Docket No. DMA-432

This office has reviewed the above subject case.

With one exception the case appears to be in satisfactory form. It is to be noted that a portion of the area covered by the project is being purchased under an option agreement by the applicant for the sum of $30,000. The balance owing is $10,000 with $5,000 thereof payable May 15, 1951. Assuming that the May 15 payment will be made when due, there will be remaining the payment of $5,000 before the applicant obtains fee simple title to this part of the project area.

Title to said area is vested in two individuals, one of which has executed a subordination agreement. There is no explanation in the file as to why the other party holding an undivided interest has not executed a similar agreement. In view of the small amount remaining to be paid by the applicant in order to obtain title to this area and the amount of investment which it has in the property, it is believed that a subordination agreement from the individual holding an outstanding undivided interest in the tract may be waived. Accordingly, we are returning the complete file on the case and offer no objection to the contract being presented to the Administrator for execution.

CJKonntz/em
Copy to: Adm. Reading File
L. F. Strobel
J. L. Hofflund
C. J. Koontz
Files

J. L. Hofflund

J. L. Hofflund
General Counsel

Attachment

FILE COPY
SURNAME:

Mittendorf

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

May 8, 1951

Memorandum

TO: Mr. C. O. Mittenderf, Director
Production Expansion Div. - DMA

FROM: Frank E. Johnson, Engineer
Production Expansion Div. - DMA

SUBJECT: Docket No. DMA-432 (Zinc)
Mines Management, Incorporated
612 Chronical Building
Spokane 8, Washington
Iroquois Exploration Project

The Operator originally filed an application for a loan in the amount of $750,000.00 for the purpose of purchasing mine and milling equipment, construction of a mill, developing the mine, and the mining sulphide ores containing zinc and minor amounts of lead and cadmium.

The DMA Field Team of Region II examined the property and recommended that action on the loan application be deferred because of insufficient ore resources, but that an Exploration Project be authorized in the amount of 25,400.00 to explore by Diamond Drilling the areas above and below the mineralization exposed in present underground workings. The applicant has indicated to the Field Team that the proposal for an Exploration Project is acceptable on a 50-50 basis.

CRITERIA

(a) Zinc, lead and cadmium are all in short supply and needed for civilian use and defense industry.

(b) A mineralized replacement zone in dolomite is exposed by drifts, crosscuts and a raise driven from an adit. A number of Diamond Drill holes have been drilled from these workings to intercept possible extensions of this zone. The zone in general follows the bedding of the dolomite and extends about 850 feet along the strike of the beds and is from 45 to 50 feet thick.

DMA 432

Criteria (Continued)

(b) Continued

Sampling indicates approximately 230,000 tons of ore averaging 3.71% combined zinc-lead. Metallurgical tests and cost estimates indicate that this ore could be profitably mined if sufficient tonnage were found to justify the necessary investment.

The geology is favorable to finding additional ore at the ends of the ore zone and also above and below the present exposures in the mine workings.

(c) Sufficient manpower is reported to be available in the immediate surrounding area. Adequate housing facilities are available at the mine.

(d) The property is reported to be fully equipped for carrying out the project. As other mines are operating in this general locality, no doubt, necessary supplies are available in nearby towns.

(e) The property is accessible by an improved but unsurfaced county road from Northport, Washington. The town of Trail, B.C. is 20 miles north of the property and the railroad at Boundary, Washington is about 12 miles distant.

(f) Adequate power is available and also water for all purposes.

(g) Operator has been engaged in mining since 1947 and operated the Iroquois and Advance mines for about two years. The Directors of the company have other mining interest and the operating personnel are reported to have had several years previous mining experience.

Operator's Property Rights

Operator states it holds part of the property under mineral location laws (Names of claims not given) and the balance under a purchase agreement on which $10,000.00 is still due. (Copy of this agreement and assignment to the Operator accompanied the application for a loan and describes property covered by the lease and option).

It will be necessary to obtain Landlord's Subordination Agreement for the leased portion of the property.

EXPLORATION PROJECT

The Operator shall commence work within 30 days from date of contract on exploration for mine and proceed in workmanlike manner to complete the project within six months from date of contract.

The Government will participate to the extent of 50% of the cost of the project but such participation shall not exceed $12,700.00.

EXHIBIT "A"

The approved project is as follows:

Approximately 26 Diamond Drill holes drilled above and below present mine workings and from surface (including supervision, sampling, fuel, etc.) 2,800 feet @ $7.50 per feet	$21,000.00
Equipment rental	2,000.00
Assays	2,400.00
Total cost	$25,400.00

EXHIBIT "B"

Fixtures and Improvements:

Any additional facilities, buildings, and fixtures to be purchased, installed or erected by the Operator shall not be charged to the project.

EXHIBIT "C"

Operating Equipment:

No operating equipment is to be purchased or rented, the cost of which shall be charged to the project. However, rental value of equipment furnished by the Operator for the project shall not exceed $2,000.00.

An itemized list of the equipment to be furnished by the Operator, with the allowable rental value of each item is required for Exhibit "C".

EXHIBIT "D"

Labor and Supervision:

Cost of Diamond Drilling is given at $7.50 per foot, including

Exhibit "D" (Continued)

Labor and Supervision (Continued)

supervision, sampling, fuel, etc. It is necessary that we have an itemized schedule of labor, by numbers and classes (drill runners, samplers, helpers, etc.) and of supervisors by numbers and positions, with maximum wages or salaries that may be paid as a cost of the project, for incorporation as Exhibit "D", since the Diamond Drilling will evidently be done by the Operator and not contracted.

EXHIBIT "E"

Rehabilitation and Repairs:

Any rehabilitation and repairs of existing facilities, buildings, installations or fixtures shall not be charged to the project.

The project is recommended for certification subject to obtaining satisfactory Subordination Agreement and data for completing Exhibits "C", "D" and "E".

Attached is letter to the Director, Field Team Region II, together with three copies of contract for signature of the Operator.

Frank E. Johnson

Attachment

FEJohnson/bih

cc to: Messrs. COMittendorf
HEOlund
LFStrobel
Otto Herres
Tom Lyons
FEJohnson
F I L E S

FILE COPY
SURNAME:

Feg Mittendorf

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

May 8, 1951

Memorandum

TO: Mr. A. E. Weissenborn, Executive Officer
DMA Field Team, II.

FROM: C. O. Mittendorf, Director,
Production Expansion Division - DMA

SUBJECT: Docket No. DMA-432 (Zinc)
Mines Management, Incorporated
Iroquois Exploration Project

Reference is made to your letter of April 3, 1951 addressed to Otto Herres, Chief, Lead-Zinc Branch, DMA, concerning the subject project and enclosing report prepared by the Field Team, Region II, on this project.

We are approving the project subject to obtaining Landlord's Subordination Agreement as required under the contract where the project property is held under lease by the Operator, and to obtaining additional information required for completing the Exhibits to be attached to the contract.

In order to expedite the completion of the contract, we are enclosing three copies of the contract for execution by the Operator. Please have each copy signed by the proper official of Mines Management, Inc., and return all copies to this office with the additional information requested below.

There are also enclosed three copies of the Landlord's Subordination Agreement. Please arrange with the Operator to have each copy completed and return all executed copies to this office. You will note that this Agreement is required under Paragraph 2(b) of the contract form.

We have also prepared Exhibits "A", "B" and "E" required to be attached to the contract. These are being sent to you for your information and confirmation of the Operator's understanding and acceptance of them. They should be returned to this office with the copies of the completed contract.

It will be necessary for you to prepare Exhibits "E" and "D" in triplicate to be attached to the copies of the contract. These may follow the form of the enclosed Exhibits. On Exhibit "C" it should be stated that any operating equipment purchased or rented by Operator shall not be charged as a cost of the project. With respect to the equipment furnished by Operator, the rental value of which will be charged as a cost of the project in an amount not to exceed $2,000.00, each item of such equipment shall be listed on Exhibit "C" and the rental value allowed for each item also shown on the Exhibit. You should determine a fair rental value for each item that is acceptable to the Operator for this purpose.

On Exhibit "B", a detailed schedule should be furnished showing labor, by numbers and classes (drill runners, helpers, samplers, etc.) and of supervisors, by numbers and positions with maximum wages or salaries that may be paid as a cost of the project. Maximum wages and salaries should conform to local prevailing rates.

It is suggested that, if possible, three maps showing only plan and section of the proposed work and related present workings, be prepared on 11" x 16" size sheets for attachment to the three copies of the contract as part of Exhibit "A".

If you have any questions regarding the foregoing, please do not hesitate to call on this office.

C. O. MITTENDORF

Enclosures

FEJohnson/bih

ccto: Messrs. COMittendorf
HEOLund
LFStrobel
Otto Herres
Tom Lyon
FEJohnson
F I L E S

Docket No. DMA-432

Commodity - Zinc

EXPLORATION PROJECT CONTRACT

EXHIBIT "A"

Exploration Project:

Drill approximately 26 Diamond Drill Holes from surface and present underground workings to intercept the possible extensions of a mineralized zone above and below the present workings.

2800 ft. of D.D. @ $7.50 per ft. -	$21,000.00
Equipment rental	2,000.00
Assaying	2,400.00
Total Cost	$25,400.00

EXHIBIT "C"

Fixtures and Improvements:

Any additional facilities, buildings and fixtures to be purchased, installed or erected by the Operator shall not be charged as a cost of the project.

EXHIBIT "E"

Rehabilitation and Repair:

Any rehabilitation and repairs of existing facilities, buildings, installations or fixtures shall not be charged as a cost of the project.

dma 432

LANDON F. STROBEL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
So. 157 Howard Street
Spokane, Washington

May 3, 1951

Mr. Otto Herres, Chief
Lead-Zinc Branch
Defense Minerals Administration
Department of Interior
Washington 25, D. C.

Dear Mr. Herres:

This letter is with reference to the application of Mines Management, Inc., for an exploration loan on the Iroquois mine, docket DMA-432. This exploration is being undertaken at our advice because we felt that a small amount of exploration was required before the original application for a production loan could be considered. The proposed exploration was described in the report which the Field Team returned to you following our examination of the property.

Mines Management, Inc., is extremely anxious to begin the exploration at the earliest possible date and with the thought that they might save some time, they have filled out an exploration project contract, four copies of which are enclosed herewith. If you have any further questions on the contract, I will be glad to take them up with Mines Management, Inc.

Sincerely yours,

A. E. Weissenborn

A. E. Weissenborn
Executive Officer, DMA
Field Team, Region II

Enclosures

cc: U.S. Bur. Mines

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MAY 8 1951

BUREAU OF MINES
WASHINGTON, D. C.

MAY 7 2 44 PM '51

FILE COPY
SURNAME:

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

Cyn
W. Knight
NWK
Kerres

Memorandum C. O. Mattondorf May 1, 1951

To: Production Expansion Division

From: Director, Supply Division Re: Docket DMA-452

Subject: Approval of exploration loan for Mines Management, Incorporated Commodity: Zinc, lead, cadmium

A. Mines Management, Incorporated
612 Chronicle Building
Spokane 8, Washington

B. Iroquois Mine
Parts of sections 19, 20, 29, and 30, T. 40 N., R. 42 E., W.M.
Stevens County, Washington

C. (1) If the exploration program proposed is successful, an appreciable tonnage of mineable lead and zinc ore will be added to the nation's supply.

(2) Because previous diamond drilling on this property was successful, no technical difficulties are anticipated.

(3) The company has complete equipment on the property to undertake the proposed program.

(4) The applicant's half of the cost will be met by approximately $10,700 in cash and the remaining $2,000 by equipment rental.

(5) The company is managed by experienced and competent personnel.

D. It is recommended that the Government grant a loan of $12,700 to Mines Management, Incorporated, as its one-half share of the cost of an exploration project.

E. The company proposes that 2800 ft. of diamond drilling be done to determine the vertical limits of the ore body exposed in the Iroquois mine. It is estimated that the drilling will cost $7.50 per foot or a total of $21,000. To this would be added $2,000 for rental of equipment and $2,400 for assays making a total of $25,400. The applicant requests a loan of one-half of this total of $12,700 from the Government.

Docket 452

856

F. This program, if successful, will increase the tonnage of an exposed ore body of zinc and lead, both of which are strategic and critical minerals.

G. (1) The Iroquois deposit is exposed by a lateral drift and a number of crosscuts, all on one level, and by a raise and a number of drill holes. The mineralized body, which is a replacement in dolomite in general following the bedding, is at least 850 ft. long parallel to the strike of the beds and up to 45 or 50 ft. thick. The continuity along the dip is not known. The deposit where exposed has been thoroughly and competently sampled and assayed. On the basis of the data available the field geologists and engineers reporting for the Defense Minerals Administration estimate the deposit to contain 230,000 tons of ore averaging 3.71% combined zinc and lead.

The company, with the concurrence of the Defense Minerals Administration's field team, proposed to drill a series of holes to extend the vertical range of the mineralized zone and to obtain more information so that the deposit can be better evaluated as to size and grade.

(2) Not applicable.

(3) Not applicable.

(4) Not applicable.

(5) Not applicable.

(6) The company is prepared to start the exploration program immediately and plans to complete it as quickly as possible.

H. (1) The applicant has complete equipment on the property.

(2) No new equipment, other than replacements, will be needed.

(3) Transportation is adequate.

(4) Manpower is available in the immediate area.

(5) Power is available.

I. (1) No alternative proposed.

(2) The estimate of cost appears reasonable.

(3) Not applicable.

(4) Repayment will be made in accordance with Section 14 of Form MO-5.

(5) Not applicable.

J. In the opinion of the field representatives of DMA the application has been made by responsible people who will carry the contract to completion in a minimum of time.

K. No correspondence, communication, etc. with company other than original application and conference in the field between the company representatives and the DMA field team.

Tom Lyon
at

Tom Lyon, Director
Supply Division

EJLyons:emp
G 5/1/51
Copies to A. E. Weissenborn, Region II (2)
Chief, Lead-Zinc Br.
E. T. McKnight 4204 GSA
L. B. Moon
R. H. Mote
L. F. Strobel
C. O. Mittendorf
Files

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
So. 157 Howard Street
Spokane, Washington

April 3, 1951

Mr. Otto Herres, Chief
Lead-Zinc Branch
Defense Minerals Administration
Department of Interior
Washington 25, D. C.

Dear Mr. Herres:

Enclosed is a memo from the Field Team, Region II, with reference to Mines Management, Incorporated, Docket DMA 432.

In the opinion of the Field Team, present knowledge of the vertical continuity of the ore deposit does not justify a production loan, although the deposit is well developed on one level. The Field Team has suggested to the applicant that further exploration would be desirable, and the applicant has agreed to undertake this on a 50-50 basis with the intention of putting through his original application for a loan of $750,000 as soon as the exploration demonstrates the continuity of the ore above and below the present development level. The applicant would also like to have a purchase contract for the zinc which he expects to produce, such contract to go into effect after the proposed exploration is completed. Would you kindly advise me whether it would be possible to enter into a purchase contract of this nature at this time. - Herres

Application blanks and contract forms for exploration and development loans have not yet been received in this office. Nevertheless, we are enclosing our recommendations in the hope that the program will soon be in effect, and that the applicant's proposal for exploration can be processed in Washington by filling out the special application form for him, using the information contained in the attached memorandum and in his original application on NSRB-146. The applicant is extremely anxious to begin the exploration at the earliest possible moment, inasmuch as he hopes to complete it in time to have his loan approved so that he can begin construction of mill and mine plant before the snow sets in next fall. The applicant has complete equipment on the property and can undertake the proposed exploration immediately after approval of the contract.

The original docket is returned herewith
Dew

Sincerely yours,
A. E. Weissenborn
A. E. Weissenborn
Executive Officer, DMA,
Field Team, Region II

Enclosure

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
So. 157 Howard Street
Spokane, Washington

April 3, 1951

Memorandum

To: Otto Herres, Chief, Lead-Zinc Branch, DMA

From: Field Team, Region II Through: Operating Committee

Subject: Docket DMA 432
Mines Management, Inc.
612 Chronicle Building
Spokane 8, Washington

RECOMMENDATIONS

On February 23, 1951, this docket was referred to the field team for information and advice. A geological examination of the property has been made, and various metallurgical and other data have been studied. As a result of these investigations, the following recommendations are made:

1) That action on the request for a loan of $750,000 for mining and milling equipment, power, and mine development be deferred until exploration recommended below has been completed.

2) That an exploratory contract in the amount of $25,400 be let, $12,700 to be furnished by the Government and $12,700 in cash and rental credit to be furnished by the applicant. The nature of the proposed exploration is outlined as follows:

The application of Mines Management, Inc. requesting a Government loan of $750,000 for mining and milling equipment, power, and mine development has been reviewed by this office. A. E. Weissenborn, M. R. Klepper, and Willard Puffett examined and mapped the mine on February 27-28 and March 1. As a result of this examination and a careful appraisal of assay data and diamond drill logs, the field team concluded that the development work done to date has not been adequate to indicate a sufficient reserve of minable ore to justify a loan of the type and amount requested. The team does believe, however, that the deposit may contain a considerable tonnage of low-grade zinc-lead ore in one or more bodies that may be available to low-cost mining methods. Preliminary metallurgical tests by the U.S. Bureau of Mines and by several private companies indicate that acceptable zinc and lead concentrates can be made with a good recovery. The advisability of sink-float treatment prior to flotation has not been demonstrated. In view of the potential of the deposit, the field team proposed to the applicant that additional exploratory drilling at a total cost of $25,400 be done on a 50-50 basis with the understanding that final action on the $750,000 loan be deferred until the exploration has been completed. This proposal was acceptable to the applicant and is transmitted to the committee herewith with the recommendation that it receive prompt favorable action.

A brief description of the geology of the deposit follows:

The Iroquois mine in Stevens Co., Washington, is a few miles south of the Canadian border and about 25 miles east of Northport, Washington, by improved but unsurfaced county road. It is 20 miles south of Trail, B.C., and 12 or 13 miles from railhead at Boundary, Washington.

The principal known deposit on the property, and the only one to which this application has reference, is a replacement in a homoclinal sequence of dolomite and dolomitic limestone, which appears to overlie graptolite-bearing slate. The field team believes, however, that the sequence is overturned, and that the slates are Ledbetter formation and the carbonate rocks Metaline limestone. If this interpretation is correct, the ore zone is 250 to 300 feet beneath the slate-dolomite contact at about the same position as the highly productive Josephine horizon in the Metaline district, about 10 miles southeast of the Iroquois.

The Iroquois deposit is a replacement in dolomite that in a general way follows bedding. Coarsely crystalline dolomite with subordinate sphalerite, galena, pyrite, quartz, and calcite heals brecciated zones and forms irregular replacements within a zone that is known to be at least 850 feet long and up to 45 or 50 feet thick. (See figs. 1 & 2.) Little is known of the continuity of this zone along the dip. The zone is expressed at the surface by discontinuous leached outcrops that contain sporadic bunches of carbonate ore. These surface showings were covered by snow at the time of our examination but were seen in part at an earlier date by Klepper. In the adit level, a few hundred feet beneath the outcrop, the zone has been explored for a length of 850 feet by a lateral drift and a number of crosscuts and diamond drill holes. (See figs. 1 & 2.) Information between the adit level and the surface is limited to a raise and a few drill holes; below the level only a few holes have been drilled. The level workings and raise have been thoroughly sampled by the applicant. In the drift, samples have been cut in rings spaced at 5 foot intervals. In the crosscuts, samples were cut from 5 foot diagonal cuts in the back. The samples were taken by competent engineers and assayed by recognized assayers. We saw no reason why they should not be accepted, and consequently have used them in our calculations of tonnage and grade.

The elongation of the mineralized zone parallels the strike of the bedding, and the dip, insofar as it can be determined from incomplete data by projection, more or less parallels the dip of the bedding. Sphalerite and galena are erratically distributed throughout the zone as shown on figure 2 on which the assay data have been plotted. These data are too scant and conflicting to demonstrate conclusively either the shape or size of a minable ore body. Four holes have been drilled below the level. Two of these (holes 10 and 26) intersected good ore at about the anticipated position and two (holes 20 and 21) did not. One of the failures (hole 20) may be explained at least in part by the presence of a dike within the zone. Exploration above the level consists of a raise that starts in ore but passes out probably into hanging wall at about 70 feet above the level, two holes drilled horizontially from a station in the raise 100 feet above the level, and two drill holes inclined up from the level. Two of these openings (the raise and hole 6) disclose good ore; the others (holes 2, 11, and 12) disclose only low-grade mineralization. Hole 12 is not particularly applicable to the present problem as it was drilled away from the expected position of the ore to test the hanging wall area for parallel zones. Horizontal holes 3 and 16 on the adit level illustrate the erratic distribution of the ore minerals

and the consequent inability of the few holes thus far drilled to outline the limits of minable ore for even a few score feet above and below the level. These two holes intersect or virtually intersect one another at an angle of 60°; for 15 feet on either side of this intersection hole 16 is in good ore and the actual intersection is in the middle of a 5 foot unit of plus 6 percent Zn and Pb. Hole 3 at and near the intersection is mostly barren, with only one assay exceeding 1 percent combined Zn-Pb.

On the basis of the limited data, the writers have outlined a body shown on figure 2 that is estimated to contain 230,000 tons of ore averaging 3.71 percent combined Zn-Pb.* The applicant's estimate of indicated ore is 640,000 tons averaging 3.92 percent combined Zn-Pb. Our tonnage and grade has been calculated using only the body outlined by dots on the plan and using the three cross sections for which some information was available above and below the level, assuming for purposes of this calculation that the ore body is a flattened ellipse tapering at both ends. The estimate is, therefore, considered to be conservative, but nevertheless it gives an idea of the potential of the deposit should further exploration prove minable extensions above and below the level as well as along the strike where mineralization is known to be present.

It seems apparent to the writers that additional information relative to the main ore zone must be obtained before an intelligent decision can be reached on the applicant's request for a $750,000 loan. To this end it is proposed that 2,800 additional feet of diamond drilling be done along the general lines indicated on figures 3-7. These sketch sections are intended merely to serve as guides and should not be construed as inflexibly fixing the location of holes. On the contrary, the writers feel that considerable flexibility should be allowed, or better demanded, and that the program of drilling be re-evaluated from time to time as drilling proceeds, using the information obtained in preceding holes to more intelligently layout future holes. The sections do illustrate, however, that with an additional 2,800 feet of hole there is reasonable hope of getting a much better picture of the ore zone over a length of 800 feet and a vertical range of 250 to 500 feet than is now possible. Such an endeavor seems to be fully justified in view of the tonnage of minable, though low-grade, ore that would be indicated if a body of about the same grade and cross section as that exposed in the adit level were demonstrated to continue for 150 to 250 feet above the level and for 100 to 150 feet below the level.

* With the exception of a few tens of tons reserved for metallurgical tests, all ore mined in development was treated at the Sierra Mill in Stevens Co., Washington. The calculated grade of this 2,898 tons of development ore was 3.3 percent Zn and 0.39 percent Pb, which is in close agreement with our weighted assay of drift, crosscut, and drill hole samples. The mill feed also contained about 0.1 pounds of cadmium and 0.025 ounces of silver per ton.

An estimate of cost of this proposed drill program made by the applicant is as follows:

Drilling (including supervision, sampling, fuel, etc.) $2,800 @ 7.50 average	$21,000
Equipment rental	2,000
Assays	2,400
	$25,400

Applicant's half to be accounted for by approximately $10,700 in cash expenditure and about $2,000 credit for equipment rental. This estimate appears to be reasonable to the field team. Allowable rental costs will have to be worked out later in more detail.

The application has been made by responsible people. We believe that if an exploration contract be entered into, the applicant will carry the contract to completion in a minimum of time. The applicant now has a drill and crew on the property and would start work as soon as the contract is signed. It is urgent that he begin work as soon as possible because if the exploration indicates the expected continuity of ore up and down the dip, the applicant intends to immediately follow through with his original application for production loan or purchase contract in the hope that he will be able to begin mine plant and mill construction before the severe winter weather, typical of this region, sets in.

An analysis of expected mining costs is, at this time, premature for the applicant states that "the ore at the Iroquois mine is not adequately developed to determine the mining method best suited to its extraction." The applicant hopes to achieve about the same mining and milling costs as at the Pend Oreille mine in Stevens County, which during 1950 were $6.11 per ton. The Pend Oreille mine is in an ore body similar in type to the Iroquois.

A statement on mining cost prepared by the applicant is attached.

Field Team, Region II

A. E. Weissenborn

A. E. Weissenborn, Executive Officer

U. S. Geological Survey

E. Volin

Mr. E. Volin

U. S. Bureau of Mines

ESTIMATE OF MINING COSTS AT IROQUOIS MINE

The ore at the Iroquois Mine is not adequately developed to determine the mining method best suited to its extraction.

The ore occurs in a mineralized zone which development to date indicates has a general strike of about north 60 degrees east and a dip of about 50 degrees to the southeast. This has been opened by a valley bottom adit at an altitude of 2810 feet that was driven in a south 40 degrees east direction and encountered the zone at 570 feet. The outcrop of the zone directly above the adit is at an altitude of about 3130 to 3150 feet. Northeastward the projection of the outcrop runs close to parallel to the hillside with little change in altitude, whereas to the southwest a bend in the valley to a more southerly direction causes the projected outcrop to descend to 2950 altitude in 800 of distance along limestone cliffs before passing under deep overburden for another 800 feet to the valley bottom.

The surface expression of this mineralized zone consists of disseminated limonite in dolomitic and silicified limestone with only an occasional showing of sulfide minerals. The depth to which the sulfides have been removed by leaching has not been determined.

The mineralized zone has been explored at adit level by drifts off the main crosscut about 200 feet to the northeast and 500 feet to the southwest. Off these drifts 7 crosscuts and 14 horizontal drill holes have developed certain data which give varied horizontal traces for the ore zone depending upon cut-off of grade and upon geological interpretation. One interpretation of this is a horizontal trace of an ore body on this level that varies from 16 to 80 feet wide over a length of about 800 feet with indicated average grade

of 3.9 percent combined zinc and lead. Another interpretation is a horizontal trace of several roughly eliptical areas varying from 15 to 70 feet of maximum width and 140 to 230 feet of maximum length with indicated average grade of 5% combined zinc and lead.

The vertical dimension of the ore zone is not known in much detail. Four diamond drill holes have explored below the adit level, and one shows good ore to a depth of 46 feet.

Above the adit a 55 degree inclined raise has been driven to the surface. This started in the ore zone and passed into the hanging wall at about 100 feet. One diamond drill hole from a station at an altitude of 2945 feet driven northward from a station in this raise penetrated a partially leached mineral zone on the upward projection of the zone. Two inclined upward holes from the adit level add some data on the upward extent of the ore zone.

Present data has not determined how much if any of the ore may be mined by open surface pit, nor whether the orebody is a vein-like replacement, continuous from the adit to the surface, and mineable accordingly, or the ore is in irregular lenses that should be mined by open stope methods.

This information must be developed first to determine how mining should be done. However, a preliminary concept of costs to be expected be various methods may be gained from the experience of neighboring operators in similar host rocks.

The open pit mining method is used at the Anderson Mine of Goldfield Consolidated in a zinc-lead deposit in limestone similar in grade, and located about four miles southwest of the Iroquois.

This deposit was originally explored by the Bureau of Mines which indicated an ore zone chimney-like in shape 50 to 80 feet wide and 30 to 80 feet deep that rakes about 15 degrees below the horizontal in a direction about 30 degrees into the hill from parallel to the contour. The first 100,000 tons was estimated as recoverable with removal of only a few feet of overburden. The remaining ore will require removal of progressively increasing quantities of cover, mostly rock in place, until the economic limit is reached for open pit extraction, after which underground methods are to be used. Mining to date is in the first 100,000 ton block.

Precise data on operating cost experience are not available on this property. A verbal statement by the management, however, is to the effect that mining, milling, transportation and overhead costs $2.20 a ton.

The Reeves-McDonald Mine is situated in British Columbia about 8 miles northeast of the Iroquois. The ore body is a veinlike replacement of zine and lead in limestone about 60 to 80 feet wide and 500 feet long, which dips about 55 degrees. It is opened by an adit crosscut from mill level about 800 feet below the outcrop. This is being mined by horizontal rooms alternating with horizontal pillars, each about 50 feet high, that remove the ore by bench cutting and scraper loading into two ore chutes that connect with the adit level. The pillars are to be removed progressively after the rooms have been completed. Mining now is in process of extracting from the rooms only. When pillars are removed, costs are expected to be lower. The mine started operations in 1949.

Official cost figures for the operation are : mining $2.301; milling $1.072; and other direct costs $1.159, for a total of $4.532 a ton.

The Pend Oreille Mine is situated in the Metaline district about 8 miles southeast of the Iroquois. The ore bodies are irregular replacement bodies of zinc and lead in limestone. Production has been in excess of 2,000,000 tons. This has been produced from open stopes that have been bench blasted and scraper loaded into ore chutes that deliver to the haulage level from which it was train hauled and hoisted to the surface prior to the recent installation of a conveyor belt to hoist through a low angle incline shaft.

Official cost figures for this operation as published in annual reports are as follows. The 1950 figures are pre-publication estimates and will probably vary a few cents from the official figure to be published soon.

Production Costs of Pend Oreille Mines & Metals Co.:

Period	Mining	Milling	Other Direct	Gen. & Admin. Exp. & Taxes	Total
5/1/37-38	$1.56	$0.53	$.35	$.42	$2.86
5/1/38-39	1.05	0.42	.23	.28	1.98
5/1/39-40	1.28	0.47	.22	.27	2.24
5/1/40-41	1.37	0.51	.20	.26	2.34
5/1/41-42	1.65	0.54	.22	.23	2.64
5/1/42-43	1.72	0.59	.28	.25	2.84
5/1/43-44	2.07	0.72	.29	.30	3.38
5/1/44-45	2.059	0.783	.304	.337	3.483
5/1/45-46	2.178	0.794	.393	.420	3.785
5/1/46-47	3.007	0.883	.465	.455	4.81
5/1/47-48	3.056	0.966	0.475	.634	5.131
5/1/48-1/1/49	3.643	1.142	0.603	.886	6.274
1/1/49-1/1/50	3.598	1.012	0.615	.751	5.976
1/1/50-1/1/51	3.553	1.109	0.698	.751	6.111

February 23, 1951

Re: Docket DMA-458

Mr. W. R. Green, President
Mines Management, Inc.
612 Chronicle Building
Spokane 8, Washington

Dear Mr. Green:

The application for government assistance submitted by you in behalf of Mines Management, Inc. has been reviewed by the Lead-Zinc Branch of the Defense Minerals Administration and has been referred for information and advice, to the Executive Officer, Field Team, Region II, South 157 Howard Street, Spokane, Washington.

Very truly yours,

/S/
Tom Lyon
Acting Director
Supply Division

EJLYONS:jeh:pfb
G-2/23/51

copy to: Chief, Lead-Zinc Branch
Geological Survey - McKnight
J. H. Hedges
R. H. Mote
Strobel
Mittendorf
2 copies to Executive Officer,
Regional Field Team, Region II
Files

58

February 23, 1951

Memorandum

To: Executive Officer of Field Team, Region II

From: Lead-Zinc Branch, DMA

Subject: Docket DMA-432
Mines Management, Inc.
612 Chronicle Building
Spokane 8, Washington

The application for government assistance submitted by Mr. W. R. Green in behalf of Mines Management, Inc. has been reviewed by the Lead-Zinc Branch, DMA.

The applicant requests a loan of $750,000 for mining and milling equipment, power, and mine development. According to the applicant the property has reserves of 640,000 tons of indicated ore assaying 3.02% Zn. and 0.88% Pb. It is planned to mine this body at the rate of 500 tons of ore per day.

The Lead-Zinc Branch, DMA recommends that the application be referred to the field team for information and advice. A geological examination of the property and an investigation of the mining methods and costs would be desirable.

OTTO HERRES, Chief
Lead-Zinc Branch, DMA

Approved:
DMA Operating Committee

_____
Chairman

_____
J. H. Hedges

_____
Olaf W. Reve

copy to: Chief, Lead-Zinc Branch
Geological Survey - McKnight
J. H. Hedges
R. H. Mote
Strobel
Mittendorf
2 copies to Executive Officer,
Regional Field Team, Region II
Files

EJLYONS:jeh G-2/15/51

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

January 29, 1951

Hon. Walt Horan
United States Senate
Washington 25, D. C.

My dear Senator Horan:

In reply to your letter of January 22, regarding the application for a Government loan under Section 302 of the Defense Production Act filed by Mr. W. R. Green of Spokane, Washington:

Mr. Green's application has been assigned DMA Docket number 432 and presently is being reviewed by the Defense Minerals Administration's Lead-Zinc Branch. You can assure Mr. Green that his application is receiving the full and prompt consideration of the Defense Minerals Administration.

Returned herewith as per your request is the copy of Mr. Green's letter of January 19.

If I can be of further service to you at any time, please feel free to call upon me.

Very truly yours,

JAMES BOYD

Administrator

Enclosure 1

RHMOTE/ppm
Copy to - Mrs. Parker
Base Metals Branch
R. H. Mote
Otto Herres, Chief - Lead-Zinc Br.
J. H. Hedges, Minerals Div.
Ed McKnight-Geological Survey.
C. O. Mittendorf
L. Strobel
Files

2 carbons to Field Team
Region II
Mr. A. E. Weissenborn(USGS)
South 157 Howard Street
Spokane 8, Washington
and
M. E. Volin (same address)
S. M. Shelton
U. S. Bureau of Mines
Box 492
Albany, Oregon

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

January 29, 1951

Hon. Warren G. Magnuson
United States Senate
Washington 25, D. C.

My dear Senator Magnuson:

In reply to your letter of January 22, regarding the application for a Government loan under Section 302 of the Defense Production Act filed by Mr. W. R. Green of Spokane, Washington:

Mr. Green's application has been assigned DMA Docket number 432 and presently is being reviewed by the Defense Minerals Administration's Lead-Zinc Branch. You can assure Mr. Green that his application is receiving the full and prompt consideration of the Defense Minerals Administration.

Returned herewith as per your request is the copy of Mr. Green's letter of January 19, addressed to the Defense Minerals Administration together with his inquiry of January 19, to you.

If I can be of further service to you at any time, please feel free to call upon me.

Sincerely yours,

JAMES BOYD

Administrator

Enclosures 2
RHMOTE/ppm
Copy to - Mrs. Parker
Base Metals Branch
R. H. Mote
Otto Herres, Chief, Lead-Zinc Br.
J. H. Hedges, Minerals Division
Ed McKnight, Geological Survey
C. O. Mittendorf
L. Strobel
Administrator's Reading File
Files

2 carbons to Field Team, Region II
Mr. A. E. Weissenborn
and Mr. M. E. Volin at
South 157 Howard Street
Spokane 8, Washington

Mr. S. M. Shelton
U. S. Bureau of Mines
Box 492
Albany, Oregon

January 25, 1951

Mr. W. R. Green, President
Mines Management, Inc.
Suite 612 Chronicle Building
P. O. Box 178
Spokane, Washington

Dear Mr. Green:

This will acknowledge receipt of your letter of January 19, regarding your application for government aid under Section 302 of the Defense Production Act of 1950.

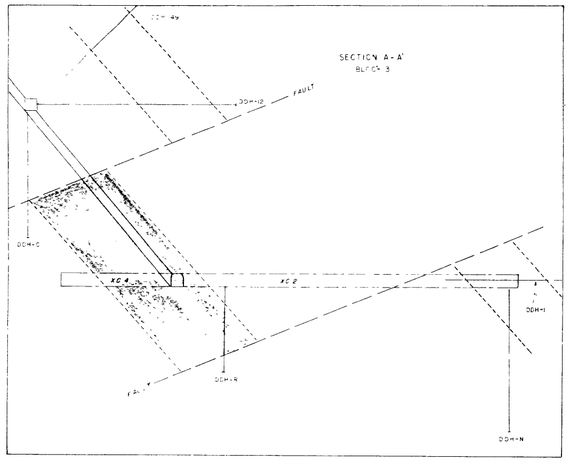
Your application has been assigned DMA Docket No. 432, and is now being reviewed by the United States Geological Survey. I assure you the application will receive the full and prompt consideration of Defense Minerals Administration and you will be informed of further action taken.

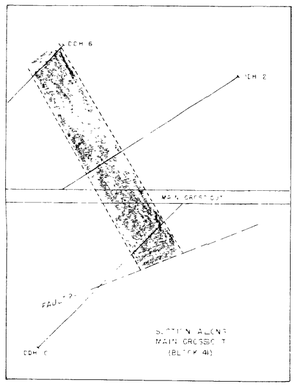
Very truly yours,

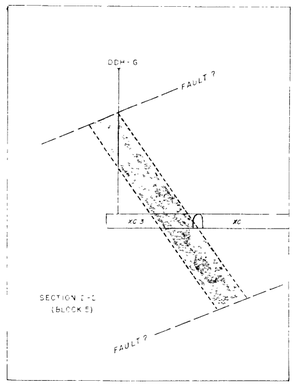
OTTO HERRES, Chief
Lead-Zinc Branch, DMA

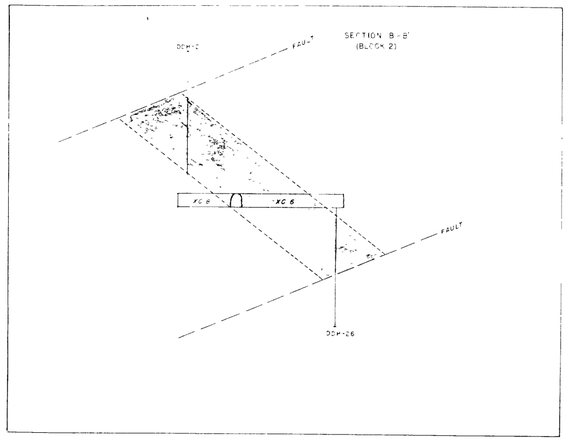
RHMote:vwm

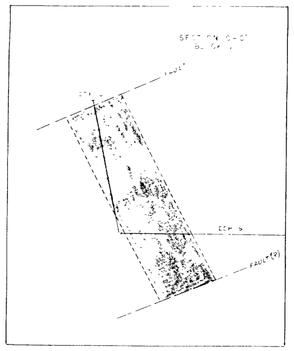
CC: Mr. Mote
Mr. McKnight
Mr. Herres
Mr. Strobel
Field Team - 2 Region II
Files

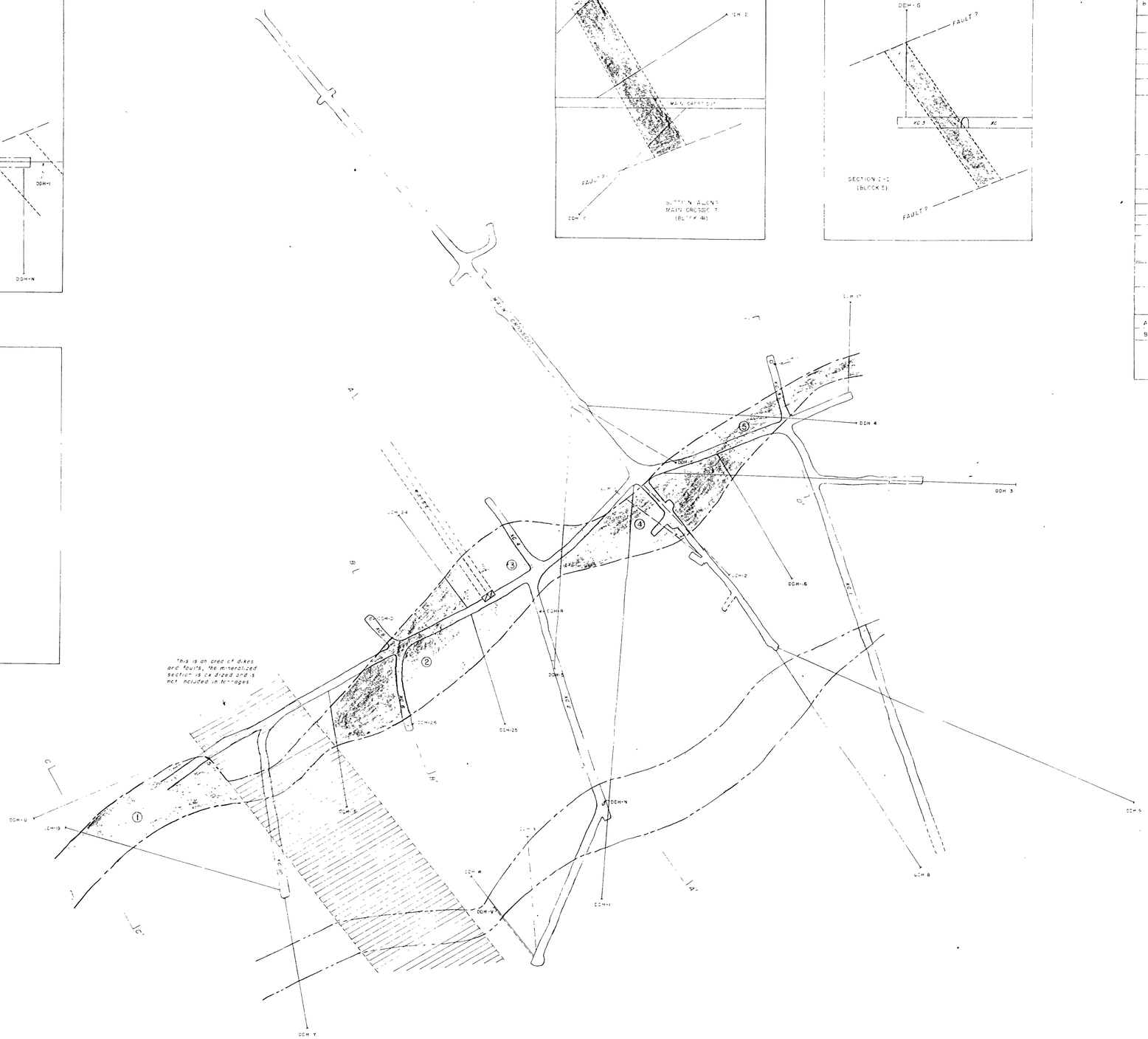












"INDICATED ORE"

TONNAGE & GRADE BY BLOCK METHOD

ORE BLOCK	CROSS SECTIONAL AREA SQUARE FEET	HORIZONTAL HEIGHT FEET	VOLUME CUBIC FEET	Wt AVER ASSAY COMBINED Pb & Zn
1	6124	180	1,111,320	4.12
2	7543	[illegible]	1,176,678	3.86
3	5078	170	1,542,750	4.93
4	7137	17[illegible]	1,2[illegible]	2.72
5	3420	15[illegible]	528,000	3.03

TOTAL 5,559,148 cu ft

11.5 Cu Ft = 1 Ton TONS = 502,286

Wt Aver Assay = 3.88% Pb & Zn

TONNAGE & GRADE PLANIMETER METHOD

TOTAL SQ FT = 42,560

AVER HEIGHT = 125'

VOLUME = 5,440,000 cu ft

TONS = 494,540

AVER GRADE BASED ON Wt AVER OF ALL SAMPLES = 3.76% Pb & Zn

"INFERRED ORE"

BLOCK	AREA SQUARE FEET	HEIGHT FEET	VOLUME CUBIC FEET
ABOVE INDICATED ORE	43,520	80	3,481,600
BELOW INDICATED ORE	25,240	60	1,516,800

TOTAL 4,998,400 cu ft

TONS = 454,400

Wt Aver Assays = 4.52% Pb & Zn

INDICATED ORE

INFERRED ORE

ORE BLOCKS ④

DRILL HOLES DDH-Z

CROSSCUTS XC 3

TONNAGE ESTIMATE MAP

IROQUOIS MINE

STEVENS COUNTY, WASHINGTON

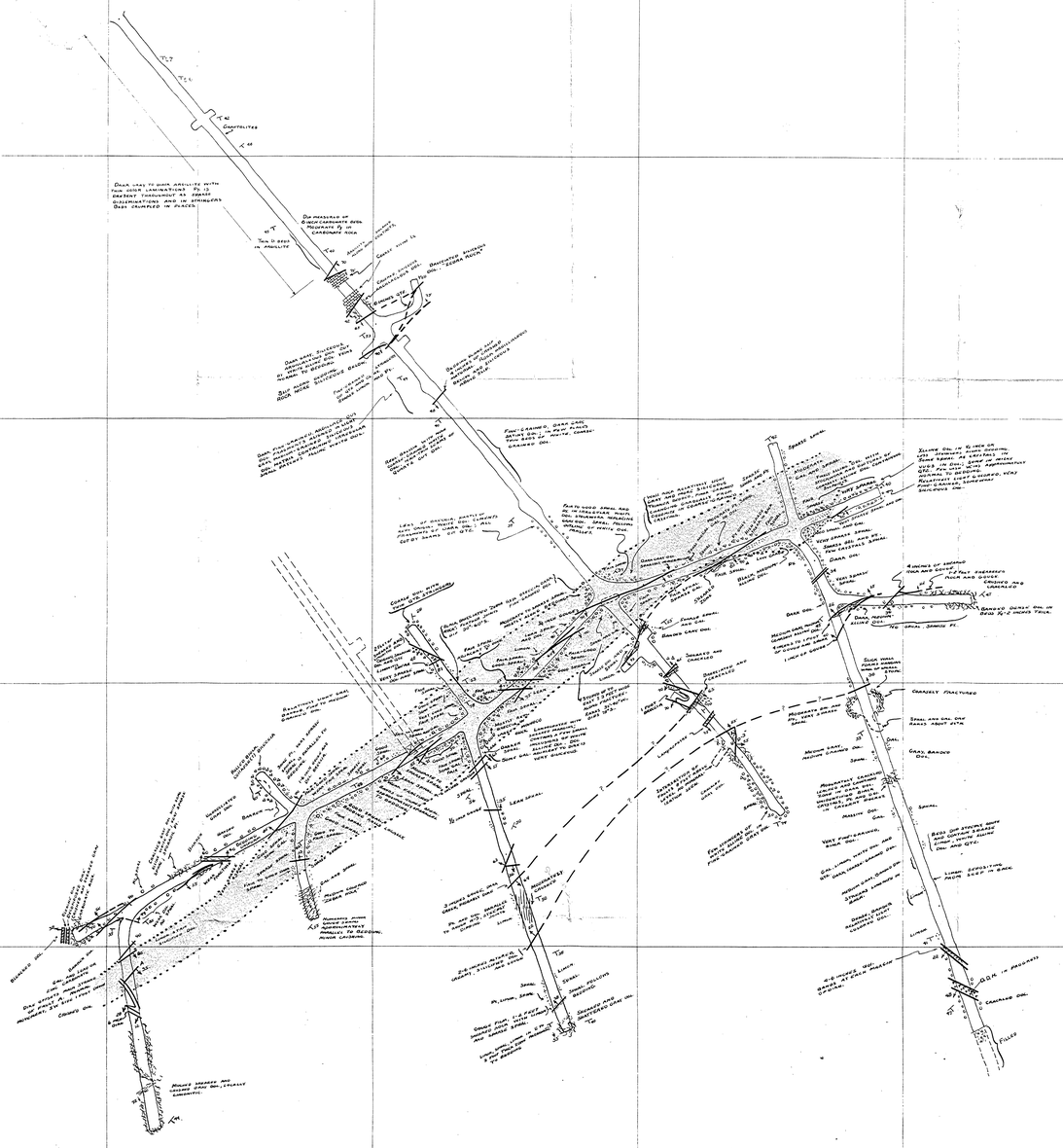
FEET

0 20 40 80

FIGURE 1

DOCKET-D.M.A. 432

ADVANCE or TRIAL COPY
Not Yet Approved for Citation
Release Subject to Revision and Re-
vision. Your Comments are Invited.
U. S. GEOLOGICAL SURVEY



EXPLANATION

- Lamprophyre and other dike rocks
- Limestone
- Strike and dip of beds
- Fault or fracture, showing dip
- Vertical fault or fracture
- Crushed and crackled zone
- Joint
- Breccia (tectonic or collapse?)
- Light gray to white dolomite occurring as replacement or fracture filling
- Sphalerite, galena, pyrite, and limonite, concentration of dots indicates approximate grade of ore
- Limit of significant disseminated sphalerite and galena on basis of visual inspection

ABBREVIATIONS

DOL.	Dolomite
GAL.	Galena
LIMON.	Limonite
LS.	Limestone
PY.	Pyrite
QTZ.	Quartz
REPL.	Replacement
XLLINE.	Crystalline

TRUE NORTH
MAGNETIC NORTH
23° 30'

BASE MAP FROM COMPANY MAP
GEOLOGY BY A. E. WEISSENBORN AND M. R. KLEPPER, 1951

GEOLOGIC MAP OF MAIN UNDERGROUND WORKINGS

IROQUOIS MINE

SEC.30, T40N, R42E, STEVENS COUNTY, WASHINGTON

SCALE 50 0 50 100 150 200 FEET