DMEA Form 9
Rev. 6/57

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration

OFFICIAL DOCKET FILE | Idm-E NO. 189 | DMEA NO. 255

Application
- [ ] Denied
- [ ] Withdrawn

Contract
- [ ] Terminated - Not Certified
- [x] 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
- [ ] Closing Letter
- [x] Cost Audits
- [x] 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
- [x] Application and attachments

Folders 1 & 2 Corres.

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) 9/18/58.
- [x] Operator's Final Report (Tab) 1/3/58
- [ ] 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. 3 & 4: Reports
- [x] 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. _____: Maps (Use pocket folder or envelope)

Folders No. 5: Settlement Sheets

Folders No. _____: Drill Logs

Folders No. _____: Royalty material

Reported Inactive 12/28/59

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OFFICE OF MINERALS EXPLORATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

REPORT OF ROYALTY REVIEW

I have reviewed the files of the Washington office pertaining to Contract Idm-Z189, Docket DMM-255X (lead), dated October 19, 1951, with

Whitedelph Mining and Development Co.
Box 536
Clark Fork, Idaho

for the purpose of determining the amount of royalty payable to the U. S. Government on sales of minerals from property referred to as the Whitedelph Mine located in Bonner County, Idaho, during the period July 15, 1959, through October 8, 1962.

A certification of discovery or development was issued on February 8, 1957, and, in accordance with Annex III (attached to and a part of Amendment No. 7) and Amendment No. 8 of the contract, royalty is payable on all minerals produced from the land described in Article 2 of the contract for a period of 15 years from the date of the contract or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first. A Report of Review dated September 11, 1957, indicated accepted costs under the exploration contract amounting to $223,482.76 with the Government's contribution on a 50 percent basis being $111,741.38.

The status of the project, the scope of review, and the reasons therefor are stated on page 2.

This review established no sales subject to the Government's royalty subsequent to the period covered by a prior Report of Royalty Review which found the sales subject to the Government's royalty through July 14, 1959, to be $64,223.58. The royalty account as of July 14, 1959, was:

Total Royalty Payable	$3,210.18
Total Royalty Paid	3,211.16
Overpayment of Royalty	$ .98

As of October 8, 1962, the royalty account of this project was found to be:

Total Royalty Payable	$3,210.18
Total Royalty Paid	3,211.16
Overpayment of Royalty	$ .98

October 16, 1962

E. D. Telbert

E. D. Telbert, OME Auditor

Idm-X189 Whitedelph Mining and Development Co. DMEA-255X

STATUS OF PROJECT, SCOPE OF REVIEW AND REASONS THEREFOR

This contract as amended provides that the Operator, as principal if the producer or as surety if not the producer, shall pay to the Government a percentage royalty on all minerals produced from the land thereunder. The land consists of the NE¼ of sec. 34, T. 56 N., R. 2 E., Boise Meridian. At the time the contract was executed the Operator was the owner of the S½ of the quarter, subject only to a 5% reservation of mineral rights to Compton I. White, Sr., and was the lessee of the N½ under a 50-year lease dated March 30, 1926, from Compton I. White, Sr. Consents to Lien and Subordination Agreements were executed by Compton I. White, Sr., who was the Operator's majority stockholder and secretary-treasurer.

Exploration work under the contract was terminated effective July 31, 1956. During the exploration and thereafter until February 22, 1958, shipments of ores and concentrates were made by the Operator and intermittently by several lessees (Rounsville, Anderson, Brockway, and Moefner). These sales of production are covered by Royalty Audit Reports and Certificates dated May 10, 1956, and November 16, 1956, and a Report of Royalty Review dated July 15, 1959.

Examinations of the property and inquiries by DMEA and OME regional personnel established that the property remained inactive from early 1958 through July 14, 1959, all sales of production had been reported, and that no production had been stockpiled. In an October 8, 1962, reply to a MME Form 63 inquiry, the Operator stated that neither production nor change in property status had occurred since July 15, 1959.

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

(1) The files indicate that all production since the date of the contract has been reported;
(2) The property has been inactive since early 1958; and
(3) The administrative cost to the Government of an on-site royalty audit at this time would be excessive in relation to the amount of possible additional royalty which might be disclosed.

OFFICE OF MINERALS EXPLORATION
CONTRACT ADMINISTRATION AND AUDITS DIVISION

REPORT OF ROYALTY REVIEW

I have reviewed the files of the Executive Officer, OME Field Team, Region I, Spokane, Washington, pertaining to Contract Idm-2189, Docket No. DMA-235X (lead), dated October 19, 1951, with

Whitedelph Mining and Development Co.
Clark Fork, Idaho

for the purpose of determining the amount of royalty due the U. S. Government on sales of crude ore and lead concentrates from property referred to as Whitedelph Mine located in Bonner County, Idaho, during the period October 11, 1956 through July 14, 1959.

A certification of discovery or development was issued on February 8, 1957, and, in accordance with Article 15 of the contract and Amendments Nos. 7 and 8 thereto, royalty is payable on the net smelter returns or other net proceeds realized from production from the land described in Article 2 of the contract during a period of 15 years from the date of the contract. A Report of Review in lieu of final audit dated September 11, 1957, indicated accepted costs under the exploration contract amounting to $223,882.76 with the Government's contribution, on a 50 percent basis, being $111,741.38. The scope of review and the reasons therefor are stated on page two.

The review established the total sales of lead concentrates (no sales were made of crude ore) for this period to be $28,817.49. Royalty due the Government at the contract rate of 5 percent is $1,440.86.

Prior royalty audits covering the period October 19, 1951 through October 10, 1956, found the sales as of the last date to be $35,406.09 which, added to the sales for this period, make a total of $64,223.58 as of July 14, 1959. The royalty account as of October 10, 1956, was

Total Royalty Due	$1,769.32
Total Royalty Paid	1,770.30
Royalty overpaid	$ 0.98

As of July 14, 1959, the royalty account of this project was found to be

Total Royalty Due	$3,210.18
Total Royalty Paid	3,211.16
Royalty overpaid	$ 0.98

July 15, 1959

C. E. Fisher

C. E. Fisher, Auditor

DESCRIPTION OF THE REVIEW
AND STATEMENT OF VERIFICATION

Contract Idm-2189, Docket No. DMA-255X

My review included a verification and tabulation of copies of settlement sheets (Lot Nos. 179 to 200, incl.) covering sales of lead concentrates to The Bunker Hill Company forwarded by that company to the Regional office in support of payments of royalty due to the Government and withheld from settlements with the Operator.

The last sale covered by Lot. No. 200 was received by the smelter on February 22, 1958, and settlement was made on February 27, 1958. The mine property has not been operated and there have been no sales subsequent to that date.

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

(a) Periodic inspections by representatives of the Field Team, Region I, have indicated that all sales subject to Government royalty have been reported, and

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

MME Form 22
April 59

DEPARTMENT OF THE INTERIOR
Office of Minerals Exploration

OFFICIAL FILE COPY
O. M. E.
RECEIVED JUL 20 1959

DATE	INITIALS	CODE
Docket	No. 255X (lead)	

CHECK SHEET OF EXAMINING ENGINEER

Operator's Name Whitedelph Mining and Development Co.

Address Clark Fork, Idaho

Exploration Contract No. Idm-E189

		Check One Yes	No.
1.	(a) Does the Operator stockpile ore subject to royalty repayment?		x
	(b) If so, is segregation and identification procedure adequate?		
2.	(a) Does Operator commingle production subject to DMEA or OME royalties with exempt production?		x
	(b) If so, do you consider the allocation of the commingled production equitable?		
3.	(a) Does the Operator stockpile mine or mill rejects (low grade ore, tailing, middlings, etc.) that may have potential value within the royalty payment period?		x
	(b) If so, are adequate records maintained on such material to protect the Government's interest?		
4.	Do you consider the assay controls in effect are adequate?	x	
5.	Do you consider that the manner of disposing of production gives the Government its fair royalty returns?	x	
6.	Do your periodic examinations of operations indicate the Operator is properly reporting his production of ores subject to DMEA or OME royalties?	x	
7.	Does the Operator buy from or sell to other Operators?		x
8.	Comment on any item 2 (b) to 6 if answer is No.		

Property has been inactive since April 1958.

July 14, 1959
Date

S. W. Zoldok
Mining Engineer
S. W. Zoldok

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DEFENSE MINERALS EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

SECOND ROYALTY AUDIT CERTIFICATE

I have examined the records and sales documents pertaining to the sale of gold, silver, copper, lead, zinc and antimony crude ore and concentrates for the period of October 31, 1955 to October 10, 1956, by the

Whitedalph Mining and Development Co.
Clark Fork, Idaho

produced from the Whitedalph Mine, located at Clark Fork, Bonner County, State of Idaho, under the terms of Contract No. Idm-X189, Docket No. DMA-255X (Lead), dated October 19, 1951.

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

The audit established the net sales of gold, silver, copper, lead, and zinc ore and concentrates for this period to be $7,480.73. Royalty due the United States Government at the contract rates of one and one half percent to five percent is $373.05.

The First Royalty Audit by C. A. Turner, DMEA Auditor for the period of October 19, 1951 to October 31, 1955 found the sales as of October 31, 1955 to be $27,925.36 which added to the sales of this period make a total of $35,406.09 as of October 10, 1956. The royalty account as of October 31, 1955, was

Total Royalties Due	$1,396.27
Total Royalties Paid	1,045.74
Balance Royalties Due	$ 350.53

As of October 10, 1956, the royalty account of this project was found to be

Total Royalties Due	$1,769.32
Total Royalties Paid	1,770.30
Royalties Overpaid	$ .98

C. A. Turner, Auditor

November 16, 1956

SECOND ROYALTY AUDIT REPORT

I. INTRODUCTION

During the month of October, 1956, an audit was made of the production, sales and royalty accounts and records of the

Whitedelph Mining and Development Company
Clark Fork, Idaho

pertaining to the sale of gold, silver, copper, lead, zinc and antimony crude ore and concentrates during the period of October 19, 1951, to October 10, 1956, produced from the Whitedelph Mine located near the town of Clark Fork, in Bonner County, State of Idaho, on which royalties are due the United States Government under the terms of Amended Contract No. Idm-K189, Docket No. DMA-255X dated October 19, 1951. This second royalty audit covers the period since the date of the first royalty audit made by C. A. Turner, DMEA Auditor, covering the period of October 19, 1951, to October 31, 1955 inclusive.

The production and sales records pertaining to this contract are maintained by and in the custody of Edythe I. Fisher, Empire State Building, Spokane, Washington.

During the on-site audit the following representatives of the Company and the United States Bureau of Mines were consulted as necessary:

Edythe I. Fisher, Accountant
M. R. Lickes, U. S. Bureau of Mines

The cooperation of all greatly facilitated the audit work.

II. GENERAL INFORMATION

Annex III to the contract provides for royalty on production. The Operator, as principal, if the Operator is the producer, or as surety, if the Operator is not the producer, shall pay to the Government a royalty on all minerals mined or produced from the land, described in Article 2 of the contract, as follows:

(1) regardless of any certification of discovery or development, from the date of the contract until the lapse of the time within which the Government may make such certification, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first; or (2) if the Government makes a certification of discovery

or development, for a period of ten years from the date of the contract, or until the total net amount contributed by the Government without interest is fully repaid whichever occurs first. Annex III increases the period of repayment from ten years to fourteen years.

Amendment No. 8 increases the maximum period for royalty payments and lien for payment thereof from fourteen years to fifteen years.

A certificate of discovery has not been issued on this project.

The final audit of the exploration project was made by C. A. Turner, DMEA Auditor. The audit certificate dated November 16, 1956, indicates the total accepted costs of exploration to be $223,882.76 and the Government's contribution on a 50% basis to be $111,941.38.

The balance of royalties due as shown by Revised First Royalty Audit, $350.53, have been paid. The royalties on shipments subsequent to the First Royalty Audit have been paid direct to the Executive Officer, Region I, Northwest, Spokane, Washington by the Bunker Hill Company, Kellogg, Idaho. Payments have been accompanied by a copy of the Bunker Hill Smelter settlement sheets which was rendered to the Operator.

III. SCOPE OF AUDIT AND FINDINGS

A. Conference with the examining engineer M. R. Lickes, U. S. Bureau of Mines disclosed the following:

(a) The operator does not stockpile ore subject to DMEA royalty; nor are low grade ores, tailings, or middlings stockpiled.

(b) All production from the mine is subject to DMEA royalties.

(c) The sampling and assay controls in effect are considered adequate.

(d) The manner of disposing of production is considered as giving the Government its fair royalty returns.

(e) Examination indicated that the operator is properly reporting the current production subject to DMEA royalty.

B. Audit of Settlement Statements

A considerable amount of preaudit work was accomplished in the Spokane office of DMEA, Region I, Northwest District, Spokane, Washington, prior to the field work. During this preaudit work a statement or royalties received was prepared from copies of the smelter settlement sheets furnished by the Bunker Hill Company (formerly known as the Bunker Hill and Sullivan Mining and Concentrating Company), purchasers of the crude ore and mill

concentrates, in support of royalty payments made on ore purchased from the operator. The royalty receipts were verified with deposits made by the Regional Executive Officer. All of the data included in the statement was confirmed by the smelter settlement sheets which had been recomputed for accuracy. This statement, which is filed as a part of my audit work papers, was reconciled with the production and sales records of the operator during the on-site audit.

The last shipment on which settlement of royalty had been received by the Regional Executive Officer at the time of the audit was covered by the Bunker Hill Company settlement sheet No. 172 dated October 4, 1956.

IV. CONCLUSIONS AND RECOMMENDATIONS

A summary analysis of the operator's production and sales subject to DMEA royalties include the smelter settlement sheets Nos. 137 to 178 inclusive with the exception of two shipments Nos. 157 and 162 (which were from old dumps and exempt of royalty payment) for the period of October 19, 1951 to October 10, 1956 as follows:

	Net Receipts			Royalty	
	Amount	Short Dry Tons	Per S.D.T.	Rate	Amount
Crude Ore					
	$ 3,116.17	31.3285	$ 99.47	5.0%	$ 155.80
	27.89	5.2350	5.33	1.5%	.42
	$ 3,144.06	36.5635			$ 156.22
Concentrates					
	$32,262.03	167.5515	$192.55	5.0%	$1,613.10
Total Net Sales Subject to Royalties and Royalties Due					
	$35,406.09				$1,769.32
Royalties Paid					1,770.30
Overpayment of Royalties					$ .98

The net proceeds from sales of ore and concentrates during the period, after deduction of smelting charges, amounted to $36,602.76, whereas the net proceeds on which royalties have been paid amounted to $35,406.09. This difference of $1,196.67 is comprised of allowable deductions from the net proceeds before royalty computations as follows:

	Crude ore	Concentrates	Total
Railroad Freight	$ ——	$ 251.39	$ 251.39
Freight on Lead	67.79	667.49	735.28
Sampling	60.00	150.00	210.00
	$127.79	$1,068.88	$1,196.67

The audit has confirmed the accuracy and propriety of the royalty payments received by the Regional Finance Officer applicable to ore and concentrates sales during the period of October 19, 1951 to October 10, 1956. It has also determined that all indicated sales during the period have been properly accounted for.

At the conclusion of the audit the findings were discussed with A. E. Weissenborn, Executive Officer, DMEA Field Team, Region I, Northwest District.

C. A. Turner, Auditor

November 16, 1956

Check Sheet of Examining Engineer

Operator's Name Whitedelf Mining & Development Company

Address Clark Fork, Idaho

Exploration Contract No. Idm-E189 Docket No. 255X

	Check One Yes	No
1. (a) Does the Operator stockpile ore subject to royalty repayment?		x
(b) If so, is segregation and identification procedure adequate?		
2. (a) Does Operator commingle production subject to DMEA royalties with exempt production?		x
(b) If so, do you consider the allocation of the commingled production equitable?		
3. (a) Does the Operator stockpile mine or mill rejects (low grade ore, tailing, middlings, etc.) that may have potential value within the royalty payment period?		x
(b) If so, are adequate records maintained on such material to protect the Government's interest?		
4. Do you consider the assay controls in effect are adequate?	x	
5. Do you consider that the manner of disposing of production gives the Government its fair royalty returns?	x	
6. Do your periodic examinations of operations indicate the Operator is properly reporting his production of ores subject to DMEA royalties?	x	
7. Does the Operator buy from or sell to other Operators?		x

8. Comment on any item 2 (b) to 6 if answer is No.

3a. All ore is treated in flotation mill. Tailings go to mill pond.

M. R. Lickes

M. R. Lickes

Mining Engineer

Date October 10, 1956

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DEFENSE MINERALS EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

REVISED FIRST ROYALTY AUDIT CERTIFICATE

I have examined the production records and sales documents pertaining to the sales of lead, silver, copper, zinc, and antimony ores and concentrates for the period of October 19, 1951 to October 31, 1955 by the:

Whitedelf Mining and Development Co.
Clark Fork, Idaho

produced from the Whitedelf Mine, located near Clark Fork in Bonner County, State of Idaho, under the terms of Contract No. Idm-B189, Docket No. DMA 255X, dated October 19, 1951, including Amendments Nos. 1 to 7, inclusive.

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

The audit established the total sales of such ores and concentrates for this period, subject to DMEA royalties, to be $27,925.36. Royalty due the Government at the rates specified in the contract is $1,396.27. The royalty paid and the balance due are as follows:

Total Royalties Due	$1,396.27
Total Royalties Paid	1,045.74
Balance Royalties Due	$ 350.53

C. A. Turner, Auditor

May 10, 1956

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FIRST ROYALTY AUDIT REPORT - ADDENDUM No. 1

The First Royalty Audit Report, covering royalty payments due for the period of October 19, 1951 to October 31, 1955 under the Exploration Project Contract No. Idm-5189, Docket No. DMA 255X, including Amendments Nos. 1 to 7, inclusive, with the:

Whitedelf Mining and Development Co.
Clark Fork, Idaho

was issued under date of January 10, 1956, and this Addendum has been prepared to state the amount of Royalties Due after the elimination of the two shipments of ore which are exempt of royalties.

Mr. A. E. Weissenborn, Executive Officer, DMEA Field Team, Region I, Northwest District, received authority April 20, 1956 from Mr. George C. Selfridge, Chairman of the Operating Committee, that shipments, Lots No. 157 and No. 162, of ore derived from old dumps, to be exempt from royalty payments.

The Revised First Royalty Audit Certificate indicates the Balance of Royalties Due as shown by the following summarization:

	Shipments Net Proceeds	Royalty Due	Royalty Paid	Balance Royalty Due
First Royalty Audit Report				
Schedule No. 1	$20,931.44	$1,046.57	$1,045.74	$ .83
Schedule No. 2	8,132.05	406.60	-0-	406.60
Total	$29,063.49	$1,453.17	$1,045.74	$ 407.43
Shipments From Old Dumps Exempt from Royalties				
Schedule No. 2				
Lot 157	$ 450.55	$ 22.52	-0-	$ 22.52
Lot 162	687.58	34.38	-0-	34.38
Total	$ 1,138.13	$ 56.90	-0-	$ 56.90
Revised First Royalty Audit Certificate				
Total	$27,925.36	$1,396.27	$1,045.74	$ 350.53

C. A. Turner, Auditor

May 10, 1956

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DEFENSE MINERALS EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

FIRST ROYALTY AUDIT CERTIFICATE

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I have examined the records and sales documents pertaining to the sale of lead, silver, copper, zinc and antimony ores for the period of October 19, 1951 to October 31, 1955 by:

Whitedelph Mining and Development Co.
Clark Fork, Idaho

produced from the Whitdelph Mine, located near Clark Fork, in Bonner County, State of Idaho under the terms of Contract No. Idm E 189, Docket No. DMA 255X.

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

The audit established the total net sales of lead, silver, copper, zinc and antimony for this period to be $29,063.49. Royalty on these sales is due the United States Government at the contract rate of 5 percent. Royalties received on these sales amounting to $1,045.74 leave a balance of $407.43 of royalties due, as follows:

Total Royalties Due	$1,453.17
Total Royalties Paid	1,045.74
Balance of Royalties Due	$ 407.43

January 10, 1956

C. A. Turner

C. A. TURNER, Auditor

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FIRST ROYALTY AUDIT REPORT

I. Introduction

During the month of November 1955 an audit of royalty payments received covering the period of October 19, 1951 to October 31, 1955, was made of the production and sales records of crude ore and concentrates pertaining to Contract No. Idm E 189, Docket No DMA 255X with the

Whitedelph Mining and Development Co.
Clark Fork, Idaho

covering a project of exploration for lead on property known as the Whitedelph Mine, located near the town of Clark Fork, in Bonner County, State of Idaho.

The ore production records are located at the mine office near Clark Fork in the possession of Compton I. White, Jr., and the sales records are in the possession of Edythe I. Fisher, located at 401 Empire State Building, Spokane, Wash.

During the course of the audit Edythe I. Fisher was consulted as necessary.

M. R. Lickes, Mining Engineer, U. S. Bureau of Mines, was available for Consultation.

II. General Information

This royalty audit was made simultaneously with the First Interim Audit dated December 12, 1955 of the Exploration Project. At the time of this audit a certificate of discovery had not been issued. However, Annex III of the contract requires payment of royalties on all minerals mined or produced from the land, regardless of any certification of discovery from the date of the contract until the lapse of the time within which the Government may make such certification, or until the total net amount contributed by the Government without interest is fully repaid, whichever comes first.

The total accepted cost of the Exploration Project was $201,210.28, in which the Government participated 50 percent or $100,605.14., for the period of October 19, 1951, to June 30, 1955, inclusive.

The shipments of crude ore and concentrates consisted of lead and silver with minor amounts of copper, zinc and antimony.

III. Scope of Audit and Findings

The audit was limited to determining the accuracy and propriety of royalty payments received by the Executive Officer, DMEA Field Team, Region I Northwest District, during the period of October 19, 1951 to October 31, 1955, and a determination that all indicated sales of ore subject to repayment royalties under the exploration project contract and amendments, for which smelter settlement sheets had been released and had been properly accounted for.

The audit findings are as follows:

A. Conference With the Examining Engineer, U. S. Bureau of Mines

The conference disclosed the following:

The Operator does not stockpile ore subject to DMEA repayment royalties, nor are low grade ores, tailings or middlings stockpiled.

All minerals mined or produced from the mine are subject to DMEA royalties.

The assay controls in effect are considered adequate.

The manner of disposing of the production is considered as giving the Government it"s fair royalty returns.

Periodic examinations indicate the Operator is properly reporting theproduction of ores subject to DMEA royalty, with the exception of ore produced by lessees from areas described in Article 2 of the contract which have not benefitted by the exploration project. These omissions will be discussed in Section "B" and Schedule No. 2.

The Operator does not buy ore from other Operators and there is no indication of sales of ore to other than the Bunker Hill Smelter, Kellogg, Idaho.

B. Audit of Smelter Settlement Statements

During the audit, a statement of royalty payments received (Schedule No 1) was prepared from copies of settlement sheets received by the Executive Officer DMEA Field Team, Region 1 Northwest District.

Analysis of smelter settlement sheets which included recomputations and comparison with the Operator's ledger records of ore sales, indicated that fourteen smelter settlement sheets were not included with those received by the

Executive Officer. Upon request Edythe I. Fisher, accountant for the Operator, supplied the missing settlement sheets.

Schedule No. 2 "Shipments on Which Royalties are Unpaid" was prepared with audit findings as follows:

All fourteen smelter settlement sheets covered ore produced by lessees which is by the terms of Annex III of the contract subject to royalties.

An undeterminable amount of the first lot No. 136 covering 1.6 tons of concentrates was produced prior to the effective date of the contract. This lot was deducted from Schedule No. 2 because of the lack of positive information as to the date this ore was mined.

IV. Conclusions

A summary analysis of the Operator's production and sales of crude ore and concentrates subject to DMEA royalties consisted of Bunker Hill Smelter Lots No. 136 to No. 172 Inclusive, as follows:

Sales 11-3-51 to 6-22-55 Lots 136 to 172 Incl.	Sales Crude Ore and Concentrates	Net Proceeds		Royalty @ 5%	
	Short Dry Tons	Amount	Per SDT	Due	Unpaid
Schedule No 1	118.2930	$20,931.44	$176.95	$1,046.57	$ .83
Schedule No 2	54.2895	8,132.05	149.79	406.60	406.60
Total	172.5825	$29,063.49	$168.40	$1,453.17	$407.43

Total Sales - After Deducting Smelter Charges		$29,868.01
Allowable deductions		
Freight on lead	$614.52	
Sampling	190.00	804.52
Net total - Subject to 5% Royalty		$29,063.49

The audit has confirmed the accuracy and propriety of the royalties due for the period of October 19, 1951 to October 31, 1955, the amount of royalty payments received by the Executive Officer, DMEA Field Team, Region 1 Northwest, and the balance of unpaid royalties due October 31, 1955.

The findings were discussed with Edythe I. Fisher, accountant for the Operator.

At the conclusion of the audit the findings were discussed with A. E. Weissenborn, Executive Officer, DMEA Field Team Region 1 Northwest District.

C. A. Turner

C. A. TURNER, Auditor

Schedule No 1

Whitedelph Mining and Development Co.
Shipments - On Which Royalties Were Paid.

Contract No. Idm E 189
Docket No DMEA 255X

Smelter Settlements				Allowable Deductions		Net Proceeds	
Date	Lot No	Short Dry Tons	Gross	Freight On Lead	Sampling	Amount	Per Ton S.D.T.
12-4-53	142	7.4805	$ 1,442.09	$ 32.76	$---	$ 1,409.63	$188.44
12-5-53	143	2.9470	283.31	5.19	10.00	268.12	90.98
12-17-53	145	6.5405	1,301.10	29.25	---	1,271.85	194.46
2-5-54	146	5.3985	991.38	24.60	---	966.78)	182.17
2-5-54	146	Correction	16.67	---	---	16.67)	
2-27-54	147	4.4415	886.24	20.25	10.00	855.69	192.66
3-6-54	148	5.0760	1,012.20	23.34	---	988.86	194.81
3-27-54	150	4.9770	1,036.46	23.34	10.00	1,003.12	201.55
4-7-54	152	5.3130	1,098.54	24.55	---	1,073.99	202.14
4-30-54	154	5.7705	1,161.52	25.49	---	1,136.03	196.87
5-18-54	156	5.1120	1,062.32	23.37	---	1,038.95	203.24
5-21-54	158	4.5645	854.24	18.40	10.00	825.84	180.93
5-29-54	159	6.0150	1,035.12	22.73	---	1,012.39	168.31
6-5-54	160	6.9190	1,237.30	27.36	---	1,209.94	174.87
6-30-54	163	7.2035	1,237.94	27.93	---	1,210.01	167.98
7-6-54	164	2.7950	500.88	8.06	10.00	482.82	172.74
7-6-54	165	3.5075	343.11	7.98	10.00	325.13	92.70
8-4-54	166	3.5180	569.48	12.70	10.00	546.78	155.42
8-25-54	167	4.1400	651.42	14.86	10.00	626.56	151.34
9-13-54	168	5.5405	899.36	19.81	---	879.55	158.75
9-21-54	169	5.3340	632.84	11.84	---	621.00	116.42
10-19-54	170	4.2635	745.57	15.90	10.00	719.67	168.79
3-17-55	171	5.4795	497.70	7.63	---	490.07	89.55
6-22-55	172	5.9565	1,976.63	24.64	---	1,951.99	327.71
Total		118.2930	$21,473.42	$451.98	$90.00	$20,931.44	$176.95

Shipments - Net Proceeds $20,931.44

Royalties Due - 5% of Net Proceeds	$1,046.57
Royalties Paid	1,045.74
Balance Royalties Due	$ .83

Schedule No 2

Whitedelph Mining and Development Co.
Shipments on Which Royalties are Unpaid

Contract No Idm E 189
Docket No DMEA 255X

Date	Smelter Settlements Lot No	Short Dry Tons	Gross	Allowable Deductions Freight On Lead	Sampling	Net Proceeds Amount	Per Ton S.D.T.
11-3-51	136*	1.6330	$ 428.96	$ 6.58	$ 10.00	$ 412.38	$252.53
11-10-51	137	3.7680	639.62	10.28	10.00	619.34	164.36
12-4-51	138	1.9675	680.75	4.54	10.00	666.21	338.61
12-18-51	139	4.2965	935.31	12.33	10.00	912.98	212.49
1-12-53	140	7.3990	1,501.40	32.11	---	1,469.29	198.57
11-6-53	141	6.3180	1,005.83	22.99	-- -	982.84	155.56
12-5-53	144	2.3030	300.56	8.13	10.00	282.43	122.64
3-16-54	149	2.7650	157.24	3.55	10.00	143.69	51.97
3-29-54	151	4.2080	341.89	6.70	10.00	325.19	77.28
4-13-54	153	3.5290	684.88	13.25	10.00	661.63	187.48
5-6-54	155	4.9205	282.56	5.57	10.00	266.99	54.26
5-21-54	157	2.7980	471.48	10.93	10.00	450.55	161.03
6-14-54	161	5.3770	678.84	15.51	---	663.33	123.36
6-16-54	162	4.6400	714.23	16.65	10.00	687.58	148.19
Total		55.9225	$8,823.55	$169.12	$110.00	$8,544.43	$152.79
Deduct Lot No 136		1.6330	428.96	6.58	10.00	412.38	252.53
Total		54.2895	$8,394.59	$162.54	$100.00	$8,132.05	$149.79

Shipments - Net Proceeds $8,132.05

Royalties Due - 5% of Net Proceeds $406.60
Royalties Paid None
Balance Royalties Due $406.60

* Lot No 136 deducted because of the lack of information which would indicate that it was produced after the effective date of the contract.

Check Sheet of Examining Engineer

RECEIVED
JAN 19 1956

Operator's Name Whitedelph Mining & Development Co.

Address Clark Fork, Idaho

Exploration Contract No. Idm-E189 Docket No. 255X

	Check One Yes	No
1. (a) Does the Operator stockpile ore subject to royalty repayment? Only in bin until enough is available to mill.	X	
(b) If so, is segregation and identification procedure adequate?	X	
2. (a) Does Operator commingle production subject to DMEA royalties with exempt production?		X
(b) If so, do you consider the allocation of the commingled production equitable?		
3. (a) Does the Operator stockpile mine or mill rejects (low grade ore, tailing, middlings, etc.) that may have potential value within the royalty payment period?		X
(b) If so, are adequate records maintained on such material to protect the Government's interest?		
4. Do you consider the assay controls in effect are adequate?	X	
5. Do you consider that the manner of disposing of production gives the Government its fair royalty returns?	X	
6. Do your periodic examinations of operations indicate the Operator is properly reporting his production of ores subject to DMEA royalties?	X	
7. Does the Operator buy from or sell to other Operators?		X

8. Comment on any item 2 (b) to 6 if answer is No.
3(a) Flotation tailings, considered valueless, are impounded in settling pond.

M. R. Ficken

Mining Engineer

Date January 10, 1956

82448

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
2/6	[illegible]	500
2/6	[illegible]	140
2/7	Chamberlain	800
2/8	Selfridge	130
"	Johnson	110
2/12	C	220

100
225

Lamb
Kiilsgaard

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

To; Mr. Compton I. White, Jr., President
Whitedelf Mining & Development Company
401 Empire State Building
Spokane 1, Washington

Pursuant to the provisions of Exploration Project Contract No. Idm-E189, dated October 19, 1951, Docket No. DMA-255, hereinafter called the "contract", between The Whitedelf Mining & Development Company, a corporation, 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 land described in the contract, the Government considers and therefore certifies that discovery or development from which production may be made has resulted from the exploration work.

The nature of said discovery or development is described broadly or indicated as follows: Drifting along the Pearl vein on the 800 level of the Whitedelf mine showed the existence of silver-lead ores occurring in a mineralized fault in the Wallace formation (argillites and impure quartzites).

Dated FEB 8 - 1957

THE UNITED STATES OF AMERICA

By [signature]
Administrator, Defense Minerals
Exploration Administration

WRGriswold/er 2/4/57
Copy to: Docket
Mr. C. A. Fredell, DR., Tec.Ser.Div.
Mr. Lamb, USBM
Mr. Kiilsgaard, USGS
Admr R File
Op. Committee
Base Metals
Cont. Adm & Audit Div.
Finance Office
Region I, NW Dist. (2)
MR. F. E. Johnson
Mr. W.R. Griswold
Chron.

8623

DEFENSE MINERALS EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

REPORT OF REVIEW

I have reviewed the Monthly Reports of:

Whitedelph Mining and Development Co.
Clark Fork, Idaho

pertaining to Exploration Project Contract No. Idm-E189, Docket No. DMA-255X, dated October 19, 1951, including Amendments Nos. 1 to 8, inclusive, and a Termination Agreement dated October 12, 1956, having an effective date of July 31, 1956, for the period of October 19, 1951 to July 31, 1956, covering a project for the exploration of lead on property known as the Whitedelph Mine, located in Bonner County, State of Idaho.

My review included an examination of the Monthly Reports (Forms MF-104) and supporting documents attached thereto, comparison of the costs claimed with the contract and pertinent schedules, consultation with the Government representative who visited and examined the project, and a determination of the reasonableness and propriety of the costs.

This review was made in lieu of a final audit of the Operator's accounts and records for the following reason:

(a) The accepted costs ($223,882.76) of all work on an actual cost basis were covered by a final Audit Report and Audit Certificate dated November 16, 1956, issued by C. A. Turner, DMEA Auditor.

The review disclosed the following facts in regard to the amount paid or to be paid the contractor:

Total cost as billed by Contractor		$227,006.26
Less proceeds from property disposition		2,645.25
Net Claimed Cost		224,361.01
Exceptions (see Audit Report)		
Prior to Audit	$152.05	
During Audit	411.02	
	563.07	
Less additions to Operator's claim	84.82	478.25
Total accepted costs		$223,882.76

The contract calls for a 50 percent participation of exploration expenses by the United States Government. Therefore, payment to the contractor by the Government of $111,941.38 (50% of the accepted costs) less a debit of $200.00 to compensate for not furnishing a final project report, or the net amount of One hundred eleven thousand seven hundred forty one and 38/100 Dollars

--$111,741.38--

is considered valid and proper, provided that the Regional Executive Officer, the Administrator, or other competent official has accepted or will accept the project as having otherwise met the terms of the contract.

C. A. Turner, Auditor

September 11, 1957

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DATE	INITIALS	CODE

DEFENSE MINERALS EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

RECEIVED NOV 26 1956 D.M.E.A.

AUDIT CERTIFICATE

I have examined the records and transactions of:

Whitedelph Mining and Development Co.
Clark Fork, Idaho

pertaining to Exploration Project Contract No. Idm E 189, Docket No. DMA 255X, dated October 19, 1951, including Amendments Nos. 1 to 8 inclusive, covering a project for the exploration of lead on property known as the Whitedelph Mine, for the period of October 19, 1951 to July 31, 1956, and the subsequent disposition of project property.

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

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

Total Cost as billed by Contractor		$ 227,006.26
Less Proceeds from Disposition of Property		2,645.25
Net Claimed Cost		224,361.01
Exceptions (See Audit Report for details)		
Prior to audit	$ 152.05	
During this audit	411.02	
	563.07	
Less Additions to Operator's Claim	84.82	478.25
Total Accepted Cost		$ 223,382.76

The contract calls for a 50 percent participation of exploration expenses by the United States Government. Therefore, payment to the Contractor by the Government in the amount of One Hundred Eleven Thousand Nine Hundred Forty-One and 38/100 Dollars

--$111,941.38--

is valid and proper.

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

C. A. Turner, Auditor

November 16, 1956

AUDIT REPORT

I. INTRODUCTION

During the month of September, 1956, a final audit (covering operations for the period of July 1, 1955 to July 31, 1956) was made of the records and transactions pertaining to Exploration Project Contract No. Idm E 189, Docket No. DMA 255X, dated October 19, 1951, including Amendments Nos. 1 to 8 inclusive, and the subsequent disposition of project property, with the:

Whitedelph Mining and Development Co.
Clark Fork, Idaho

covering a project for the exploration of lead, on property known as the Whitedelph Mine, located approximately two miles north of Clark Fork, in Bonner County, State of Idaho.

The first interim audit covering the period of October 19, 1951, to June 30, 1955, was made by C. A. Turner, DMEA Auditor during the month of November, 1955.

The original accounting records under the contract are maintained by and are in the custody of the Edythe I. Fisher Bookkeeping Service, located at 401 Empire State Building, Spokane, Washington. Items of original entry are supplied by Compton I. White, Jr., President of the Corporation, from the mine office, located at the mine near Clark Fork, Idaho. Mr. White is the manager of the mine and supervises the Exploration Project.

M. R. Lickes, Mining Engineer, U.S. Bureau of Mines and representative of the Region I, Northwest District DMEA Field Team, was available for consultation as questions arose during the audit.

Prior to the DMEA Exploration Project Contract, the Whitedelph Mining and Development Company received a loan from the Reconstruction Finance Corporation. The balance of the loan at the time of the audit is $25,000.00, plus accrued interest at the rate of 4% per annum. This loan is secured by certain equipment which was on hand at the time the loan was made, (July, 1943) and equipment to be purchased with the proceeds of the loan, together with a lien upon all proceeds from mining operations. This contract has been modified to the extent that the Reconstruction Finance Corporation will permit the payment of royalties to the Defense Minerals Exploration Administration. Renewal of the loan is being renegotiated at this time.

II GENERAL INFORMATION ON RECORDS

The accounting records made available for the audit consisted of a general ledger, combination cash receipts and cash disbursements journal, payrolls, vendors' invoices, bank statements and cancelled checks, Federal Employer's Quarterly Federal Tax Return, Federal Employer's Annual Tax Return, States of Idaho and Washington Contribution Reports, Liability Insurance Policies and reports, and various correspondence related to the Exploration Project.

The Operator's Monthly Report and Voucher Form MF-104 was prepared by the Edythe I. Fisher Bookkeeping Service under the direction of Compton I. White, Jr., from a comprehensive work sheet which was made available to the auditor. Compton I. White, Jr. signed the Forms MF-104 as president of the company.

III SCOPE OF AUDIT AND FINDINGS

The audit was limited to ascertaining the accuracy, propriety and validity of the costs shown in the "Totals to Date" column of the final Form MF-104, Operator's Monthly Report and Voucher, for the month of July, 1956, but including the subsequent liquidation of the Government's equity in certain project property.

The audit disclosed a considerable amount of improper distribution of charges to the "Items of Cost" shown on the final Form MF-104. Therefore, the audit findings presented below are those resulting after correction of the cost distribution.

(1) Independent Contracts

Costs properly allowable under the terms of the contract, performed by independent contractors are as follows:

Rehabilitation of Main Winze	$ 2,600.00
Rehabilitation of South Adit	460.00
Rehabilitation of Shaft	6,924.03
Sinking Shaft 413 ft. @ $155.26	64,122.30
Accepted Costs	$ 74,106.33

Contracts with independent contractors have all been approved by the Government.

Rehabilitation of the Main Winze was completed by Ivar Anderson under two contracts as follows:

Rehabilitation and retimber in mine shaft station at the top of the Main Winze	$ 1,500.00
Rehabilitation and retimber in mine shaft at the collar of the Main Winze	1,100.00
Total	$ 2,600.00

Rehabilitation of South Adit Completed by Paul M. Thornton and Edward Carl Anderson, consisted of entering into south adit, Jim White Tunnel, rehabilitate and retimber the drift to collar of the raise connecting the adit to the 400 level.	$ 460.00
Rehabilitation of Shaft Completed by R. S. McClintock, consisted of rehabilitating the collar of the existing shaft and the shaft itself to a good condition of repair.	$6,924.03

Sinking Shaft

Completed by R. S. McClintock

Sinking shaft	413 ft. @ $155.00 per ft.	$64,015.00
Delays		157.30
		$64,172.30
Less Unfinished Work		50.00
Total Sinking Shaft		$64,122.30

(2) Labor and Supervision

The basic records for labor costs consisted of monthly payrolls prepared by Edythe I. Fisher from the pocket time book kept by the mine foreman in the mine, which contained the name of the employee, dates of shifts worked, hours worked or footage accomplished in lieu of hours worked, rates of pay and classification of labor.

During the audit all of the pocket time books were checked against the payrolls. Computations and distributions were checked on all of the hourly workers and those paid on a footage basis in lieu of an hourly basis. Rates were examined and charges made to the exploration project were found to be in agreement with the rates authorized in the contract.

Labor was charged to the exploration project at the following rates:

Wages per shift	1952	1953 to 1956 inclusive
Miners	$14.00	$14.34
Surface Labor	12.50	12.50
Hoistman	14.00	14.00
Mechanic	15.00	15.00

Footage Basis	1953
Drifting	$10.00 to $13.00
Timbering	3.00 to 4.00

Wages Monthly Basis	1952	1953 to 1956, Inc.
Supervision	$200.00 to $300.00	$300.00
Auditing (Clerical)	75.00 to 100.00	100.00

In some instances miners were paid at rates in excess of the rates authorized by the contract. However, the Operator adjusted his claims to the exploration project on the Forms MF-104 to conform to the rates authorized by the contract.

The Whitedelph Mine employees do not have a Union affiliation, vacation plan, retirement plan or group insurance. Employees are paid by checks drawn on the Idaho First National Bank, Shaft Account, Sandpoint, Idaho. The checks required two signatures, Compton I. White, Sr. and Compton I. White, Jr. Subsequent to Compton I. White, Sr.'s death, the checks are signed by Compton I. White, Jr. and Edythe I. Fisher.

The allowable labor costs were determined by the audit to be as follows:

Labor	$ 76,039.88
Supervision	13,736.00
Technical	122.91
Auditing (Clerical)	4,687.00
Accepted Costs	$ 94,585.79

A disallowance of $16.40 was made from labor. The Operator claimed miners' wages on his July, 1956, Form MF-104 at the rate of $1.8425 per hour which exceeded the allowable maximum of $1.7925 per hour as follows:

John H. McDonald	168 hours @ $1.8425	$309.54
Harold Rounsville	160 hours @ $1.8425	294.80
Total	328 hours @ $1.8425	$604.34
Allowable Maximum	328 hours @ $1.7925	587.94
Disallowance		$ 16.40

Technical services were performed by the firm of Preston and Reynolds and were adequately supported by invoices.

(3) Operating Materials and Supplies

The costs chargeable to this category were determined by a detailed audit and analysis of the Vendors' invoices, freight bills and cancelled checks. The following summarizes the costs determined by the audit to be allowable under the terms of the contract.

Timber		$ 8,634.50
Explosives		4,970.52
Pipe and Fittings		1,972.08
Track		1,049.21
Track - Used rail and supplies		324.06
Hoist cable		1,217.63
Power		10,904.84
Bits and steel		904.80
Fuel oil and lube.		902.60
Vent pipe		273.85
Small tools and supplies		1,812.34
Miscellaneous		841.60
		$ 33,808.03
Less Salvage Proceeds (See schedule)		
Provided by Amendment No. 6		
Rail and Splice Bars	$260.23	
Pipe and Fittings	701.89	962.12
		32,845.91
Completion of Project		
Rail and Splice Bars	280.83	
Pipe and Fittings	274.42	555.25
Net Costs		$ 32,290.66

An inventory of the remaining project supplies was made by M. R. Lickes, Mining Engineer, United States Bureau of Mines. The only usable supplies remaining on hand was found to be nine boxes or 450 pounds of 40% Gelatin powder, priced on the basis of the Operator's latest invoice amounted to $97.65. A disallowance was made of the surplus powder, $97.65.

During the pre-audit work, it was determined that a duplicate charge for explosives was made by the Operator of $152.05, on the March, 1956 Form MF-104. This charge was also made on the February, 1956, Form MF-104. A disallowance of $152.05 was made to correct this duplication.

Power charges were prorated during the months that the mill was in operation. Prior to the milling operation, the power costs for drifting alone averaged $3.00 per foot. The power costs for drifting was set at $3.00 per foot during the periods that milling and exploration operations were simultaneous. This rate was verbally agreed on by the Field Team.

(4) Operating Equipment

The acceptable costs under this category was determined by the audit to be:

Rental

This item of cost not applicable to this contract.

Purchases

The acceptable costs under this category were found to be as follows:

1 Coffing Ratchet Hoist	$ 87.55
1 I.R. Sump Pump Serial No. 29755	460.00
1 Motor Pump 2 MRV 50	1,308.99
1 Motor Pump 2 MRV 40	400.00
Accepted Costs	$ 2,256.54
Less Salvage Proceeds (See schedule)	1,127.88
Net Costs	$ 1,128.66

Depreciation

The acceptable costs under this category were found to be as follows:

2 Rock Drills - Drifters	2-3/4	Mo. @	$ 33.33	$ 91.66
1 Rock Drill - Drifter	32-3/25	Mo. @	16.66	535.12
1 Loader	34-3/25	Mo. @	50.00	1,706.00
1 Locomotive	32-3/25	Mo. @	110.00	3,533.20
1 Air Compressor	7/30	Mo. @	133.33	30.87
1 Air Compressor	3/25	Mo. @	133.33	16.00
1 Air Compressor	42	Mo. @	133.33	5,599.86
1 Dump Truck	1/2	Mo. @	41.67	20.84
1 Dump Truck	3/25	Mo. @	41.67	5.00
1 Dump Truck	12	Mo. @	41.67	500.04
2 Sump Pumps	43-3/25	Mo. @	11.67	503.22
				$12,541.81

Depreciation charges were based on the time that the equipment was actually in use. The Operator does not maintain an equipment log. However, the time used was checked by the payroll periods worked.

Depreciation for the month of June, 1956, in the amount of $321.66 was carried forward to the June, 1956, Form MF-104 as $321.56. The Operator was given credit for the additional $ .10 depreciation which was allowable under the terms of the contract.

(5) Initial Rehabilitation and Repairs

This item of cost not applicable to this contract.

(6) New Buildings, Improvements, etc.

This item of cost not applicable to this contract.

(7) Miscellaneous

The allowable costs in this category were determined by an audit of the vendors' invoices, cancelled checks, the company's payroll tax reports, and industrial insurance reports. The allowable costs are as follows:

Repairs to Equipment	$ 2,806.70
Sampling and Analysis	25.50
Payroll Taxes	3,368.68
Liability Insurance	4,486.15
Total	$ 10,687.03

Repairs to Equipment are summarized as follows:

Truck	$ 657.26
Motor 40 H.P.	454.88
Compressor	262.65
Hoist	374.66
Rockershovel	165.82
Pump	74.29
Mine Cars	53.82
Locomotive	167.16
Battery Charger Panel	90.01
Rock Drills	403.97
Miscellaneous	102.18
Accepted Costs	$ 2,806.70

Sampling and Analysis was by the audit determined to be

10 Assays $ 25.50

made by the

W. F. Stowell Co., Chemists and Assayers
Spokane, Washington

Payroll Taxes were determined by an analysis of the Operators payrolls and the various State and Federal Tax Returns. Returns examined and the rates in effect were found to be as follows:

Federal Insurance and Contributions Act
Employer's Quarterly Federal Tax Return, Identification Number 82-0177615

Rates	1952 and 1953	1.5%
	1954, 1955 and 1956	2.0%

State of Idaho Unemployment Insurance
Employer's Contribution Report No. 40-1041-00108

Rates Year of	1952	2.5%
	1953	1.7%
	1954	1.9%
	1955	2.1%
	1956	1.8%

State of Washington Unemployment Insurance
Employer's Contribution Report No. 188603-00
Rates 1952 to 1956 Inclusive 2.7%

Federal Excise Taxes on Wages (Form 940) Annual Federal Tax Return of Employees
Identification Number 82-0177615
Rates 1952 to 1956 Inclusive .3%

Payroll taxes were computed on the payrolls which made up the accepted labor costs as follows:

F.I.C.A.	$ 1,562.09
Idaho Unemployment Insurance	1,454.48
Washington Unemployment Insurance	126.54
Federal Excise Tax	225.57
Accepted Costs	$ 3,368.68

Payroll Taxes amounting to $84.72 were allowed the Operator in addition to the amount claimed on the final Form MF-104. This addition to the Operator's claim was properly allowable under the terms of the contract.

Liability Insurance was made up of industrial insurance premiums paid to the:

Liberty National Insurance Company
Coeur d'Alene, Idaho
Policy No. C 4107

whose rates

Year of 1952	5.5%
1953	5.5%
1954	5.48%
1955	5.24%
1956	5.04%

Liability Insurance premiums for the period of the entire contract were computed at the above rates, taking into consideration the employee contributions (which reduced the premiums payable by the Operator.)

The Accepted Costs were found to be $4,486.15. A disallowance of $296.97 was made to take into consideration employee contributions made.

(8) Contingencies

While the contract provides for contingencies, none were claimed under this contract.

Salvage of Supplies and Equipment

Amendment No. 6 dated May 5, 1954, provided that certain supplies remaining on hand and equipment purchased prior to Amendment No. 6 have a salvage value of $2,090.00. The Government's equity, $1,045.00, for the convenience of the Operator, will be deducted from the Operator's vouchers at the rate of $1.00 for each foot of advance under the "Additional Work" of Exhibit A. The salvage value was found to be as follows:

	Equipment	Rail and Splice Bars	Pipe and Fittings	Total
Cost	$ 2,256.54	$ 520.65	$ 1,404.28	$ 4,181.47
Salvage Value	1,127.88	260.23	701.89	2,090.00
Footage of Advance, 1045 ft. @ $2.00	1,127.88	260.23	701.89	2,090.00

Deducted from the Operator's voucher 1045 ft. @ $1.00 $ 1,045.00

Subsequent to Amendment No. 6, additional pipe and fittings and track supplies were purchased by the Operator to complete the exploration project, in which the Government has an equity, as follows:

	Pipe and Fittings	Track	Total
Cost	$ 802.38	$ 784.06	$ 1,586.~~38~~ 44
Salvage Value	280.83	274.42	555.25

By letter dated November 8, 1956, the Operator bid $555.25 for the pipe and rail purchased subsequent to Amendment No. 6. The Government accepted this offer by letter dated November 9, 1956.

Disallowance of Development Expense

This disallowance is based on a memorandum dated Feb. 23, 1954, from W. S. Anderson, Mining Engineer, U.S. Bureau of Mines, to the Field Team, in which he informed the Field Team that the Operator on his January, 1954, Form MF-104, submitted as work completed under the contract, 30 feet of drift to the southwest on the footwall of the Pearl Vein at USBM #341 plus 142 feet, which he considered to be development work rather than exploration work. The Field Team in a letter dated March 9, 1954, to Mr. Compton I. White, Jr., president of the Whitedelph Mining and Development Company, disallowed the 30 feet of drifting.

The Operator's cost records do not have a complete distribution of costs in which an exact allocation is made of the costs of the various phases of exploration. The cost of drifting provided by the original contract as amended by Amendment No. 2, was determined by the Form MF-104 costs claimed for labor and supplies without considering the opening and closing inventories of supplies. Payroll taxes and liability insurance were computed on the labor charges at the rates in effect at the time the labor was performed. The costs were found to be as follows:

Cost of Drifting, February, 1953 to April, 1954 Inclusive

Drifting authorized by the contract as amended by Amendment No. 2.

Labor	$ 40,744.10
Supervision	4,500.00
Clerical	1,500.00
Timber	1,849.22
Explosives	1,986.20
Pipe and Fittings	832.23
Track	573.94
Hoist Rope	489.30
Power	3,612.50
Other supplies	2,225.70
Depreciation on Equipment	4,653.26
Repairs to Equipment	749.92
Payroll Taxes	1,717.38
Liability Insurance	2,486.58
Total 1,398 ft. @ $48.58	$ 67,920.33
Accepted Costs 1,368 ft. @ $48.58	66,462.81
Disallowance 30 ft. @ $48.58	$ 1,457.52

The disallowances, $1,216.80 made by the certifying officer and $240.72 made by the first interim audit, totalling $1,457.52 have been accepted by the Operator on his final Form MF-104.

Cost of Drifting, June 1954 to July, 1956, Inclusive

The cost of drifting authorized by Amendment No. 6 was determined by a method similar to that used in determining the cost of drifting authorized by Amendment No. 2, since the Operator's cost records do not reflect the costs of the various phases of the exploration project. The costs claimed on the Forms MF-104 were used, without reference to opening inventories of supplies. Payroll taxes and liability insurance premiums were computed on the labor charges at the rates in effect at the time the labor was performed. The costs were found to be as follows:

Labor	$ 32,245.73
Supervision	6,036.00
Clerical	2,012.00
Timber	938.80
Explosives	3,556.08
Pipe and Fittings	802.38
Track	784.06
Hoist Rope	517.33
Power	4,639.34
Bits and Steel	454.95
Fuel Oil and Lube	305.03
Small Tools and Supplies	375.16
Miscellaneous	323.26
Depreciation	6,601.82
Repairs to Equipment	849.14
Payroll Taxes	1,686.33
Liability Insurance	2,010.57
Total 1,433.5 ft. @ $44.74	$ 64,137.98

The estimated unit cost of $46.00 per foot and the estimated total cost of the additional work of $69,000.00 are allowable maximums under the terms of Amendment No. 6. The "allowable maximums" were not exceeded.

Second Royalty Audit

The Second Royalty Audit and the Final Audit of the exploration project were simultaneous. Royalty payments on shipments of ore were found to be current.

IV CONCLUSIONS

The audit disclosed that all costs charged to this project, with the exception of disallowances aggregating $563.07, and additions to the Operator's claim aggregating $84.82 as itemized in the preceding section of this report, are reasonable and proper under the terms of the contract.

The adjustments between "Items of Costs" as shown on the July, 1956, Form MF-104, the disallowances, the additions to the Operator's claim, the accepted costs and the salvage proceeds as disclosed by this audit are summarized in Exhibit "A" (Audit Summary) attached hereto.

This contract contained certain items of cost expressly designated as allowable maximums, as follows:

Labor Rates	1952	1953-1956
Miners	$14.00 per shift	$14.34 per shift
Surface Labor	12.50 " "	12.50 " "
Hoistman	14.00 " "	14.00 " "
Mechanic	15.00 " "	15.00 " "

Footage Basis

Drifting on a bonus basis providing the total cost of drifting not to exceed $52.50 per foot.

Sinking shaft on a bonus basis providing that the total underground shaft labor costs do not exceed $75.00 per foot.

Supervision	$ 500.00 per month
Engineer	100.00 " "
Clerical	100.00 " "

Drifting - Amendment No. 6

Allowable Maximums	
Cost per foot $46.00	
Total Cost	$ 69,000.00
Completed	
1433.5 ft. @ $44.74 per ft.	64,137.98
Balance	$ 4,862.02

At the conclusion of the audit, Mr. Compton I. White, Jr. was at the mine and not available for a discussion of the audit findings. However, Edythe I. Fisher, auditor for the Operator, discussed the findings with Mr. Compton I. White, Jr. On November 16, 1956, the audit findings were discussed in detail with Mr. A. E. Weissenborn, Executive Officer of the Field Team, Region I Northwest District.

C. A. Turner, Auditor

November 16, 1956

EXHIBIT "A" **AUDIT SUMMARY**

	Total July, 1956 MF-104	Corrected Distribution	Disallowed By Audit	Accepted Costs
	$	$	$	$
1. Independent Contracts				
Rehabilitation	9,984.03			
Rehabilitation - Main Winze		2,600.00		2,600.00
Rehabilitation - South Adit		460.00		460.00
Rehabilitation - Shaft		6,924.03		6,924.03
Sinking Shaft	64,122.30	64,122.30		64,122.30
2. Labor and Supervision				
Labor	76,056.28	76,056.28	16.40	76,039.88
Supervision	13,736.00	13,736.00		13,736.00
Technical	122.91	122.91		122.91
3. Operating Materials and Supplies				
Timber	8,634.50	8,634.50		8,634.50
Explosives	5,220.22	5,220.22	97.65	
			152.05	4,970.52
Pipe	1,954.32	1,972.08		1,972.08
Track	1,371.21	1,373.27		1,373.27
Hoist Rope	4,712.45	1,217.63		1,217.63
Power	10,904.84	10,904.84		10,904.84
Miscellaneous	1,299.25	4,735.19		4,735.19
4. Operating Equipment				
Rental	----	----	----	----
Purchase	2,256.54	2,256.54		2,256.54
Depreciation	12,541.71	12,541.71	(.10)	12,541.81
5. Initial Rehabilitation and Repairs	----	----	----	----
6. New Buildings, Improvements, etc.	----	----	----	----
7. Miscellaneous				
Repairs to Equipment	2,767.64	2,806.70		2,806.70
Sampling and Analysis	25.50	25.50		25.50
Payroll Taxes	3,381.77	3,283.96	(84.72)	3,368.68
Liability Insurance	4,685.31	4,783.12	296.97	4,486.15
Auditing - Clerical	4,687.00	4,687.00		4,687.00
8. Contingencies				
None				
Deduction for Develppment	(1,457.52)	(1,457.52)		(1,457.52)
	$ 227,006.26	$ 227,006.26	$ 478.25	$ 226,528.01

Salvage Proceeds

	Amendment No. 6	Final	Total	
Rail and Splice Bars	$ 260.23	$ 274.42	$ 534.65	
Pipe and Fittings	701.89	280.83	982.72	
Equipment	1,127.88	--	1,127.88	
	$ 2,090.00	$ 555.25	$ 2,645.25	$ 2,645.25

Net Cost of Project $ 223,882.76

Flight
Klingenfeld
Betty

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DEFENSE MINERALS EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

INTERIM AUDIT CERTIFICATE

I have examined the records and transactions of the:

Whitedelph Mining and Development Co.
Clark Fork, Idaho

pertaining to Exploration Project Contract No. Idm-E189, Docket No. DMA-255X, dated October 19, 1951, including amendments Nos. 1 to 7 inclusive, covering a project for the exploration of lead, on property known as the Whitedelph Mine, located in Bonner County, State of Idaho, for the period of October 19, 1951 to June 30, 1955 inclusive, and the partial liquidation of project property.

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

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

Total cost as billed by contractor		$203,101.29
Less: Proceeds from disposition of property		1,878.00
Net Claimed Cost		$201,223.29
Exceptions (see audit report for details)		
Prior to audit	$ -	
During this audit	13.01	13.01
Total Accepted Cost		$201,210.28

The contract calls for a 50 percent participation of exploration expenses by the United States Government. Therefore, payment to the contractor by the Government in the amount of One Hundred thousand six hundred five and 14/100 Dollars,

—$100,605.14—

is valid and proper.

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

C. A. Turner

C. A. TURNER, Auditor

December 12, 1955

INTERIM AUDIT REPORT

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I. Introduction

During the month of November 1955 an interim audit (covering operations for the period of October 19, 1951 to June 30, 1955) was made of the records and transactions pertaining to Exploration Project Contract No. Idm-E189, Docket No. DMA-255X dated October 19, 1951, including amendments Nos. 1 to 7 inclusive, with the:

Whitedelph Mining and Development Co.
Clark Fork, Idaho

covering a project for the exploration of lead on property known as the Whitedelph Mine, located in Bonner County, State of Idaho.

The original accounting records under this contract are maintained by and are in the custody of the Edythe I. Fisher Bookkeeping Service, 401 Empire State Building, Spokane, Washington. Items of original entry were supplied the Edythe I. Fisher Bookkeeping Service by Compton I. White, Jr. President of Corporation from the mine office located at the mine near Clark Fork, Idaho.

M. R. Lickes, Mining Engineer, U. S. Bureau of Mines, was available for consultation as questions arose during the audit.

Prior to the DMEA Exploration Project Contract the Whitedelph Mining and Development Co. received a loan from the Reconstruction Finance Corporation. The balance on the loan at the time the audit was made is $25,000.00 plus accrued interest @ 4% per annum. This loan is secured by certain equipment which was on hand at the time the loan was made (July 1943) and equipment to be purchased with the proceeds of the loan.

II. General Information on Records

The accounting records made available for the audit consisted of a general ledger, combination cash receipts and cash disbursements journal, payrolls, vendor's invoices, bank statements and cancelled checks, Federal Employer's Quarterly Federal Tax Return, annual Federal Tax Return of Employers, State of Idaho Employer's Contribution Report, Liability Insurance policies, and various correspondence related to the Exploration Project.

The Operator's Monthly Report and Voucher Form MF-104, was prepared by the Edythe I. Fisher Bookkeeping Service under the direction of Compton I. White, Jr. from a comprehensive work sheet which was available for audit. Compton I. White, Jr. signed the MF-104 forms as president of the company.

III. Scope of Audit and Findings

The audit was limited to ascertaining the accuracy, propriety and validity of the costs shown in the "Totals to Date" column of the Form MF-104, Operator's Monthly Report and Voucher, for the month of June 1955, but including the liquidation of the Government's equity in certain project property.

The audit disclosed a considerable amount of improper distribution of charges to the "Items of Cost" shown on the Form MF-104. Therefore, the audit findings presented below are those resulting after correction of the cost distribution.

(1) Independent Contracts

Costs allowed to the Operator for work performed by Independent Contracts are as follows:

Rehabilitation of Main Winze	$2,600.00
Rehabilitation of South Adit	460.00
Rehabililation of Shaft	6,924.03
Sinking Shaft 413 ft. @ $155.26	64,122.30
Accepted Costs	$74,106.33

Contracts with the independent contractors have been approved by the Government.

Rehabilitation of main winze was completed by Ivor Anderson under two contracts as follows:

Rehabilitate and retimber in mine shaft station at the top of the main winze	$1,500.00
Rehabilitate and retimber in main shaft at the collar of the main winze	1,100.00
Total	$2,600.00

Rehabilitation of South Adit Completed by Paul M. Thornton and Edward Carl Anderson consisted of entering into the south adit, Jim White tunnel, rehabilitate and retimber the drift to collar of the raise connecting the adit to the 400 foot level.	$460.00
Rehabilitation of Shaft Completed by R. S. McClintock consisted of rehabilitating the collar of the existing shaft and the shaft itself to a good condition of repair.	6,924.03
Skinking Shaft Completed by R. S. McClintock consisted of the following:	64,122.30
Sinking Shaft 413 ft. @ $155.00 per foot	$64,015.00
Delays	157.30
	$64,172.30
Less Unfinished Work	50.00
Accepted Costs	$64,122.30

Distribution of the Independent Contract items of cost as shown on the June 1955 MF-104 is corrected as follows:

	June 1955 MF-104	Corrected Distribution
1. Drilling	$1,500.00	$ -
Bulldozing	64,130.97	-
Drifting	9,222.61	-
Rehabilitation	10,175.17	-
1. Independent Contracts	-	-
Rehabilitate Main Winze	-	2,600.00
Rehabilitate South Adit	-	460.00
Rehabilitate Shaft	-	6,924.03
Sinking Shaft	-	64,122.30
2. Labor (Footage Accomplished Basis)		
Drifting	-	7,517.61
Timbering	-	1,705.00
Station	-	1,500.00
3. Operating Materials & Supplies	-	191.14
7. Compressor Repairs	-	8.67
Total	$85,028.75	$85,028.75

Labor which had been paid on a footage accomplished basis in lieu of an hourly basis was included by the Operator in the independent contractors. This labor as well as the supply items have been transferred to the proper categories in this report.

(2) Labor and Supervision

The basic records for labor costs consisted of monthly payrolls prepared by Edythe I. Fisher from pocket time books kept by the mine foreman in the mine, which contained the name of the employee, dates of shifts worked, hours worked or footage accomplished in lieu of hours worked, rates of pay and classification of labor.

During the audit all of the pocket time books were checked against the payrolls for the period under review. Computations and distributions were checked on 50 percent of the hourly workers and all of those paid on a footage accomplished basis. Rates used were examined and found to be in agreement with the rates authorized in the contract.

Labor charged to the exploration project was paid at the following rates:

Wages Per Shift	1952	1953	1954	1955
Miners	$14.00	$14.34	$14.34	$14.34
Surface Labor	12.50	12.50	12.50	12.50
Hoistman	14.00	14.00	14.00	14.00
Mechanic	15.00	15.00	15.00	15.00

Contract Rates Per Foot	1953
Drifting	$10.00 to $13.00
Timbering	3.00 to 4.00

Wages - Monthly Basis	1952	1953	1954	1955
Supervision	$200.00 to $300.00	$300.00	$300.00	$300.00
Auditing (Clerical)	75.00 to 100.00	100.00	100.00	100.00

In some instances miners were paid in excess of the rates authorized by the contract. However, the Operator adjusted his claims on Forms MF-104 to conform to the rates authorized by the contract.

The Whitedelph Mine employees do not have a Union affiliation, vacation plan, retirement plan or group insurance. Employees are paid by checks drawn on the Idaho First National Bank, Sandpoint, Idaho, which require the signatures of both Compton I. White, Sr. and Compton I. White, Jr.

Allowable labor costs were found to be as follows:

Labor	$64,013.62
Supervision	11,336.00
Clerical (Auditing)	3,887.00
Technical Services	122.91
Accepted Costs	$79,359.53

A disallowance of $125.00 was made from Clerical. Auditing costs were claimed at the rate of $100.00 per month while Edythe I. Fisher was paid $75.00 for the five months, January 1952 to May 1952 inclusive.

Technical Services were performed by the firm of Preston and Reynolds. These charges were adequately supported by invoices.

(3) Operating Materials and Supplies

The costs chargeable to this category were determined by an analysis of the vendor's invoice and freight bills. The following summarizes the costs determined by this audit to be allowable:

Timber		$8,428.50
Explosives		3,982.67
Pipe and Fittings		1,598.75
Track		1,049.21
Hoist Cable		963.20
Power		9,231.50
Bits and Steel		794.69
Fuel Oil and Lubrication		776.85
Vent Pipe		273.85
Small Tools and Supplies		1,605.79
Miscellaneous		816.64
Accepted Costs		$29,521.65
Less Salvage Proceeds (see schedule)		
Rail and Splice Bars	$233.83	
Pipe and Fittings	630.69	864.52
Net Costs		$28,657.13

Power charges were prorated during the months that the mill was in operation. Prior to the milling operation the power costs for drifting alone averaged $3.00 per foot. The power cost for drifting was set at $3.00 per foot during the periods that milling and exploration operations were simultaneous. This rate was verbally agreed on by the Field Team.

(4) Operating Equipment

Rental

This item of cost not applicable to this contract.

Purchases

The acceptable costs under this category were found to be:

1 Coffing Ratchet Hoist	$87.55
1 Ingersoll Rand Sump Pump Serial No. 29755	460.00
1 Motor Pump 2MRV50	1,308.99
1 Ingersoll Rand 2MRV40 Serial No. 6095508	400.00
Accepted Costs	$2,256.54
Less Salvage Proceeds (see schedule)	1,013.48
Net Cost	$1,243.06

Depreciation

The allowable depreciation charges were found to be as follows:

Deprication

2 Rock Drills Drifting	2 3/4 Mo @ $33.33	$91.66
1 Rock Drill Drifting	24 3/25 Mo @ $16.66	401.84
1 Loader	26 3/25 Mo @ $50.00	1,306.00
1 Locomative	24 3/25 Mo @ $110.00	2,653.20
1 Air Compressor	7/30 Mo @ $133.33	30.87
	3/25 Mo @ $133.33	16.00
	34 Mo @ $133.33	4,533.22
1 Dump Truck	1/2 Mo @ $ 41.67	20.84
	3/25 Mo @ $ 41.67	5.00
	12 Mo @ $ 41.67	500.04
2 Sump Pumps	35 3/25 Mo @ $ 11.67	409.86
Accepted Costs		$9,968.53

Depreciation charges were made for the time the equipment was actually in use.

(5) Initial Rehabilitation and Repairs

This item of cost not applicable to this contract.

(6) New Buildings, Improvements, Etc.

This item of cost not applicable to this contract.

(7) Miscellaneous

The allowable costs in this category were determined by an audit of the invoices, the company's payroll tax reports, and industrial insurance reports for the period. The allowable costs are itemized as follows:

	Corrected Distribution	Allowed By Audit	Accepted Costs
Repairs to Equipment	$2,502.22	$ -	$2,502.22
Sampling and Analysis	25.50	-	25.50
Payroll Taxes	2,342.70	352.71	2,695.41
Liability Insurance	4,110.09	-	4,110.09
	$8,980.51	$352.71	$9,333.22

Repairs to Equipment are summarized as follows:

Repairs to Equipment

Truck	$657.26
Motor C.E. 40 H.P.	251.17
Compressor	262.65
Hoist	374.66
Rockershovel	95.34
Pump	61.14
Mine Cars	53.82
Mancha Locomotive	167.16
Battery Charger Panel	90.01
Rock Drills	386.83
Miscellaneous	102.18
Total	$2,502.22

Sampling and Analysis was found by the audit to cover the costs of 10 assays made by the

W. F. Stowell & Co. Chemists and Assayers,
Spokane, Washington

Payroll Taxes were determined by an analysis of the Operator's payrolls and the various State and Federal Tax Returns. Returns examined and the rates were found to be as follows:

Federal Insurance and Contributions Act
Employers Quarterly Federal Tax Return
Identification Number 82-0177615

Rates 1952	1.5%
1953	1.5%
1954	2.0%
1955	2.0%

State of Idaho Unemployment Insurance
Employer's Contribution Report
No. 40 1041-00108

Rates 1952	2.5%
1953	1.7%
1954	1.9%
1955	2.1%

State of Washington Unemployment Insurance
Employment Security Department
Account Number 188603-00
Rates 1952 to 1955 Inclusive 2.7%

Federal Excise Tax on Wages (Form 940)
Annual Federal Tax Return of Employers
Rates 1952 to 1955 Inclusive .3%

Payroll Taxes were computed as follows:

F.I.C.A.	$1,257.56
Idaho Unemployment Ins.	1,189.21
Washington Unemployment Ins.	104.94
Federal Excises Taxes	143.70
Accepted Costs	$2,695.41

Additional payroll taxes amounting to $352.71 were allowed by this audit.

Liability Insurance costs were made up of premiums paid to the
Liberty National Insurance Co.
Coeur d'Alene, Idaho
Policy No. C-4107

	1952	1953	1954	1955
Rates	5.5%	5.5%	5.48%	5.24%

Premiums were computed on the above rates and the allowable costs were found to be $4,110.09

The Operator's final MF-104 included the following items under (7) Miscellaneous:

Transportation	$ 44.30
Audit	4,012.00
Total	$4,056.30

Transportation was found to be freight on supplies and was transferred to (2) Operating Materials and Supplies.

Audit was found to be clerical labor by Edythe I. Fisher and was transferred to (2) Labor and Supervision.

(8) Contingencies

While the contract provides for contingencies none were claimed under this category by the Operator.

Salvage Supplies and Equipment

Amendment No. 6 dated May 5, 1954 provides that certain supplies remaining on hand and equipment purchased prior to amendment No. 6 have a salvage value of $2,090.00. The Government's equity, $1,045.00, for the convenience of the Operator, will be deducted from the Operator's vouchers at the rate of $1.00 per foot for each foot of advance under the "Additional Work" of Exhibit "A" so long as the Government determines this procedure feasible.

Property to be liquidated	Equipment	Rail and Splice Bars	Pipe and Fittings	Total
Cost	$2,256.54	$520.65	$1,404.28	$4,181.47
Salvage value	$1,127.88	$260.23	$ 701.89	$2,090.00
Footage advance 939'@ $2.00	1,013.48	233.83	630.69	1,878.00
Balance to be liquidated	$ 114.40	$ 26.40	$ 71.20	$ 212.00

Charged to the Operator 939 feet @ $100 per foot $939.00

Disallowance of Development Expense

Cost of Drifting February 1953 to April 1954 Inclusive

Drifting Authorized by Original Contract and Amendment No. 2

Labor		$40,744.10
Supervision		4,500.00
Clerical		1,500.00
Timber		1,849.22
Explosives		1,986.20
Pipe and Fittings		832.23
Track		573.94
Hoist Rope		449.30
Power		3,612.50
Other Supplies		2,225.70
Depreciation on Equipment		4,653.26
Repairs to Equipment		749.92
Payroll Taxes		1,717.38
Liability Insurance		2,436.58
Total	1,398 ft. @ $48.58	$67,920.33
Accepted	1,368 ft. @ 48.58	66,462.81
Disallowance	30 ft. @ $48.58	$ 1,457.52
Previous disallowance		1,216.80
Additional disallowance by this audit		$ 240.72

This disallowance is based on a memorandum dated February 23, 1954 from W. S. Anderson, Mining Engineer, U. S. Bureau of Mines, to the Field Team, in which he informed the Field Team, that the Operator on his January 1954 MF-104 submitted as work completed under the contract 30 feet of drift to the southwest on the footwall of the Pearl Vein at USBM #341 + 142 feet, which he considered to be development work rather than exploration, and a letter from the Field Team dated March 9, 1954, which disallowed the 30 feet of drifting.

The Operator's cost records do not have a complete distribution of costs in which an exact allocation is made of the costs of the various phases of exploration. The cost of drifting provided by the original contract amended by amendment No. 2 was determined by the MF-104 costs claimed for labor and supplies without considering the opening and closing inventories of supplies, and computing payroll taxes and liability insurance at the rates in effect at the time the labor was performed.

Cost of Drifting June 1954 to June 1955 Inclusive
Authorized by Amendment No. 6

Labor	$20,219.47
Supervision	3,636.00
Clerical	1,212.00
Timber	732.80
Explosives	2,568.23
Pipe and Fittings	429.05
Track	460.00
Hoist Rope	262.90
Power	2,966.00
Other Supplies	991.03
Depreciation on Equipment	4,028.54
Repairs to Equipment	544.66
Payroll Taxes	1,049.26
Liability Insurance	1,279.75
Total 939 feet @ $43.00 per foot	$40,379.69
Allowable Maximum 1500 feet @ $46.00 per foot	69,000.00
Balance 561 feet	$28,620.31

The cost of drifting authorized by amendment No. 6 was determined by a process similar to that used in determining the cost of drifting authorized by amendment No. 2. By using the costs claimed on Forms MF-104 and computing the payroll taxes and liability insurance the costs were determined to be $43.00 per foot which did not exceed the allowable maximum of $46.00 per foot.

IV. Conclusions

The audit disclosed that all costs charged to this project including the allowance made by the audit of $352.71, with the exception of the disallowances aggregating $365.72, as itemized in Section III of this report, are reasonable and proper under the terms of the contract.

Allowable maximums under this contract are labor rates of pay, depreciation items and rates and the additional work provided by amendment No. 6, drifting footage, rate per foot, and amount.

The adjustments between the "Items of Cost" as shown on the June 1955, Form MF-104, the additional costs allowed, the disallowances, salvage proceeds, and the accepted costs as disclosed by this audit are summarized as follows:

AUDIT SUMMARY

	Total June 1955 MF-104	Corrected Distribution	Disallowed By Audit	Total
1. Independent Contracts				
Rehabilitation Main Winze	$ 10,175.17	$ 2,600.00	$ -	$ 2,600.00
Rehabilitation South Adit	-	460.00	-	460.00
Rehabilitation Shaft	-	6,924.03	-	6,924.03
Sinking Shaft	-	64,122.30	-	64,122.30
Drilling	1,500.00	-	-	-
Bulldozing	64,130.97	-	-	-
Drifting	9,222.61	-	-	-
2. Labor and Supervision				
Labor	52,885.11	64,013.62	-	64,013.62
Supervision	11,136.00	11,336.00	-	11,336.00
Technical	122.91	122.91	-	122.91
Clerical	-	4,012.00	125.00	3,887.00
3. Operating Materials & Supplies				
Timber	8,230.58	8,428.50	-	8,428.50
Explosives	4,565.11	3,982.67	-	3,982.67
Pipe and Fittings	1,535.13	1,598.75	-	1,598.75
Track	1,033.94	1,049.21	-	1,049.21
Hoist Cable	752.20	963.20	-	963.20
Power	9,201.50	9,231.50	-	9,231.50
Miscellaneous	4,684.43	4,267.82	-	4,267.82
4. Operating Equipment				
Rental	-	-	-	-
Purchase	2,748.88	2,256.54	-	2,256.54
Depreciation	9,968.53	9,968.53	-	9,968.53
5. Initial Rehabilitation & Repairs	-	-	-	-
6. New Buildings, Improvements, Etc.	-	-	-	-
7. Miscellaneous				
Repairs to Equipment	1,890.43	2,502.22	-	2,502.22
Sampling and Analysis	25.50	25.50	-	25.50
Payroll Taxes	6,452.79	2,342.70	(352.71)	2,695.41
Liability Insurance	-	4,110.09	-	4,110.09
Transportation	44.30	-	-	-
Audit	4,012.00	-	-	-
8. Contingencies	-	-	-	-
	$204,318.09	$204,318.09	$(227.71)	$204,545.80
Disallowance for Development	1,216.80	1,216.80	240.72	1,457.52
	$203,101.29	$203,101.29	$ 13.01	$203,088.28
Salvage Proceeds				
Pipe and Track $864.52				
Equipment 1,013.48	1,878.00	1,878.00	-	1,878.00
	$201,223.29	$201,223.29	$ 13.01	$201,210.28

At the conclusion of the audit the findings were discussed with Edythe I. Fisher, auditor for the Operator and A. E. Weissenborn, Executive Officer, DMEA Field Team, Region I, Northwest District.

December 12, 1955

C. A. TURNER, Auditor

Docket Copy

DISPOSAL OF GOVERNMENT'S INTEREST IN PROPERTY

(FORM A)

1/ To: Whitedelf Mining & Development Co.

401 Empire State Building

Spokane 1, Washington

The United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, for a valuable consideration hereby sells, assigns, transfers and sets over to you all of its right, title and interest in all property acquired under Exploration Project Contract Idm-E 189, Docket No. DMEA-255, dated October 19, 1951. (~~which is listed below~~ 2/

Dated November 9 1956 THE UNITED STATES OF AMERICA

By A. E. Weissenborn
A. E. Weissenborn
Executive Officer, DMEA

Title
Field Team, Region I
Northwest District

1/ Insert name of purchaser.

2/ If the Government's interest in all property is being transferred at one time, strike the words "which is listed below." If the Government's interest in less than all property is being transferred, list the property being transferred, in the space provided, or if there is insufficient space provided, write in the space on the form the words "See Exhibit 1, attached hereto and made a part hereof," and attach list entitled "Exhibit 1" to form.

3/53

Docket copy

Patin
Appl. Con. Off.
J. ALD
Approved
Chandler
Selfridge

TERMINATION AGREEMENT

It is agreed this 12th day of October, 1956, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government," and Whitedelf Mining and Development Company, hereinafter called the "Operator," parties to that certain Exploration Project Contract Idm-8189 (Docket No. DMEA-255X), dated October 19, 1951, as amended, hereinafter called the "Contract," that:

1. Effective July 31, 1956, the Contract and all obligations of the parties thereunder, except as otherwise herein expressly provided, shall be and are hereby terminated.

2. The Government shall contribute to allowable costs incurred prior to said effective date; and shall contribute to allowable costs incurred or to be incurred beginning with said effective date in performing winding-up and settlement actions provided for in the Contract, including (a) the preservation and disposal of property in which the Government has an interest, and (b) the making and rendering of reports and accounts.

3. The Operator shall promptly perform all winding-up and settlement actions provided for in the Contract, including (a) the disposal of any facilities, buildings, fixtures, equipment, or other items in which the Government has an interest; and (b) the rendering of the final report and final account.

4. All rights of the Government provided for in the Contract with respect to a certification of discovery or development and a percentage royalty and lien for its payment are preserved.

5. The Operator hereby releases and agrees to save the Government harmless from all claims or demands under or arising out of said Contract, except as otherwise provided in this termination agreement.

IN WITNESS WHEREOF, these parties have executed this agreement as of the day and year first above written.

THE UNITED STATES OF AMERICA

By C D Mitchenson
Administrator, Defense Minerals
Exploration Administration

WHITEDELF MINING AND
DEVELOPMENT COMPANY

By Compton Lewhile Jr

Title Pres

Docket copy

RECEIVED
JAN 12 1956

AMENDMENT NO. 8
To
EXPLORATION PROJECT CONTRACT Idm-E189 (DOCKET NO. DMA-255X)
Between
UNITED STATES OF AMERICA and WHITEDELF MINING AND DEVELOPMENT COMPANY

It is agreed that Contract Idm-E189 (Docket No. DMA-255X), as amended, is further amended as follows:

1. (a) The Operator may suspend work under the contract from July 1, 1955 to January 1, 1956.

(b) No costs incurred by the Operator during the period of suspension shall be allowable for contribution by the Government; and the Government shall not contribute to any costs of rehabilitation or repair which, in its opinion, would not have occurred if there had been no suspension of the work.

(c) The Operator, at its own cost and expense, without contribution by the Government, during the period of suspension shall preserve and protect the project work and any property in which the Government has an interest.

2. The time fixed in Article 3 of the Contract, as amended, for completion of the work is further extended to September 1, 1956.

3. The maximum period for royalty payments and lien for the payment thereof is increased from 14 to 15 years.

This amendment shall not be construed to increase the estimated total cost of the project, the aggregate total amount which the Government may be required to contribute, or the cost of any item of work.

Executed in sextuplicate this 4th day of November, 1955.

THE UNITED STATES OF AMERICA

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

WHITEDELF MINING AND DEVELOPMENT COMPANY

By [illegible]

Title President

Indirect Dunyel 12/31/55
"Appr. Sol. (M)"
J. A. Grimwood
Chapman
Selfridge

Docket copy

RECEIVED

JUN 16 1955

EXPLORATION PROJECT CONTRACT
WHITEDELF MINING AND DEVELOPMENT COMPANY
DOCKET NO. DMA-255X

AMENDMENT NO. 7

It is agreed this 26th day of May, 1955, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, and Whitedelf Mining and Development Company, that Contract Idm-E189 (Docket No. DMA-255X), dated October 19, 1951, as amended, is further amended effective October 19, 1951, as follows:

1. In Article 3 of the contract form, the period for completion is further extended to "March 1, 1956."

2. Annex I attached to Amendment No. 5 is cancelled and Annex III, attached hereto and made a part hereof, is substituted for Article 15 of the Contract form.

This amendment shall not be construed to increase the estimated total cost of the project nor the aggregate total amount which the Government may be required to contribute.

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By C. O. Mitteuser
Administrator, Defense Minerals
Exploration Administration

Rubin Hoffland
"Appd. Sol. Off."

WHITEDELF MINING AND
DEVELOPMENT COMPANY

By Compton Dewhirst Jr
President & Director

Talbot
Selfridge

EXPLORATION PROJECT CONTRACT
WHITEDELF MINING AND DEVELOPMENT COMPANY
DOCKET NO. DMA-255X

RECEIVED
JUN 16 1955

ANNEX III

The following provisions are in lieu of Article 15:

Repayment by Operator.--a. Certification.--If the Government considers that a discovery or development from which production may be made has resulted from the work, the Government, at any time not later than six months after the Operator has rendered the final report and final account, may so certify in writing to the Operator. Such certification shall describe broadly or indicate the nature of the discovery or development.

b. Royalty on production.--The Operator, as principal, if the Operator is the producer, or as surety, if the Operator is not the producer, shall pay to the Government a royalty on all minerals mined or produced from the land,* as follows: (1) regardless of any certification of discovery or development, from the date of the contract until the lapse of the time within which the Government may make such certification, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first; or (2) if the Government makes a certification of discovery or development, for a period of ten years* from the date of the contract, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first.

c. Basis for computation.--The Government's royalty shall be a percentage of the gross proceeds (including any bonuses, premiums, allowances, or other benefits) from the production sold, in the form sold (ore, concentrates, metal, or equivalent), at the point of delivery (the f.o.b. point); except, that charges of the buyer arising in the regular course of business, and shown as deductions on the buyer's settlement sheets, on account of the cost of treatment processes performed by the buyer, sampling and assaying to determine the value of the production sold, and freight paid by the buyer to a carrier (not the Operator), shall be allowed as deductions in arriving at the "gross proceeds" as that term is used herein. Any costs of treatment processes, sampling or assaying, or transportation, performed or paid by the

***The word "land" refers to the land described in Article 2 of the contract form.**
***The period "fourteen years" is substituted for the period "ten years."**

Operator or by anyone other than the buyer, are not deductible in arriving at the "gross proceeds" as that term is here used. The term "treatment processes," as here used, means those processes (such as milling, concentrating, smelting, refining, or equivalent) applied to the raw ore or other production after it is extracted from the ground, to put it into a commercially marketable form; excluding fabricating or manufacturing.

d. Unsold production.--If any production (ore, concentrates, metal, or equivalent), after the lapse of six months from the date the ore was extracted from the ground, remains neither sold nor used by the Operator in integrated manufacturing or fabricating operations (for instance, if it is stockpiled), the Government, at its option, as long as it so remains, may require the computation and payment of its royalty on the value of such production in the form (ore, concentrates, metal, or equivalent) it is in when the Government elects to require computation and payment. If any production is used by the Operator in integrated manufacturing or fabricating operations before the Government makes its election, the Government's royalty on such production shall be computed on the value thereof in the form in which and at the time when it is so used. "Value" as here used means what is or would be gross income from mining operations for percentage depletion purposes in Federal income tax determination, or the market value, whichever is greater.

e. Percentages of royalty.--The percentages of the Government's royalty shall be as follows:

> One and one-half ($1\frac{1}{2}$) percent of amounts ("gross proceeds" or "value") not in excess of eight dollars ($8.00) per ton of production in the form in which sold, held, or used, plus one-half ($\frac{1}{2}$) percent for each additional full fifty cents ($0.50) by which such amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) percent of such amounts.
>
> (For instance: the royalty on an amount of five dollars ($5.00) per ton, would be one and one-half ($1\frac{1}{2}$) percent; on an amount of ten dollars ($10.00) per ton, three and one-half ($3\frac{1}{2}$) percent.)

f. Lien for payment.--To secure the payment of its percentage royalty, there is hereby granted to the Government a lien upon the land or the Operator's interest in the land and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

g. Notice to purchasers.--The Operator shall give notice of the Government's claim for royalty to any purchaser of the production, and shall authorize and direct such purchaser to pay the royalty directly to the Government and to furnish the Government with copies of the settlement sheets. If the records of any production and sales or other disposition of production, whether the production is by the Operator or by others, are not made available to the Government, the amount of the royalty may be estimated by the Administrator, Defense Minerals Exploration Administration, or his successor, and his estimate thereof shall be final and binding upon the Operator.

h. No obligation to produce.--Nothing in this contract is to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any mining or production operations.

i. Government not obligated to buy.--Nothing in this contract shall be construed as imposing any obligation on the Government to purchase any minerals mined or produced from the land.

DOCKET

MF-203
Revised March 24, 1955

For Government's Use Only
EXPLORATION PROJECT CONTRACT
Operator Whitedelf Mng. & Dev. Co.
Docket No. ~~DMEAx~~ DMA-255X (lead)
Contract No. Idm-E 189
Contract Date October 19, 1951

CONSENT TO LIEN

RECEIVED
JUN 16 1955

To the United States of America:

Referring to that certain land in the County of BONNER, State of IDAHO, described as follows:1/

NE¼ sec. 34, T. 56 N., R. 2 W., Boise Meridian, Idaho

which is the subject of ~~xxxxxxxxx~~ an exploration project contract, hereinafter called the "contract," with the United States of America, hereinafter called the "Government;" in consideration of the contract and as an inducement to the Government to enter into it, the undersigned hereby--

1. Undertakes and agrees that property in which the Government may acquire an interest or equity under the contract may be dismantled, severed from the land, and removed, as may be provided in the contract; and the Government's interest and equity in such property shall be prior and superior to any adverse right or claim of the undersigned;

2. Grants to the Government a lien upon all of the undersigned's right, title, and interest in the land and upon any production of minerals therefrom to secure the payment to the Government of a percentage royalty on production as may be provided for by the contract;2/ and represents and undertakes that there are no claims, liens, or encumbrances upon the undersigned's right, title, or interest in the land prior to that hereby granted to the Government other than the following:3/

NONE, other than stated in original contract

3. Undertakes and agrees neither to commit any act nor assert any claim in conflict with the provisions of this Consent to Lien; and to give advance notice of the Government's rights under this Consent to Lien to any subsequent transferee, mortgagee, encumbrancer, or lessee of any of the undersigned's right, title, or interest in the land; and

1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

2/ Mining or production from the land is not required, and in the absence of production there is no obligation to repay the Government.

3/ Write "none" if that is the case. Do not leave lines blank.

4. Consents to all amendments and assignments of the contract without notice thereof, and agrees that this Consent to Lien shall extend and apply thereto.

5. Added provision: _____

Dated this 10th day of June, 1955.

Compton I. White Jr. [Seal]

Compton I. White [Seal]

_____ [Seal]

I, Compton I. White, Jr. certify that I am the President ~~(Secretary, etc.)~~ of the corporation named herein; that Compton I. White, Sr. who signed this agreement was then Secretary-Treasurer ~~(President or Vice-President~~, etc.) of said corporation; that said agreement was duly signed for and in behalf of said corporation by authority of its governing body, and was within the scope of its corporate powers.

Compton I. White Jr.
[Corporate Seal]

Docket Copy

EXPLORATION PROJECT CONTRACT
WHITEHELF MINING AND DEVELOPMENT COMPANY
DOCKET NO. DMA-255X

AMENDMENT NO. 6

It is agreed this 5th day of May, 1954, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, and Whitehelf Mining and Development Company, that Exploration Project Contract IAm-X189 (Docket No. DMA-255X), dated October 19, 1951, as amended, is further amended, effective October 19, 1951, as follows:

1. In Exhibit "A":

a. Under the heading "Exploration Project," add the following item:

Additional Work

In order to explore more extensively on the 800 level, not to exceed 1,500 feet of additional drifting shall be performed at locations, in directions, and to the extent approved in advance by the Government.

b. Under the heading "Estimated Cost of Project," add the following item:

Estimated Cost of Additional Work

1,500 feet of drifting @ $46.00/ft.	$69,000.00

The estimated unit cost and the estimated total cost of the additional work are "allowable maximums." Any excesses over said allowable maximums shall not be allowable costs under the contract. To the extent that excesses over said allowable maximums may be necessary for the performance of the additional work, the Operator shall incur such excesses for his own account without contribution by the Government.

If the additional work is carried on in conjunction with any other operations, or if labor, supervision, services, materials, supplies, equipment, facilities, or other requirements for carrying on the additional work are also used in connection with other operations, the costs shall be segregated and accounted for on a basis and by methods and accounts that are satisfactory to and approved by the Government.

c. In Amendment No. 2, Exhibit "F," paragraph numbered 2, change the estimated total cost of the project from "$163,950.00" to "$232,950.00" and the aggregate total of sums to be paid by the Government from "$81,975.00" to "$116,475.00."

2. In Article 3 of the contract form, delete the completion date "not later than April 19, 1954," provided by Amendment No. 5, and substitute "to bring the project to completion not later than May 1, 1955."

3. In Annex I attached to Amendment No. 5, delete the period "eleven years" and substitute "twelve years."

4. Annex II attached hereto is made a part of this contract.

5. As a part of the consideration for this amendment, a new Owner's Consent to Lien is attached to this Amendment No. 6, in lieu of the Landlord's Subordination Agreement dated October 10, 1951, attached to the contract.

6. The Government's equity in the operating equipment purchased under the contract prior to this Amendment No. 6 is agreed upon as being of the value of $ 1,045.00, and this sum may be deducted by the Government from any sums which may hereafter become due from the Government to the Operator. However, for the convenience of the Operator, the Government will make deductions from vouchers at the rate of $ 1.00 per foot for each foot of advance under

"Additional Work" of Exhibit "A" so long as the Government determines this procedure to be feasible.

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By C O Mittendorf
Administrator, Defense
Minerals Exploration
Administration

Robin
Hoffman
Chamberlin

WHITEHELP MINING AND
DEVELOPMENT COMPANY

By Compton J. White Jr

President

EXPLORATION PROJECT CONTRACT
WHITEDELF MINING AND DEVELOPMENT COMPANY
DOCKET NO. DMA-255X

ANNEX II

Materials and Supplies. For the purpose of determining the Government's interest in materials or supplies remaining upon any termination of the work, they shall be considered in groups or categories (such as pipe, or explosives, or rails, or drill steel), and if the original cost of the remaining unexpended portion of any such group or category exceeded $50, the Government shall have an interest therein as provided in Article 11 of the contract form.

Equities in Equipment. Unless expressly permitted by provisions in Exhibit "A", the operator shall not procure equipment or any other item under a rental-purchase agreement, an installment-purchase agreement, any agreement which creates or builds up an equity or interest in the thing procured which can be converted to legal title only by further payment or some other consideration, or any agreement other than for straight rental or cash purchase and delivery.

Preservation of Property. Until the final disposal of any equipment or other property in which the Government has an interest or equity, the operator shall preserve and protect same for the mutual best interests of the parties, any reasonable and necessary cost thereof to be treated as an allowable cost of the exploration work to which the Government will contribute.

MF-203
(Revised July 1, 1953)

OWNER'S CONSENT TO LIEN

WHEREAS, the undersigned, as owner, co-owner, lessor, or seller has an interest in certain property in the State of Idaho, County of Boise, described as follows:1/

NE¼ sec. 34, T. 5N R., B. & M., Boise Meridian, Idaho

which is the subject of a proposed exploration project contract, hereinafter called the "contract", between the United States of America, hereinafter called the "Government", and

2/ Philadelph Mining and Development Co., a Corporation

hereinafter called the "Operator"; and

WHEREAS, under the provisions of said contract the Government is entitled to a percentage royalty on production (as set forth on the reverse side hereof) and to other rights and equities which do or may conflict with or be adverse to the rights of the undersigned:

NOW THEREFORE, the undersigned, in consideration of said contract and as an inducement to the Government to enter into same, undertakes and agrees as follows:

1. The Government's equity in and right to dismantle, sever, take possession of, and remove and dispose of facilities, buildings, fixtures, equipment, or other items as provided in the contract, or any amendment thereof, shall prevail over and be prior and superior to any conflicting or adverse rights of the undersigned, and the Government is authorized to enter upon the land for such purposes.

2. To secure the payment to the Government of the percentage royalty on production3/ provided for under the terms of said exploration project contract, or any amendment thereof, there is hereby granted to the Government a lien upon the land above referred to and upon any production of minerals therefrom, until said royalty is fully paid or ten years have elapsed from the date of the contract, whichever occurs first.

3. The undersigned shall commit no act nor assert any claim that may contravene or conflict with the lien, claim, or rights of the Government under the provisions of said contract. This agreement shall be binding upon the heirs, executors, administrators, successors, and assigns of the undersigned.

4. Changes and added provisions _____

Dated this 11th day of May, 1956.

Campbell L. Sutton [Seal]

_____ [Seal]

_____ [Seal]

1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

2/ Insert the name of the Operator as it will appear in the exploration project contract.

3/ Mining or production from the land is not required, and in the absence of production there is no obligation to repay the Government.

Repayment by Operator.--a. Certification.--If at any time the Government considers that a discovery or development from which production may be made has resulted from the exploration work, the Government, at any time not later than six months after the Operator has rendered the final report and final account, may so certify in writing to the Operator. Such certification shall describe broadly or indicate the nature of the discovery or development.

b. Percentage royalty.--The Operator, or his successor in interest, shall pay to the Government a royalty on all minerals mined or produced from the land described in Article 2,--(1) regardless of any certification of discovery or development, from the date of the contract until the lapse of the time within which the Government may make such certification of discovery or development, or until the total net amount contributed by the Government, without interest, is fully repaid, whichever occurs first, unless the Government waives its right to a royalty; or (2) if the Government makes a certification of discovery or development, for a period of ten years (or other period fixed by the contract) from the date of the contract, or until the total net amount contributed by the Government, without interest, is fully repaid, whichever occurs first. Said royalty shall be a percentage of the net smelter returns, the net concentrator returns, or other net amounts realized from the sale or other disposition of any such production (including any bonuses), in whatever form disposed of, including ore, concentrates, or metal, as follows:

(a) One and one-half (1½) per cent of any such net amounts not in excess of eight dollars ($8.00) per ton.

(b) One and one-half (1½) per cent of any such net amounts, plus one-half (½) per cent of such net amounts for each additional full fifty cents ($0.50) by which such net amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) per cent of such net amounts.

(For instance: the percentage royalty on a net amount of five dollars ($5.00) per ton, would be one and one-half (1½) per cent; on a net amount of ten dollars ($10.00) per ton, three and one-half (3½) per cent.)

c. Definitions.--As here used, "net smelter returns", "net concentrator returns", and "other net amounts realized from the sale or other disposition", mean gross revenue from sales; or if not sold, the market value of the material after it is mined in the form in which and the place where it is held. In the case of integrated operations in which the material is not disposed of as such, these terms mean what is or would be gross income from mining operations for percentage depletion purposes in income tax determination.

d. Lien for Payment.--To secure the payment of its percentage royalty, the Government shall have and is hereby granted a lien upon the land described in Article 2 and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

e. Notice to Purchasers.--The Operator shall notify any purchaser of the production of the Government's royalty interest, and shall authorize and direct the purchaser to pay the royalty directly to the Government and to furnish the Government with copies of the settlement sheets; but failure or refusal by the purchaser to comply shall not relieve the Operator of liability to pay any royalty falling due.

f. No Obligation to Produce.--This article is not to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any mining or production operations.

Docket Copy

EXPLORATION PROJECT CONTRACT
WHITEDELF MINING AND DEVELOPMENT COMPANY
DOCKET NO. DMA-255X

AMENDMENT NO. 5

It is agreed this 23d day of November, 1953, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, and Whitedelf Mining and Development Company, each acting in consideration of the agreement of the other to the terms hereinafter set forth, that Exploration Project Contract Idm-E189, Docket No. DMA-255X, dated October 19, 1951, as amended, between the parties hereto, be further modified and amended as follows:

1. In Article 3 of the contract form, as amended, the words "within a period of 24 months from the date of this contract," are deleted and the words "not later than April 19, 1954" are substituted.

2. Annex I, attached hereto, is substituted for Article 15 of the contract form.

This amendment shall not be construed to increase the estimated total cost of the project nor the aggregate total amount which the Government may be required to contribute.

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By C O Mittendorf
Acting Administrator, Defense Minerals Exploration Administration

WHITEDELF MINING AND DEVELOPMENT COMPANY

Chamber

By Compton J Whitely

Department of the Interior
Bureau of Mines Administration
RECEIVED
DEC 10 1953

ANNEX I

The following provisions are in lieu of Article 15 :

Repayment by Operator.--a. Certification.--If at any time the Government considers that a discovery or development from which production may be made has resulted from the exploration work, the Government, at any time not later than six months after the Operator has rendered the final report and final account, may so certify in writing to the Operator. Such certification shall describe broadly or indicate the nature of the discovery or development.

b. Percentage royalty.--The Operator, or his successor in interest, shall pay to the Government a royalty on all minerals mined or produced from the land described in Article 2,--(1) regardless of any certification of discovery or development, from the date of the contract until the lapse of the time within which the Government may make such certification of discovery or development, or until the total net amount contributed by the Government, without interest, is fully repaid, whichever occurs first, unless the Government waives its right to a royalty; or (2) if the Government makes a certification of discovery or development, for a period of ten years (or other period fixed by this contract) from the date of the contract, or until the total net amount contributed by the Government, without interest, is fully repaid, whichever occurs first. Said royalty shall be a percentage of the net smelter returns, the net concentrator returns, or other net amounts realized from the sale or other disposition of any such production (including any bonuses), in whatever form disposed of, including ore, concentrates, or metal, as follows:

(a) One and one-half ($1\frac{1}{2}$) per cent of any such net amounts not in excess of eight dollars ($8.00) per ton.

(b) One and one-half ($1\frac{1}{2}$) per cent of any such net amounts, plus one-half ($\frac{1}{2}$) per cent of such net amounts for each additional full fifty cents ($0.50) by which such net amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) per cent of such net amounts.

(For instance: the percentage royalty on a net amount of five dollars ($5.00) per ton, would be one and one-half ($1\frac{1}{2}$) per cent; on a net amount of ten dollars ($10.00) per ton, three and one-half ($3\frac{1}{2}$) per cent.)

c. Definitions.--As here used, "net smelter returns", "net concentrator returns", and "other net amounts realized from the sale or other disposition", mean gross revenue from sales; or if not sold, the market value of the material after it is mined in the form in which and the place where it is held. In the case of integrated operations in which the material is not disposed of as such, these terms mean what is or would be gross income from mining operations for percentage depletion purposes in income tax determination.

d. Lien for Payment.--To secure the payment of its percentage royalty, the Government shall have and is hereby granted a lien upon the land described in Article 2 and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

e. Notice to Purchasers.--The Operator shall notify any purchaser of the production of the Government's royalty interest, and shall authorize and direct the purchaser to pay the royalty directly to the Government and to furnish the Government with copies of the settlement sheets; but failure or refusal by the purchaser to comply shall not relieve the Operator of liability to pay any royalty falling due.

f. No Obligation to Produce.--This article is not to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any mining or production operations.

49450

"The period "eleven years" is substituted for the period "ten years".

AMENDMENT NO. 4 DOCKET COPY

Docket No. 2552 (Lead) Carlin

It is agreed this 29th day of April 1953, between the United States of America, acting through the Department of the Interior, Defense Minerals Administration, and ~~Whitedolph Mining and Development Co., a corporation, Clark Fork, Idaho.~~

each acting in consideration of the agreement of the other to the terms hereinafter set forth, that the Exploration Project Contract Idm-E 139 of October 19 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 January 1 1953.

This amendment is made by authority granted the Executive Officer, DMEA Field Team, Region II, in Order No. 2684 by the Acting Secretary of the Interior.

This amendment shall not be construed to increase the estimated total cost of the project, the amount of the Government's contribution, or any item of allowable cost which is expressly designated "Allowable Maximum."

Executed in sextuplicate the day and year first above written.

WHITEDOLPH MINING & DEVELOPMENT CO.
(Operator)

By Compton L. White Jr.

THE UNITED STATES OF AMERICA

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

Docket No. DMEA 255X (Lead)
Whitedelph Mining & Development Co.
Exploration Project Contract Idm-M189

AMENDMENT NO. 4

Exhibit "F"

Changes and Modifications

1. In Exhibit "A" of the contract, page 3, under "Labor and Supervision", change the rate shown for miners from $14.00/8 hr. shift to $14.34/8 hr. shift and add the following paragraph:

"Labor for the drifting may be employed on a bonus or unit contract basis providing the total cost of drifting does not exceed $52.50 per foot."

Justification for Amendment No. 4

This amendment is necessary to provide for using "contract labor" for the drifting specified in the contract. This is usual practice in the district and it is difficult to obtain good miners for this work on a days pay basis. The amendment is considered to be for the benefit of the Government as paying labor on a unit contract or bonus basis will make for more rapid and efficient conduct of the work.

DOCKET COPY

2/4/53
Hoffhund

AMENDMENT NO. 3

Docket No. DMEA 255X (Lead)

It is agreed this 15th day of December 195 2, between the United States of America, acting through the Department of the Interior, Defense Minerals Administration, and ~~Whitecliff~~ Mining and Development Co., Clark Fork, Idaho

each acting in consideration of the agreement of the other to the terms hereinafter set forth, that the Exploration Project Contract Idm-E 189 of October 19 195 1 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 October 19 195 1.

This amendment is made by authority granted the Executive Officer, DMEA Field Team, Region II, in Order No. 2684 by the Acting Secretary of the Interior.

This amendment shall not be construed to increase the estimated total cost of the project, the amount of the Government's contribution, or any item of allowable cost which is expressly designated "Allowable Maximum."

Executed in sextuplicate the day and year first above written.

WHITECLIFF MINING & DEVELOPMENT CO.
(Operator)

By Compton J. White Jr.

THE UNITED STATES OF AMERICA

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 19 1953

WHITEDELF MINING AND DEVELOPMENT CO.
Bonner County, Idaho
Exploration Project Contract No. Idm-E189
Docket No. DMEA 255X (Pb)

Amendment No. 3

Exhibit "F"

Exhibit "A" of the contract, as amended by Amendment No. 2 dated August 20, 1952 is further amended as follows:

1. Change Item 4 of Estimated Cost of Project to read as follows:

"4. Equipment to be purchased - $4,247.55."

2. Change Item 6 of Estimated Cost of Project to read as follows:

"6. Contingencies - for unforeseen expenditures with reference to all above items - $9,752.45."

3. Under Operating Equipment - To be purchased - add the following:

1 - I-R Electric motor driven pump (used) to be used as standby - $ 850.00

WHITEDELF MINING AND DEVELOPMENT CO.
Bonner County, Idaho
Exploration Project Contract No. Idm-F189
Docket No. DMEA 255X (Pb)

Justification for Amendment No. 3

Amendment No. 3 to contract No. Idm-F189 dated October 19, 1951, between the United States of America and the Whitedelf Mining and Development Company is approved to allow purchase of a used electric water pump for the estimated cost of $850.00.

Some trouble has been experienced with the present pump and a standby pump is considered a justified safety precaution.

There is adequate money in the contract for the purchase either in Equipment to be purchased or Contingency items.

DOCKET COPY

WHITEDELPH MINING AND DEVELOPMENT COMPANY
Docket No. DMA-255 - Lead
EXPLORATION PROJECT CONTRACT - Idm-E189

AMENDMENT NO. 2

EXHIBIT "F"

Changes and Modifications

1. In paragraph 3, Exploration Project Contract (Form MF-200), dated October 19, 1951, change the time allowed to bring the project to completion from 12 months to 24 months.

2. In paragraph 13, Payment to the Operator, change the estimated total cost of the project from $120,250.00 to $163,950.00 and the aggregate total of sums to be paid by the Government from $60,125.00 to $81,975.00.

3. In Exhibit "A" of the contract under Estimated Cost of Project, delete items 1, 2, 3, 4, and 5, and substitute the following:

1.	Deepening existing winze 400 feet at $180 per foot	$72,000.00
2.	Install skip loading pocket on 800 level	2,000.00
3.	Drifting, 1,100 feet at $52.50 per foot	57,750.00
4.	Equipment to be purchased	3,997.55
5.	Rehabilitation and repairs to existing winze	17,600.00
6.	Contingencies - for unforeseen expenditures with reference to all the above items	10,602.45

4. In Exhibit "A" of the contract under Operating Equipment - To be Purchased, delete everything thereunder and substitute the following:

1 Deep well type pump for lift of 800 ft. - 200 gpm	$1,800.00

SLS 9/29/52

1 Blower and pipeline for ventilation	$ 1,100.00
1 Hoisting rope 1000 ft. 7/8 in. diameter	550.00
* 1 Sump Pump I. R. Mdl. 35	460.00
* 1 Coffing Rachet hoist	87.55

The effective date of this amendment shall be October 19, 1951, the date of the contract.

Dated August 20, 1952 THE UNITED STATES OF AMERICA

By C D Mitteudorf
Acting Administrator
Defense Minerals Exploration Administration

WHITEDELPH MINING AND DEVELOPMENT COMPANY

By Compton L. White Jr
President

Chambers
Hoffman

* Amendment No. 1

Docket copy

WHITE DELPH MINING AND DEVELOPMENT COMPANY
Docket No. DMA-755 (Lead)
Exploration Project Contract No. Idm-F189

Justification of Amendment No. 2

The following is a comparison of the costs of this exploration project as estimated in the contract and in the amendment.

	Estimated Costs	
	Contract	Amendment
1. Deepening existing winze 400 ft.		
at $165.00 per foot	$ 66,000.00	
at $180.00 per foot		$ 72,000.00
2. Installing skip loading pocket on 800 Level	2,000.00	2,000.00
3. Drifting 1,100 feet		
at $32.50 per foot	35,750.00	
at $52.50 per foot		57,750.00
4. Equipment to be Purchased	4,500.00	3,997.55
5. Rehabilitation and repairs to existing winze	12,000.00	17,600.00
6. Contingencies	000.00	10,602.45
Total	$120,250.00	$163,950.00

It has been necessary to revise the estimated cost of this project because of the increase in the cost of labor and supplies since the contract was signed and because actual operating costs are higher than originally estimated.

1. The subcontract for sinking the winze with R. S. McClintock is for $155.00 per foot, but in addition to this are the following supplies and services which must be furnished by the Operator:

	Cost per foot
Depreciation on air compressor	$ 1.10
Timber	8.00
Supervision	4.00
Surface worker	5.00
Power	3.00
Repairs to ca[illegible] equipment	2.00
Hoist signal [illegible]es	2.00
Total ext[illegible]	$25.10

Total cost equals $155.00 plus $25.10 = $180.10.

The cost of $180.00 per foot of shaft sinking is in line with costs being obtained on other projects and appears justified.

3. The original estimate of $32.50 per foot of drifting has been reestimated by the Field Team engineers, who have recommended an estimated cost of $52.50 per foot on the following basis:

	Cost per foot
Labor	$26.62
Supplies	13.87
Equipment depreciation	3.27
Power	3.75
Maintenance and Repairs	2.65
Supervision	2.50
Total cost	$52.66

This cost of $52.66 appears relatively high, but the necessary expense of hoisting and waste disposal are included as part of the estimated cost and alone account for approximately $17.00 per foot of drifting.

4. The difference in the estimated cost of equipment is the result of the purchase of different types of equipment than estimated.

5. To date approximately $12,000.00 has been expended on the rehabilitation of the winze, and the Field engineers estimated that to complete that part of the project would require an additional $5,600.00, with which we concur.

6. No contingent fund was provided for in the contract, but we concur with the recommendation of the Field engineers in providing such a fund, and therefore have allowed the sum of $10,602.45 for this purpose. The Field engineers recommended that $10,800.00 for contingencies be allowed for sinking the winze only, but we have allowed approximately this amount for the whole project.

We recommend that Amendment No. 2 be approved.

H. F. Keller

H. F. Keller, Acting Chief
Base Metals Division

AMENDMENT NO. 1

It is agreed this 15th day of April 1952, between the United States of America, acting through the Department of the Interior, Defense Minerals Administration and Whitedelf Mining and Development Co., Clarks Fork, Idaho

each acting in consideration of the agreement of the other to the terms hereinafter set forth, that the Exploration Project Contract Idm-E189 of October 19 1951 between the parties hereto be modified and amended as described in Exhibit "F", attached hereto, which, with any maps or drawings attached therto, is made a part of this aggrement. The effective date of this amendment shall be January 1 1952.

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

This amendment shall not be constued 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.

WHITEDELF MINING & DEVELOPMENT CO.
(Operator)

By Compton D. White Jr.

The United States of America

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

RECEIVED
APR 16 1952
U. S. G. S.
SPOKANE, WASH.

WHITEDELF MINING & DEVELOPMENT CO. - Docket No. 255
Exploration Project Contract Idm-E189

Amendment No. 1

EXHIBIT "F"

Changes and modifications

In Exhibit "A" under:

Operating Equipment

To be purchased:

Add:

1 sump pump, I-R, Mdl. 35	$460.00
1 Coffing Ratchet hoist	87.55

Delete:

1 Sinking pump	350.00

Under Labor and Classification

Add:	Maximum salary per month
Auditing	$100.00

RECEIVED
APR 16 1952
U. S. G. S.
SPOKANE, WASH.

Docket Copy
Lead

APPROVAL

Contract dated March 20 19 52, between Whitedelf Mining and Development Co., Clarks Fork, Idaho (DMA Docket 255X)

and Ivor Anderson, Clarks Fork, Idaho

for carrying out certain specified work under the provisions of Exploration Project Contract Idm-E189 between the United States of America and Whitedelf Miningand Development Co., Clarks Fork, Idaho

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 April 16 19 52.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 8 1952

The United States of America

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

SdS

This agreement made and entered into on the [illegible] day of [illegible], [illegible] by and between the [illegible] TITLE AND [illegible] COMPANY, party of the first part, and [illegible] of Clearfield, Pa., party of the second part,

WITNESSETH:

In consideration of the payment to be made by the party of the first part, the party of the second part agrees to furnish and re-[illegible] necessary material for solid timbering in the mine shaft of the Mitchell Mine at the collar of the mine's main vein.

This work shall consist of replacing all old timbers in the shaft from the collar, including the collar set, down to and including the fourth set from the collar.

It is agreed that the party of the second part shall remove and replace all lagging in the said section of the shaft with proper timbers and landings. The party of the second part shall also install the timber for support of the skip rail.

It is further agreed that the party of the second part shall remove all old timber from the mine and dispose of the same on the surface. The party of the second part shall also remove all [illegible] and remove to shop.

It is agreed that the party of the second part shall remove the wooden supporting timber under the mine hoist and replace with a cement base and floor. The cement base shall include six 3/4 inch bolts, suitably set into the base for the installation of the hoist in the proper position with respect to the shaft and shaft.

It is further agreed, that the party of the second part will install a protecting set of timber on the south side of the station under the brow left by the excavation of the station and drift with necessary timbering and logging. The party of the second part shall place two sets of the station on the south side above the drift with blocking to support the said brow.

It is agreed that the party of the second part shall remove additional material from the hanging wall of the rope raise to gain the proper clearance for the haulage rope.

It is further agreed that the party of the second part shall install the emergency brake in its proper position for correct operation.

Party of the second part agrees to complete this work on or before the 20th day of April, 1952.

Party of the second part agrees to carry employers liability insurance covering all employees and himself as required by law and the Workmen's Compensation Act of Idaho and assume all risks and liability for accidents or injuries to him or his employees or others arising out of his operation hereunder.

The party of the second part agrees that in the absence of provisions in the Federal and State statutes to the contrary, he will be liable for all contributions or taxes required to be made, paid and/or withheld by the employer pursuant to Federal and/or State old age benefit and Unemployment Insurance Laws and/or the Federal Current Tax Payment Act in respect of his employees and hereby agrees to and does accept exclusive liability for any and all said contributions and/or taxes.

The party of the second part further agrees to supplement and/or amend this agreement and acceptance of liability in any manner necessary and otherwise to meet all State and Federal requirements in order to make full compliance with the State and Federal regulations so as to relieve this Company from any and all liability or responsibility for such payments and/or withholding or the making of reports and keeping of records thereto.

In consideration of the faithful performance of the above work, completed in a workmanlike manner, the party of the first part agrees to pay to the party of the second part the sum of Eleven hundred dollars ($1100.00).

The party of the first part also agrees to furnish all material and equipment necessary for the performance of this contract.

IN WITNESS WHEREOF, we have hereunto set our hands and affixed our seals the day and year first above written.-

Pembroke Lumber Department
for the Whitcomb Lumber and Development Co.
Party of the first part.

Ivar Anderson
Party of the second part.

Signed and sealed in
presence of

Gary J. Ross

Docket Copy
DMEA-255
Idm-E 189
Lead.

APPROVAL

Approval is hereby given to the Whitedelf Mining and Development Company, Clarks Fork, Idaho, under Contract Idm-E189 to furnish the timber required in said contract as outlined in the attached letter of March 20, 1952.

It is understood that the timber will be taken from lands owned by the Whitedelf Mining and Development Company. It is further understood that no charge will be made to the project by the company for such timber other than framing costs incurred prior to use. In no event will the Government participate in a cost greater than $50 per thousand board feet delivered at the mine.

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 March 27, 1952

The United States of America

By A. E. Weissenborn

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

COMPTON I. WHITE
SECRETARY-TREASURER
CLARKS FORK, IDAHO

W. W. VON GAHON
PRESIDENT
SANDPOINT, IDAHO

COMPTON I. WHITE, JR.
VICE-PRESIDENT
CLARKS FORK, IDAHO

WHITEDELF MINING AND DEVELOPMENT CO.

MINE OFFICE
CLARKS FORK, IDAHO

FISCAL OFFICE
401 EMPIRE STATE BLDG.
SPOKANE 8, WASHINGTON

EASTERN OFFICE
608 NORTH CAROLINA AVE. S.E.
WASHINGTON, D. C.

March 20, 1952.

Defense Minerals Administration,
Bureau of Mines,
1207 North Division St.,
Spokane, Washington.

Gentlemen:

The following is submitted to substantiate the contention that timber that has been supplied by the Whitedelf Mining and Development Co. by contract logging, sawing and road building has been procured at an appreciable saving over purchase from a timber supplier.

It might also be pointed out that this has been an expedient manner of procuring the necessary timber due to the seasonal lumbering operations in Northern Idaho and the availability of the right specie of timber.

This company in the month of December, 1951, attempted to procure sufficient timber to retimber the main station at the Whitedelf Mine and after several inquiries, located the nearest fir and larch timber at Bonners Ferry, Idaho. A quantity of this timber was purchased and delivered to the Whitedelf Mine at a cost of $65.00 per thousand. On the basis of this information, it was decided to log the timber on the Whitedelf property.

This has been done and the following is a resume of the cost of that operation.

Logging	$1 284 32
Sawing	1 321 92
Road Building	710 00
Labor	186 75
Equipment	86 67
	3 588 76

It was contemplated at the outset that the necessary timber required for the program as outlined in the DMA contract would be in excess of 100,000 board feet. To date the total amount delivered to the Whitedelf Mine is 73,390 feet and for the purpose of cost determination, we have charged the entire road building cost to this amount of timber. The timber now at the mine has cost this company $48.89 per thousand board feet. This is a saving of $16.11 per thousand board feet over present milling prices.

We hope that this information will prove satisfactory in the analysis of the cost of the timber that has been procured.

Yours very truly,

WHITEDELF MINING AND DEVELOPMENT CO.

Docket
Dmea - 255
Lead

APPROVAL

Contract dated January 15, 19 52, between Whitedelf Mining and Development Company, Clarks Fork, Idaho

and Ivor Anderson, Clarks Fork, Idaho

for carrying out certain specified work under the provisions of Exploration Project Contract Idm-E189 between the United States of America and Whitedelf Mining and Development Co., Clarks Fork, Idaho

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 February 21, 1952.

The United States of America

By A. E. Weissenborn

A. E. Weissenborn, Exec. Officer
~~DMEA Field Team, Region III~~

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 1 1 1952

THIS AGREEMENT made and entered into on the 15th day of January, 1952, by and between the WHITEDELF MINING AND DEVELOPMENT COMPANY, party of the first part, and IVOR ANDERSON, of Clarks Fork, Idaho, party of the second part,

WITNESSETH:

In consideration of the payment to be made by the party of the first part, the party of the second part agrees to retimber and to remove necessary material for said timbering in the mine shaft station of the Whitedolf Mine at the top of the mine's main winze.

This work shall consist of replacing all 6x8 timbers on station and in rope raise to new location of sheave and also entirely replacing mine timber below present sheave set.

It is agreed that the party of the second part shall remove and replace all lagging in the entire station and rope raise wherever present lagging exists. The part of the second part shall also retimber and re-lag the ore pockets and install new chute lips.

It is further agreed that the party of the second part shall remove all old timber from the mine and pile as designated on the exterior dump. The party of the second part shall also salvage all iron and remove to the shop.

It is further agreed that the party of the second part shall install ladders to the sheave set and to the skip dump, and shall also redeck the collar of the shaft.

It is further agreed that the party of the second part shall lower the sheave to a satisfactory point for the operation of the skip dump, and install satisfactory sheave supporting timber. He shall also remove the sheave for regrooving, if required.

It is further agreed that the party of the second part shall remove necessary rock to insure the proper operation of the skip and for the clearance of the rope return to the hoist. The party of the second part shall also install skip dump rails and rail from the collar of the winze to the skip pocket with necessary supporting timber.

It is further agreed that the party of the second part will maintain his work so that the company can use the present hoist installment and move equipment up and down the winze, if necessary.

Party of the second part shall not disturb, except for a minimum period, the pump electrical and discharge installations.

It is further agreed that the party of the second part shall install suitable timber for the supporting of the electrical boxes, cable and wiring together with the present piping.

Party of the second part agrees to complete this work on or before the 10th day of March, 1932.

Party of the second part agrees to carry employer's liability insurance covering all employees and hi self as required by the Workmen's Compensation Act of Idaho and assume all risks and liability for accidents or injuries to ~~you~~ his or ~~your~~ his employees or others arising out of his operation hereunder

The party of the second part agrees that in the absence of provisions in the Federal and State statutes to the contrary, he will be liable for all contributions or taxes required to be made, paid and/or withheld by the employer pursuant to Federal and/or State old age benefit and Unemployment Insurance laws and/or the Federal Current Tax Payment Act in respect of his employees and hereby agrees to and does accept exclusive liability for any and all said contri-

Dutions and/or taxes.

The party of the second part further agrees to supplement and/or amend this agreement and acceptance of liability in any way necessary and otherwise to meet all State and Federal requirements in order to make full compliance with the State and Federal regulations so as to relieve this Company from any and all liability or responsibility for such payment and/or withholdings or the making of reports and keeping of records thereto.

In consideration of the faithful performance of the above work, completed in a miner-like manner, the party of the first part agrees to pay to the party of the second part the sum of Fifteen Hundred Dollars ($1,500.00).

The party of the first part also agrees to furnish all material and equipment necessary for the performance of this contract.

IN WITNESS WHEREOF, we have hereunto set our hands and affixed our seals the day and year first above written.

Compton J. White Jr. President
For Whitedell Mining and Development Co.
Party of the first part.

Ivy Anderson
Party of the second part.

Signed and sealed in presence of

Guy J. Rose

MF-200
(June 1951)

Docket No. DMA 255I
Commodity Lead
Idr- 189

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

EXPLORATION PROJECT CONTRACT[1]

It is agreed this 19th day of October, 1951, between the United States of America, acting through the Department of the Interior, Defense Minerals Administration, hereinafter called the "Government," and[2] Whitedelph Mining and Development Co., a Corporation Clark Fork, Idaho

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 Idaho, County of Bonner described as follows:[3] NE ¼ Sec. 34, T 56 N., R. 2 E Boise Meridian Idaho

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

(*a*) That he is the sole owner, in possession and entitled to possession, and that the property is subject only to the following claims, liens, or encumbrances as to each of which the subordination agreement of the holder is attached: R. F. C. Loan in amount of $25,000.00
S½, NE¼, Sec 34, T 56 N, R 2 E, Boise Meridian - Owned by Applicant
N½, NE¼, Sec 34, T 56 N. R 2 E, Boise M. Held under lease - copy attached

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

3. *Exploration project.* The Operator, within 30 days from the date of this contract shall commence work on a project of exploration for[5] Lead; shall prosecute the work efficiently, expertly, in a workmanlike manner, in accordance with good mining standards, with suitable and adequate equipment, materials, and labor, all properly designed to bring the project to completion within a period of[6] 12 months from the date of this contract. The exploration project and the work to be performed are more fully described on Exhibit "A" attached hereto, which, with any maps or drawings thereto attached, is made a part of this contract.

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

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

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

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

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

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

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

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

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

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

13. *Payment to the Operator.* The monthly progress report (invoice), to the extent approved by the Government, shall be processed for payment by the Government. Payment shall be made in the amount of 50 percent of the approved costs incurred; *Provided,* That the aggregate total of all sums paid by the Government under this agreement shall not exceed $60,125.00, which is 50 percent of the agreed estimated total cost of this project, $120,250.00.

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

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

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

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

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

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

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

Executed in sextuplicate the day and year first above written.

Whitedelph Mining & Development Company
(Operator)

By Campbell H. Dhile
Secy-Treas

THE UNITED STATES OF AMERICA

By Frank E. Johnson
for C. O. Mittendorf, Director
Production Expansion Division
Defense Minerals Administration

Whitedelph Mining and Development Co.
Clark Fork, Idaho
Exploration Contract

Exhibit "A"
Page 1 of (3) pages and 1 illustration

Exploration Project

Est. Time
in months

2. Rehabilitation of existing winze to make it safe for operation

4. Deepen existing winze 400 feet from present 400 level sump to the 800 level allowing for similar sump and skip loading pocket on that level.

5. Drift 900 feet northeasterly along the pearl fissure zone to the projected position of the north orebody.

Drift 200 feet southwesterly along the pearl fissure to intersect the projected position of the Daugherty orebody.

The applicant proposes that Compton White Jr. shall have complete charge of its part of the project, and in the event that he cannot act, someone satisfactory to the Government will be employed.

Estimated Cost of Project

1.	Deepening existing winze 400 feet at $165.00 per foot	$ 66,000.00
2.	Installing skip loading pocket on 800 level	2,000.00
3.	Drifting 1100 feet at $32.50 per foot	35,750.00
4.	Equipment to be purchased	4,500.00
5.	Rehabilitation and repairs to existing winze.	12,000.00

Unit cost estimate includes labor, supervision, pipe, vail air, water, tools, sampling, assaying, and all operating expense.

Fixtures and Improvements

None

Whitedelph Mining and Development Co.
Clark Fork, Idaho
Exploration Contract

Exhibit "A"
Page 2 of (3) pages and 1 illustration.

Operating Equipment

To be rented

None

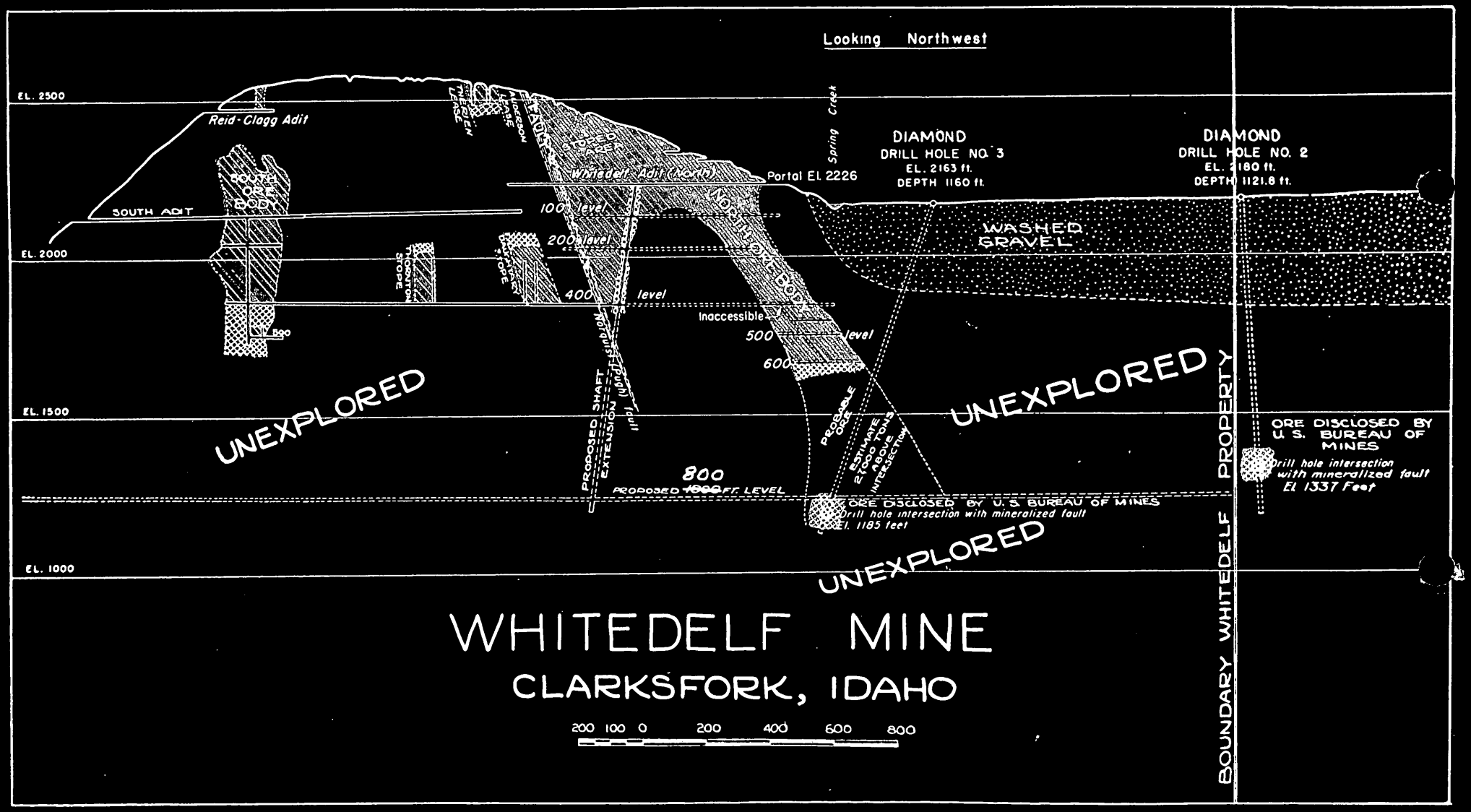
To be purchased

Description	Estimated Cost
1 Sinking pump	$ 350.00
1 Deep well type pump for lift of 800 feet- 200 gpm	1,800.00
Pipe for water column	700.00
1 Blower and pipeline for ventilation	1,100.00
1 Hoisting rope 1000 feet 7/8 inch diameter	550.00
	$ 4,500.00

To be supplied by operator

Description	Value	Monthly Deprec. Allowed
2 Sinker rock drills	$ 800.00	$ 13.33
2 Drifter " "	2,000.00	33.33
1 Loader	3,000.00	50.00
1 Storage-battery locomotive complete with batteries and charger	6,600.00	110.00
1 Air compressor 750 CFM with motor	8,000.00	133.33
1 Dump truck	2,500.00	41.67
2 Sump pumps - air driven	700.00	11.67

Depreciation allowed only for months during which equipment is actually used.



WHITEDELF MINE

CLARKSFORK, IDAHO

This is to certify that the Whitedelph Mining and Development Company owns the S½ of the NE¼ of Sec. 34 T 56 N, R 2 E, Boise Meridian, Bonner County, Idaho, except 5% of the mineral rights which are held by Compton I. White.

Whitedelph Mining and Development Company

Date Oct. 5, 1951 By Compton I. White

Compton I. White, Sr.
Secretary - Treasurer

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 Bonner, State of Idaho, described in a certain Exploration Project Contract dated October 19, 1951, between Whitedelph Mining and Development Company, the Lessee of said property, and the United States of America;

NOW, THEREFORE, the undersigned, as Lessor of said property under lease dated March 20, 1951, 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 10 day of October, 1951

Cempton H. White

Josephine E. White

U. S. GOVERNMENT PRINTING OFFICE 16—64582-1

STATE OF IDAHO
County of Bonner } ss.

I, Wayne Haradone, County Recorder in and for the County and State aforesaid, do hereby certify the within and foregoing to be a full, true and correct copy of the whole thereof, of LEASE, BETWEEN GEORGE T. [illegible] and JOSEPHINE WHITE, his wife, lessors, and WHITE-[illegible] DEVELOPMENT CO. a Delaware corporation, lessee.

as the same appears on record in my office in book 1 of Leases at page 407.

In testimony whereof I have hereunto set my hand and affixed my official seal

this 3th day of August, 1951.

Wayne Haradone
County Recorder, Bonner County, Idaho

By [illegible] Deputy

©GOES 455

No. 64373

THIS LEASE Made this 30th day of March, 1926, between CAMPTON I. WHITE AND JOSEPHINE WHITE, his wife, lessors, and WHITEDELF MINING & DEVELOPMENT COMPANY, a Delaware Corporation, lessee.

WITNESSETH: That the said lessors, for and in consideration of the rents, royalties, covenants and agreements hereinafter reserved and by said lessee to be paid, kept and performed, have let and by these presents do let unto said lessee all of the following described mine and mining property situated in the County of Bonner, and State of Idaho, to-wit:

> North half (N½) of the Northest quarter (NE¼) of Section 34, Township 56 North, Range 2 East of the Boise Meridian, together with the appurtenances.

TO HAVE AND TO HOLD Unto said lessee for the term of fifty (50) years from the date hereof, unless sooner forfeited as determined.

AND IN CONSIDERATION of said lease the said lessee does covenant and agree with said lessors as follows, to-wit:

To enter upon said mine or premises and work the same in a manner necessary to good and economical mining so as to take out the greatest amount of ore possible, with due regard to the safety, development and preservation of said premises as a workable mine.

To work and mine said premises as aforesaid, and within two (2) years from this date to expend not less than Twenty thousand and no/100 ($2,000.00) Dollars in the development of said property and the production of ore therefrom, and thereafter to expend annually in the development and improvement of said property, and the production of ore therefrom, a sum not less than Five thousand ($5,000.00) Dollars per annum.

To well and sufficiently timber said mine at all points where proper.

To allow the lessors, or their agents, to enter upon or into all parts of said mine at any time for the purpose of inspection.

To not assign this lease, or any interest thereunder, and not to sublet the said premises or any part thereof without the written assent of said lessors, and not to allow any person or persons, except the said lessee and its workmen, to take or hold possession of said premises or any part thereof under any pretense whatever.

To keep books of account showing the amount of ores extracted from said mine, the amount of ore shipped, sold or treated, and the amount of money received from the sale of said ores or the values extracted therefrom; that from and out of the values obtained from the ores so extracted, and which may be found in, upon, or around said mine, and reduced, treated, sold, or

shipped, the said lessee will pay to the said lessor fifteen (15%) per cent of the gross proceeds thereof, and to deliver to said lessor, at the end of the term, fifteen (15%) per cent of all ores extracted from said mine and which have not been shipped, sold, treated or reduced; that a duplicate of all mill, smelter, or retort returns shall be furnished by the mill owner, or by the owner of the smelter or retort, to the said lessor; and that said books of account shall be open, at all reasonable times, to the said lessor and his representatives.

To deliver up to the said lessor the said premises, with the appurtenances and all improvements, in good order and conditions, accidents not arising from negligence alone excusing, upon the expiration of this lease or at any time previous upon demand for forfeiture.

And finally, upon the violation by the said lessee, or any other person under it, of any covenant or covenants hereinbefore reserved, the term of this lease shall, at the option of said lessor, expire and the same and said premises, with the appurtenances, shall become forfeited to said lessor, and said lessor or his agent may thereupon, after demand of possession, enter upon said premises and dispossess all persons occupying the same, with or without force, and with or without process of law, or at the option of said lessor or in any other manner.

Each and every clause and covenant of this lease, where the context requires it, shall extend to and include the heirs and assigns of the lessors, and the successors and assigns of lessee.

IN WITNESS WHEREOF, The parties to this agreement have hereunto set their hands and seals the day and year first above written.

In the presence of:

J. B. Whitcomb
W. E. Mehnston

Compton I. White (Seal)

Josephine White (Seal)

(Corporate Seal)

WHITEHALF MINING & DEVELOPMENT COMPANY

By John F. Delaney (Seal)
President

By Frank Frankel (Seal)
Secretary

STATE OF IDAHO,)
)
County of Bonner.)

On this 11st day of March, 1926, before me, John B. Whitcomb, a Notary Public in and for the County and State aforesaid, personally appeared Compton I. White and Josephine White, his wife, known to me to be the persons whose names are subscribed to the above and foregoing instrument, and acknowledged to me that they executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal the day and year in this certificate first above written.

(Notarial Seal)

John B. Whitcomb
Notary Public for Idaho, Residing at Clarks Fork, Idaho, My Com. Expires Ap 29, 1926

YORK, } ss.
New York.}

his 13th day of April, 1926, before me personally came JOHN P. and FRANK FRANKEL, to me known, who being by me duly sworn, did and say that they reside in the County of Nassau; that they are the nt and Secretary respectively, of WHITEDELF MINING & DEVELOPMENT Y, the corporation described in, and which executed the foregoing instrument; that they know the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said Corporation; and that they signed their names thereto by like order.

Irving G. Warshaw
Notary Public, Nassau Co. Cert.
Filed Nas. Co. #[illegible]

THIS AGREEMENT made and entered into this 21st day of April, 1926, between COMPTON I. WHITE and JOSEPHINE WHITE, his wife, parties of the first part, and WHITEDELF MINING & DEVELOPMENT COMPANY, a Delaware corporation, party of the second part.

WITNESSETH: This agreement is made for the purpose of supplementing and modifying that certain agreement dated March 30th, 1926, entered into between the same parties, which is attached hereto.

IT IS UNDERSTOOD AND AGREED, That the payments of gross proceeds of the sale of ore provided to be made by party of the second part to parties of the first part, by paragraph four (4) on page two (2) of said contract, shall be made on the 5th of each month to cover all amounts that become due under said contract out of the proceeds of ore received during the preceding month.

IT IS FURTHER UNDERSTOOD AND AGREED, That the forfeiture provided for in said contract shall not be declared or become effective, except as follows:

That parties of the first part shall be required to give party of the second part thirty (30) days notice of their intention to declare a forfeiture, specifically setting forth the grounds for declaring said forfeiture and setting forth the terms or provisions of said agreement alleged or claimed to have been violated. Such notice shall be given by sending the same by registered mail addressed to the Secretary of said Corporation, or to the New York office of said corporation, and said notice shall not be effective to create a forfeiture until the expiration of the period of thirty (30) days after such notice shall have been mailed, and party of the second part shall have the right, during said thirty (30) day period, to comply with the terms of said agreement and perform the covenant alleged to have been violated, if the corporation is able to comply with such covenant or provision.

IN WITNESS WHEREOF, The parties to this agreement have executed the same the day and year first above written.

In the presence of:

Irving G. Warshaw

S. Secular (Corporate Seal)

Compton I. White (Seal)

Josephine White (Seal)

WHITEDELF MINING & DEVELOPMENT COMPANY

By John P. Delaney (Seal)
President

Frank Frankel (Seal)
Secretary

STATE OF IDAHO,)
) ss.
County of Bonner.)

On this 22nd day of April, 1926, before me, John B. Whitcomb, a Notary Public in and for the County and State aforesaid, personally appeared Compton I. White and Josephine White, his wife, known to me to be the persons whose names are subscribed to the above and foregoing instrument, and acknowledged to me that they executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

(Notarial Seal)

John B. Whitcomb
Notary Public for Idaho,
Residing at Clarks Fork, Idaho
My Com. Expires Apr. 29, 1930

STATE OF NEW YORK,)
) ss.
County of New York.)

On this 3rd day of May, 1926, before me personally came JOHN P. DELANEY and FRANK FRANKEL, to me known who, being by me duly sworn, did depose and say that they reside in the County of Nassau, that they are the President and Secretary respectively of WHITEDELF MINING & DEVELOPMENT COMPANY, the corporation described in, and which executed the foregoing instrument; that they know the seal of said corporation, that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said Corporation; and that they signed their names thereto by like order.

(Notarial Seal)

S. Secular
Notary Public, Bronx No. 59, N. Y. Co. Clks No. 818, Reg. No. 8645, Kings Co. Clks No. 296, Reg. No 8363 Commission expires March 30, 1928.

STATE OF IDAHO,)
) ss.
County of Bonner.)

Filed for record at the request of E. W. Wheelan on the 12 day of May, 1926 at 3:40 o'clock P.M., and recorded in Book 1 of Leases on page 407.

Robt. S. Mc Crea, County Recorder By Ruby Cooper, Deputy Fee $3.25

- -

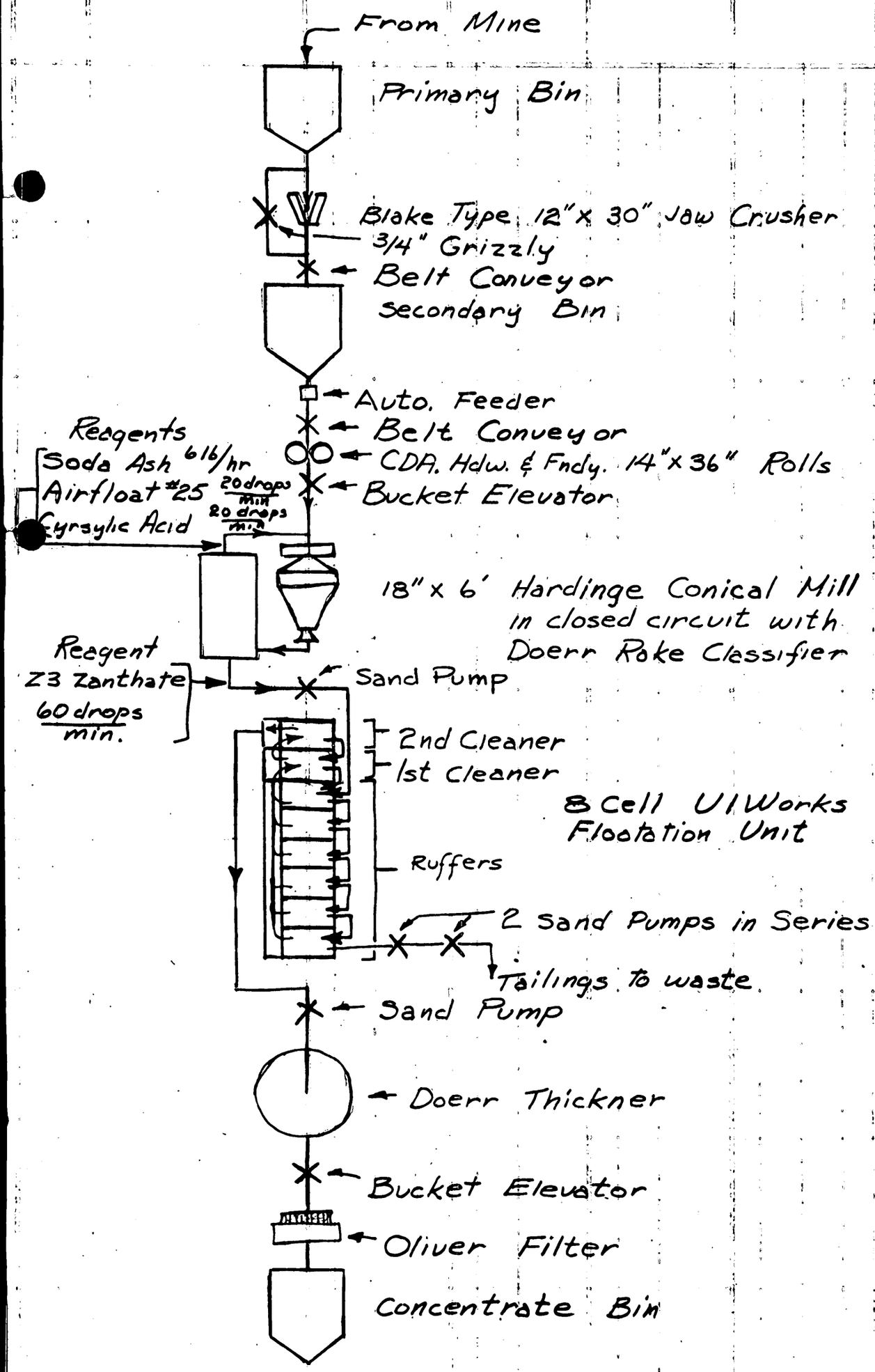
Whitedelf Loan application

Exhibit No 8

FLOW SHEET

original set

WHITEDELF MINING & DEVELOPMENT COMPANY
75 TON FLOATATION CONCENTRATOR AS OF 1-19-51



DEFENCE MINERALS
ADMINISTRATION
WASHINGTON, D.C.
Nov 19 9 16 AM '51

[illegible]

[illegible]

14th November

[illegible], SA.

Form MF-103
(April 1951)

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

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

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

DO NOT FILL IN THIS BLOCK

Docket No. dma-255X

Date received 5/14/51

Participation

Whitedelf Mining and Development Co.
Box 153
Clarkfork, Idaho

Name and address of applicant

Date May 4, 1951

FILL IN THIS BLOCK

Date of application May 4, 1951

Estimated cost $150,000.00

Mineral or metal Lead

Percentage of Government participation 50%

Location of mine Clarkfork, Idaho

Date of filing MF-100 May 4, 1951

DMA Docket Number, if available 255 X

INSTRUCTIONS

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

THE APPLICANT

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

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

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

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

16—64067-1

THE PROPERTY

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

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

*11. State the present and former names of the property, if any.
*12. State, in detail, the location of the property with reference to towns, railroads, roads, shipping points, including distances and directions and kinds and conditions of roads.
*13. State source and quantity of water available for operations and its sufficiency at all seasons.
State amount of power to be used, rate per hour or other cost, and source.
*14. Describe any existing useable facilities, equipment, buildings, or structure now on the property that will be devoted to the exploration work.
15. State in detail how the ore could be shipped and how and where milled.
*16. History:
    (*a*) Give a statement, as complete as possible, of previous exploration, development, operation, and production of property, with reasons for any past suspensions of operations.
    (*b*) State briefly the known history and production of adjoining and neighboring properties.
    (*c*) Furnish any available (private) reports that may apply to this application, including results of mine examinations, recommended exploration and development, and metallurgical investigations.
*17. Production:
    (*a*) If mine is in production, furnish the following information:

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

*18. Ore or mineral reserves: (If property is or has been operating.)
    (*a*) Describe the ore or mineral deposits briefly.
    (*b*) Submit available maps and assay data.
    (*c*) Give estimated tonnage and grade of each class of ore reserves.
19. State any conditions or circumstances regarding the property not sufficiently brought out by the foregoing questions.

THE EXPLORATION

20. For what mineral or minerals and for what types of deposits and ores will the exploration be conducted?
21. Describe briefly, but concisely, the proposed work and the estimated time required to complete it.

    NOTE.—The Government will not participate in a project that will require more than 2 years to complete.
22. Furnish statement of the geological basis of the project with particular emphasis on factors leading the operator to expect the finding of commercial ore bodies. This statement should be accompanied by supporting maps such as geological maps, maps of the proposed openings and assay maps, sample lists, and other pertinent data.

THE REQUIREMENTS AND COSTS

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

CERTIFICATION

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

Whitedelf Mining and Development Co. (Name of company) By Compton Dell Shell (Signature of authorized official)

May 4, 1951 (Date) Secty.-Treas. (Title)

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

*Same as footnote on page 1.

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

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

WHITEDELF MINING AND DEVELOPMENT CO.
Box 153
Clark Fork, Idaho.

1. Refer to MF-100
2. Refer to MF-100
3. Refer to MF-100
4. Refer to MF-100
5. Refer to MF-100

6. Mortgage to Reconstruction Finance Corporation in sum of $25,000.00; $9,700.00 in trust mortgage, 5% bonds.

7. Lloyd property is held under a 50-year lease from Compton I. White, to the company in consideation of 5% royalty of gross production, in lieu of a fixed rental.

8. Attached (As of February 28, 1951)

9. $75,000.00 which would be sufficient to pay our part of the cost of the project.

10. (a) For description of each piece, see attached sub-division plat, which includes to Lloyd eighty; the Pugh eighty; Mead one hundred forty; Daugherty 500; Kimball eighty; Ralph tract and warehouse site, totaling approximately 950 acres of deeded land.

(b) On the NE¼ of Section 34, TWP 56 N, R2E, B. M., on which is located the Whitedelf plant and mill.

11. Refer to Form MF-100
12. Refer to Form MF-100
13. Refer to Form MF-100
14. Refer to Form MF-100

15. Ore can be milled in company owned concentrator and shipped by truck or rail to the Bunker Hill Smelter, at Kellogg, Idaho, or the American Smelting and Refining Company at East Helena, Montana.

16. Refer to Form MF-100
17. Refer to Form MF-100
18. Refer to Form Mf-100

19. None

WHITEDELF MINING AND DEVELOPMENT CO
Box 153
Clark Fork, Idaho.

20. Lead sulphide deposit occurring in the mineralized fault referred to as the Pearl Vein.

21. Six hundred (600) foot extension of the main mine shaft, mine station and ore pockets, and two thousand (2,000) feet of drift and cross cuts to open the ore in the vein to the north boundary. Estimated time for completion - twelve months.

22. Refer to Lorain report, Grattan Lynch report and Anderson report attached to Form MF-100.

23. (a) and (b) Operation is contemplated on contract basis and figures given include supervision and engineering and overhead. Estimated costs are as follows:

600 feet of shaft at $180.00 per foot	$108,000.00
including station and ore pockets,	10,000.00
10,000 feet of drifts and crosscuts (1,000 feet) at $25.00 per foot	25,000.00
Equipment, repairs and reserve	7,000.00
	$150,000.00

(g) Rental value of items of equipment which the operator proposes to rent are as follows:

Compressor	$250.00 per month
Machines (~~6~~ 2 sinker drills & 2 automatic drifters)	300.00 per month
Bars, columns and hose, etc.	
Hoist, skip and cable	200.00 per month
Mucker, trammer and ore cars	250.00 per month
Pumps	100.00 per month
	1,100.00 per month

24. Ninety feet of shaft per month, total time 7 months - cost $108,000.00
Station and ore pockets 1 month 10,000.00
drifts and crosscuts - 250 feet per month - 4 months 25,000.00

WHITEDELF MINING AND DEVELOPMENT CO.

FINANCIAL STATEMENT

FEBRUARY 28, 1951

ASSETS		$65 547 43	
FIXED ASSETS			
PROPERTY	[illegible]		
MINE BUILDINGS	18 601 59		
MILL AND EQUIPMENT	42 052 79		
HEATING PLANT	3 703 92		
	71 358 30		
LESS RESERVES	55 358 84	15 999 46	
MINING EQUIPMENT	58 572 95		
LESS RESERVES	42 737 77	15 835 18	
OFFICE EQUIPMENT	604 02		
LESS RESERVES	365 42	238 60	
TRUCK	1 575 74		
LESS RESERVES	1 260 59	315 15	
TAILING RESERVOIR		2 500 00	
POWER INSTALLATION		5 437 77	
TIMBER		10 000 00	
NEW ORE RESERVES	60 000 00		
LESS DEPLETION	59 585 86	413 14	$116 286 73
DEVELOPMENT		229 773 79	
EXPLORATION		46 842 78	
DEFERRED CHARGES FOR 1951		2 208 60	278 825 17
INTANGIBLES			
WATER RIGHTS		10 000 00	
ORGANIZATION EXPENSE		3 430 01	
SEC REGISTRATION EXPENSE		1 134 27	14 564 28
CURRENT ASSETS			
CASH IN BANKS		678 69	
ACCOUNTS RECEIVABLE		6 077 98	
NOTES RECEIVABLE		4 550 00	11 306 67
OTHER ASSETS			
INSURANCE DEPOSIT		250 00	
PREPAID INSURANCE		258 00	508 00
TOTAL ASSETS			$421 490 85

LIABILITIES, CAPITAL AND SURPLUS

CURRENT LIABILITIES			
ACCOUNTS PAYABLE		5 619 09	
NOTES PAYABLE		31 651 46	
ROYALTIES PAYABLE		2 091 02	
PAYROLL PAYABLE		1 659 38	
STATE & GOVERNMENT TAXES PAYABLE		156 25	41 177 20
CAPITAL	2 000 000 SHARES PAR 10¢	200 000 00	
UNISSUED	291,921	29 192 10	
ISSUED	1 708 079	170 807 90	
IN TREASURY	22 050	2 205 00	
OUTSTANDING			168 602 90
SURPLUS - PAID IN		84 139 49	
EARNED		8 469 45	
DONATED		10 462 24	103 071 18
BOND SALES			44 400 00
UNREALIZED APPRECIATION - REVALUED ASSETS			64 239 57
TOTAL LIABILITIES, CAPITAL AND SURPLUS			$421 490 85

Form MF-100
(March 1951)

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Form approved.
Budget Bureau No. 42-R1026.

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

NOT TO BE FILLED IN BY APPLICANT

Docket No. Dma-255X

Date received 5/14/51

Whitedelf Mining and Development Co.
Box 153
Clarkfork, Idaho

Name and address of applicant

Date May 4, 1951

INSTRUCTIONS

This form is to be filed with Defense Minerals Administration, Department of the Interior, Washington 25, D. C. It should be accompanied by appropriate application form when a specific type of Government assistance is requested, in the form of (1) loan, (2) purchase contract, (3) Government guarantee of a private loan, (4) Necessity Certificate pursuant to the provisions of Sec. 124–A (Amortization Deduction) of Internal Revenue Code, 1950, (5) priorities or allocation of mining equipment, and maintenance, repair and operating supplies, and (6) other forms of Government assistance that might arise under the Act. Submit four (4) signed copies of the form and accompanying papers. Name and address should be stamped or typed on each sheet of this form and all accompanying papers. *When a question is inapplicable it should be so stated on the form.* Additional sheets may be attached in answering any questions or in supplying additional information. (IF YOU CANNOT ANSWER A QUESTION, SO STATE.) If a question is answered elsewhere indicate where answered. It is not necessary to answer it again.

GENERAL TECHNICAL DATA

Supply the following information on separate sheets, arranged, numbered, and lettered as indicated:

1. Materials produced:
   (*a*) What are the chief mine, mill, or smelter products?
   (*b*) What are the byproducts, if any?
2. Name(s) and type(s) of mine(s), mill(s), smelter(s), refinery(ies), pit(s), quarry (ies), drilling operation(s). Include old names of property, if any. Show extent of workings, including the following:
   (*a*) Linear feet of shafts.
   (*b*) Linear feet of drifts and crosscuts.
   (*c*) Linear feet of tunnels or adits.
   (*d*) Linear feet of other mine openings (explain briefly).

   Indicate whether mine is flooded or not. Describe any pumping problems. Give size or productive capacity.
3. For each operation listed above supply the following:
   (*a*) Distance and direction from nearest town and shipping point.
   (*b*) Mining district.
   (*c*) Township, Section, Range.
   (*d*) County, State.
4. (*a*) State whether or not property is now in operation, and if in operation, by whom operated.
   (*b*) Are you operating this property as:
   - ☐ Owner.
   - ☐ Lessee.
   - ☐ Contractor.
5. Number of years in production _____

   If not in production or operation, estimated date when production will begin _____
6. Experience of operators:

   Describe the mining and general business experience of (*a*) the applicant, and (*b*) the person or persons who manage the project.
7. History:
   (*a*) Give a statement, as complete as possible, of previous exploration, development, operation, and production of property, with reasons for suspension of operation.
   (*b*) State briefly the known history and production of adjoining and neighboring properties.
   (*c*) Furnish any available (private) reports that may apply to this application, including results of mine examinations, recommended exploration and development, and metallurgical investigations.

8. Names and addresses of Officers, Directors, or Partners, and in addition thereto, the five largest stockholders if applicant is a corporation.

Name and Address (a)	Official Title (If officer is also director indicate by "D") (b)	Total of Annual Salary, Commissions, Bonuses, Etc., Received From Applicant and Affiliates During Last Fiscal Year (c)	Estimated Net Worth Outside of Interest in Applicant (d)	Number of Shares Held in Applicant Corporation: Common (e)	Number of Shares Held in Applicant Corporation: Preferred (f)	Life Insurance Carried for Benefit of Applicant: Amount (g)	Life Insurance Carried for Benefit of Applicant: Net Cash Surrender Value After Loans (h)
Compton I. White Jr. Clarkfork, Idaho	D Pres.	$1200.	$5000	50,000	----	----	----
Compton I. White Sr. Clarkfork, Idaho	D Sec.-Treas.	none	$5,000	27,[illegible]			
E. C. Vontanson Sandpoint, Idaho	D Vice Pres.	none	50,000	45,000			
Truman Wade S. C. B., Wash., D. C.	D	none	20,000	125			
F. Michael Cook Washington, D. C.	D	none	50,000	100			
Albert Sandquist 2[illegible]45 E. Rockford, Ill		none	----	30,000			
Marvin Walker 1020 Hussey Bldg. Baltimore, Md.		none	----	44,000			
	Total	$1200.	x x x x x	216,[illegible]		x x x x x	x x x x x

If more lines are needed continue on separate sheet.

9. Capital Stock Issues:

For Corporate Applicants

Item	Authorized (a)	Outstanding (b)	Par Value (c)	Number of Shares Outstanding (d)	Dividend Rate Last Paid* (e)
Common stock	$500,000.00	170,000.	$ 0.10	1,708,079	none
Preferred stock	$	$	$		

*Indicate period covered.

10. Production:

Item	Kind of Product (a)	1948 Total (b)	1949 Total (c)	1950 Total (d)	Present Average Monthly (e)
		Long tons 2000 lbs	Long tons 2000 lbs	Long tons 2000 lbs	Long tons 2000 lbs
1. Quantity of product mined or quarried (Short, long, metric tons; barrels; pounds; etc.)	Lead ore	1835.62	1577.62	974.88	80
2. Quantity of product processed (specify unit of measure and type of process)	Lead ore	*	*	*	*
3. Quantity and grade of product sold or shipped (specify units of measure)	Lead ores.	127.26	136.40	81.19	6.66

11. Do you contemplate a change in the present average monthly rate of production? If so, state estimated maximum monthly production and basis of change.

12. Ore or Mineral Reserves:

(a) Describe the ore or mineral deposit briefly. Accompany the application by any available report on the geology and ore reserves.

(*b*) If deposit is other than placer:

(1) Submit assay plans and/or sections showing location and size of proved (measured) and probable (indicated) ore or mineral reserve.

(2) State the tonnage (indicate type of ton) and grade of each class of ore reserve, as above, and show how computed. Tabulated total ore reserve as follows:

TOTAL ORE OR MINERAL RESERVES

Ore or Mineral Reserve	Estimated Tons (a)	Metal or Mineral Content Per Ton (Grade) (b)	Gross Value Per Ton (c)	Recoverable Unit Value Per Ton (d)	Estimated Cost of Production Per Ton (e)
Measured (proved)					
Indicated (probable)	37,000	30% Pb	$100.00	090.00	$18.00

(*c*) If placer:

(1) Give estimated total yardage and average marketable mineral content of each deposit.

(2) Submit map showing location of placer deposit and surrounding area, with all test holes or pits. Submit logs of each hole and test pit with depth and average value of each.

(3) Describe gravel, stating whether fine, medium or coarse; loose, tight, cemented, or frozen, and whether it contains stumps or boulders more than 1 foot in diameter; if so, how large, and in what proportion.

(4) Describe bedrock, giving type (granite, sandstone, shale, etc.) and state whether it is hard or soft, smooth, uneven or rough.

(5) Describe overburden, stating whether loose, tight, or cemented; fine or coarse textured; furnish estimate of average thickness and total amount.

(6) Tabulate the reserves using the form outlined above for ore or mineral reserves.

13. Access Roads:

Give road distances to shipping, supply and residence points, stating kind and condition of roads.

14. Water Supply:

State source and quantity of water available for operations and whether sufficient for all seasons of year.

15. Power:

State amount of power used, rate per hour, and source thereof.

16. Labor:

State number and classes (miners, muckers, millmen, etc.) of men employed during a recent representative payroll period.

17. Equipment and Facilities:

Describe present equipment on the property, including buildings. (State condition.) List major pieces of equipment now owned or controlled and in serviceable condition available for this operation.

18. Are there any particular conditions or circumstances affecting your operations that are not described above? If so, explain.

CERTIFICATION

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

WHITEDELE MINING & DEVEL. CO
(Name of company)

By Compton J. White
(Signature of authorized official)

MAY 4, 1951
(Date)

SECTY.-TREAS.
(Title)

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

U. S. GOVERNMENT PRINTING OFFICE 16—63792-1

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

WHITEDELF MINING AND DEVELOPMENT CO.
Box 153
CLARKFORK, IDAHO.

1. (a) Lead concentrates
   (b) Silver sulphide

2. Whitedelf Mines (lode), Whitedelf Mill, 75-ton flotation. No smelter, no refinery, no drilling operation except diamond drilling incidental.

   (a) Seven hundred fifty (750) feet of shafts.
   (b) Thirty three hundred (3,300) feet of drifts and crosscuts.
   (c) One thousand (1,000) feet of tunnels or adits
   (d) Nine hundred fifty five feet (955) feet of raises.

   Mine is unwatered to the 400-foot level. Mine unwatering is accomplished with 40-HP Pomona turbine type pump operating approximately ten to twelve hours per day. No problem.

3. (a) one and a quarter (1¼) miles northwest of Clarkfork, Idaho on Norther Pacific Radlroad which is shipping point.

   (b) Clarkfork Mining District.
   (c) Township 56 N, Section 34, Range 2 E, BM (see accompanying plat.
   (d) Bonner County, Idaho.

4. (a) Mine is in operation producing ores and concentrates mined by leasers.
   (b) Owner

5. Number of years in production - - 25 years.

6. Thirty years experience, managing, organizing and operating mining properties.

   (b) Six years managing the operation of two mining properties. Three and one half years training as mining engineer.

7. (a) The Pearl Vein of the Whitedelf Mine has been opened and mined down to the 400 foot level, below the main adit and has produced 12,619.35 tons of crude ore and concentrates. The ore above the 400 foot level having been extracted, it is now proposed to deepen the main shaft to reach and mine the proven ore above the 1,000 foot level. (for reference see U. S. Bureau of Mines R.I. 3992, August, 1946, by S. H. Lorain; U. S. G. S. Geological Survey Bulletin No. 944 B, and Bulletin No2, Volume XLI of the Society of Economic Geology by Alfred L. Anderson.

WHITEDELF MINING AND DEVELOPMENT CO.
BOX 153
CLARKFORK, IDAHO.

(b) The Lawrence Consolidated Mining Company has been in production of high grade lead ores intermittently for over thirty years. The Hope Silver Lead Mines has been in production of crude ore and lead-silver concentrates for approximately 25 years. The Hope property adjoins the Whitedelf property and the Lawrence Mine is one mile east of the Whitedelf property.

(c) Refer to report by H. Grattan Lynch (attached)

8. Completed on form

9. Completed on form

10. Completed on form. (additional information)

1. Quantity of product ~~sel~~ mined or quarried - - - -

Average product sold 1948 31.5% lead, 60.2 oz silver
Average product sold 1949 43.6% lead, 71.0 oz. silver
Average product sold 1950 60.2% lead, 55.6 oz. silver.

11. Yes. It is proposed to deepen the shaft and mine the proven ore between the 400 and 1,000 foot levels at the rate of 100 tons per twenty four hours.

12. (a) See Lorain report and Grattan Lynch report.

(b) See vertical section "Whitedelf Mine" (Exhibit A)
(1) See vertical section "Whitedelf Mine"
(2) 27,000 tons (See Grattan Lynch report - assay 30 oz. silver, 30% lead (See Lorain report)

13. One and one quarter miles on good, all year graveled and paved road to Clarkfork.

14. Two two-inch taps from village water main which crosses property. 40-foot head.

15. Power supplied by Mountain States Power Co to mine and mill over 13,000-volt three phase line, at an approximate rate of one cent (1¢) per kilowatt.

16. Adequate local labor available.

17. 75-ton flotation mill and sufficient underground equipment, hoists, trammer, mucking machine, drills, etc. to produce 100 tons per 24 hours.

18. No.

EXHIBIT 3

WHITEDELF MINING AND DEVELOPMENT CO.
EQUIPMENT

1	C-P Drifter	C-P 564
1	I-R Drifter	DA-30
1	I-R Drifter	DA-35
1	I-R Jackhammer	J-50
1	I-R Self Rotating Stoper	49 R 58
1	I-R Jackhammer	X-49
1	C-D Self Rotating Stoper	R 91 S
1	C-P " " "	A L 159
1	C-P " " "	Serial 85119
1	I-R Stoper	

1 6-foot column - single screw with saddle and collar

1 Sullivan W. J. 3 750 cu. ft. air compressor

3 CDA Hdw. 21 cu. ft. ore cars
1 Card Iron Works, 16 cu. ft. ore car
2 10 cu. ft self dumping ore skops
1 mine skip.

1 Eimco-Finlay 12-B mucking machine
1 Mancha Little Trammer
2 Edison A-40-65 batteries for trammer
1 Hertner Charger and Panel A-40-65

1 Sullivan Air Tugger
1 Double Drum I-R air slusher
1 Single Drum I-R air tugger
1 Sullivan electric hoist 500-1000' per minute
1 CDA H&F Hoist 1,000 ft. 1 ton 800 to 900 ft. per minute

1 20 HP U.S. 3600 RPM pump motor not installed
1 1 HP 220/440 GE motor (small compressor)
125 HP Electric Mchy Co. Synchronous electric motor

40 HP Pomona Pump (turbine) 300 gal per minute - 500 ft. head
CP sump pump - tank type
IR sump pump - 25 turbine
Allis Chalmers 7½ HP motor pump

Lincoln 300 Amp Welder
welding rod - mild steel and hard face.

il bender (UIW)
et rail installed
t rail unused
and bolts to install

/8" wire rope
/4" hoisting cable
/2" hoisting cable

ter proof electric cable - 3 conductor - 440 volt -
25 circular mill, armored

WHITEDELF MINING AND DEVELOPMENT CO.
EQUIPMENT (Page 2)

400 ft. 6" vent pipe
500 ft. 10" vent pipe
1 000 2½" tailings pipe
450 ft. 4" pump discharge column

1 set Greenfield tap & die 1 - 3/16"
4 in. pipe dies
2 in. pipe dies
1 in. pipe dies
2 in pipe cutter
2 pipe vises

1 15 lb. per square inch boiler steam piping and radiators

1 steel sharpener - Sullivan air-operated - 5 dollies, piston & clamp
75 pieces steel

300 ft. each air and water hoses with connections

Air pipe for entire mine.

1 200 Amp fuse box
2 30 HP automatic starters

1 Black & Decker 3/4" electric drill

1 6" ventilating fan
1 10" ventilating fan
swing
1 10 HP cut off saw

2 CDA Reagent Feeders (wet)

30 ft. Republic 14" 4-Ply rubber covered conveyor belt
130 ft. Hewitt 18" 4-ply rubber covered conveyor belt

1 set of 2 guages with cutting and welding torches for acetylene
outfit plus 40' hose
1 International K-7 Dump Truck

BUILDINGS
1 Oil house
1 20 x 40 Framing shed and tool room
1 20 x 20 dry room and blacksmith shop
14 x 30 heating plant
20 x 20 dry room
12 x 20 compressor house
12 x 20 trammer shed

1 75-ton flotation concentrating plant, complete

EXHIBIT 4

WHITEDELF LOAN APPLICATION

RECORD OF PRODUCTION

To 1946	Tons	Gross Value	Average	#Lead	Oz silver
	12 253 8	$719 219 05	$ 58 68		
1946	6 659 35	8 212 62	123 33	46 586 36	6 665 35
1947	21 23	3 141 79	143 27	11 856 00	2 261 51
* 1948	127 96	20 666 58	162 30	70 786 32	7 390 71
* 1949	156 46	26 709 64	177 70	116 161 16	11 692 98
* 1950	81 19	14 960 42	184 26	96 539 09	4 559 19

Leasers
Above figures include premiums paid in 1944-45-46

EXHIBIT 5

WHITEDELF LOAN APPLICATION

INSURANCE POLICIES

A 276 129	Fireman's Fund Insurance Co.	$6 000.00	expires 9-1-51
53 003	Continental Insurance Co.	2 500.00	"
318 615	N. Y. Underwriters Insurance Co.	2 500.00	expires 9-1-51
170 840	Piedmont Standard Ins. Co.	2 500.00	"
S 355 165	Springfield F & M Insurance Co.	4 000.00	"
79 482	U S Fire Insurance Company	2 500.00	"
		$20,000.00	

$4,000.00 on frame concentrator, its additions, attachments, adjoining and communicating foundations, bins, partitions, closets, platforms, cribbings, elevators, frame tracks, trestles, lifts, slides, wiring, drops, plumbing and connections, steam and water pipes and their connections, outside stairways and all permanent fixtures and improvements, together with material in and around the premises within one hundred feet thereof for repairs or reconstruction.

$16,000.00 on fixed and movable machinery, electric and other machines, tools, implements, appliances, utensils, devices engines, motors, pumps, boilers, heaters, blowers, burners, their settlings, connections, attachments, and all extra, spare and duplicate parts and supplies therefor, millwright work, shafting, belting, gearing, fuel, fire hose, extinguishing apparatus, trucks, vehicles, and all such furniture, fixtures, tools and supplies not otherwise specifically mentioned used in the business of the assured while contained in the above described building.

COPY

MINER M 6 50

Exhibit No 7

original sent to

BUNKER HILL SMELTER

P.O. Address: KELLOGG
R. R. Station: BRADLEY

BUNKER HILL & SULLIVAN MINING & CONCENTRATING COMPANY

In Account With

[illegible]

Name of Mine: Whitedelf Mine Lot No.: _____ Smelter Lot No.: 126

Location: Clark Fork, Ida. R. R. Shipping Point: By Truck Class: Lot

DATE OF ARRIVAL: 11/24/50 DATE OF SAMPLING: 11/24/50 DATE OF SETTLEMENT: 12-1-50

Car Initial	Car No.	H_2O	Weight, lbs.
1 Truck [redacted]		7.3	15470

TOTAL GROSS WEIGHT	15470
____ Sacks. Weight of Sacks	
GROSS WEIGHT OF ORE	
Moisture Pounds	1129
DRY WEIGHT OF ORE	14341

Metal Assay

Gold		Oz. P. T.
Silver	49.1	Oz. P. T.
Copper	[redacted]	% P. T.
[redacted]		% P. T.
[redacted]		% P. T.
[redacted]	7.3	% P. T.
Lime		% P. T.
Sulphur	15.0	% P. T.
Zinc	2.0	% P. T.
Antimony	.6	% P. T.
Arsenic	1.05	% P. T.
Bismuth		% P. T.

QUOTATIONS

_____ Per Oz.

_____ Per Oz.

Silver 11-24-50 = .90 Per Oz.

Lead 11-24-50

.17000-.01500 = .15436 Per Lb.

Copper _____

_____ = _____ Per Lb.

Zinc _____

_____ = _____ Per Lb.

SMELTING AND REFINING DEDUCTIONS — PER TON

Base Smelting Charge	$
Credit ____% Iron over (____% Zinc x 1.77) @ 40c a unit	$
Debit ____% Iron under (____% Zinc x 1.77) @ 40c a unit	$
Credit ____% Silica over (____% Iron x .886) @ 8c a unit	$
Debit ____% Silica under (____% Iron x .886) @ 8c a unit	$
Credit ____% Lime over (____% Iron x .979) @ 10c a unit	$
Debit ____% Lime under (____% Iron x .979) @ 10c a unit	$
TOTAL SMELTING DEDUCTIONS	$
Silver charge over ____ oz. per ton @ ____ c per oz.	$
Antimony charge over ____% @ ____ per unit	$
Arsenic charge over ____% @ ____ per unit	$
Bismuth charge over ____% @ ____ per pound	$
Moisture charges over ____% @ ____ per unit	$
Sulphur charge over ____% @ ____ per unit	$
TOTAL SMELTING AND REFINING DEDUCTIONS	$ 11.000

PAYMENT FOR METALS — VALUE PER TON

Gold	____ Oz.		@ ____	Per Oz.	$	
Gold	____ Oz.		@ ____	Per Oz.	$	
Silver	49.1 Oz.	95	% @ .90	Per Oz.	$	37.316
Lead	11.3 %	92	% @ .15436	Per Lb.	$	174.003
Copper	____ %		% @ ____	Per Lb.	$	
Zinc	____ %		% @ ____	Per Lb.	$	
				Gross Value	$	211.319
LESS SMELTING AND REFINING DEDUCTIONS					$	11.000
NET VALUE PER TON					$	200.319
TOTAL OUNCES SILVER IN THIS SHIPMENT						352.07

SETTLEMENT

DRY WEIGHT 14341 POUNDS = 7.1705 TONS @ $ 200.319 PER TON EQUALS $ 1436.96

Less Freight from Shipping Point to Bradley, Idaho

Gross Weight ____	Pounds = ____	Tons @ $ ____	per ton equals	$ ____
				$
Crl. on lead 70% 11a paid (22.50-17.35)				$ 20.33
				$
				$
				$
				$
				$
				$
to Whitedelf Min. & Dev. Co., Clark Fork, Idaho			NET PROCEEDS	$ 1416.13

MINER FM 67 12M 6 50

BUNKER HILL SMELTER

P. O. Address: KELLOGG, ID
R. R. Station: BRADLEY, ID

BUNKER HILL & SULLIVAN MINING & CONCENTRATING COMPANY

In Account With

PAUL PARENTEAU

Name of Mine: Whitedalf Mine Lot No.: ____ Smelter Lot No.: 125

Location: Clark Fork, Ida. R. R. Shipping Point: By Truck Class: Flot

DATE OF ARRIVAL: 10/31/50 DATE OF SAMPLING: 10/31/50 DATE OF SETTLEMENT: 11-4-50

Car Initial	Car No.	H_2O	Weight, lbs.
1 Truck		6.8	15680

TOTAL GROSS WEIGHT	15680
____ Sacks. Weight of Sacks	
GROSS WEIGHT OF ORE	
Moisture Pounds	1066
DRY WEIGHT OF ORE	14614

Metal Assay

Gold		Oz. P. T.
Silver	52.6	Oz. P. T.
Copper	.20	% P. T.
Lead	66.0	% P. T.
Iron	3.4	% P. T.
Insol.	6.0	% P. T.
Lime		% P. T.
Sulphur	15.2	% P. T.
Zinc	2.1	% P. T.
Antimony	2.9	% P. T.
Arsenic	.58	% P. T.
Bismuth		% P. T.

QUOTATIONS

____ Per Oz.

____ Per Oz.

Silver 10-31-50 = .90 Per Oz.

Lead 10-31-50

.17000-.01566 = .15434 Per Lb.

Copper

____ = ____ Per Lb.

Zinc

____ = ____ Per Lb.

SMELTING AND REFINING DEDUCTIONS

PER TON

Base Smelting Charge ____ $____

Credit ____% Iron over (____% Zinc x 1.77) @ 40c a unit $____

Debit ____% Iron under (____% Zinc x 1.77) @ 40c a unit $____

Credit ____% Silica over (____% Iron x .886) @ 8c a unit $____

Debit ____% Silica under (____% Iron x .886) @ 8c a unit $____

Credit ____% Lime over (____% Iron x .979) @ 10c a unit $____

Debit ____% Lime under (____% Iron x .979) @ 10c a unit $____

TOTAL SMELTING DEDUCTIONS . . . . . $____

Silver charge over ____ oz. per ton @ ____ c per oz. $____

Antimony charge over ____% @ ____ per unit $____

Arsenic charge over ____% @ ____ per unit $____

Bismuth charge over ____% @ ____ per pound $____

Moisture charges over ____% @ ____ per unit $____

Sulphur charge over ____% @ ____ per unit $____

TOTAL SMELTING AND REFINING DEDUCTIONS Min. . $ 11.000

PAYMENT FOR METALS

VALUE PER TON

Gold	____ Oz.			@ ____	Per Oz.	$	
Gold	____ Oz.			@ ____	Per Oz.	$	
Silver	52.6 Oz.	95	%	@ .90	Per Oz.	$	44.973
Lead	66.0 %	92	%	@ .15434	Per Lb.	$	187.430
Copper	____ %		%	@ ____	Per Lb.	$	
Zinc	____ %		%	@ ____	Per Lb.	$	

Gross Value $ 232.403

LESS SMELTING AND REFINING DEDUCTIONS . . . . . $ 11.000

NET VALUE PER TON . . . . . $ 221.403

TOTAL OUNCES SILVER IN THIS SHIPMENT 384.35

SETTLEMENT

DRY WEIGHT 14614 POUNDS= 7.3070 TONS @ $ 221.403 PER TON EQUALS $ 1617.79

Less Freight from Shipping Point to Bradley, Idaho

Gross Weight ____ Pounds= ____ Tons @ $ ____ per ton equals $ ____

Frt. on Lead 8873 lbs paid @ (22.50-17.35)	$ 22.85	
Hauling @ $8.00 F/wt to Whitedalf Mng. & Dev. Co., Clark Fork, Idaho	$ 62.72	85.57
	$	1532.22
20% Royalty to Whitedalf Mng. & Dev. Co., Clark Fork, Idaho	$ 306.44	
Milling to " " " " " " "	$ 225.60	532.04
	$	
	$	
	$	

to Paul Parenteau, Clark Fork, Idaho NET PROCEEDS $ 1000

DMA-255

NER FM 67 12M 6 50

BUNKER HILL SMELTER

BUNKER HILL & SULLIVAN MINING & CONCENTRATING COMPANY

P. O. Address: KELLOGG, IDAHO
R. R. Station: BRADLEY, IDAHO

In Account With

PAUL PARENTEAU

Name of Mine: Whitedelf Mine Lot No.: ____ Smelter Lot No.: 122

Location: Clark Fork, Ida. R. R. Shipping Point: Truck Class: Flot

DATE OF ARRIVAL: 8/11/50 DATE OF SAMPLING: 8/11/50 DATE OF SETTLEMENT: 8-16-50

Car Initial	Car No.	H_2O	Weight, lbs.
1 Truck		6.1	12780
1 "		5.5	9810

TOTAL GROSS WEIGHT	22590
____ Sacks. Weight of Sacks	
GROSS WEIGHT OF ORE	
Moisture Pounds	1319
DRY WEIGHT OF ORE	21271

Metal Assay

Gold		Oz. P. T.
Silver	53.9	Oz. P. T.
Copper	.20	% P. T.
Lead	61.9	% P. T.
Iron	4.2	% P. T.
Insol.	7.6	% P. T.
Lime		% P. T.
Sulphur	14.6	% P. T.
Zinc	.7	% P. T.
Antimony	4.1	% P. T.
Arsenic	1.47	% P. T.
Bismuth		% P. T.

QUOTATIONS

____ Per Oz.

____ Per Oz.

Silver 8-11-50 = .90 Per Oz.

Lead 8-11-50

.12000-.01401 = .10599 Per Lb.

Copper

____ = ____ Per Lb.

Zinc

____ = ____ Per Lb.

SMELTING AND REFINING DEDUCTIONS — PER TON

Base Smelting Charge ____ $____

Credit ____% Iron over (____% Zinc x 1.77) @ 40c a unit $____

Debit ____% Iron under (____% Zinc x 1.77) @ 40c a unit $____

Credit ____% Silica over (____% Iron x .886) @ 8c a unit $____

Debit ____% Silica under (____% Iron x .886) @ 8c a unit $____

Credit ____% Lime over (____% Iron x .979) @ 10c a unit $____

Debit ____% Lime under (____% Iron x .979) @ 10c a unit $____

TOTAL SMELTING DEDUCTIONS . . . . . $____

Silver charge over ____ oz. per ton @ ____ c per oz. $____

Antimony charge over ____% @ ____ per unit $____

Arsenic charge over ____% @ ____ per unit $____

Bismuth charge over ____% @ ____ per pound $____

Moisture charges over ____% @ ____ per unit $____

Sulphur charge over ____% @ ____ per unit $____

TOTAL SMELTING AND REFINING DEDUCTIONS . . . . $ Min. 11.000

PAYMENT FOR METALS — VALUE PER TON

Gold	____ Oz.			@ ____	Per Oz.	$	
Gold	____ Oz.			@ ____	Per Oz.	$	
Silver	53.9 Oz.	95	% @	.90	Per Oz.	$	46.085
Lead	61.9 %	92	% @	.10599	Per Lb.	$	120.718
Copper	____ %		% @	____	Per Lb.	$	
Zinc	____ %		% @	____	Per Lb.	$	

Gross Value $ 166.303

LESS SMELTING AND REFINING DEDUCTIONS . . . . . $ 11.000

NET VALUE PER TON . . . . . $ 155.303

TOTAL OUNCES SILVER IN THIS SHIPMENT 573.25

SETTLEMENT

DRY WEIGHT 21271 POUNDS= 10.6355 TONS @ $ 155.303 PER TON EQUALS $ 1657.04

Less Freight from Shipping Point to Bradley, Idaho

Gross Weight ____ Pounds= ____ Tons @ $ ____ per ton equals $ ____

Frt. on lead 12114 lbs paid @ (22.50-17.35)		$ 31.19	
Hauling @ $8.00 P/wt to Whitedelf Mng. & Dev. Co., Clark Fork, Idaho		$ 90.36	121.55
		$	1535.49
20% Royalty to Whitedelf Mng. & Dev. Co., Clark Fork, Idaho		$ 307.10	
To Whitedelf Mng. & Dev. Co., Compressor	$27.50	$	
Supplies	19.15	$	
Milling	288.50	$ 335.15	642.25
		$	

To Paul Parenteau, Clark Fork, Idaho NET PROCEEDS $ 893.24

REPORT OF H. GRATTAN LYNCH

dma - 255 X

September 27, 1947

Mr. M. P. Flannery
345 Peyton Building
Spokane, Washington

Dear Mr. Flannery:

Whitedelf Mining and Development Co.
Clark Fork, Idaho

The following report is a result of three days study of the Whitedelf Mine located at Clark Fork, Bonner County, Idaho. Information contained in the Report of Investigations No. 3992 -- Clark Fork Lead Zinc District, Bonner County, Idaho -- By U. S. Bureau of Mines, 1946, and in the Annual Report of the Mining Industry of Idaho, 1946 is used to supplement the field study.

SUMMARY: The Whitedelf Mine is located on a good road within two miles of the railroad; it is fully equipped for a 50-ton per day production, and is connected to electric power.

The district has geological conditions similar to the Dry Belt of the Coeur d'Alene Mining District. The Whitedelf Mine has a very strong vein with small ore shoots.

At present there is no ore blocked and the mine must be better developed if it is to be successful. To develop it properly there should be spent about $350,000.00. To warrant this expenditure, some diamond drilling and development are recommended.

The Whitedelf Mine has geological conditions very similar to those of the Silver Mines of the Dry Belt of the Coeur d'Alene District, the veins are strong, the wall rock is highly altered, and it has had a considerable production of high grade silver ore. Its further prospecting and development are recommended.

INTRODUCTION

LOCATION: The Whitedelph Mine is situated 2 miles north of the town of Clark Fork, Bonner County, Idaho, a town of about 400 population, being on the Northern Pacific Railroad and U. S. HIGHWAY 10A at a distance of about 100 miles northeasterly from Spokane, Washington. A graveled country road connects the mine with the town and railroad.

PROPERTY AND OWNERSHIP: Whitedelph Mining and Development Company is a Delaware Corporation filed in Idaho, in March, 1926. It has 2,000,000 shares of par value 10 cents stock; 1,687,000 shares are issued.

The Company owns and leases 960 acres of patented land. As this is not patented mining claims, the land does not own extralateral rights on the veins. To the north, the veins dip and strike into adjoining property which should be acquired.

MINING FACILITIES:

Transportation: There are good roads and rail connections between the mine and the smelters at East Helena and Kellogg. Freight on concentrates from Clark Fork to Helena runs from $3.47 per ton for $25.00 valuation to $4.72 per ton on $80.00 per ton valuation.

Power: The mine is connected to the power line of the Washington Water Power Co. which supplies power to the mines of the Coeur d'Alene District. All equipment is electrically driven.

Water: The property is located on the bank of Lightning Creek which furnishes sufficient water throughout the year.

Housing: There is sufficient housing in Clark Fork for a fair-sized crew. No camp at the mine is necessary.

Labor: Experienced miners are scarce but there is an adequate supply of unskilled labor. The wage scale usually runs from 50 cents to $1.00 below the scale at Wallace. However, it is believed that the same scale will be necessary if and when the mines become larger and require more men.

Timber: There are lumber operations and small mills in the district. The price at present is around $40.00 per thousand board feet.

TOPOGRAPHY: Lightning Creek meanders southwesterly through a wide flat valley which lies on the southeast side of the Whitedelph Mine. It joins Clark Fork River at a point about 3 miles above its entry to Pend Oreille Lake. To the northwest of Lightning Creek the hills rise rather steeply to heights of about 500 feet. These hills are covered by brush and small timber. The large timber was cut years ago. The Whitedelph mine buildings and tunnels are located a few feet above the level of the valley.

HISTORY AND PRODUCTION: The first ore of the Clark Fork District was probably discovered in 1888 but the first ore shipments were made from the Lawrence Mine in 1913.

The Whitedelph Mine was discovered in 1926 on patented land owned and being logged by Compton I. White. It has been worked intermittently since mostly by lessers. It has never been adequately financed.

The production of the district from 1913 to 1942 is given by U.S. Bureau of Mines as 190,486 tons containing 37,18 ounces gold; 19,993 pounds of copper; 23,478,863 pounds lead; and 989,746 ounces silver. At the present prices of metals, this production would have a value of $4,500,000 which is a considerable sum from so small a district.

The development of the district has been slow due to the low price of silver that prevailed for years, and due also, probably, to the fact that most of the land in the district is patented and not open for prospecting and location.

GENERAL GEOLOGY

The region is underlain by the Belt Series of Pre-Cambrian sediments. The same formations found in the Coeur d'Alene District are present. The surface rocks at the Whitedelph Mine are the Wallace formation. Although not exposed in the immediate vicinity, it is quite probable that the St. Regis, Burke, and Prichard Formations underlie the Wallace. The beds have a general north strike and dip at the low angles to the east. In the Whitedelph mine, the dips are more northeasterly. Some two miles to the northeast of the Whitedelph Mine is a large granodiorite mass.

A very large fault, known as the Hope Fault, strikes northwest through the district. It is one of the large structures of the region and has a throw of from many thousand feet to probably ten miles. It has been traced for more than 20 miles and is compared to the great Osborn Fault of the Coeur d'Alene District by Alfred L. Anderson in "Geology and Ore Deposits of the Clark Fork District, Idaho", Bulletin 12, Idaho Bureau of Mines and Geology, University of Idaho, 1930.

Also, similar to the Coeur d'Alene District, there are present in the Clark Fork District numerous strong faults and fractures which are probably contemporaneous to the Osborn Fault. The ore bodies in the Clark Fork District are related to the contemporaneous faults just as the ore bodies in the Coeur d'Alene District are related to the contemporaneous faults there.

There are two major and at least two minor faults in the Whitedelph Mine. The major faults are the Pugh and the South Faults. These two may represent part of the same movement; they are parallel in strike, East-West, and are practically merged above the Main Tunnel. However, below the Main Tunnel, the South Fault dips about 80 degrees south, while the Pugh is vertical or has a steep dip north. Both faults have breccia zones of from 2 to 20 feet wide. The South Fault contains drag ore where it cuts the vein on the 400 level. There is ore along the Pugh Fault also but it has the appearance of being vein filling rather than drag.

The Pearl Fault fissure is the productive structure of the Whitedelph Mine. It strikes N40E and dips about 75 degrees southeast. It is a zone 25 feet wide with two well-defined fissures on each wall. The production to date has come from the foot wall or northwest strand.

Two other fault fissures, the Middle and East veins have been discovered but not prospected extensively.

ORE DEPOSITS

The ore deposits consist of shoots of high grade silver copper lead ore in the fault fissures. The ore consists of galena, tetrahedrite, sphalerite and antimonial and arsenical silver minerals. The gangue is quartz and siderite. The wall rock is highly altered or bleached similar to the wall rock of the silver mines of the Dry Belt of the Coeur d'Alene District.

In the Whitedelph Mine, two larger shoots have been mined; one at the north end of the mine and the other at the south end. Each is from 160 to 180 feet long and from 2 to 8 feet wide. The North shoot has been mined from the surface to the 600-foot level and a drill hole driven by the U. S. Bureau of Mines shows it to continue 500 feet deeper. The South shoot has been mined from the surface to the 400-foot level and a winze is now opening it on the 500-foot level. These two shoots are 1500 feet apart. Along the vein between them are several small shoots that pinches on strike and dip.

On the Main Tunnel Level the North shoot was 700 feet long but was not productive over a length of 200 feet below the 100-foot level. Because of water, the north end of the mine could not be examined so the reason for the absence of ore below the Main Tunnel Level could not be determined.

Near the Pugh Fault on the Main Tunnel Level are two stopes that are considered drag ore. The ore on the level, however, has the appearance of vein filling rather than drag ore and it is quite possible that the ore shoots are on a junction of the Middle, Pugh, and Pearl fissures.

The Middle Vein was followed for a distance of 180 feet where it was lost against a north south fault. There are indications that this vein intersects the Pugh on the Main Tunnel Level near the East Cross Cut. The vein strikes N50E and dips from 85 degrees south to 85 degrees northwest. This vein could be tested on the 400-foot Level by a short cross cut.

The East Vein was followed by an adit which is now caved. Notations on the mine maps say: "4' vein-Limonite with scattered galena". The East Cross Cut on the Main Tunnel Level was driven to cut this vein at a depth of 250 feet. The vein was not cut but a north south fault similar to those that offset the Middle Vein was cut at a distance of 350 feet from the Main Tunnel. It is quite possible that the cross cut went through the vein on this fault and the vein can be picked up by drifting along the fault strike.

THE MINE

The mine consists of several adits, an inclined winze to a depth of 400 feet, and two winzes from the 400-foot Level. The two principal adits are the Main Tunnel from the North and the Jim White Tunnel from the south; both are on the Pearl Vein. The Main Tunnel is at an elevation of 200 feet and the Jim White Tunnel at an elevation of 2100 feet. Both are connected to the 400-foot Level by winzes but do not join each other. The arrangement, however, makes a good circulation of air. There are about 5000 feet of lateral workings.

In general the present workings are small and unsuited for large scale operations. The ore must be handled several times. The main winze is an incline with skids for a bucket. The old drifts are narrow, small and crooked; newer ones have been driven with use of mucking machines and are better.

The mine is equipped with a compressor, mucking machine, hoist, battery trammer, cars, machines, etc.

The mill has a rated capacity of 25 tons per 8 hour shift. It consists of crusher, bins, ball mill, classifier, and flotation machines. It is not in operation at present.

ORE RESERVES

There is no ore blocked. The South ore shoot is being developed by sinking a winze from the 400-foot level. It is completed to the 500-foot level but the drift has not been driven.

The north shoot has been mined to the 600-foot level and the drill hole sunk by the Bureau of Mines shows that it continues to an elevation of 1180 feet or 500 feet below the 600-foot level. If the ore shoot maintains its length to that elevation, it should contain about 27,000 tons of ore. The average grade of the ore is about 20 ounces silver per ton which, at present prices, would mean a mill head of about $18.00 per ton. The ore cut in the Bureau of Mines drill hole assayed 16% lead and 22 ounces silver per ton which would mean a mill head of about $67.00 at the present prices.

RECOMMENDATION

The Whitedelph Mines has a strong vein structure, has good ore in small shoots near the surface, and the well rock is highly altered indicating strong mineralization. The ore has been proved to a depth of 500 feet below the bottom of the north ore shoot. It is necessary therefore to prove additional ore and develop the mine.

The following steps are recommended:

1. Make a deal with the Whitedelph Extension Mining Company because the south ore shoot is plunging into their ground.

2. Survey the Whitedelph Extension workings.

3. Continue the Whitedelph Extension diamond drill hole to a depth of 800 feet to test the Pearl Vein at that point.

4. Drill a hole from the same set up N37E -- 54 degrees 1200 feet to test the south ore shoot.

An alternative to 4 -- it may be possible to drill the south shoot from the Whitedelph Extension workings.

5. From the face of the East Cross Cut drill S76W 75 degrees 1100 feet.

If the holes cut ore or vein matter with some ore, start a new shaft at a point above the county road and south of the Pugh Tunnel. A connection can be raised from the 400-foot level. This shaft should be vertical, three compartment and carried to a depth of 1200 feet.

It seems possible to develop additional ore in the workings above the 400-foot level and the following are recommended.

6. On the East Cross Cut, Main Tunnel Level, drift south on the south side of the mineralized fault to pick up the East Vein.

7. Drill or cross cut the block of ground lying south of East Cross Cut and east of the Main Tunnel near the Pugh Fault.

8. Cross cut south east from the 400 North Level at a point 200 feet north of the turn from the shaft.

The cost of this program would be as follows:

Diamond Drilling 3100 feet	$12,000
Drifting and cross cutting	14,000
Shaft sinking	200,000
Drifting new levels	60,000
	$286,000

CONCLUSION

The Whitedelph Mine has geological conditions very similar to those of the silver mines of the Dry Belt of the Coeur d'Alene District. The veins are strong, the wall rock alteration is intense. It has had a very considerable production of silver ore from these veins and there are known ore shoots to follow.

The operation has always been limited by inadequate financing and small ore reserves.

The showing and geology of the Whitedelph warrants the expenditure of money necessary for further testing and if that testing results in favorable results, sufficient money should be provided to develop the mine properly.

The steps recommended should be followed.

Very truly yours,

(signed) H. Grattan Lynch

Exhibit No 9 Coeur d'Alene Mine Loan Application

R. I. 3992

AUGUST 1946

Original set

UNITED STATES
DEPARTMENT OF THE INTERIOR
J. A. KRUG, SECRETARY

BUREAU OF MINES
R. R. SAYERS, DIRECTOR

REPORT OF INVESTIGATIONS

CLARK FORK LEAD-ZINC DISTRICT, BONNER COUNTY, IDAHO

BY

S. H. LORAIN

R. I. 3992,
August 1946.

REPORT OF INVESTIGATIONS

UNITED STATES DEPARTMENT OF THE INTERIOR - BUREAU OF MINES

CLARK FORK LEAD-ZINC DISTRICT, BONNER COUNTY, IDAHO[1]

By S. H. Lorain[2]

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INTRODUCTION

The veins of the Clark Fork district have been mined on a small scale since 1913. In May 1943, the district was examined by an engineer[3] of the Bureau of Mines with a view to possible exploration for larger ore deposits

1/ The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is made: "Reprinted from Bureau of Mines Report of Investigations 3992."

2/ Chief, Albany Division, Mining Branch, Bureau of Mines.

3/ Glenn C. Reed, Albany Division, Mining Branch, Bureau of Mines.

that might be of value to the war effort. The area adjacent to the Hope, Whitedelf, and Lawrence mines was re-examined[4] December 27, 1943. As a result, the Bureau of Mines started exploratory operations in the district during the summer of 1944 which was continued until the late spring of 1946. This report presents the data obtained from the investigation.

ACKNOWLEDGMENTS

In its program of exploration of mineral deposits, the Bureau of Mines has as its primary objective the more effective utilization of our mineral resources to the end that they make the greatest possible contribution to national security and economy. It is the policy of the Bureau to publish the facts developed by each exploratory project as soon as practicable after its conclusion. The Mining Branch, Lowell B. Moon, chief, conducts the preliminary examinations, performs the actual exploratory work, and prepares the final report. The Metallurgical Branch, R. G. Knickerbocker, chief, analyzes samples and performs beneficiation tests.

The exploratory work at Clark Fork was part of the activities of the Albany Division of the Mining Branch, S. H. Lorain, chief. Project work was under the immediate direction of Miro Mihelich, mining engineer, Albany Division, Mining Branch.

Chemical analyses were performed at Reno, Nev., under the direction of A. C. Rice, acting engineer in charge, Rare and Precious Metals Experiment Station, Bureau of Mines.

The author wishes to acknowledge the wholehearted and courteous cooperation extended by officials of the Hope Mining Co. and the Whitedelf Mining Co., on whose properties the work was done.

LOCATION AND ACCESSIBILITY

The producing mines of the Clark Fork district are in Lightning Creek Valley, 1 to 2 miles north of the town of Clark Fork, Idaho. Clark Fork (population 400) is near the eastern end of Pend Oreille lake. It is on U. S. Highway 10 (alternate) and on the main line of the Northern Pacific Railroad (fig. 1). The nearest large supply center is Spokane, Wash., 93 miles by rail or 100 miles by road southwest of Clark Fork. The mines are about 2 miles by nearly level, graveled road from the railroad station at Clark Fork. Freight rates to lead smelters at East Helena, Mont., or Kellogg, Idaho, are nearly identical. The rates on concentrates from Clark Fork to East Helena are as follows:

Per ton valuation	Rate, dollars per ton
$25	$3.47
30	3.64
40	4.02
60-80	4.72

4/ S. H. Lorain, chief, Albany Division, Mining Branch, Bureau of Mines.

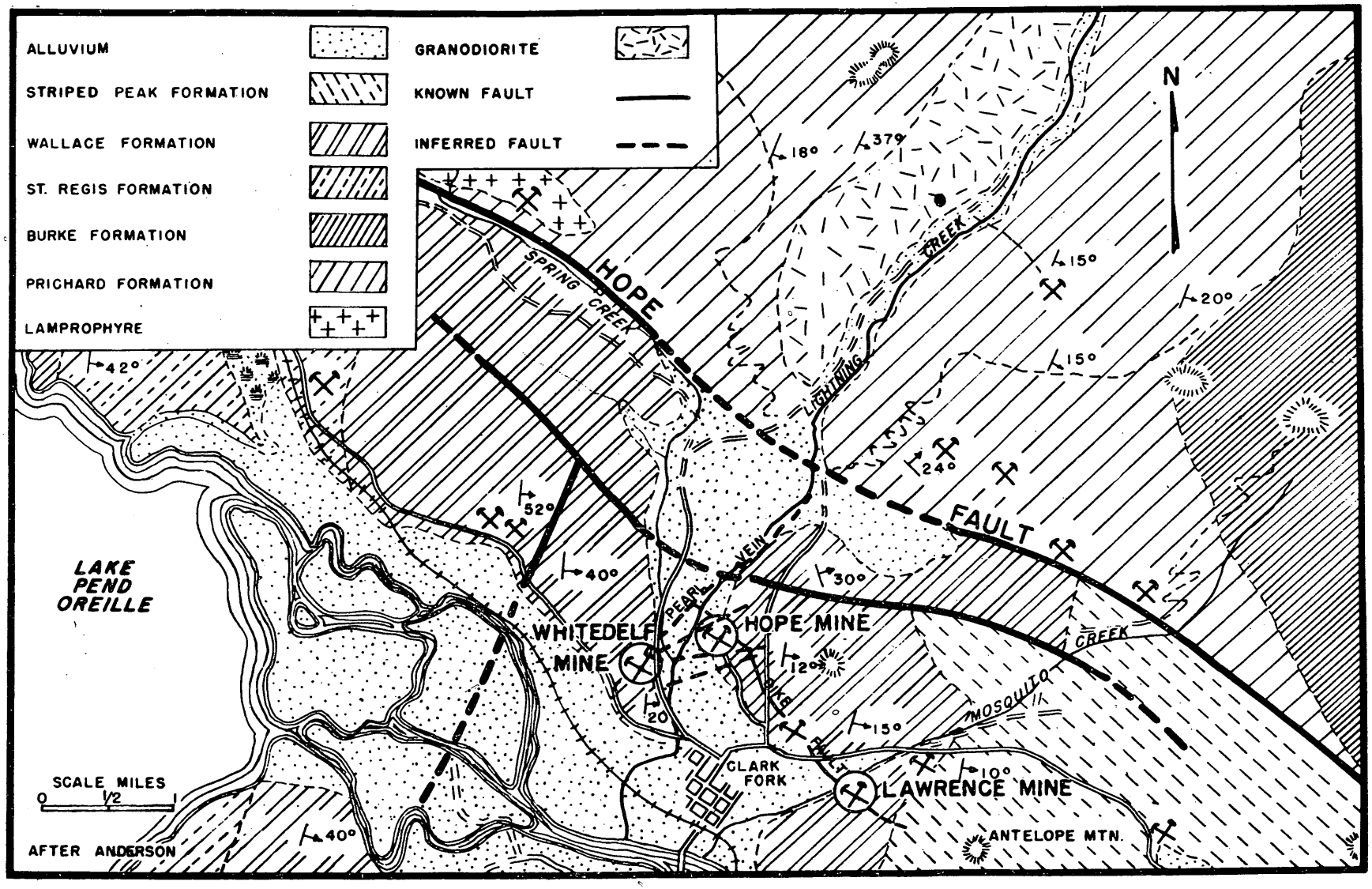


FIG.I GEOLOGY OF PART OF CLARK FORK DISTRICT

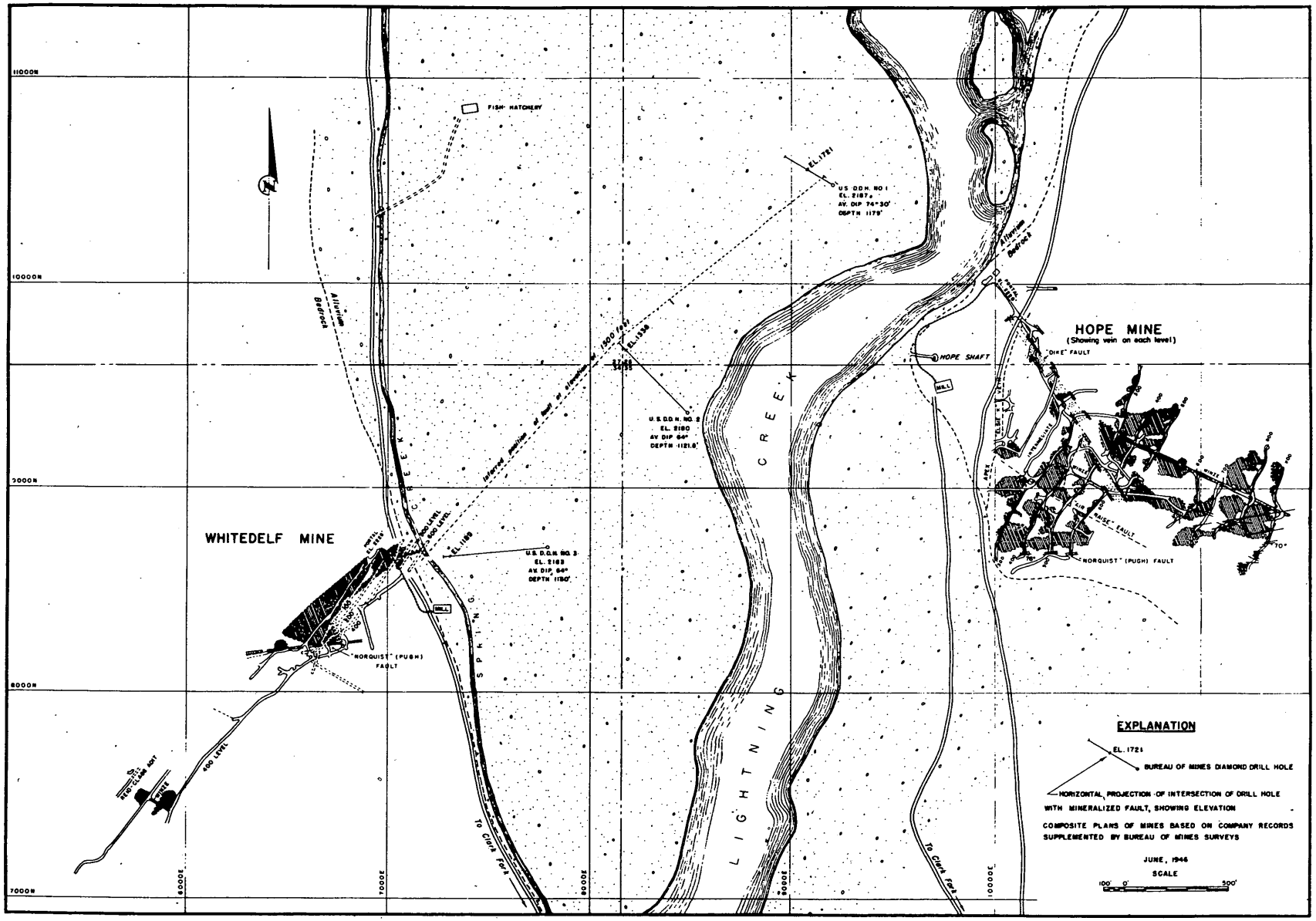


FIG. 2 PLAN SHOWING RELATION OF BUREAU OF MINES DRILL HOLES TO WHITEDELF AND HOPE MINES

HISTORY AND PRODUCTION

The first ore discoveries in the Clark Fork district probably were made shortly after the discovery of ore in the nearby Pend Oreille district in 1888. The first recorded shipments of ore were from the Lawrence mine, in 1913. The Hope vein (fig. 2), originally known as the Elsie K., was discovered in 1923. The Whitedelf vein is said to have been discovered in a road constructed in 1926. Although numerous other veins have been discovered within the district, the only noteworthy production has been derived from the three mines mentioned above. The recorded production from 1913 to 1942, inclusive, is tabulated below:5/

Year	Crude ore, tons	Concentrated, tons	Metal recovered				
			Gold, oz.	Silver, oz.	Copper, lb.	Lead, lb.	Zinc, lb.
1913.....	4,746	355	0.26	4,877	-	-	-
1914.....	324	81	.21	1,326	111	510,579	-
1915.....	457	110	.08	1,455	40	121,914	-
1916.....	454	73	-	943	74	163,308	-
1917.....	762	127	0.08	2,254	160	111,225	-
1918.....	772	128	-	2,195	159	197,271	-
1919.....	144	37	-	518	-	199,753	-
1920.....	-	-	-	-	-	56,514	-
1921.....	-	-	-	-	-	-	-
1922.....	94	-	-	1,458	-	145,167	-
1923.....	36	-	-	535	-	51,970	-
1924.....	-	-	-	-	-	-	-
1925.....	224	34	-	6,080	-	198,078	-
1926.....	1,322	46	0.95	45,760	1,051	1,003,067	-
1927.....	3,028	92	.20	116,661	246	2,179,146	-
1928.....	2,483	71	-	74,461	398	1,445,445	-
1929.....	11,797	660	2.70	88,522	805	1,791,854	-
1930.....	19,182	1,128	-	85,960	2,607	1,992,496	-
1931.....	21,516	1,380	-	89,550	2,629	2,125,320	-
1932.....	11,992	242	-	53,105	1,193	1,189,915	-
1933.....	6,455	414	0.60	24,219	762	642,848	-
1934.....	6,700	-	.50	22,348	450	665,495	-
1935.....	4,764	-	.80	12,713	226	394,546	-

5/ Compiled under the direction of George E. Woodward, supervising engineer, Salt Lake Section, Economics and Statistics Service, Bureau of Mines.

Year	Crude ore, tons	Concentrates, tons	Metal recovered				
			Gold, oz.	Silver, oz.	Copper, lb.	Lead, lb.	Zinc, lb.
1936.....	10,250	-	2.80	37,162	-	1,168,358	-
1937.....	23,806	-	14.00	52,206	-	1,695,466	-
1938.....	12,591	626	4.00	47,320	-	1,346,668	-
1939.....	12,135	798	4.00	48,355	1,597	1,232,797	-
1940.....	12,759	821	3.00	63,279	2,400	1,195,176	-
1941.....	9,616	685	1.00	58,747	3,171	841,867	-
1942.....	12,077	630	2.00	47,737	1,914	812,620	70,000
Total....	190,486	8,538	37.18	989,746	19,993	23,478,863	70,000

Approximately 12 percent of the lead and 2.6 percent of the silver were produced by the Lawrence mine. The remainder of the lead was produced in nearly equal amounts by the Hope and Whitedelf mines. The Whitedelf, however, has produced nearly 67 percent of the total silver. Neither zinc nor copper were paid for prior to 1942, when the premium-payment plan was introduced in connection with the war effort; consequently, the production of these metals was not recorded. Nevertheless, it is estimated that output from the three mines has been approximately 1,600,000 pounds of zinc and 100,000 pounds of copper.

For the past several years the Lawrence and Whitedelf mines have been operated only intermittently and on a small scale by leasers. The Hope mine continued full-scale production until 1944, when the Bureau of Mines demonstrated that the Pearl (Whitedelf) mineralized fault extended into Hope ground. In 1944 the original Hope mine was abandoned, and a shaft (fig. 2) was started for the purpose of exploring and developing the northeasterly and deeper extensions of the Pearl vein.

PHYSICAL FEATURES AND CLIMATE

The town of Clark Fork is on the broad alluvial floor of Lightning Creek Valley (fig. 1) near its confluence with the valley of Clark Fork River. It is about 2,000 feet above sea level and 4 miles east of the eastern shore of Pend Oreille Lake. The mines discussed in this report are in or near Lightning Creek Valley. The Hope and Whitedelf mine plants are on the lower hillsides, very near the outer edges of the alluvial deposits, which in this locality are about 2,700 feet wide and 400 feet deep. The Lawrence mine workings are on the lower slopes of Antelope Mountain, a few hundred feet above the valley floor.

The heavily forested foothills of the Cabinet Range rise sharply from the sides of the river and creek valleys. Within 6 to 7 miles northeasterly from Clark Fork, the summits of the Cabinet Range attain an altitude of 7,000 feet or more.

The climate in the vicinity of Clark Fork is moderate throughout the year. Rainfall is sufficient to support a prosperous farming community in

the Clark Fork Valley and on the large delta near the mouth of the Clark Fork River. In the higher parts of the Cabinet Range, the winters are severe and snowfall is heavy. At the altitude of Clark Fork and the nearby mines snow seldom constitutes a serious problem; it occasionally accumulates to a depth of as much as 30 inches, but during some winters the fall is almost negligible. Normally, the ground is bare of snow from April to December, inclusive.

LABOR AND LIVING CONDITIONS

In normal times a fair supply of skilled mine labor is available in Spokane and in the Coeur d'Alene mining district, which, in turn, derives a considerable part of its labor from the Spokane area. A few skilled miners reside in Clark Fork and in nearby towns. In the past, wage rates in the Clark Fork district have been lower than in the Coeur d'Alene district. It is probable, however, that with deeper mining operations in the Clark Fork district the Coeur d'Alene scale will have to be met. In the spring of 1946, the Coeur d'Alene rate for underground workers ranged from $7.75 for stope muckers to $8.75 for timbermen. As this report is being written (June 1946), negotiations are under way for a substantial increase in these rates. An increase of 18-1/2 cents per hour would raise these rates to $9.23 and $10.23, respectively.

No housing or boarding accommodations are available at the mines of the Clark Fork district; the workers live in Clark Fork. Only very limited accommodations for transients or for a greater number of permanent workers are now available in the town. These accommodations could readily be increased, however, as soon as building materials become available.

PROPERTY AND OWNERSHIP

The Hope mine is owned by the Hope Silver-Lead Mines, Inc. Albert Nash, of Clark Fork, is president and manager. The company owns 360 acres of patented land in the S 1/2, sec. 26. T 56 N., R 2 E, and the N 1/2, sec. 35, T 56 N., R 2 E. It also holds 14 unpatented claims in sections 25 and 26. The company is capitalized for 3,000,000 shares, par value $0.25.

The Lawrence mine is owned by the Lawrence Consolidated Mining Co. Joseph Reed, of Clark Fork, is president and manager. This company holds 12 unpatented claims. It is capitalized for 1,500,000 shares, par value 1 cent.6/

The Whitedelf mine is owned by the Whitedelf Mining & Development Co. Compton I. White, of Clark Fork, is president. The company owns or leases 300 acres of patented land. It is capitalized for 2,000,000 shares, par value 10 cents.6/ According to reports, this company has recently acquired part of the holdings of the Lawrence Consolidated Mining Co.

6/ Campbell, Arthur, Inspector of Mines, Boise, Idaho: Forty-second Annual Report of the Mining Industry of Idaho, pp. 114-115.

MINE WORKINGS AND PLANT

Underground workings on the Hope mine property have a total length of about 11,000 feet. These workings have developed the Hope (Elsie K.) vein for a strike length of 1,300 feet and a dip length of 900 feet (fig. 2). A vertical 2-1/2-compartment shaft is now being sunk from the surface to a depth of 750 feet. It is planned to drive a crosscut from the bottom of this shaft to intersect the Pearl (Whitedelf) vein about 2,800 feet northeast of the Whitedelf mine. In June 1946, the shaft had been sunk to a depth of about 650 feet. The mine and nearby flotation plant are fully equipped for a production of 50 tons per day.

The Whitedelf mine is developed by approximately 5,000 feet of underground workings (fig. 2). These workings comprise a main adit level, which has developed the main ore shoot for a strike distance of about 700 feet, a shaft from the main adit level to the 400-foot level, and a winze to about 250 feet below the 400 level. The winze is now inaccessible. The mine is partly equipped. A 50-ton flotation mill is adjacent to the mine portal.

The Lawrence mine has been developed by 5,000 to 6,000 feet of underground workings, but most of them are now inaccessible. One adit several hundred feet long is being worked intermittently by leasers.

DESCRIPTION OF THE DEPOSITS

General Geology

The general geology of the region has been described by Anderson,7/ and the following is based on his report.

The area is underlain by sedimentary rocks of the Belt series (Pre-Cambrian). This series comprises, from top to bottom, the Striped Peak, Wallace, St. Regis, Burke, and Prichard. An intrusive body of granodiorite is exposed 2-1/2 miles northeast of the Hope mine (fig. 1). The veins described in this report are in the upper and middle parts of the Wallace formation, which Anderson estimates to be over 6,000 feet thick. The Wallace formation is composed of grayish calcareous shales and quarzites interbedded with greenish or bluish shales and argillites. These beds strike N. 15° E. to N. 40° E. and dip 10 to 20 degrees southeasterly. Numerous large lamprophyre dikes traverse the Clark Fork district. One of these dikes follows the "Dike Fault" (fig. 2) through the workings of the Hope mine. Similar dikes, on the strike extension of the dike in the Hope mine, are near the Lawrence mine. Anderson considers these dikes to be definitely premineral.

Faults. - The Hope fault (fig. 1) is 2 miles northeast of the Hope vein. The horizontal displacement along the Hope fault is estimated to be

7/ Anderson, Alfred L., Geology and Ore Deposits of the Clark Fork District, Idaho: Bull. 12, Idaho Bureau of Mines and Geology, University of Idaho, 1930, 130 pp.

many thousands of feet - it may be as much as 10 miles. This fault has been traced for more than 20 miles, from Heron, Mont., to Hope, Idaho. It was probably formed by the same regional movements that formed the great Osborn fault of the Coeur d'Alene mining district.

The course of the Hope fault deviates southward near the Clark Fork district (fig. 1). Numerous strong faults and fractures, which may have been caused by local adjustments to the deviation of the Hope fault, traverse the Clark Fork district. Because of the heavy overburden, only a few of the local faults have been mapped in detail. Most of the local faults that have been mapped are exposed in the various mine workings. The local faults of particular interest to this report are the Pugh (or Norquist), the Dike, the Pearl, and the Elsie K.

The Pugh, or Norquist, fault is exposed on several levels of the Hope mine and on nearly every level of the Whitedelf mine. It is a strong, gouge-filled fissure which strikes S. 85° W. and dips about 75 degrees to the southeast. The principal ore shoots in both the Whitedelf and Hope mines terminate southwesterly against this fault. One good ore shoot in the Whitedelf mine, however, was on this fault a short distance west of its intersection with the main ore shoot. The Pugh fault appears to merge with the Dike fault just beyond the lowest and most southeasterly workings of the Hope mine. The Pugh fault displaces the Pearl fault about 175 feet westward on the south side.

The Dike fault is essentially a shear zone. Where exposed in the Hope mine, it may be as much as 50 feet wide. A strong and very persistent lamprophyre dike occupies part of the shear zone. This fault is well-exposed in the Hope mine; it was intersected by Bureau of Mines drill hole 1 about 1,400 feet northwest of its most northwesterly exposure in the Hope mine. Inferred extensions of this fault may be observed for a distance of about 2 miles southeasterly. The Dike fault strikes N. 40° W. and dips 60 degrees to the southwest. It is weakly mineralized at some places in the Hope mine but does not contain ore at any place where it has been exposed. The Elsie K. vein is displaced about 200 feet to the southeast on the north side of the Dike fault.

The Elsie K. vein occupies parts of a weak but very persistent fault that strikes about N. 40° E. and has an average dip of 15 degrees to the southeast. This fault is nearly parallel to the bedding but is slightly steeper. It tends to follow certain bedding planes for some distance and then cuts obliquely downward to a lower bed. In some places the ore shows a definite tendency to pinch in the steeper parts of the fault; therefore, it may be assumed that movement on the fault was reverse rather than normal. This fault is continuous between the Pugh fault and the Dike fault. It has not been found southwest of the Pugh fault nor for more than about 400 or 500 feet northeast of the Dike fault.

The Pearl fault is a strong shear zone that ranges in width from a few feet to 30 or more feet. Where exposed in the northeasterly workings of the Whitedelf mine, the Pearl fault consists of a central crushed section 3

to 4 feet wide, with 10 to 30 feet of strongly fractured and brecciated wall rock. Its average strike is about N. 40° E.; in the Whitedelf mine it dips 65 degrees to the southeast. This fault has been followed by mine workings 1,500 feet southwest from the Pugh fault and has been followed by mine workings or indicated by diamond-drill intersections for 3,400 feet northeast from the Pugh fault. Its further continuation for a mile or more to the northeast may be suspected from topographic features. The Pearl fault contains a couple of small ore shoots southwest of the Pugh fault, but it is not generally well-mineralized southwest of the Pugh fault. Northeast of the Pugh fault it is strongly mineralized wherever it has been intersected. It has been proved to contain at least one rich ore shoot - the Whitedelf ore shoot.

Ore Shoots

The productive ore shoots of the Clark Fork district are of two types. Flatly dipping veins in weak faults similar to the Elsie K. are the most numerous. The ore shoots worked by the Hope and Lawrence mines were of this type. On the other hand, the ore shoots worked by the Whitedelf mine are on steeply dipping veins in the strong Pearl fault. The main Whitedelf ore shoot has been stronger and more productive than any other ore shoot in the district.

Seven or eight parallel veins have been discovered on the Lawrence property. These occupy small, flat-dipping faults distributed over a vertical range of about 1,000 feet. The aggregate production from these veins has been considerable, but their actual extent has not been recorded in detail. The Elsie K. vein is similar to the veins on the Lawrence property. Its outcrop is slightly lower than the lowest vein outcrop on the Lawrence property. Ore shoots on the Elsie K. vein have been almost continuous for a strike length of about 1,000 feet in the upper levels to 400 feet in the lower levels, for a dip length of about 900 feet. The ore usually occurs as vein fillings or replacements consisting of nearly massive sulfides. The width of these deposits ranged from a few inches to several feet. The veins pinch and swell locally in both strike and dip. The recurrence of ore shoots along the strike is fairly regular but is generally unpredictable in detail. There is some suggestion that the ore shoots are stronger and more productive near the transverse faults. Along the dip, the veins tend to pinch to a narrow gouge seam where the fault steepens to cross the bedding and to widen where the fault conforms exactly with the bedding.

The ore in the main ore shoot of the Whitedelf mine usually occurs as a vein of massive sulfides along the footwall of the central or crushed section of the Pearl fault. In places the vein splits into small, closely spaced stringers; at other places the sulfides may be distributed throughout the fault. According to Anderson,8/ the ore shoot on the main level was 3 inches to 29 inches wide for 500 feet from the portal southwesterly to the Pugh fault; in places it widened to 8 feet of massive sulfides. This ore shoot has been mined continuously from the surface downward for 700 feet.

8/ See footnote 7.

A Bureau of Mines diamond-drill hole has demonstrated the existence of good ore 500 feet below the lowest level.

The Ore

The ore consists essentially of galena, tetrahedrite, sphalerite, and iron sulfides in a gangue of siderite, quartz, and altered wall rock. Alteration of the wall rocks consists chiefly of sericitization. Recent investigations by Anderson9/ indicate that many of the minerals that have been loosely classified as tetrahedrite are actually lead sulfantimonites and sulpharsenites, copper-lead sulfantimonites, and silver-lead sulfantimonites. Anderson has also recognized ruby silver. He lists boulangerite, geocronite, meneghinite, semseyite, jordanite, guitermanite, bournonite, freieslebenite, and pyrargyrite. Anderson postulates two separate periods of ore deposition. These periods were separated by a lowering of the rock temperatures and renewed fracturing of some of the original ore fissures. Deposition during the first period was characteristic of mesothermal temperatures; the sequence was similar to the mineralogic sequence in the Coeur d'Alene mining district; i.e., sericite, siderite, quartz, pyrite, arsenopyrite, sphalerite, and galena. During the second period there was further deposition of quartz, followed by the above-named series of sulfantimonites and sulfarsenites. These minerals are characteristic of relatively low temperature deposition. Minerals of the second period are most abundant in the Whitedelf mine, less abundant in the Hope mine, and are relatively rare in the Lawrence mine. They appear to increase with depth in the Whitedelf mine.

The ratio of silver to lead in the ores that have been produced from the three mines of the district is as follows:

Mine	Ounces Ag	Percent Pb.
Whitedelf.....	1	0.85
Hope.....	1	1.56
Lawrence.....	1	5.44

No accurate records of the zinc content of the ores are available. During 1942, when the Hope mine was paid a premium for the zinc content of its ores, it was indicated that the concentrates contained 1 pound of zinc to 9 pounds of lead. Analysis of the mill heads indicates, however, that the actual ratio may have been more nearly 1 pound of zinc to 6 pounds of lead.

WORK BY THE BUREAU OF MINES

The data obtained from preliminary examinations by Bureau of Mines engineers indicated that the Pearl fault is not only the strongest known ore-bearing fissure in the Clark Fork district but is an ore fissure of

9/ Anderson, Alfred. L., Lead-Silver Mineralization in the Clark Fork District, Bonner County, Idaho: Econ. Geol., vol. XLI, No. 2 (March-April 1946), pp. 105-123.

exceptional strength and persistence by any standards. It had been proved to be ore-bearing from its intersection with the Pugh fault northeasterly to where its outcrop was masked by the thick alluvial deposits of Lightning Creek Valley. Therefore, a decision was made to test its continuity for 2,800 feet northeast from its last exposure at the Whitedelf mine to its intersection with the Dike fault. Inasmuch as the vein apex in the area explored is covered by about 400 feet of alluvium, it was practicable to drill only a few holes for the purpose of proving the continuity and mineralization of the fault. It was believed, and this belief has since been confirmed, that such proof would result in deep level exploration by private enterprise. Accordingly, the Bureau of Mines drilled three holes at the positions shown on figure 2. Each hole intersected a strong mineralized fault at or very near the projected position of the Pearl fault. In order to check the findings from each hole, additional intersections with the fault were obtained by deflecting from the original hole below bedrock. Two deflections were drilled from hole 1, and one deflection each was drilled from holes 2 and 3. The total length of all holes and deflections was 4,686 feet. Some footage was lost by reason of caving ground.

A longitudinal section and cross sections through the holes are shown on figures 3, 4, 5, and 6. The assays obtained from the mineralized sections of the holes are shown on figures 4, 5, and 6.

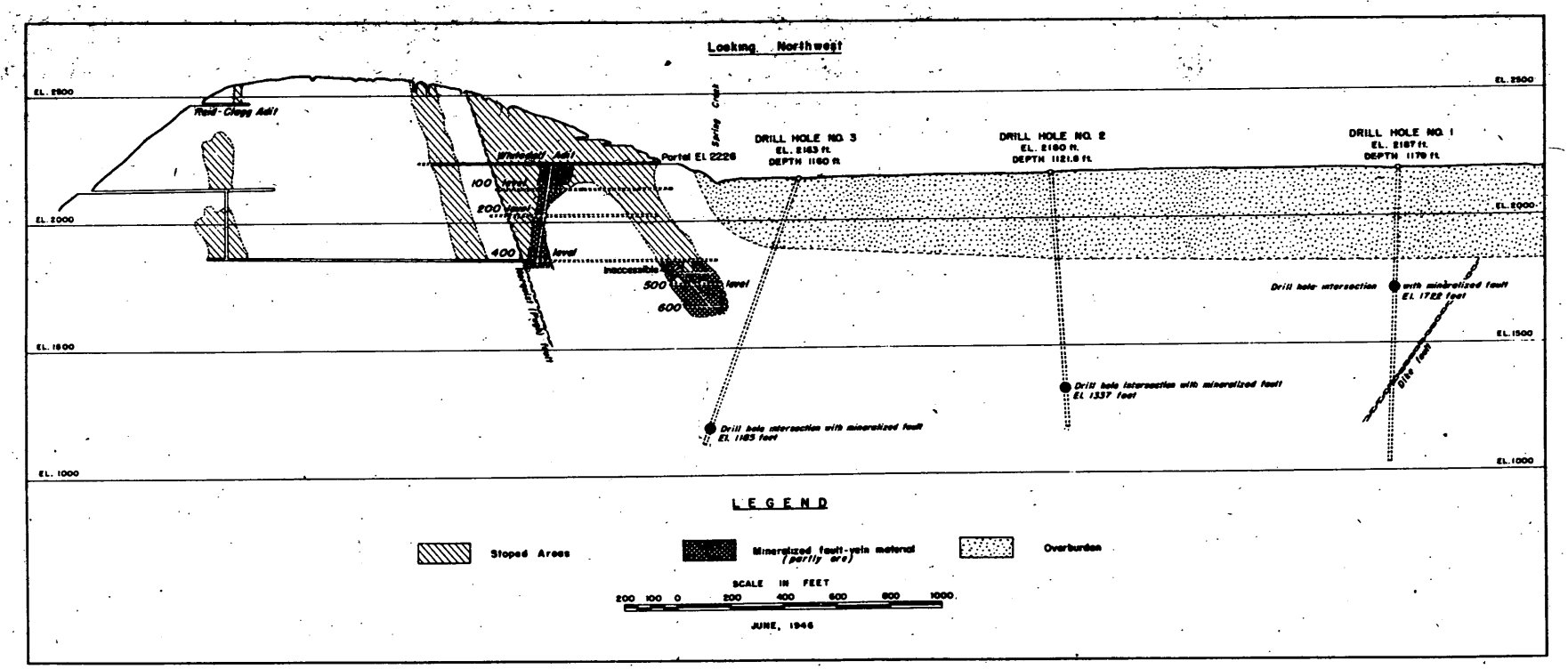
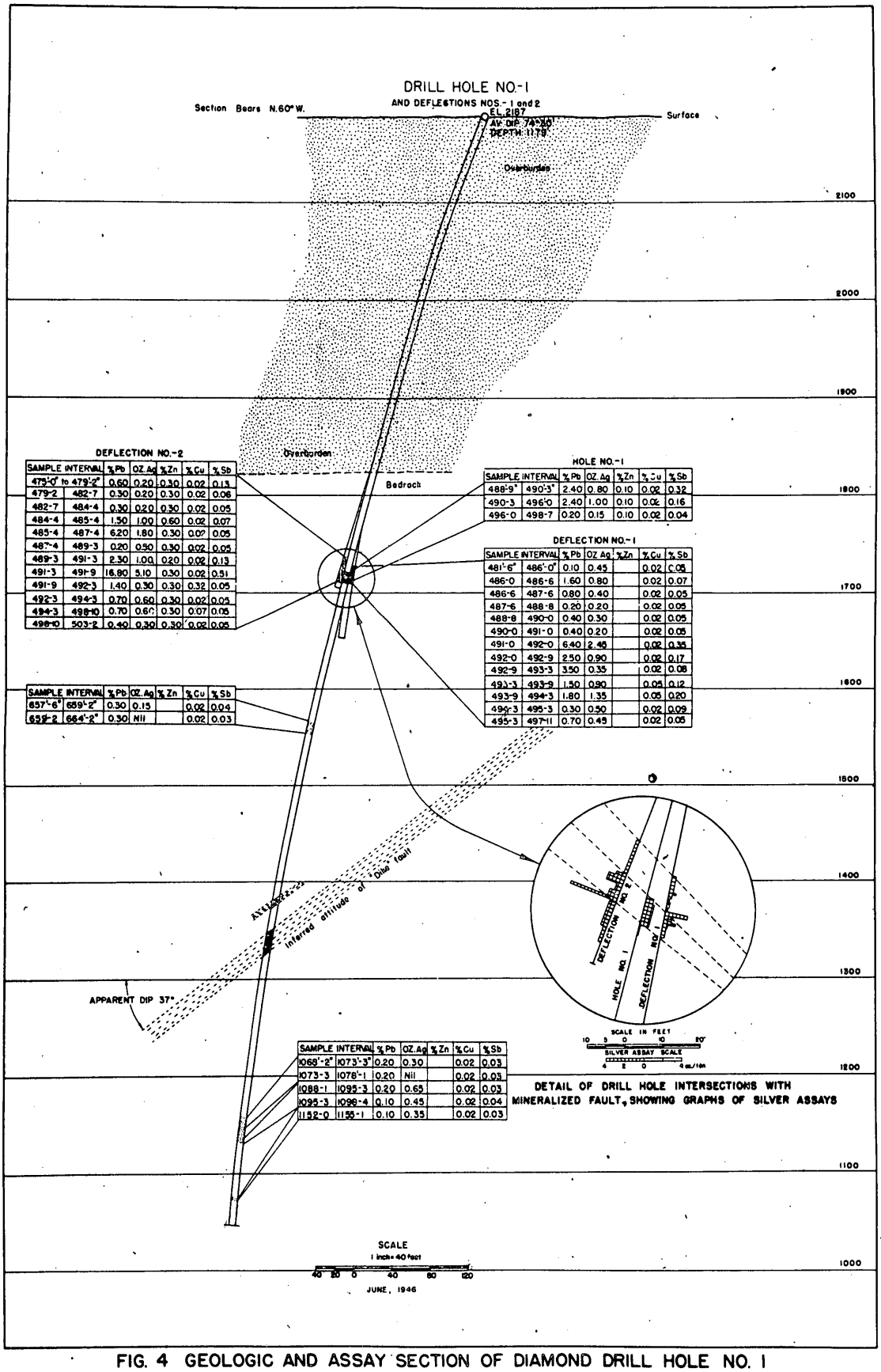


FIG. 3 LONGITUDINAL PROJECTION ON VERTICAL PLANE THROUGH PEARL FAULT



DEFLECTION NO.-2

SAMPLE INTERVAL		%Pb	OZ. Ag	%Zn	%Cu	%Sb
475'-0" to 479'-2"		0.60	0.20	0.30	0.02	0.13
479-2	482-7	0.30	0.20	0.30	0.02	0.06
482-7	484-4	0.30	0.20	0.30	0.02	0.05
484-4	485-4	1.50	1.00	0.60	0.02	0.07
485-4	487-4	6.20	1.80	0.30	0.02	0.05
487-4	489-3	0.20	0.50	0.30	0.02	0.05
489-3	491-3	2.30	1.00	0.20	0.02	0.13
491-3	491-9	16.80	5.10	0.30	0.02	0.51
491-9	492-3	1.40	0.30	0.30	0.32	0.05
492-3	494-3	0.70	0.60	0.30	0.02	0.05
494-3	498-10	0.70	0.60	0.30	0.07	0.06
498-10	503-2	0.40	0.30	0.30	0.02	0.05

HOLE NO.-1

SAMPLE INTERVAL		%Pb	OZ. Ag	%Zn	%Cu	%Sb
488-9"	490'-3"	2.40	0.80	0.10	0.02	0.32
490-3	496'-0	2.40	1.00	0.10	0.02	0.16
496-0	498-7	0.20	0.15	0.10	0.02	0.04

DEFLECTION NO.-1

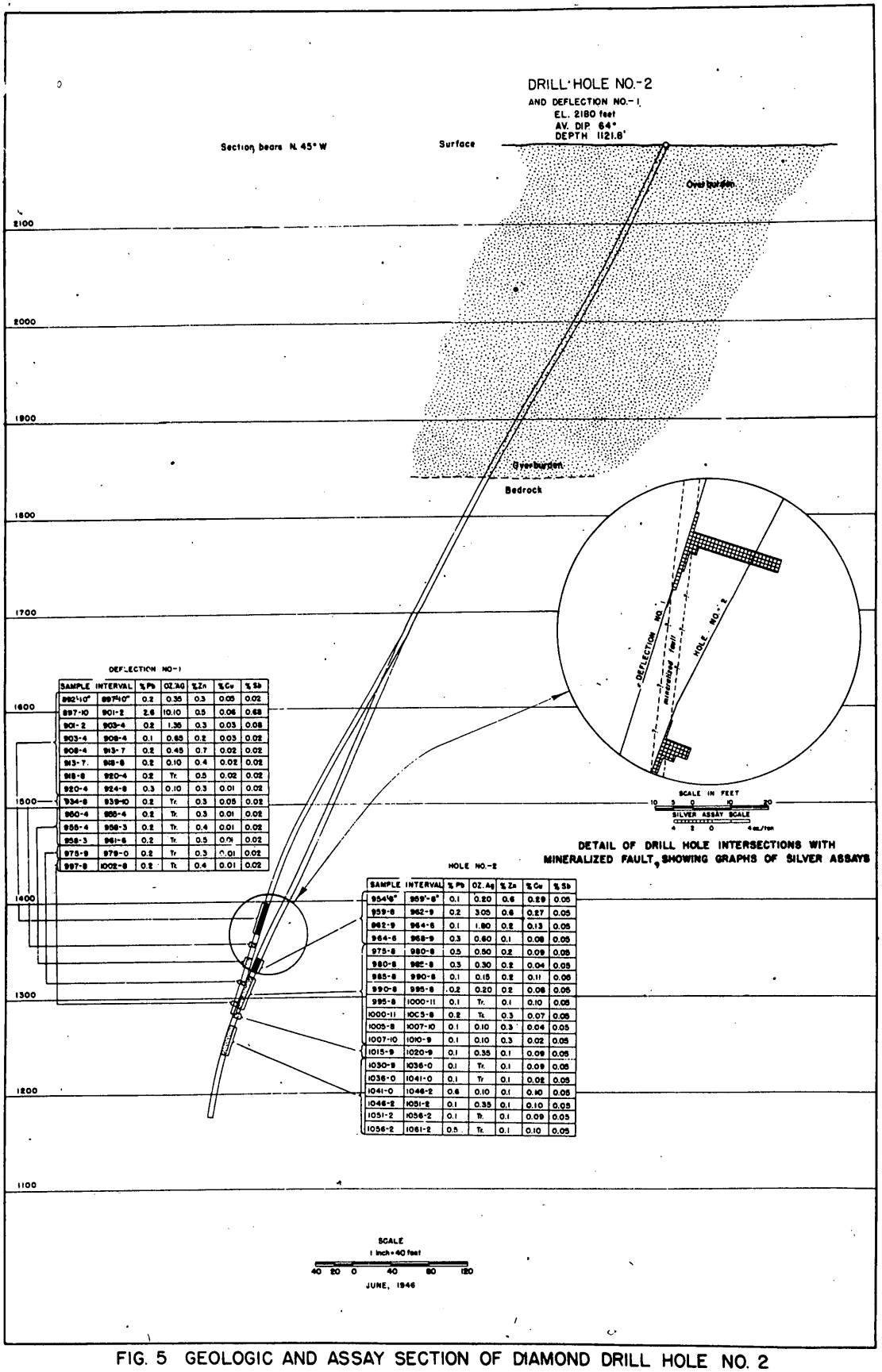
SAMPLE INTERVAL		%Pb	OZ. Ag	%Zn	%Cu	%Sb
481'-6"	486'-0"	0.10	0.45		0.02	0.05
486-0	486-6	1.60	0.80		0.02	0.07
486-6	487-6	0.80	0.40		0.02	0.05
487-6	488-8	0.20	0.20		0.02	0.05
488-8	490-0	0.40	0.30		0.02	0.05
490-0	491-0	0.40	0.20		0.02	0.05
491-0	492-0	6.40	2.45		0.02	0.35
492-0	492-9	2.50	0.90		0.02	0.17
492-9	493-3	3.50	0.35		0.02	0.08
493-3	493-9	1.50	0.90		0.05	0.12
493-9	494-3	1.80	1.35		0.05	0.20
494-3	495-3	0.30	0.50		0.02	0.09
495-3	497-11	0.70	0.45		0.02	0.05

SAMPLE INTERVAL		%Pb	OZ. Ag	%Zn	%Cu	%Sb
657'-6"	659'-2"	0.30	0.15		0.02	0.04
659-2	664'-2"	0.30	Nil		0.02	0.03

SAMPLE INTERVAL		%Pb	OZ. Ag	%Zn	%Cu	%Sb
1069'-2"	1073'-3"	0.20	0.30		0.02	0.03
1073-3	1078-1	0.20	Nil		0.02	0.03
1088-1	1095-3	0.20	0.65		0.02	0.03
1095-3	1098-4	0.10	0.45		0.02	0.04
1152-0	1155-1	0.10	0.35		0.02	0.03

DETAIL OF DRILL HOLE INTERSECTIONS WITH MINERALIZED FAULT, SHOWING GRAPHS OF SILVER ASSAYS

FIG. 4 GEOLOGIC AND ASSAY SECTION OF DIAMOND DRILL HOLE NO. 1



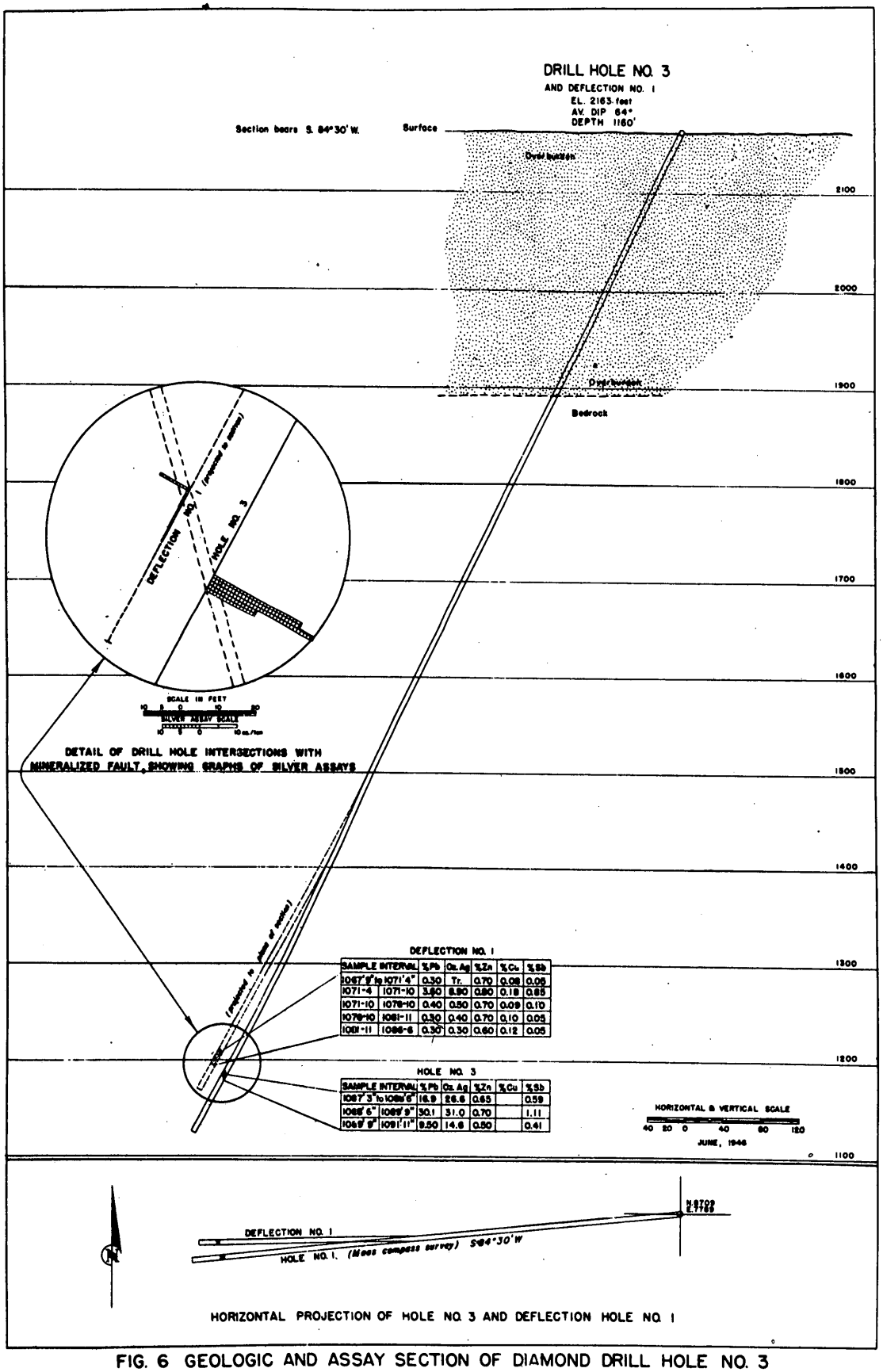
DEFLECTION NO-1

SAMPLE	INTERVAL	% Pb	OZ. Ag	% Zn	% Cu	% Sb
892½-10'	897½-10'	0.2	0.35	0.3	0.05	0.02
897-10	901-2	2.6	10.10	0.5	0.06	0.68
901-2	903-4	0.2	1.35	0.3	0.03	0.08
903-4	908-4	0.1	0.85	0.2	0.03	0.02
908-4	913-7	0.2	0.45	0.7	0.02	0.02
913-7	918-8	0.2	0.10	0.4	0.02	0.02
918-8	920-4	0.2	Tr.	0.5	0.02	0.02
920-4	924-8	0.3	0.10	0.3	0.01	0.02
934-8	939-10	0.2	Tr.	0.3	0.05	0.02
950-4	955-4	0.2	Tr.	0.3	0.01	0.02
955-4	958-3	0.2	Tr.	0.4	0.01	0.02
958-3	961-6	0.2	Tr.	0.5	0.01	0.02
975-9	979-0	0.2	Tr	0.3	0.01	0.02
997-8	1002-8	0.2	Tr.	0.4	0.01	0.02

HOLE NO.-2

SAMPLE	INTERVAL	% Pb	OZ. Ag	% Zn	% Cu	% Sb
954½"	959'-8"	0.1	0.20	0.6	0.29	0.05
959-8	962-9	0.2	3.05	0.6	0.27	0.05
962-9	964-6	0.1	1.80	0.2	0.13	0.05
964-6	968-9	0.3	0.60	0.1	0.08	0.05
975-8	980-8	0.5	0.50	0.2	0.09	0.05
980-8	985-8	0.3	0.30	0.2	0.04	0.05
985-8	990-8	0.1	0.15	0.2	0.11	0.06
990-8	995-8	0.2	0.20	0.2	0.08	0.05
995-8	1000-11	0.1	Tr.	0.1	0.10	0.05
1000-11	1005-8	0.2	Tr.	0.3	0.07	0.05
1005-8	1007-10	0.1	0.10	0.3	0.04	0.05
1007-10	1010-9	0.1	0.10	0.3	0.02	0.05
1015-9	1020-9	0.1	0.35	0.1	0.09	0.05
1030-9	1036-0	0.1	Tr.	0.1	0.09	0.05
1036-0	1041-0	0.1	Tr	0.1	0.08	0.05
1041-0	1046-2	0.6	0.10	0.1	0.10	0.05
1046-2	1051-2	0.1	0.35	0.1	0.10	0.05
1051-2	1056-2	0.1	Tr.	0.1	0.09	0.05
1056-2	1061-2	0.5	Tr.	0.1	0.10	0.05

FIG. 5 GEOLOGIC AND ASSAY SECTION OF DIAMOND DRILL HOLE NO. 2



SAMPLE INTERVAL		% Pb	Oz. Ag	% Zn	% Cu	% Sb
1067' 8" to	1071' 4"	0.30	Tr.	0.70	0.08	0.08
1071-4	1071-10	3.80	8.90	0.80	0.18	0.85
1071-10	1078-10	0.40	0.50	0.70	0.09	0.10
1078-10	1081-11	0.30	0.40	0.70	0.10	0.05
1081-11	1086-6	0.30	0.30	0.60	0.12	0.05

HOLE NO. 3

SAMPLE INTERVAL		% Pb	Oz. Ag	% Zn	% Cu	% Sb
1067' 3" to	1068' 6"	16.9	26.6	0.65		0.59
1068' 6"	1069' 9"	30.1	31.0	0.70		1.11
1069' 9"	1091' 11"	9.50	14.6	0.50		0.41

FIG. 6 GEOLOGIC AND ASSAY SECTION OF DIAMOND DRILL HOLE NO. 3

salaries and overhead expenses except for insurance premiums and the interest on the Company's notes.

Mine Being Developed At No Expense to the Company

In developing the ore in the leased ground the lessees at heavy expense have installed expensive pumping equipment and kept the mine workings below the main adit pumped out, and have extended the tunnel on the 400 level from the main shaft, a distance of 1,000 feet to reach the south ore body. This tunnel has intercepted and exposed a series of ore shoots in following the vein on this level as indicated on the attached profile map. This tunnel has now reached the south ore body, as stated in the enclosed telegram and is being driven ahead on the vein to determine the full length and extent of the recently opened ore shoot on this lower level.

Mine Income Paying Off Indebtedness

As money becomes available and the Company's indebtedness is reduced the work can be resumed in driving the tunnel from the winze in the north ore body to the north boundary line of the Company's property, approximately 1,000 feet distance from the north end of the present tunnel on the 600 level. This will determine the length and extent of the north ore body in the direction of the Hope Mine now in operation less than one-half mile away, across Lightning Creek.

Unsold Treasury Stock Ample to Finance Mine Development

As stated in the April report the pending litigation instituted in the Delaware Courts has seriously handicapped the operation of the mine due to the lack of the necessary capital and restrictions that pending litigation imposes on the sale of the large block of stock remaining authorized and unissued in the Company's treasury which has placed a heavy financial load on the Company's management in financing the Company's mining operation, and made it necessary for President White to make large cash advances to the Company to meet emergencies.

Loyal Support of Stockholders and Creditors Necessary to Success

Your support of the Company as one of its stockholders and the present management in putting through the development program to protect the interest of the stockholders in paying off the Company's indebtedness and to put your mining property into profitable production is greatly appreciated.

COMPTON I. WHITE

MINING ENGINEER'S REPORT

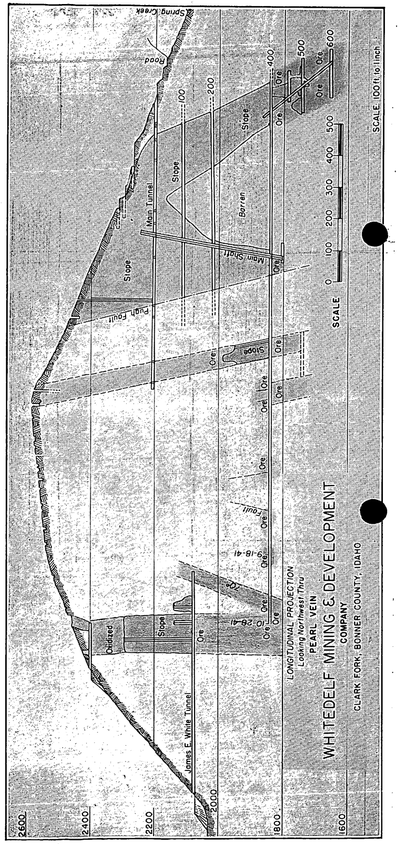
GEOLOGY

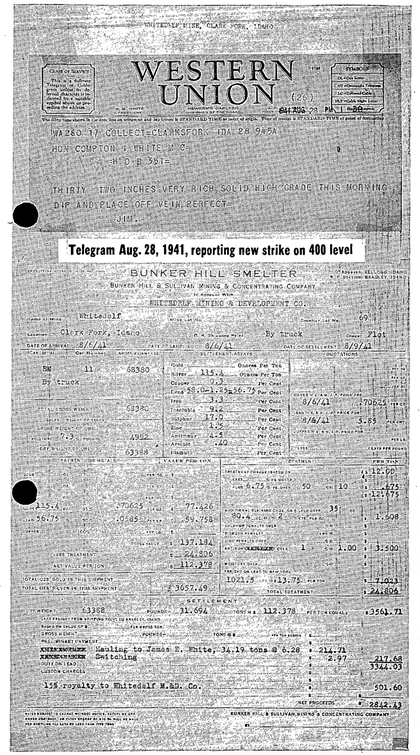
The country rock is the Upper St. Regis and lower Wallace calcareous shales and slates. These are the ore bearing rocks of the Belt series in the Coeur d'Alene mining District. It is in these that the Sunshine and Polaris large silver mines occur.

CONCLUSIONS

It will not be a case of quick returns and short life but steady production and long life from which the aggregate profits will be vastly greater and far more dependable. **It will be an investment rather than a speculation.**

(Signed)—J. H. Eby
Mining Engineer and Geologist





Telegram Aug. 28, 1941, reporting new strike on 400 level

Smelter Returns for Car Concentrates Shipped Aug. 6, 1941, Assaying 115 Ounces Silver and 58 per cent Lead with Net Value of $112.37 per Ton

Exhibit No 11 Attached to Application 1st sub

REPORT

TO THE

STOCKHOLDERS

OF THE

WHITEDELF MINING AND DEVELOPMENT COMPANY

AT CLARK FORK, IDAHO

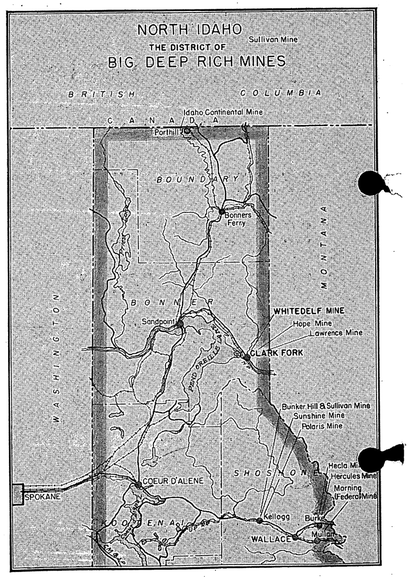
ENGINEERING REPORT

"ASIDE from the large Mines in present operation no property in the Coeur d'Alene District is as attractive for development as the Whitedelf"

—OSCAR HERSHEY

Consulting Mining Engineer
Bunker Hill and Sullivan Mining and Smelting Company

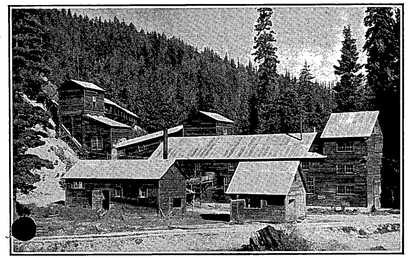
WHITEDELF MINE, CLARK FORK
LOCATION OF MINES



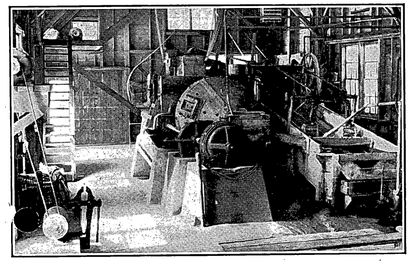
DIVIDENDS PAID BY NORTH IDAHO MINES
UP TO THE END OF 1939

Bunker Hill & Sullivan Mining Company	$53,303,018
Sunshine Mining Company	18,422,907
Polaris Gold Mines, Limited	280,000
Hecla Mining Company	23,105,000
Hercules Mining Company	18,581,227
Federal Mining & Smelting Company	26,048,001
TOTAL	$139,740,153

WHITEDELF MINE, CLARK FORK, IDAHO



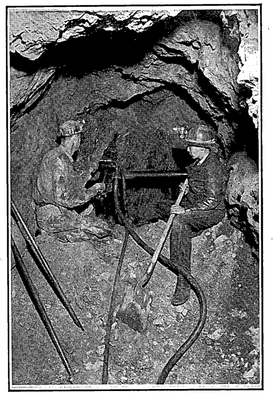
Concentrator (Mill) Whitedelf Mine



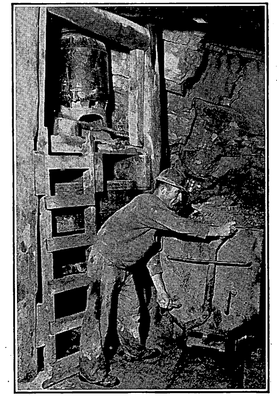
Hardinge Ball Mill and Classifier

Day Crew at Portal of Main Adit

WHITEDELF MINE, CLARK FORK, IDAHO

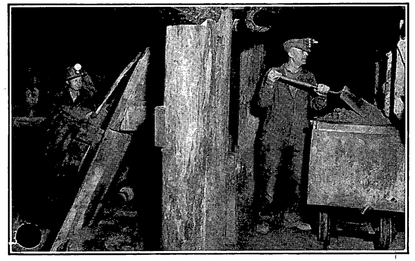


Face of Tunnel on 400 Level

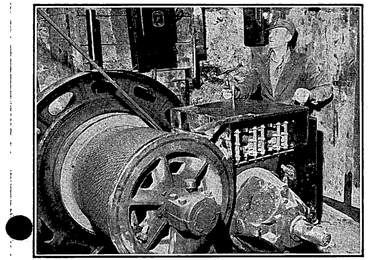


Main Station and Pump, 400 Level

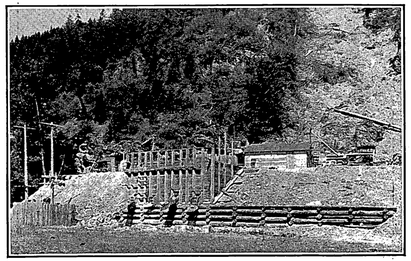
WHITEDELF MINE, CLARK FORK, IDAHO



Mine Station and Ore Bins at Collar Shaft



Main Hoist in Station at Collar of Shaft



Ore Bins and Compressor Plant at Portal Main Adit (In [illegible] Tunnel on South Side of Mountain

NOW, A WORD FROM YOUR PRESIDENT!

Report to Stockholders

This illustrated report of the Whitedelf Mining and Development Company is submitted to the Company's stockholders for their information as to the nature and value of their property and the progress made in developing their mine located at Clark Fork, Idaho, and the difficulties that have hindered the efforts of the management to bring the mine into profitable production.

Pictures and Mine Maps

This report is illustrated with maps and pictures and photostats of communications to demonstrate the present status of the mine which will indicate the prospects of future production and profits as a result of recent developments.

As Reported on April 1, 1941

In the Company's report at the meeting of the stockholders April 1, 1941 a statement was made that:

"As a result of the new ore discoveries and the reduction of mining expenses, the management is pleased to report that your Company is receiving an income from ore sales, which is being applied in reducing the Company's indebtedness. In this connection it might be explained, that the management is seriously handicapped by litigation still pending which prevents the sale of treasury stock to adequately finance the mine operations and the acquisition and installation of needed mine equipment, and to extend the mine workings to lower levels to open new ore reserves, that would materially increase the mine production. (It is interesting to note that the Whitedelf veins are in the same rock structure (the belt series of sedimentary formation) as the big producing mines of the Coeur d'Alene District to the south, that are mining ore bodies that extend to great depth, which have increased in size and richness in the underlying rock strata.)"

New Development

Since this report was submitted the mine operations have been continued under a leasing arrangement which was confined to a block of ground above the 400 level and south of the Pugh fault containing the new ore body recently discovered by the operations of lessees working on a royalty basis.

The money received by the Company as the proceeds from ore production has been applied in reducing the outstanding indebtedness and no part of the money so far received from this source has been paid out for

WHITEDELF MINE, CLARK FORK, IDAHO

Measuring 7 feet 10 inches Solid Ore, Sharpe Stope, North Ore Body

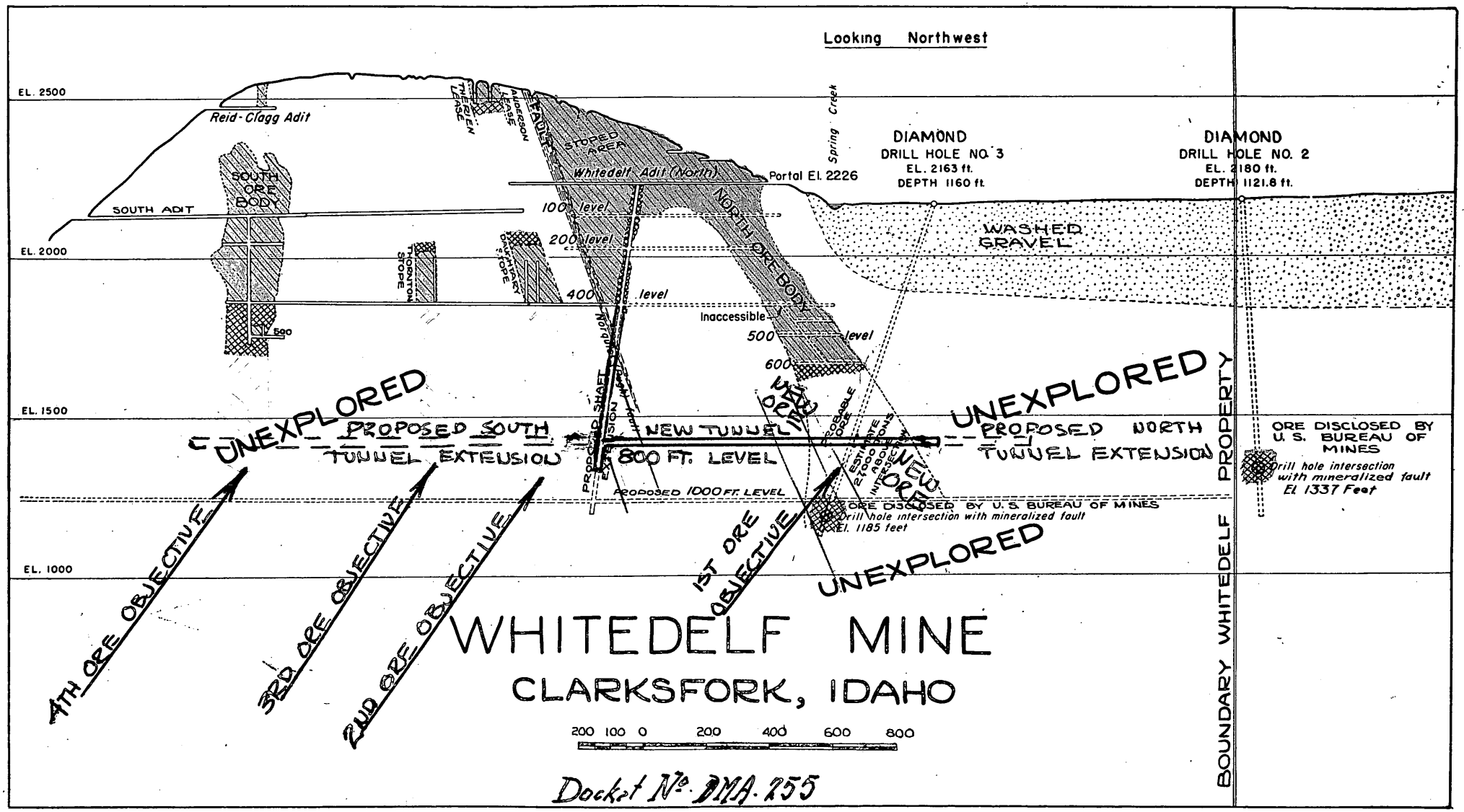

Looking Northwest
EL. 2500
EL. 2000
EL. 1500
EL. 1000
Reid-Clagg Adit
SOUTH ORE BODY
SOUTH ADIT
THORNTON STOPE
DAUGHTREY STOPE
ANDERSON LEASE
THORNTON LEASE
STOPED AREA
Whitedelf Adit (North)
Portal El. 2226
100 level
200 level
400 level
Inaccessible
500 level
600
NORTH ORE BODY
Spring Creek
DIAMOND
DRILL HOLE NO. 3
EL. 2163 ft.
DEPTH 1160 ft.
DIAMOND
DRILL HOLE NO. 2
EL. 2180 ft.
DEPTH 1121.8 ft.
WASHED GRAVEL
UNEXPLORED
PROPOSED SOUTH TUNNEL EXTENSION
NEW TUNNEL
800 FT. LEVEL
PROPOSED 1000 FT. LEVEL
PROPOSED SHAFT EXTENSION
POSSIBLE ORE
ESTIMATE 2,000 ABOVE INTERSECTIONS
NEW ORE
UNEXPLORED
PROPOSED NORTH TUNNEL EXTENSION
ORE DISCLOSED BY U. S. BUREAU OF MINES
Drill hole intersection with mineralized fault
El. 1185 feet
ORE DISCLOSED BY U. S. BUREAU OF MINES
Drill hole intersection with mineralized fault
El. 1337 Feet
BOUNDARY WHITEDELF PROPERTY
4TH ORE OBJECTIVE
3RD ORE OBJECTIVE
2ND ORE OBJECTIVE
1ST ORE OBJECTIVE
UNEXPLORED
WHITEDELF MINE
CLARKSFORK, IDAHO
200 100 0 200 400 600 800
Docket No. DMA-255

Exhibit No 2

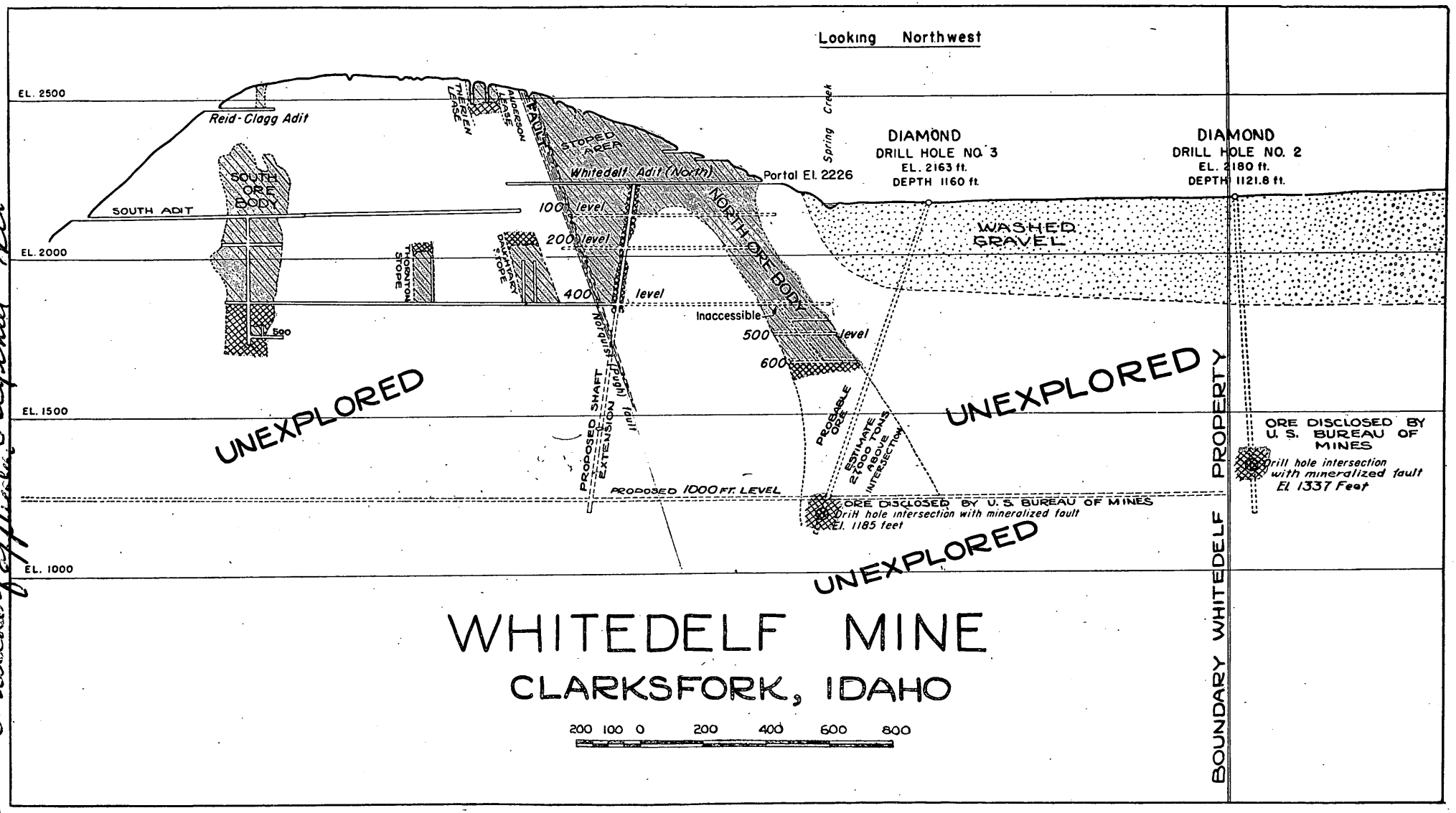


Exhibit B Whitedelf Affiliate original Adit

TABLE 1.

ETCH REACTIONS AND POLARIZATION COLORS OF THE SULPHO-MINERALS.*

Mineral	Composition	Hardness	Color	Polarization Colors	HNO_3	HCl	Miscellaneous
Geocronite	$5PbS \cdot Sb_2S_3$	B	Gray	Pinkish brown, steel blue	Eff. black	Fumes may tarnish slightly but no staining	Has greenish tinge in contact with galena
Jordanite	$4PbS \cdot As_2S_3$	C	Galena white	Light gray, pinkish gray, violet, dark gray	Slow starting, then gray to brown	Negative	
Meneghinite	$4PbS \cdot Sb_2S_3$	C −	White	Strong light gray, pinkish brown, steel blue	Eff. black. Slow starting †	Fumes tarnish slightly. Long etch develops structure	Microchemical tests for Cu. Distinctive
Guitermanite	$3PbS \cdot As_2S_3$	C	Galena white	Reddish brown, steel blue	Eff. slowly and stains iridescent	Negative	
Boulangerite	$5PbS \cdot 2Sb_2S_3$	B +	Galena white	Strong white, steel blue, brownish gray, dark gray	Eff. black. Slow starting	Fumes tarnish some areas slightly	
Semseyite	$9PbS \cdot 4Sb_2S_3$	C	Gray	Strong light gray, bluish gray, brown, dark gray	Eff. black	Fumes tarnish slightly. Surface stains	Very slowly iridescent with KOH
Bournonite	$Cu_2S \cdot 2PbS \cdot Sb_2S_3$	C −	Gray	Greenish gray, dark brown, purple	Some areas light brown after long etching. Fumes tarnish slowly	Negative	
Freieslebenite	$2Ag_2S \cdot 3PbS \cdot 2Sb_2S_3$	C	Galena white	Light gray, brownish gray, dark gray	Some areas very slightly after long etching. Mostly negative	Negative	
Pyrargyrite	$3Ag_2S \cdot Sb_2S_3$	C	Bluish gray	Light gray, steel gray, brown. Some reddish internal reflection	Fumes tarnish	Fumes slowly tarnish, halo does not wash off	Usual reactions to KCn, KOH, and $HgCl_2$

* Minerals are negative to KCn, $FeCl_3$, KOH, and $HgCl_2$ unless otherwise specified.
† Once started the etching rapidly advances as a wave from one side of drop to the other.

Meneghinite.—Meneghinite ($4PbS \cdot Sb_2S_3$) seems to be the most abundant of the sulphosalts at the Hope mine but it is sparingly present at the Whitedelf. Its white color in polished sections makes it impossible to distinguish from galena and boulangerite, despite its slightly greater hardness, but with polarized light its prominent light-gray, pinkish-brown and steel-blue polarization colors make it outstanding, particularly because the polarization colors are stronger than those of boulangerite.

Ordinarily it shows little response to hydrochloric acid, although fumes may produce a slight tarnish, but when the acid is warmed slightly, the mineral develops a distinctive more or less concentric etch pattern as shown in Figs. 3 and 4. It effervesces with nitric acid and turns black. The action is slow in starting but when started advances rapidly as a wave from one side of the drop to the other (according to Short a distinctive property).[8] It gives a microchemical test for copper, which, according to Short, is also a distinctive test.

Like the boulangerite the meneghinite forms veinlets and masses in the galena and may retain residual inclusions of galena and inclusions of pyrite and sphalerite inherited from the galena. Its relations to boulangerite are not altogether clear but small masses or seams isolated or cut off by the boulangerite may suggest that it is the oldest of the two. As it engulfs and penetrates geocronite, it must be younger than geocronite.

Geocronite.—Geocronite ($5PbS \cdot Sb_2S_3$) is fairly abundant at both the Hope and Whitedelf mines, though subordinate to meneghinite and boulangerite. It is the only sulphosalt, except pyrargyrite, that can be distinguished in polished sections without etching or without polarized light. It is not as white as most of the other sulphosalts but it stands out in polished sections mainly because in contact with galena it has a decided greenish tinge which affords enough contrast so that the two may be distinguished in photomicrographs without etching the galena (Fig. 5). Its polarization colors are rather distinctive, being deep pinkish or reddish brown and pronounced steel blue. Its surface is slightly tarnished by hydrochloric acid fumes but the reaction is not always clearly defined. It responds quickly to nitric acid, effervescing and rapidly becoming black.

Most of the geocronite was observed in masses and as veinlets and stringers penetrating and replacing galena (Fig. 6). Some of the masses isolated by boulangerite and meneghinite suggest that the geocronite had formed ahead of the other two.

Semseyite.—Semseyite ($9PbS \cdot 4Sb_2S_3$) was observed only in the ore from the sulphosalt-rich ore shoot (Fig. 2) at the Whitedelf mine where it was rather intimately associated with boulangerite and guitermanite. In polished sections the semseyite is light gray rather than white. Except for this slight difference in color and the fact that it becomes slowly iridescent after long etching with potassium hydroxide, it is similar to the boulangerite. Its reaction to hydrochloric and nitric acids is the same as for boulangerite, but its polarization colors differ slightly, showing less of the white and steel-blue colors and more of the grayish and brownish colors. It also has a rather fine

[8] Idem, p. 117.

granular texture (visible in polarized light) which tends to set it apart from the more coarsely crystalline and lath-like boulangerite.

Some of the finely granular semseyite cuts through the boulangerite in such a way as to resemble zones of finely granulated boulangerite. Such re-

FIG. 3. Peculiar etch pattern developed in meneghinite by action of warm hydrochloric acid. Both the etched and unetched (white) surface is meneghinite. × 110.

FIG. 4. Another etch pattern developed in the meneghinite by the action of hydrochloric acid. × 110.

FIG. 5. Unetched surface showing the slightly darker geocronite (Ge), with inherited inclusions of pyrite (Py), penetrating into and replacing galena (Ga). × 110.

FIG. 6. Geocronite veinlets (white) penetrating and replacing galena which has been etched with dilute hydrochloric acid to bring out the flowage structure. Small crystals of quartz (Q) mostly contemporaneous with the geocronite show in the section. × 110.

almost entirely of sulphosalts. This shoot was about 130 feet long; it contained up to 3 feet of high-grade ore, in bunches and compact seams and patches, and up to 6 feet of milling-grade ore. Small amounts of the late minerals have also been observed in a number of slightly mineralized faults near the Hope and Whitedelf mines, but none have been found at the Lawrence mine nor at immediately adjacent properties.

The late minerals that may readily be recognized include quartz and pyrargyrite; the others are so much alike that they can be distinguished only in polished sections and identified only by etch and microchemical reactions. The complete list of minerals includes quartz, boulangerite, geocronite, meneghinite, semseyite, jordanite, guitermanite, bournonite, freieslebenite, pyrargyrite, and possibly tetrahedrite. Identification was based on etch and microchemical tests outlined by Short.[7] Although mostly indistinguishable from galena without etching or without resorting to polarized light, they stand out vividly when the section is etched lightly with hydrochloric acid or with ferric chloride. Some which react to hydrochloric acid respond so slowly to a quick etch that they are easily separated from the galena. All are etched by nitric acid but the freieslebenite and bournonite react so slowly that they may remain as light gray or galena-white veinlets after the others have become blackened or made iridescent. Most of the minerals have fairly distinctive polarization colors which prove useful for identification. A table summarizing the distinctive etch reactions and polarization colors is given (Table 1).

Quartz.—Quartz belonging to the hypogene enrichment stage was relatively abundant only in the ore shoot composed almost entirely of various sulphosalts at the Whitedelf mine. There it formed rather loosely meshed, partly interlocking crystals cemented and in part penetrated by needles and laths of sulphantimonites and sulpharsenites. It forms a very subordinate part of the ore shoot as a whole, and it seems to be absent except for occasional microscopic crystals from all the other deposits in the district.

Boulangerite.—Boulangerite ($5PbS \cdot 2Sb_2S_3$) appears to be the most abundant of the sulphosalts at the Whitedelf mine but is present in almost negligible quantities at the Hope mine. In polished sections its galena-white color makes it very difficult to distinguish from galena except with the aid of polarized light, when it gives rather strong almost white, gray, dark-gray, brownish-gray and steel-blue polarization colors. These colors tend to set it apart from the other sulphosalts, except semseyite, which has somewhat similar polarization colors but otherwise is light gray rather than galena-white and has a more finely granular structure. The boulangerite is only slightly tarnished by hydrochloric acid fumes, and, although it tends to effervesce with nitric acid and turn black, the action is slow in starting.

Some of the boulangerite forms stringers less than an inch thick in the country rock, but most of it is in irregular seams, bunches, and stringers from a fraction to an inch or more thick that replace galena, or as veinlets along galena contacts.

[7] Short, M. N.: Microscopic determination of the ore minerals. U. S. Geol. Survey Bull. 914, 1940.

for remnant grains and crystals of it are enclosed in the sulphides and patches and stringers are cut and replaced by ore. Although deposition of much of the quartz apparently preceded the deposition of early sulphides, the presence of isolated quartz crystals in the galena suggests that some quartz also was deposited with the ore minerals.

Barite.—Barite is exceedingly rare, having been noted in only two places, one as a filling less than an inch thick between walls of coarse white comb quartz, the second as scattered microscopic crystals in or near seams or stringers of quartz in silicified wall rock. Its relations prove it to be younger than quartz, but there is nothing to indicate its age with respect to the sulphides. Since it is closely associated with the quartz, it may, like the quartz, have been deposited before the sulphides.

Calcite.—Calcite, though it generally escapes notice, is more or less widely distributed through the district, chiefly in microscopic stringers that cut the sulphides. At one place tiny flat rhombohedrons encrust sulphides and in another place crystalline crusts as much as a fourth of an inch thick occupy fractures in galena; but elsewhere the calcite was recognized only microscopically as fracture fillings in the sulphides, with such relations as to indicate that it is the youngest of the early-stage minerals, having apparently been deposited just after the last of the galena.

Rhodochrosite.—Rhodochrosite occurs sparsely in little stringers of no great persistence along some minor slips in the Hope mine. As it was not observed in contact with the ore, its position in the depositional sequence is in doubt.

LATE MINERALS (HYPOGENE-ENRICHMENT STAGE).

General Features.—Most of the sulphantimonites and sulpharsenites that make up the late additions to the ore form lead-gray to steel-gray granular masses, which may easily be mistaken for tetrahedrite except in a few places where they form fibrous and divergent groups. These younger minerals occur for the most part as irregular veinlets and bodies in the galena, especially in deformational zones near and along the margins of the ore seams. Stringers of them also penetrate and replace fractured siderite, and masses of them cement the marginal sphalerite, apparently in part by replacing the galena that previously had cemented the sphalerite. This latter relationship is suggested where remnants of the galena remain in the sulphosalts that cement the sphalerite. Deposition, however, has not been effected by replacement alone; stringers have been observed along some of the fault zones that contain but little galena. Some of the ore in one part of the Whitedelf mine is made up of curved laths and needles of sulphosalts that penetrate and lie between crystals of quartz.

The late minerals are visible throughout the Hope mine; in places they make up fully a third of the ore. They are even more abundant at the Whitedelf mine. On upper levels of the Whitedelf they made up from a tenth to a fourth of the ore, but with depth the proportion of sulphantimonites and sulpharsenites seemed to increase and in places these minerals made up more than half of the ore. In the southwest ore shoot (Fig. 2), the ore consisted

lationships suggest that the semseyite is somewhat younger than the boulangerite and that it replaces the boulangerite.

Jordanite.—A small amount of jordanite ($4PbS \cdot As_2S_3$) was identified in some of the ore from the southwest shoot at the Whitedelf mine that consisted almost entirely of sulphosalts. Its presence perhaps explains in part the increased arsenic content of the ore shipped from that body in 1940, when the shipments contained twice as high a percentage of arsenic as those of other years. The jordanite, though slightly harder, closely resembles boulangerite in polished sections but possesses distinctive though rather weak light-gray, pinkish, violet, and dark-gray polarization colors. It is slow in its reaction to nitric acid but when action starts the surface quickly turns gray to brown. It does not seem to be affected by hydrochloric acid or its fumes.

Most of the grains and masses of jordanite were isolated, but a few were intimately associated with guitermanite. Its relations to other sulphosalts is unknown.

Guitermanite.—Guitermanite ($3PbS \cdot As_2S_3$) is more abundant than jordanite but is one of the minor minerals, apparently confined to the sulphosalt-rich shoot at the Whitedelf mine. It is probably largely responsible for the increased arsenic content of the ore shipped from that shoot. It has the same hardness and color as the jordanite, appearing in galena-white grains and masses in polished sections, but its polarization colors—reddish brown and steel blue—are quite distinctive, also its reaction to nitric acid with which it acts slowly and stains iridescent. It is the only mineral other than tetrahedrite that stains iridescent with nitric acid.

As shown in Fig. 7, it forms some fairly pure masses where it is isolated or protected from other sulphosalts but otherwise it appears to be intimately associated with or penetrated by semseyite or boulangerite, as though in part replaced by them.

Bournonite.—Bournonite ($Cu_2S \cdot 2PbS \cdot Sb_2S_3$) reappears with the younger minerals in the ore at the Hope and Whitedelf mines, but only as a very minor constituent. It becomes visible microscopically when the associated minerals have been etched by nitric acid. Although bournonite itself reacts to nitric acid, it does so very slowly and the effects (a light tarnish by the fumes and a weak brownish staining by the liquid) are so slight that the light colored veinlets stand out conspicuously in the highly etched galena and the other sulphosalts. Its polarization colors—greenish gray, dark brown, and purple—are fairly distinctive, but as much of the mineral forms minute stringers and few large masses, the polarization colors are rarely striking and the bournonite is difficult to distinguish from freieslebenite, which has weaker and different polarization colors.

This younger generation of bournonite may be responsible for the high copper content of the ore at both the Hope and Whitedelf mines. In the latter mine, most of the ore shipped between 1939 and 1941 inclusive contained from 0.01 to as much as 0.5, and some of it contained as much as 0.8 per cent copper, whereas the ore shipped earlier contained less than 0.01 per cent copper. The increase came when ore notably rich in the sulphosalts was mined. The ore at the Hope mine likewise has fluctuated between 0.01 and 0.2 per

cent copper. The ore at the Lawrence mine, on the other hand, has never contained more than 0.01 per cent copper; that minute quantity probably represents the percentage of copper in the ore deposited throughout the district during the early stages of mineralization, any greater amount being due to enrichment during the later hypogene stage.

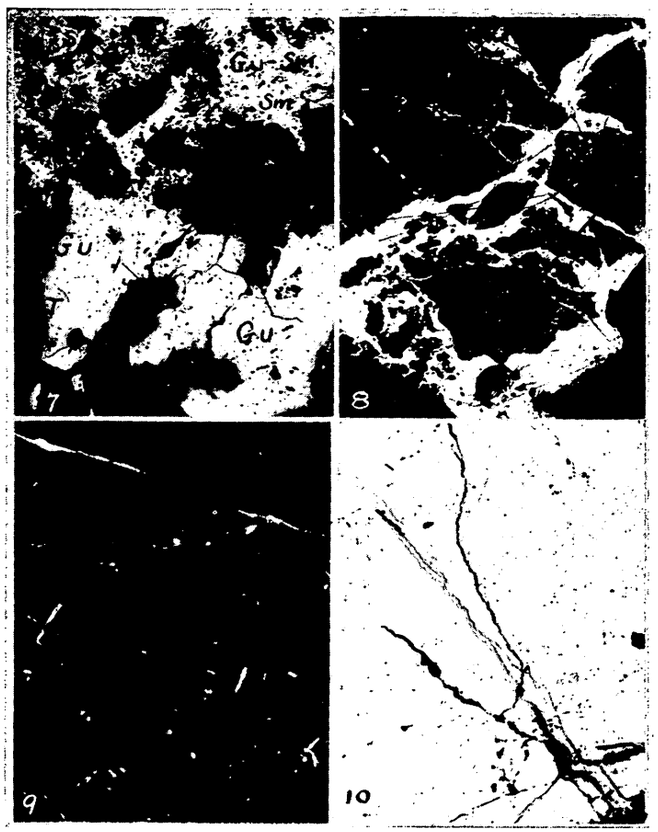


FIG. 7. Guitermanite (Gu) largely enclosed and protected by quartz crystals (black) merging with an intimate mixture of guitermanite and somewhat darker semseyite (Gu and Sm). The intimate association of the guitermanite and semseyite apparently has resulted from the penetration of and the partial replacement of the guitermanite by semseyite. A rounded grain of tetrahedrite (T) shows near the edge of the main body of guitermanite. × 110.

FIG. 8. Veinlets of freieslebenite (white) cutting and replacing boulangerite, revealed by etching the surface of the polished section with nitric acid. Grayish black quartz shows along one side and end of the photomicrographs. × 110.

FIG. 9. Small veinlets and grains of freieslebenite in meneghinite revealed by etching the surface of the polished section with nitric acid. × 110.

FIG. 10. Veinlet of pyrargyrite (light gray) penetrating and replacing galena (white) along a fracture. × 110.

with the ore, however, to have appreciable effects on smelter returns, the arsenic content ranging up to 0.1 per cent in ore that has not been enriched in sulphosalts.

Much of the arsenopyrite forms minute rhombic crystals, but some of the crystals enclosed in sphalerite and galena have indented borders and rather irregular outlines. The crystals apparently were not so easily replaced as those of pyrite. Most of the arsenopyrite, like the closely associated pyrite, impregnated the bordering walls of the ore seams, lying alongside them rather than within them. The association of the arsenopyrite with equally minute crystals of pyrite in the wall rock suggests that both were deposited at about the same time and in advance of the other sulphides.

Siderite.—The siderite is an ever-present but not abundant mineral, being conspicuous in only a few places. It is generally very subordinate to the other minerals, probably because much of that which may have been deposited has been largely replaced by sphalerite and galena.

The siderite has a pale-buff color. It is manganiferous and yields a black gossan when oxidized. It exhibits a marked tendency to form regular crystals; perfect rhombohedra not uncommonly impregnate the sericitized wall rock and form crusts on rock fragments in breccias. In places these crusts are covered or partly covered by sulphides. The siderite also occurs in more massive form, particularly in stringers and irregular veinlets in the fractured wall rock and in thin sheets along walls of the ore seams. These sheets have generally been so brecciated by faulting movements and then so extensively replaced by the ore minerals that remnants are strewn along the marginal parts of the ore seams, forming small, bleblike inclusions, small discontinuous pods and interrupted layers, or more isolated grains. Siderite is therefore most conspicuous in veinlets and small bunches in the wall rock, beyond the reach of the sulphides.

The extensive replacement of the siderite by sulphides shows it to be an early mineral; it is in fact the earliest mineral in all deposits except one. In this exceptional instance it forms a layer on quartz, whereas elsewhere it is penetrated and replaced by quartz as well as by sulphides.

Quartz.—Quartz is considerably less abundant than siderite and ordinarily is not visible in the early-stage ore except in polished and thin sections. In some places, however, it forms small stringers and masses in the fractured wall rock and small crystals and grains within the ore itself. Veinlets and irregular masses are composed of white granular quartz; crystals also are white. In some places the crystals form drusy crusts on breccia fragments of the wall rock, but in ore bodies the crystals are isolated and enclosed by sulphides.

At the Ralph property just east of the Lawrence mine two generations of quartz have been recognized, one earlier than the siderite and one later. In this exceptional occurrence the quartz-encrusted fragments of country rock are coated by siderite, and the siderite in turn is covered with quartz; but elsewhere throughout the district the quartz has been deposited on siderite crystals or in stringers or irregular patches that cut and replace the siderite as well as the country rock. For the most part, the quartz is older than the sulphides,

occurs in fractures in the sphalerite or partly encloses small grains of sphalerite, it is younger than the sphalerite, but as it also forms irregular island-like inclusions in the galena, it is older than the galena.

Bournonite.—Bournonite ($Cu_2S \cdot 2PbS \cdot Sb_2S_3$) appears with the early as well as with the late group of minerals. The early bournonite is confined to widely scattered microscopic grains which form minute masses enclosed in galena, and, as in the Coeur d'Alene region,[6] narrow margins on tetrahedrite inclusions in galena. Some enclosed tetrahedrite is also cut by tiny veinlets and is also embedded by small grains of bournonite. These relations may at least in part indicate that the bournonite was formed during the replacement of tetrahedrite by galena; the tetrahedrite, which forms irregular island-like residua in the galena, contributed the copper, antimony, and some of the sulphur, and the lead-bearing solutions contributed the lead and perhaps a part of the sulphur. The position of bournonite in the sequence, therefore, is between tetrahedrite and galena; perhaps in part as a reaction rim between them. The younger generation of bournonite, as will be shown later, replaces the galena.

Pyrite.—Small remnant grains of pyrite are invariably present in the marginal parts of the ore bodies, and scattered crystals of it occur in the bordering wall rock. It is not conspicuous except in some of the fissure and breccia zones that were not impregnated with galena. It seems probable that deposition of some of the pyrite may have been associated with the wall-rock alteration, and that some may have accompanied the later sulphides.

The crystals and grains of pyrite are generally minute, but pyritohedral faces can usually be distinguished even on the smallest crystals. Crystal outlines are absent only where the mineral has been partly replaced by sphalerite, galena, and locally by the younger sulphosalts. Pyrite forms a few massive granular aggregates, but they are small and relatively inconspicuous. In zones of brecciated rock not filled with ore, it tends to form thin crystalline crusts on breccia fragments, much of it being in thin patches on the surface of the altered rock. Where it impregnates the wall rock it is in rather sparsely disseminated crystals.

As the pyrite has been engulfed in sphalerite and galena and locally replaced by them, it is clearly older than either; but it is younger than siderite, for in places pyritohedrons encrust crystal faces of siderite and are aligned along cleavage planes in the siderite. Locally pyrite and quartz are closely associated and one or both fill fractures in siderite or form veinlets replacing siderite. So little pyrite is enclosed in the galena as to suggest that in the main masses of ore, pyrite was almost entirely replaced by the younger ore minerals.

Arsenopyrite.—Arsenopyrite has been identified along all of the mineralized faults, but only in minute grains and crystals, which as a rule are sparsely disseminated so that the mineral can ordinarily be detected only under the microscope. It usually occurs in silicified walls bordering the ore seams, rarely as inclusions in the sphalerite and galena. Enough of it is associated

[6] Anderson, R. J.: Microscopic features of ore from the Sunshine Mine. Econ. Geol., vol. 35, pp. 662–665, 1940. Willard, M. E.: Mineralization at the Polaris Mine, Idaho. Econ. Geol., vol. 36, p. 595, 1941.

Tetrahedrite.—Occasional microscopic grains of tetrahedrite have been observed as inclusions in sulphosalts, in part as grains inherited from the early-stage galena mineralization, in part, particularly in the sulphosalt-rich ore shoot at the Whitedelf mine, as grains possibly deposited during the stage of hypogene enrichment. One such small grain inclusion is shown near the border of the main mass of guitermanite in Fig. 7. A few larger grains have been observed in more isolated parts of the younger-stage quartz, less closely associated with the sulphosalts.

Freieslebenite.—Freieslebenite ($2Ag_2S \cdot 3PbS \cdot 2Sb_2S_3$) occurs as microscopic stringers and grains in the ore at both the Hope and Whitedelf mines. Because of its galena-white color in polished sections it cannot be distinguished from galena and the various sulphosalts until the minerals associated with it have been blacked out by etching with nitric acid. The freieslebenite is negative to nitric acid or is only lightly stained at the most and it therefore stands out, as shown in Figs. 8 and 9, as whitish veinlets cutting and replacing the sulphosalts. The veinlets are generally not so large nor so closely spaced as those shown in Fig. 8 but are more widely scattered through the other minerals, more like the veinlets and grains shown in Fig. 9. Except in very local occurrences, the freieslebenite is considerably more abundant than the rather closely associated bournonite, which it tends to resemble but from which it differs in its light-gray, brownish-gray and dark-gray polarization colors.

Although the freieslebenite is visible only under the microscope, it is apparently one of the most important of the ore minerals in the district, and it may be the source of a large part of the silver production at the Hope and Whitedelf mines. The ore at the Lawrence mine, which does not contain this mineral, averages about 15 ounces of silver to the ton of concentrates. These concentrates, which average 75 per cent lead, appear to contain the silver in argentiferous galena, which had only sparse microscopic inclusions of tetrahedrite. On the other hand, the concentrates at the Hope mine, which average less than 70 per cent lead but carry appreciable amounts of freieslebenite, contain 2 to 3 times as much silver as the concentrates at the Lawrence, whereas the concentrates at the Whitedelf mine contain 3 to 4 times as much silver as those at the Lawrence. In 1940 and 1941 the silver-lead ratio at the Whitedelf was somewhat higher still—probably not because of any material increase in the amount of freieslebenite but because of the presence of pyrargyrite.

Pyrargyrite.—Pyrargyrite ($3Ag_2S \cdot Sb_2S_3$) has thus far been observed only at the Whitedelf mine, and there only in the southwest ore shoot composed almost entirely of sulphosalts. It is fairly abundant in this ore shoot, where it is plainly visible in places as scattered grains and irregular stringers in the ore, particularly along fractures that cut the masses of lead sulphosalts and galena. In polished sections it is easily detected without etching, for it shows as grains and veinlets cutting across and replacing the various sulphosalts and galena (Fig. 10). As it is not so intimately associated with the group of sulphantimonites and sulpharsenites as is freieslebenite and as it has been found not far beneath a steep ridge slope where ground water circulation is possible, it may be supergene.

The presence of pyrargyrite markedly increases the silver content of the ore in which it occurs. Through much of the Whitedelf mine the silver-lead ratio has been about one ounce of silver to each per cent of lead, but in the shoot that contains the pyrargyrite the ratio commonly ranges from 2:1 to 3:1 and goes as high as 6:1. The last two shipments of concentrates in 1941 contained 210.5 and 237.5 ounces of silver to the ton and 38.6 and 36.6 per cent lead respectively.

PARAGENESIS.

Since many data on mineral succession have been included in the descriptions of the individual minerals, little more than a summary of the paragenesis need be given. The order in which the minerals were deposited during the early (Coeur d'Alene) stage of mineralization is particularly well defined, for wherever the minerals were not deposited as successive crusts in open spaces, minor faulting contemporaneous with ore deposition fractured and crushed the earlier minerals, which were then cemented and partly replaced by later minerals. During the second (hypogene-enrichment) stage of deposition, the combination of mineralization and repeated faulting was not so prominent; the order in which the various sulphosalts were deposited is therefore not so easily interpreted. A summary of the paragenetic sequence of the minerals in the ore is given in Table 2.

In all of the principal deposits mineralization was initiated by deposition of siderite in fractures, accompanied by replacement of the bordering country rock, which prior to this had been rather extensively sericitized by the mineralizing solutions. A period of minor faulting followed before other minerals were introduced. Much of the siderite that had been deposited, except that in the walls, was more or less extensively brecciated by this faulting, after which quartz and then sulphides were brought in, all of which replaced the siderite except where the siderite had only partly filled open spaces and had not been appreciably disturbed by the mineralization faulting; in those places the quartz and sulphides were deposited on the surface of the siderite crystals. A minor structural break intervened between the deposition of quartz and that of the sulphides, for much of the quartz is cut by fractures filled with sulphides, and part of the quartz is replaced by sulphides. Quartz continued to be deposited with the sulphides and is enclosed in the sulphides as widely scattered crystals. Barite was locally deposited in the quartz, perhaps before the sulphides.

The first sulphide deposited, perhaps during late stages of wall-rock alteration, was either pyrite or arsenopyrite; there is no decisive evidence as to which was first. Pyrite was again introduced as the first mineral of the main sulphide stage of deposition, but before the other sulphides were deposited it was fractured. The later and the earlier pyrite and arsenopyrite were cemented and partly replaced by the sulphides that followed—first sphalerite and later galena. Before galena was deposited, however, the sphalerite, except where it entered and was protected by the walls, was shattered by recurrent movement so that in places it is now strewn through the galena in unoriented, in part replaced fragments. Tetrahedrite was deposited after sphalerite, but

ciated particularly with the movements that reopened the early filling prior to the introduction of the younger silver- and antimony-bearing solutions. The galena cubes are now mashed or granulated and show a pronounced flowage structure that becomes visible in polished sections after light etching with hydrochloric acid. Where deformation has been less pronounced, notably in the more central parts of the galena bodies, the cleavage of the galena is curved or bent.

The galena appears to be one of the youngest of the early minerals. It commonly encloses scattered irregular grains of pyrite, tetrahedrite, and sphalerite. It also cements brecciated masses and grains of sphalerite and in places it forms tiny veinlets that cut the sphalerite. Where it has been deposited in openings, it tends to form a crust on sphalerite or, if sphalerite is absent, on siderite; but where siderite is absent or has been largely replaced, the galena may penetrate and replace earlier quartz or altered country rock. The only mineral of this stage of deposition to cut or fill fractures in galena is calcite.

Sphalerite.—Sphalerite is present in small but variable quantity in all the deposits, but since it rarely constitutes more than 5 per cent and commonly no more than 2 to 3 per cent of the ore, no attempt has been made until recently to recover it. It is not uniformly distributed through the ore but is more abundant in some ore shoots than in others and is more abundant on lower than on higher levels of the mines.

Much of the sphalerite has a distinctive reddish-brown color. Some of it is extensively brecciated and has locally even been crushed to a powder which coats the surface of the ore. Part of it is in and along the galena as small lenses, pods, and bunches, which are less than an inch to several inches long and a fraction of an inch wide, but most of it forms scattered granules or small veinlets in the wall rock.

As the grains and brecciated masses of sphalerite are cemented and partly replaced by massive galena and also are penetrated by tiny galena veinlets, the sphalerite is the older of the two minerals, but, like the galena, it encloses scattered remnants of pyrite and less commonly of arsenopyrite. The sphalerite penetrates and replaces siderite, quartz, and the altered country rock, and it is therefore one of the younger minerals of the group. Sphalerite that penetrates and replaces the siderite and altered country rock generally forms irregular ramifying veinlets which may be cut off sharply and penetrated by bands and stringers of the galena; that which has been deposited in openings forms layers next to the walls, commonly as a coating on siderite or quartz crystals. Along the edges of massive ore seams it usually forms brecciated grains cemented by galena. Where the ore is dominantly galena, the sphalerite is almost entirely restricted to stringers in the bordering wall rock.

Tetrahedrite.—Tetrahedrite is present in variable but small quantity in all the ore, generally as widely scattered microscopic grains within the galena, less commonly as larger, irregular grains associated with galena or sphalerite. The tetrahedrite is argentiferous, but because it is present in such small quantities in the ore, which ordinarily contains less than 0.01 per cent copper, it cannot have added much to the total silver content. As a little tetrahedrite

highly mineralized fault zones, but it may be observed in various degrees of intensity along all the fault zones that permitted circulation of mineral-bearing solutions. It is natural to infer that the bleaching was caused by the action of the mineralizing solutions, and this inference is confirmed by microscopic study.

Under the microscope the bleached rock shows abundant tiny flakes of sericite; generally irregular veinlike masses and embedded crystals of siderite; here and there small crystals of tourmaline; and, especially near the ore seams, much quartz and some disseminated crystals of pyrite and arsenopyrite. The bleaching appears to be largely associated with the formation of sericite, which is distributed to the very borders of the zones of alteration. The sericite has a pale-greenish color, which accounts for the greenish cast of the altered rock.

The sericite has replaced much of the quartz and calcite of the original rock, and in places it has replaced the rock altogether. Other minerals, in turn, partly replace the sericite. Siderite cuts the sericitized rock and encloses fragments of it, and where the mineral is abundant it has largely replaced the sericite. Quartz has not only replaced sericite, some of which is retained as remnant inclusions, but also penetrates and replaces siderite along fractures. Some of it thus is in veinlets, but a part of it forms irregular fine-grained masses that penetrate sericitized and siderite-impregnated rock, retaining remnant grains and patches of sericite and siderite as inclusions. Scattered crystals of pyrite and arsenopyrite may accompany the quartz, particularly the quartz of the silicified zones bordering some of the ore seams.

The alteration has not progressed uniformly; it is especially intense and widespread in certain places and in certain rocks. It appears to reflect more or less directly the intensity of mineralization. Sericite is the most widespread of these secondary minerals. Siderite is confined mostly to the rock close to the mineralized fractures. Secondary quartz is less widely distributed; it appears to be confined, like pyrite, to the immediate vicinity of the ore.

EARLY MINERALS (COEUR D'ALENE STAGE).

The minerals deposited during the early (Coeur d'Alene) mineralization include galena, sphalerite, pyrite, arsenopyrite, tetrahedrite, bournonite, siderite, quartz, barite, and possibly rhodochrosite; but the minerals that may be readily distinguished are limited to galena, sphalerite, and siderite, the others generally being visible only under the microscope. Deposition during this stage was apparently continuous except for slight interruptions concomitant with minor faulting movements.

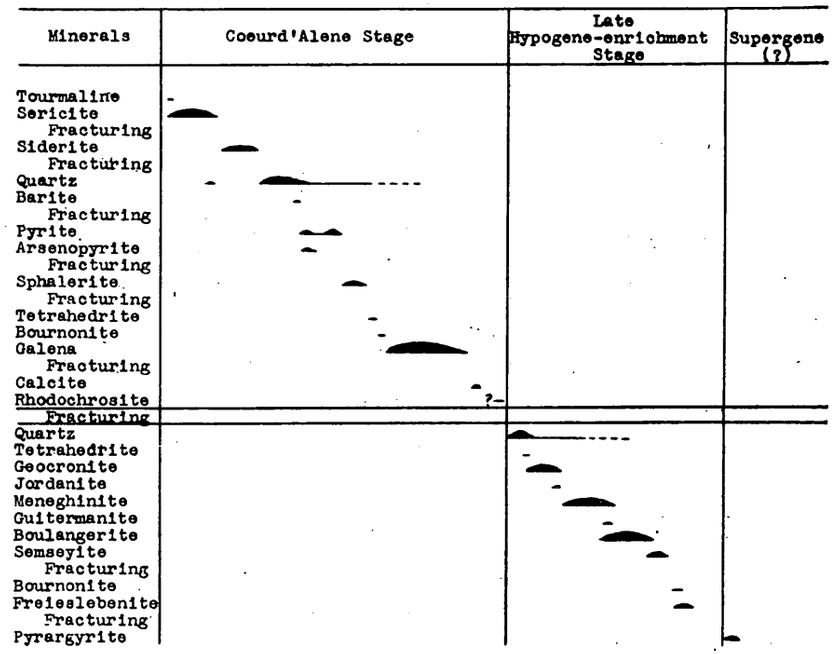
Galena.—Galena, the most abundant of the early minerals, is, except in a few ore shoots, composed largely of lead sulphosalts, the principal ore mineral, being the source of most of the lead and an appreciable part of the silver. Where the ore has not received additions of the younger silver and antimony minerals, it contains 14 to 15 ounces of silver to the ton, or about 0.20 ounce of silver to each per cent of lead. Deposits without sulphosalts are composed of 90 per cent or more of galena.

Most of the galena shows the effects of rather intense deformation, asso-

much of it was subsequently replaced by galena, locally with an intervening rim of bournonite. Very minor fracturing of the galena and other minerals permitted the introduction and deposition of a little calcite. Whether the rhodochrosite was introduced at this point or during the succeeding silver-antimony stage was not determined. In any event since the calcite cuts all galena deposits, its deposition probably marked the close of the early-stage mineralization. Renewed faulting further shattered the sphalerite and de-

TABLE 2.

PARAGENETIC SEQUENCE OF THE MINERALS IN THE CLARK FORK ORES.



formed the galena by flowage, giving much of it a prominent banded or gneissic structure or changing it to fine-grained "steel galena."

A more severe structural disturbance reopened the deposits at the Hope and Whitedelf mines and permitted introduction of minerals of the hypogene-enrichment stage. This disturbance, however, did not materially affect the deposits at the Lawrence and adjacent mines. The early ore at the Hope and Whitedelf mines was fractured, especially the ore next to the walls, and new fissures were formed. The reopening at the Whitedelf mine was more pronounced than at the Hope mine. At least in one place quartz was the first mineral deposited during the renewed mineralization, but generally the various complex sulphantimonites and sulpharsenites were deposited with little, if any quartz. Because mineralization movements were not so prevalent as during the earlier Coeur d'Alene stage, the sequential relations are not so dis-

tinctly defined and in part are rather obscure. These younger minerals filled fractures and replaced galena. Some sulphantimonites and sulpharsenites replaced other sulphantimonites and sulpharsenites, but some associations are so intimate that they may denote simultaneous deposition. The first of the sulphosalts to be deposited may have been tetrahedrite, but the first of the lead sulphosalts was geocronite, followed by meneghinite and perhaps jordanite and guitermanite, then by boulangerite and semseyite, apparently in order of decreasing lead content. Weak fracturing after the semseyite had been deposited permitted bournonite and freieslebenite to replace the other minerals along well-defined veinlet systems. Still later fracturing controlled deposition of pyrargyrite, which, however, may have been introduced by supergene rather than by hypogene solutions.

MINERAL ZONING.

Some tendency toward both horizontal and vertical zoning of minerals, part of which may be accounted for on thermal and part on structural grounds, is shown by the deposits in the district. The horizontal zoning is not especially well displayed within any single deposit except the Whitedelf (Fig. 2) but it becomes apparent when the deposits are considered collectively. Sphalerite, for example, is more plentiful in the Hope and Whitedelf mines than in the Lawrence; galena, on the other hand, is proportionately more abundant in the Lawrence than in either the Hope or Whitedelf. Where it is relatively scarce, the fact is largely due to its having been in part replaced by the lead sulphosalts. As the sulphosalts contain less lead than galena, the concentrates at the Whitedelf mine, where sulphosalts are most abundant, contain less lead than those at the Lawrence mine, where sulphosalts are lacking. On the other hand, the concentrates at the Lawrence mine carry much less silver and very little antimony, both of which are high at the Whitedelf.

Horizontal zoning has been dependent on local fracturing which was most intense at the Whitedelf and least so at the Lawrence. Apparently the deposits at the Whitedelf and Hope mines were reopened by faulting just in time to receive the solutions bearing silver and antimony, and, as the disturbance was more marked at the Whitedelf mine than at the Hope, the reopening at the Whitedelf was more complete and the channels formed were more favorable for the circulation of the ore-forming solutions. The Whitedelf deposits consequently received more of the sulphosalts while the Lawrence deposit received none at all.

Vertical zoning seems to be shown in each of the deposits, though at the Lawrence mine the inaccessibility of the lower workings made it impractical to gather much evidence bearing on this point. At both the Hope and Whitedelf mines, sphalerite appears to be somewhat more abundant at depths of several hundred feet, whereas galena tends to become somewhat less abundant, largely because of an increase in sulphosalts. There is a corresponding decrease downward in the percentage of lead, particularly at the Whitedelf (Fig. 2) where the sulphosalts are most abundant, and a proportionate increase in the amount of silver and antimony. The material gain in silver and antimony with depth at the Whitedelf mine may be explained on the supposition that these two elements were largely deposited by replacement of galena before the

sented in the Coeur d'Alene region, gives the Clark Fork ore its own unusual character.

As many observers associate sulphosalts with supergene as well as with low temperature hypogene processes, certain pertinent data are here given which indicate that the late enrichment in the Clark Fork district, except perhaps for pyragyrite, is hypogene rather than supergene. The district is in the region that was occupied by the Cordilleran ice sheet during Pleistocene time and was deeply scoured by a tongue of ice that extended up the valley of the Clark Fork of the Columbia River. Such oxidized and supergene-enriched ore as may have existed at that time was removed by the deep glacial scouring that bared the primary ore at the surface. Since the disappearance of the ice, weathering of the ore has been negligible and mining of primary ore has been carried on from the very surface. All signs of oxidation generally disappear at depths of a few feet. As the region has a humid climate, the groundwater stands close to the surface, but the distribution of the sulphosalts apparently

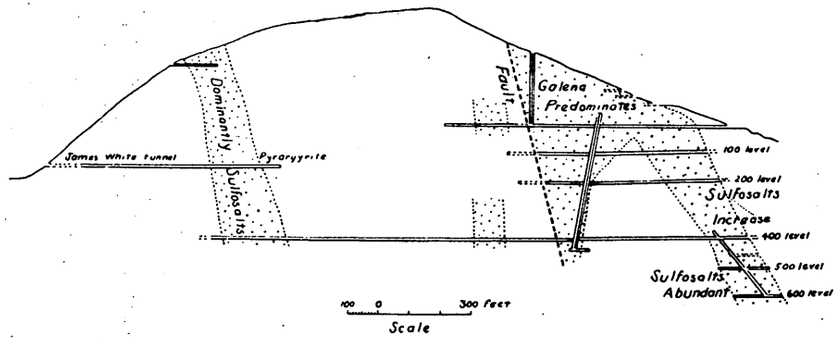


FIG. 2. Longitudinal section along the Pearl vein at the Whitedelf mine showing location of ore shoots and the distribution of galena and sulphosalts within the shoots.

has no relation to the water table, most of the silver- and antimony-rich ore, as shown in Fig. 2, having been found at depths of several hundreds of feet below the water table, increasing in amounts with increasing depth. The only pyrargyrite that has been found is in the southwest ore shoot at the Whitedelf mine (James E. White tunnel) not far beneath a steep slope where some groundwater circulation is possible.

WALL-ROCK ALTERATION.

Because the wall-rock alteration is an integral part of the mineralizing process and precedes the introduction of most of the ore, a chronological development of the picture demands that it be treated first. As in the Coeur d'Alene district the rock in and along the mineralized fault zones has lost its original blackish, reddish, or dark-greenish colors, all of it now having a pale-greenish cast. The change is generally more pronounced along the more

the famous Osborn fault does for the Coeur d'Alene region.[3] The mineralization has not been so extensive as in the Coeur d'Alene region, but the deposits, though comparatively small, are rich, in part because of the compactness of the ore and in part because of the late hypogene enrichment. Since the late twenties the district has been the most important producer of lead-silver ore in northern Idaho outside of the Coeur d'Alene region, the production up to the end of 1941 having been more than $1,200,000, mainly from the most recently discovered mines, the Hope (1923) and the Whitedelf (1926).[4]

Except for the assemblage of late hypogene silver and antimony minerals, the Clark Fork ore is like the Coeur d'Alene lead-silver ore,[5] consisting dominantly of galena, which is accompanied by lesser quantities of siderite and

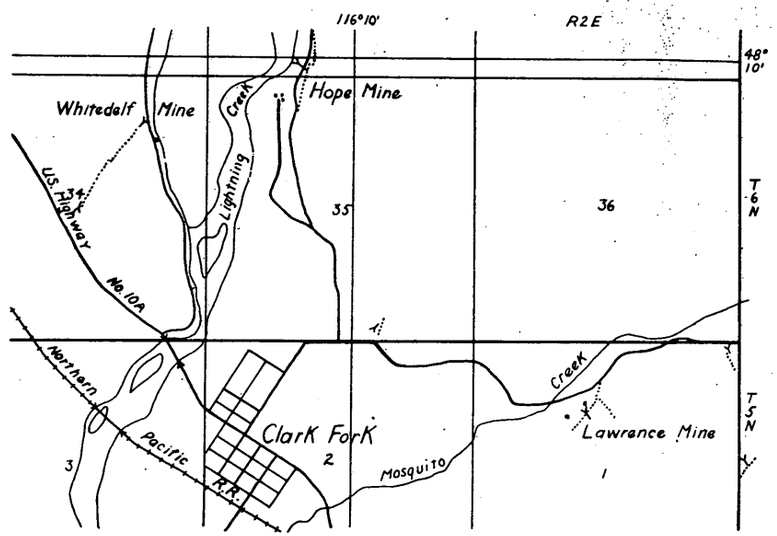


FIG. 1. Sketch map showing the location of the Whitedelf, Hope, and Lawrence mines in the Clark Fork district, Idaho.

sphalerite and still smaller amounts of several other minerals. One mine, the Lawrence (Fig. 1), contains no minerals other than these, but the two other important mines, the Whitedelf and Hope, have received additions of various complex lead sulphantimonites and sulpharsenites, copper-lead sulphantimonite, silver-lead sulphantimonite, and ruby silver. These younger sulphosalts were added after the earlier filling had been reopened by renewed faulting; deposits not reopened do not contain them. The early mineralization is distinctly of the Coeur d'Alene type; the later, which is but meagerly repre-

[3] Umpleby, J. B.: The Osborn fault. Jour. Geol., vol. 32, pp. 601–614, 1924.

[4] The Geology and the Ore Deposits of the district are to be described in detail in a report in preparation to be entitled "Geology of the lead-silver deposits of the Clark Fork district, Bonner County, Idaho." U. S. Geol. Survey Bull. 944b, 1945.

[5] Umpleby, J. B., and Jones, E. L., Jr.: Geology and ore deposits of Shoshone County, Idaho. U. S. Geol. Survey Bull. 732, pp. 41–48, 1923.

solutions that carried them reached what are now the upper levels of the mine. Whereas early shipments from upper levels of the mine contained around 60 per cent lead and 60 ounces of silver per ton, the ore from the lower levels contained between 35 and 40 per cent lead and more than 200 ounces in silver.

GENESIS.

Localization of dikes of diabase and granodiorite, quartz monzonite, granite, and rhyolite porphyry and the lead-silver deposits along the zone of structural weakness controlled by the Hope fault indicates a close relationship between faulting, intrusion, and mineralization. As intrusion and mineralization took place while faulting was still in progress, the faulting must have reached a relatively deep magma reservoir and provided avenues of escape for portions of a differentiating magma and later for mineralizing solutions.

The escape of mineralizing solutions from the magmatic source was repeatedly disturbed by structural adjustments, some of them small, some of them rather large. When the solutions first reached the levels at which the ore is now found, they apparently were rich in potash. They reacted strongly with the country rock in and along the zones of faulting, extracting lime and silica and depositing potash, which combined in sericite as the main product of reaction. The mineralizing process may then have been temporarily interrupted by renewed faulting. The successive solutions that rose subsequently differed in composition from the earlier ones, as already shown in the paragraph on paragenesis. At first they carried considerable amounts of ferrous iron and carbonates, later silica, accompanied locally by a little sulphate (barite) and were succeeded in turn by solutions bearing the various metals.

The absence of minerals diagnostic of high-temperature origin (apart from occasional crystals of tourmaline in the wall rock) indicates that temperatures of the mineralizing solutions while the minerals were being deposited never rose above moderate heights, perhaps not above 300° C.[9] Sericite, siderite, and quartz in the country rock are commonly associated with mesothermal deposits, and the ore minerals of the early stage of mineralization are also such as are deposited at mesothermal temperatures. During the second stage, however, the temperatures must have been appreciably lower, for silver and antimony generally become more concentrated as the temperature of the solutions becomes lower; the complex sulphantimonites and sulpharsenites are commonly regarded as diagnostic of epithermal or low temperature deposition.

ACKNOWLEDGMENTS.

The writer wishes to acknowledge his indebtedness to F. C. Calkins, E. T. McKnight, Charles Park and G. F. Loughlin of the U. S. Geological Survey, for their suggestions and constructive editorial assistance in the preparation of the report.

DEPARTMENT OF GEOLOGY,
CORNELL UNIVERSITY,
ITHACA, NEW YORK,
November 23, 1945

[9] Lindgren, Waldemar: Mineral Deposits, 4th Ed., p. 529, 1933.

ECONOMIC GEOLOGY
AND THE
BULLETIN OF THE SOCIETY OF
ECONOMIC GEOLOGISTS

VOL. XLI MARCH–APRIL, 1946 No. 2

LEAD–SILVER MINERALIZATION IN THE CLARK FORK DISTRICT, BONNER COUNTY, IDAHO.[1]

ALFRED L. ANDERSON.

ABSTRACT.

The lead-silver deposits in the Clark Fork district in Bonner County, Idaho, resemble those in the nearby Coeur d'Alene region, but some of the deposits have been substantially enriched by the late addition of hypogene silver and antimony minerals. The unenriched ore consists dominantly of galena, which is accompanied by lesser amounts of siderite, quartz, and sphalerite and by still smaller quantities of pyrite, arsenopyrite, tetrahedrite, bournonite and calcite. Ore that has been enriched by the addition of late hypogene silver and antimony also contains various lead sulphantimonites and sulpharsenites, copper-lead sulphantimonite, silver-lead sulphantimonite, and ruby silver. Minerals formed during the enrichment include boulangerite ($5PbS \cdot 2Sb_2S_3$), geocronite ($5PbS \cdot Sb_2S_3$), meneghinite ($4PbS \cdot Sb_2S_3$), semseyite ($9PbS \cdot 4Sb_2S_3$), jordanite ($4PbS \cdot As_2S_3$), guitermanite ($3PbS \cdot As_2S_3$), bournonite ($Cu_2S \cdot 2PbS \cdot Sb_2S_3$), freieslebenite ($2Ag_2S \cdot 3PbS \cdot 2Sb_2S_3$) and pyrargyrite ($3Ag_2S \cdot Sb_2S_3$). Some of the minerals in this younger group are rare elsewhere, and their local abundance is one of the most interesting features of the Clark Fork mineralization.

INTRODUCTION.

THE Clark Fork district, which is about 35 miles by airline northwest of the center of the Coeur d'Alene mining region in Idaho, has an unusual minereralization. Its lead-silver deposits resemble those in the Coeur d'Alene region [2] but at least two of them have been enriched by the addition of late hypogene silver and antimony minerals, several of which are rare elsewhere.

The deposits are in the Belt series (pre-Cambrian) as fillings and replacements along minor low-angle thrust and high-angle reverse faults, which genetically are related to the Hope fault, a great transverse earth fracture which provides the same sort of structural background for this district that

[1] Published with the permission of the Director, Geological Survey, U. S. Department of the Interior.

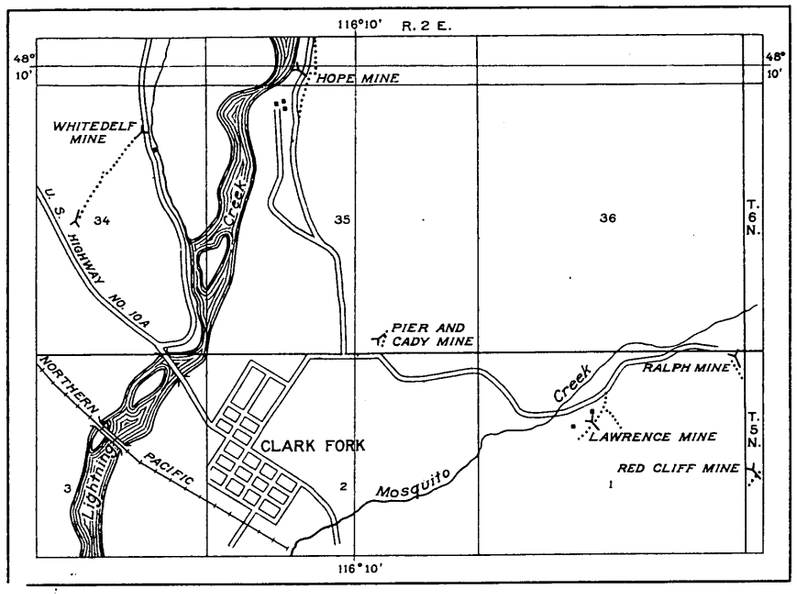
[2] Ransome, F. L., and Calkins, F. C.: The geology and ore deposits of the Coeur d'Alene district, Idaho. U. S. Geol. Survey Prof. Paper 62, 1908.

Exhibit No 10 Whitedelf Application
Original set

LEAD-SILVER MINERALIZATION

in the Clark Fork District,

BONNER COUNTY, IDAHO



ALFRED L. ANDERSON

ACKNOWLEDGEMENTS

The writer wishes to acknowledge his indebtedness to F. C. Calkins, E. T. McKnight, Charles Park and G. F. McLoughlin of the U. S. Geological Survey, for their suggestions and constructive editorial assistance in the preparation of the report.

Department of Geology
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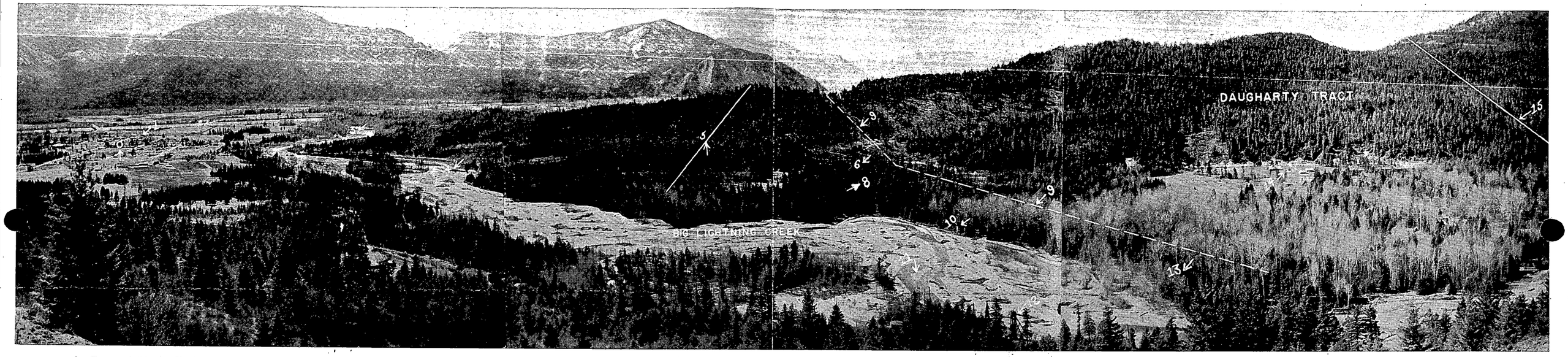
Ithaca, New York
November 23, 1945

Reprint from Volume XLI, Economic Geology, March - April, 1946.

OVERLOOKING THE WHITEDELF AND HOPE MINING PROPERTIES AND THE CLARKS FORK VALLEY



0 Town of Clarks Fork
1 Whitedelf ore loading dock Northern Pacific Railway
2 Clarks Fork River
3 Main line Northern Pacific Railway
4 Spring Creek road to Whitedelf mine
5 East boundary Whitedelf mining property
6 Whitedelf mill and surface working (screened by trees)
7 Lake Pend D'Oreille at lower end valley
8 Location diamond drill hole No. 3
9 Line tracing surface course Pearl (Whitedelf) vein
10 Diamond drill set up at location hole No. 2
11 Lightning Creek
12 Head frame at Hope mine shaft
13 Location diamond drill hole No. 1
14 State fish hatchery
15 West boundary Whitedelf mining property

(4) YOU OWN AN INTEREST IN,
The ore in and the timber on the Mead tract of 140 acres, which is located on Antelope Mountain across town from the main Whitedelf mining property. This mineral land is girdled by a blanket lead-silver vein with a series of small blanket lead-silver veins outcropping on the property, exposed by early day shallow diggings. This land, less 20 acres, comprises the (SE¼) of Section 2, Township 55, North Range 2, East Boise Meridian, and is in the same section of land with the town of Clarks Fork.

(5) YOU OWN AN INTEREST IN,
A Warehouse site 110 feet by 35 feet, with the concrete foundation already constructed adjoining Northern Pacific R. R. right-of-way across from the N. P. depot at Clarks Fork. (See map on Page 4.)

(6) YOU OWN AN INTEREST IN,
The branch electric power line and transformer station connecting the high tension power line of the Mountain States Power Company with the Whitedelf mill and mining machinery.

(7) YOU OWN AN INTEREST IN,
A 50-ton ore concentrating plant (floatation) complete, an air compressor plant, blacksmith shop, power drill sharpener, timber framing shed and various mine buildings, large and small mine hoists, a power mine loader (Eimco mucking machine) an electric mine locomotive (Mancha trammer), a series of electric mine pumps, mine cars, steel rails, air drills and drill steel, water, air and ventilating pipe, four thousand feet of submarine electric power cable installed, and in use to conduct electric power to operate underground mine machinery.

(8) YOU OWN AN INTEREST IN,
The ore bins and portal installation at the mine outlets on both sides of the mountain.

(9) YOU OWN AN INTEREST IN,
The cash operating fund on deposit in the Spokane & Eastern Bank in Spokane, Washington, amounting to $41,186.10 on April 7, 1947.

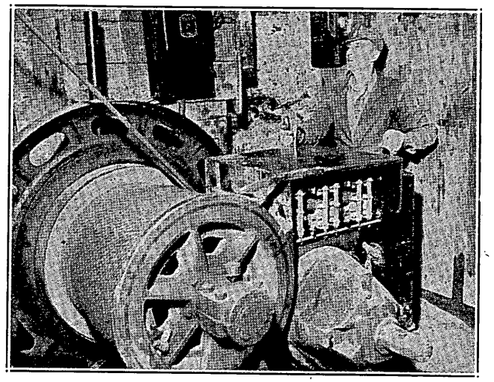
FOR A DESCRIPTION OF THE MINE WORKINGS AND RECORD OF MINE PRODUCTION.
(See the Whitedelf Company's mine prospectus.)

FOR AN AUTHENTIC REPORT ON THE NATURE AND VALUE OF THE UNDERLYING OREBODIES
As disclosed by the diamond drill explorations of the U. S. Bureau of Mines:
See the Lorain Report made by the U. S. Bureau of Mines; also see the Report made by the former Idaho State Geologist, Alfred L. Anderson, issued from Cornell University.
NOTE: All the Whitedelf mine holdings are in patented land.

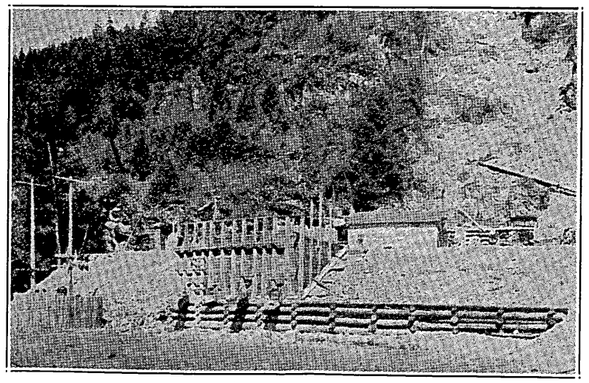
WHITEDELF IS A NEW PROPERTY AS MINES GO, NOW, IN INITIAL STAGE OF DEVELOPMENT.
Lead is scarce and high priced. The Whitedelf has the ore. The thing we must do now is to deepen the main shaft to get access to the proven ore in the lower levels and put the mine in larger and profitable production.

COMPTON I. WHITE

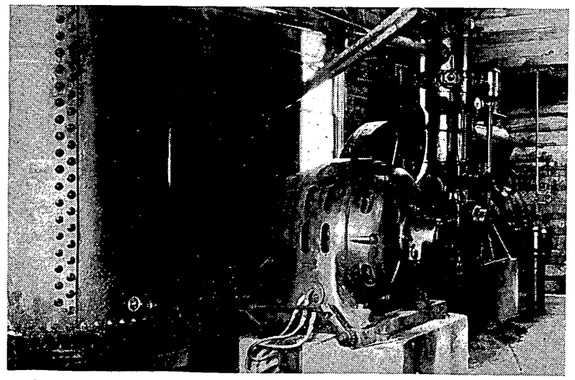
Addresses:
Home Office: Clarks Fork, Idaho.
Fiscal Office: 416 Empire State Building, Spokane, Washington.
Eastern Office: 608 North Carolina Ave., S. E., Washington, D. C.
Stock Transfer Office: U. S. Corporation Co., 15 Exchange Place, Jersey City, N. J.



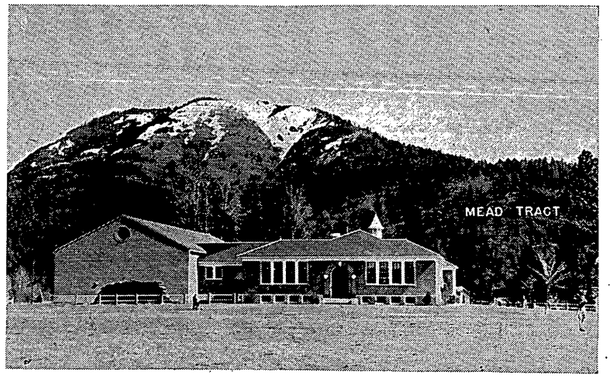
Main hoist in station at collar, Whitedelf Shaft



Ore bins and compressor plant at South (opposite) Portal Whitedelf Mine



Main Compressor Plant Whitedelf Mine

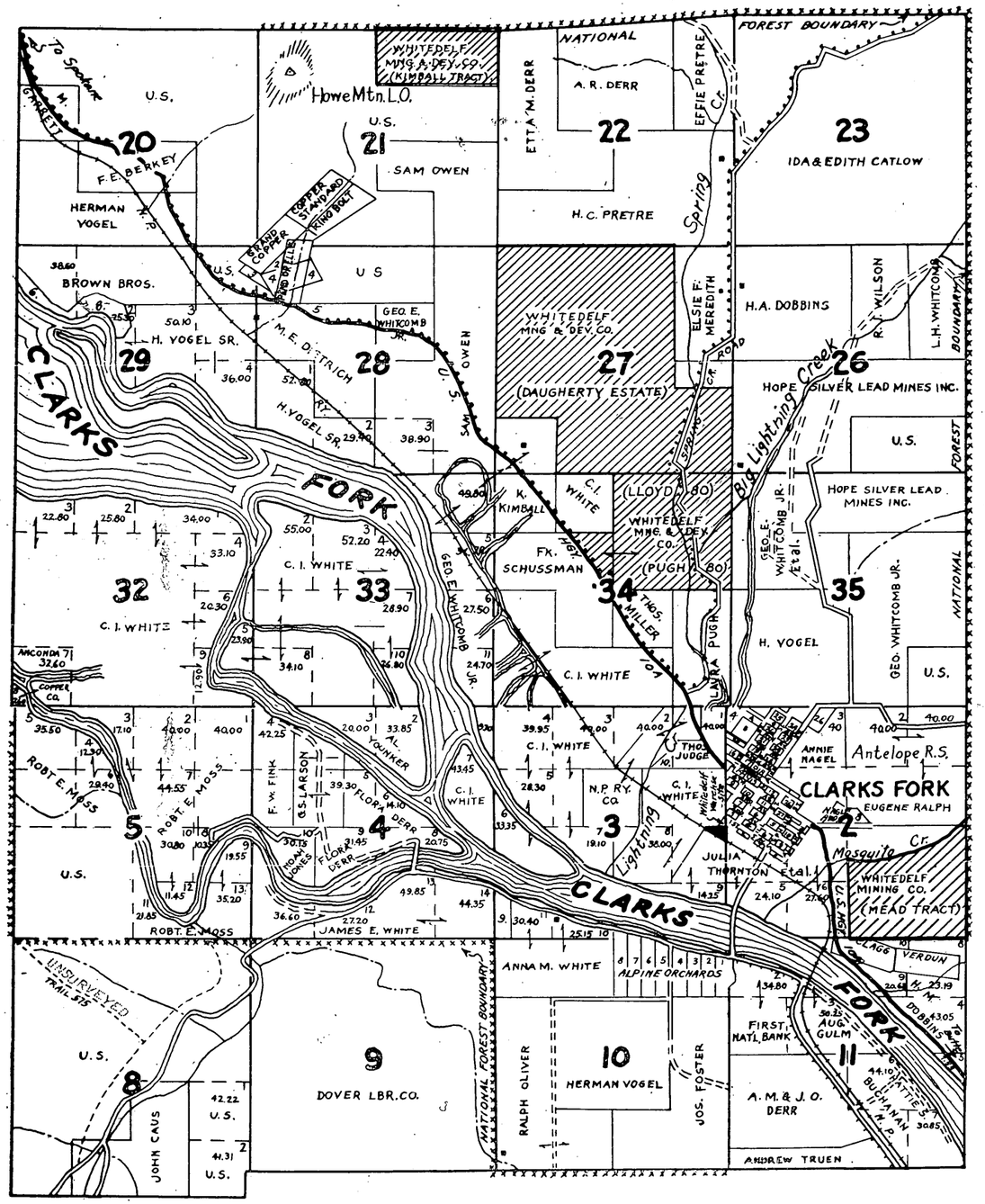


Mead Tract, Whitedelf Mining Property, on Antelope Mountain (Clarks Fork School Foreground)

EXHIBIT 1

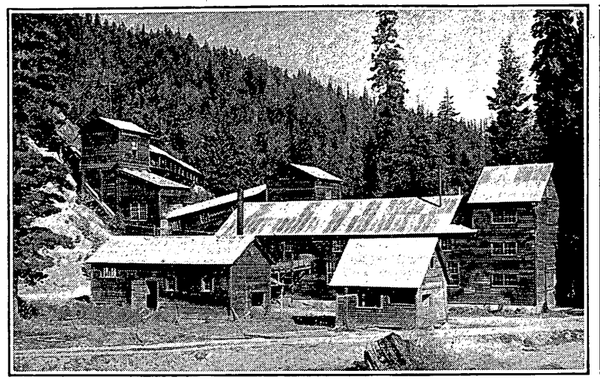
The Clarks Fork Mining District

IN IDAHO

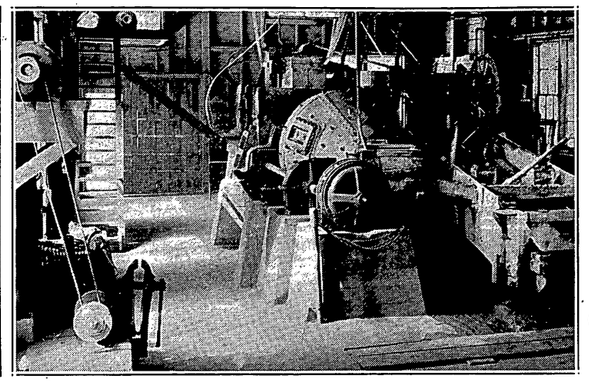


Ownership Map Showing Sections and Subdivisions in Parts of Townships 55-56
North Range 2 East Boise Meridian

WHITEDELF



Concentrator (Mill) North Portal Whitedelf Mine



Hardinge Ball Mill and Classifier,
Interior Whitedelf ore concentrating plant

To the Whitedelf Stockholders:

HERE IS WHAT YOU SHARE IN

WHEN YOU OWN WHITEDELF STOCK (NON ASSESSABLE)

YOU OWN AN INTEREST IN

A comparably new Mine developed only down to the 400 level located in the same rock formation (Belt series of sedimentary rocks) in which the famous lead-silver mines are found in the Coeur d'Alenes mining district, lying to the south, where many of the orebodies go down as deep as five thousand feet.

(1) YOU OWN AN INTEREST IN,

The proven lead-silver ore and the ore yet to be developed in the deeper levels of the Pearl vein which extends diagonally across the Lloyd 80-acre tract and the Pugh 80, comprising the Northeast quarter (NE¼), Section 34, Township 56, N. range 2 East Boise Meridian.

(2) YOU OWN AN INTEREST IN,

Three million, four hundred twenty-four thousand Board feet of standing saw-timber and one thousand three hundred sixty-two standing cedar telephone poles on 500 acres of mineral land adjoining the original Whitedelf mining property, land recently purchased from the Daugharty estate, and which comprises twelve and one-half 40-acre tracts in section 27, Township 56, N. range 2, East Boise Meridian. This land contains two prominent mineralized veins opened with shallow workings by leasers. (For picture of timber stand, see panoramic view.)

(3) YOU OWN AN INTEREST IN,

The mineral and standing timber (not cruised or estimated) on the Kimball 80-acre tract which is the North one-half (N½) of Northeast quarter (NE¼) Section 21 Township 56 N. range 2 East Boise Meridian. This tract is located north of and on the opposite side of the hill from the Clarinda and Copper Giant mining properties and is in the direction of the strike of the ore-bearing veins that cross these two mining properties. These mines lie west of and on the same mountain that contains the Whitedelf veins. (Howe Mountain.)

Miro Mihelich, U. S. Bureau of Mines Engineer, inspecting
Diamond drill Cores from Whitedelf Vein

Whitedelf Truck with Load,
Labor Saving Machinery

The production from the three mines is given in the table following:

Production of the Clark Fork district, 1913-43, in terms of gross metal content

[By G. E. Woodward, Bureau of Mines, U. S. Department of the Interior]

Year	Ore (short tons)	Gold (fine ounces)	Silver (fine ounces)	Copper (pounds)	Lead (pounds)	Zinc (pounds)
1913	4,746	0.26	4,877	111	510,579	
1914	324	.21	1,326	40	121,914	
1915	457	.08	1,455	74	163,308	
1916	454		943	160	111,225	
1917	762	.08	2,254	159	197,271	
1918	772		2,195		199,753	
1919	144		518		56,514	
1922	107		1,675		163,932	
1923	67		941		88,630	
1925	224		6,080		200,163	
1926	1,322	.95	45,760	893	1,013,625	
1927	3,028	.20	116,661	209	2,202,084	
1928	2,483		74,461	564	1,460,661	
1929	11,811	2.80	88,709	916	1,815,688	
1930	19,182		85,960	2,487	1,984,390	
1931	21,516		89,550	2,794	2,147,692	
1932	11,997		53,137	1,267	1,204,302	
1933	6,455	.60	24,219	810	646,213	
1934	6,700	.50	22,348	450	665,495	
1935	4,764	.80	12,713	226	393,221	
1936	10,250	2.80	37,162		1,168,358	
1937	23,808	14.00	52,246		1,696,704	
1938	12,591	4.00	47,320		1,346,668	
1939	12,135	4.00	48,355	1,597	1,232,797	
1940	12,759	3.00	63,279	2,400	1,195,176	
1941	9,616	1.00	58,747	3,171	841,867	
1942	12,077	2.00	47,737	1,914	812,620	700,000
1943	11,166		14,019		607,002	74,300
Total	201,717	37.28	1,004,647	20,242	24,247,852	774,300

CHARACTER

The lead-silver deposits are much like those in the Coeur d'Alene district, but on the whole they have a somewhat higher proportion of silver and antimony because of a late local hypogene enrichment. Fundamentally, however, they are galena-siderite fillings and replacements along zones of fractured and fissured rock. In addition to argentiferous galena, the deposits enriched in antimony and silver contain lead sulfantimonites in various proportions and minor quantities of silver sulfantimonites. The importance of the enrichment is reflected in the ratio of silver to lead in the different deposits. Those that were not enriched contain about 0.20 ounce of silver to one percent of lead; those that were enriched contain 0.50 to one or more ounces of silver to each percent of lead. The enriched deposits contain appreciable amounts of antimony, enough in places to be recovered as a byproduct. Some zinc is contained in the ore but generally not enough to be recoverable. The amount of copper is negligible.

Much of the ore is massive and contained in compact seams and stringers. The structural relations suggest that the ore was

UNITED STATES DEPARTMENT OF THE INTERIOR
J. A. Krug, Secretary

GEOLOGICAL SURVEY
W. E. Wrather, Director

Bulletin 944-B

GEOLOGY OF THE LEAD-SILVER DEPOSITS OF THE CLARK FORK DISTRICT, BONNER COUNTY, IDAHO

BY

ALFRED L. ANDERSON

Contributions to economic geology, 1943-46
(Pages 37-118)

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1947

For sale by the Superintendent of Documents, U. S. Government Printing Office,
Washington 25, D. C.

the State, but this new discovery proved disappointing with depth. In the meantime, however, work had begun on the Pearl vein, which had been disclosed a short time previously in a newly opened road cut. The Pearl vein proved to be one of the most important finds ever made in the district. It was soon supplying shipments of rich ore from the very surface, and was destined to become the source of practically the entire production from the Whitedelf mine. Production increased rapidly during the next several years at both the Whitedelf and Hope mines, and the Clark Fork district soon outranked all the others in the northern part of Idaho except the Coeur d'Alene. These discoveries prompted considerable prospecting, and some strikes were made, but none of them compared with those at the Lawrence, Hope, and Whitedelf mines. The later history of the district has centered in the activities of these three mines.

Since 1913 the work at the Lawrence mine has been intermittent, but some concentrates have been shipped in each year except 1921, 1924, 1928, 1930, 1933, and 1936. During the last few years the mine has been worked by leasers. Shipments from the Elsie K had totaled 14 carloads by the time of the reconnaissance study in 1927. In 1928 one or two carloads were shipped each month. Most of the shipments were made by leasers, who later purchased the mine from the owner and organized the Hope Mining Co. Production continued to increase through 1929 to 1931. In 1931 the property was equipped with a mill, but work was suspended in 1932 and the mine remained idle through 1933. Some development work was carried on later, and in 1935 the mine was taken over by the Hope Silver-Lead Mines, Inc. The new management continued operations on a greatly increased scale, generally producing 2 to 3 carloads of concentrates monthly.

The Whitedelf mine began to ship hand-sorted ore in July 1926, and in less than 18 months had sent 95 carloads to the smelter. The Whitedelf Mining and Development Co. had been organized in March 1926, but most of the early shipments were made by leasers. Production was curtailed considerably during 1928 and 1929, when deeper levels of the mine were being opened. In 1929 the property was equipped with a 75-ton flotation concentrator, and since then mostly concentrates have been sent to the smelter. Because of the low price of metals the mine was closed in 1933, and it was not fully reopened until 1937. Development was then resumed, and the company continued operations until early 1940, when the mine was taken over by leasers, who concentrated their attention upon a newly discovered shoot of rich silver ore in a faulted segment of the Pearl vein. This discovery again served to stimulate interest in the district.

of ore shoots, for the deposits that were not disturbed after the early mineral deposition were not enriched by the younger mineralizing solutions. Late addition of silver has very materially enhanced the grade of the ore at both the Hope and Whitedelf mines and has had much to do with delineating the ore shoots.

Stoping has been more continuous on upper than on lower levels, which suggests that the ore shoots may decrease in stope length with increasing depth. The ore seams at the Hope mine pinch and swell, so that they form lenticular shoots 12 to 100 feet or more in length, but above the No. 3 level the shoots were so spaced that the stopes are continuous for a horizontal distance of more than 600 feet southwest of the dike fault. Below the No. 3 level the ore shoots appear to be fewer and more widely separated. Similar conditions appear to prevail at the Lawrence mine, where the main stoping has been carried along the vein for 250 feet on the tunnel level, but scattered pillars of lean ore indicate that the individual shoots, though closely spaced, are rarely more than 40 feet long on the strike. The workings below the tunnel level explore only a small part of the vein, but, as these workings were not accessible, it could not be learned at first hand whether the ore shoots decrease in size or become more widely spaced with increasing depth. The controlling thrust fault is long, and other shoots, some of them as persistent and as highly mineralized as the one in the main part of the mine, have been uncovered. At the Whitedelf mine the ore was almost continuous from the portal of the Norquist tunnel to the Pugh fault, a distance of 530 feet, and was stoped from the level 100 feet below the Norquist tunnel level to the surface. Below the 100-foot level, however, the ore shoot split into two branches, separated by several hundred feet of barren fissure. Each of these branches appears to decrease in stope length with increasing depth, and on the 400-foot level the one near the shaft is about 80 feet long and the other about 130 feet long. On the lower levels the ore in the shoots tends to form thin lenses about 40 feet long, joined by mere seams of ore or separated by barren zones that are generally a good deal less than 40 feet long. In the southwest segment of the Pearl vein, the ore shoot exposed in the James E. White tunnel was about 130 feet long.

The ore shoots, both those on the low-angle thrust faults and those on the high-angle reverse faults, plunge more or less steeply to the northeast.

MINERAL ZONING

The deposits in the district show some tendency toward both horizontal and vertical zoning, part of which may be accounted for on thermal and part on structural grounds. The horizontal zoning is not especially well displayed within any single deposit except the Whitedelf, but it becomes apparent when the deposits are considered collectively. Sphalerite, for example, is somewhat more plentiful at the Hope and Whitedelf mines than at the Lawrence; galena, on the other hand, is proportionately more abundant at the Hope mine than at the Whitedelf and most abundant at the Lawrence. Where it is relatively scarce, the fact is largely due to its having been in part replaced by the lead sulfosalts.

The sulfosalts contain less lead and more silver and antimony than galena, and they are most abundant at the Whitedelf mine, less so at the Hope, and absent at the Lawrence. The concentrates at the Lawrence mine are therefore higher in lead than the concentrates at the Hope mine, which in turn are higher in lead than those at the Whitedelf, and, conversely, the amount of antimony and silver is greatest at the Whitedelf and least at the Lawrence. This decrease in silver and antimony and the corresponding increase in lead away from the Whitedelf may be explained on structural grounds. At the Lawrence mine the ore has been little disturbed by faulting movements during or after mineralization, and except for a thin casing of gouge on one side of the main seam it is frozen to the walls. At the Hope mine, on the other hand, the ore has been considerably disturbed by faulting concurrent with and subsequent to mineralization, so that all the minerals except those deposited last are much fractured; the ore as a whole is considerably shattered and is much more encased with gouge than the ore at the Lawrence. At the Whitedelf mine disturbance during and after mineralization has been even more marked than at the Hope mine; the Pearl fault was more active than the mineralized fault at the Hope mine, which, however, was considerably more active than the one at the Lawrence. Apparently the deposits at the Whitedelf and Hope mines were reopened by the intramineralization movements just in time to receive the solutions bearing silver and antimony, and, as the disturbance at the Whitedelf mine was the more marked, the reopening at the Whitedelf was the more complete and the channels formed were the more favorable for the circulation of the ore solutions; the Whitedelf deposits consequently received more of the sulfosalts, and the unreopened Lawrence deposits received none at all.

Vertical zoning seems to be shown in each of the deposits, though at the Lawrence mine the inaccessibility of the lower workings made it impracticable to gather much evidence bearing on this point. At both the Hope and Whitedelf mines sphalerite

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appears to become somewhat more abundant with increasing depth, whereas galena tends to become somewhat less abundant, largely because of an increase in sulfosalts. There is a corresponding decrease downward in the percentage of lead, particularly at the Whitedelf, where the sulfosalts are most abundant. The material gain in silver and antimony with depth at the Whitedelf mine may be explained on the supposition that these two elements were largely deposited by replacement of galena before the solutions that carried them reached what are now the upper levels of the mine. When it was visited, the mine showed considerable promise of becoming chiefly a silver mine rather than a lead mine; the last shipments contained 35 to 40 percent of lead and more than 200 ounces of silver, whereas ore mined nearer the surface had contained 60 percent of lead and 60 ounces of silver.

WALL-ROCK ALTERATION

The rock in and along the mineralized fault zones has lost its original blackish, reddish, or dark-greenish colors, all of it now having a pale-greenish cast. The change is generally more pronounced along the more highly mineralized fault zones, but it may be observed in various degrees of intensity along all the fault zones that permitted circulation of mineral-bearing solutions. It is natural to infer that the bleaching was caused by the action of the mineralizing solutions, and this inference is confirmed by microscopic study.

Under the microscope the bleached rock shows abundant tiny flakes of sericite; it also generally shows irregular veinlets, masses, and embedded crystals of siderite, here and there a small crystal of tourmaline, and, especially near the ore seams, much quartz and some disseminated crystals of pyrite and arsenopyrite. The bleaching appears to be largely associated with the formation of sericite, which is distributed to the very borders of the zones of alteration. The sericite has replaced much of the quartz and calcite of the original rock, and in places it has replaced the rock altogether. The sericite has a pale-greenish tint, which accounts for the greenish cast of the altered rock.

Other minerals, in turn, partly replace the sericite. Siderite cuts the sericitized rock and encloses fragments of it, and where the mineral is abundant it has largely replaced the sericite. Quartz has not only replaced some sericite but also penetrates and replaces siderite. Some of it is in veinlets, but some of it forms irregular fine-grained masses, which penetrate and replace rock that contains much sericite and siderite. Scattered crystals

other hand, the amount of gouge increases and the ore pinches, because the walls had been forced together and the rock ground to gouge as one wall rubbed against the other. Similar relations are observed on the high-angle reverse faults. Gouge impeded the circulation of ore solutions along the more steeply dipping parts, where rubbing occurred, whereas wider openings facilitated the flow along the less steeply dipping parts, where the walls were lifted apart. Consequently, the ore pinches as the dip increases and thickens as the dip decreases. On strike-slip faults, also, the ore bodies pinch along the strike at places where the mainly horizontal movement caused the walls to rub together and widen where that movement forced the walls apart.

Other structural controls have aided in the localization of ore shoots. The most important of these is the union of ore seams. At the Hope mine, for example, some of the best ore shoots have been found where more steeply dipping seams along the footwall of the thrust zone have curved upward to join the hanging-wall seam. Similarly, some of the widest shoots have been found in places where steeply dipping seams of ore have entered the thrust zone from below the footwall and have added their ore to that already in the thrust zone. In such places the best ore has been found where the seams have come close together and the one from below has flattened and become parallel to the one just above. Some of the entering seams may occupy diagonal fractures, which connect one thrust with another in a closely spaced overlapping series of thrusts. Along the steep reverse faults, such as the Pearl vein, some of the widest ore bodies have been localized by the union of mineralized fissures within the thrust zone, particularly by the union of lateral fissures that join the main fissure at an acute angle. The greatly increased shattering associated with the intersection of the low-angle thrusts and high-angle reverse faults with the crosscutting high-angle normal and strike-slip faults also has favored increased porosity and the localization of some of the larger bodies of ore. Some of the best ore shoots along the low-angle thrust at the Hope mine were near the dike fault, the air-raise fault, and the Norquist fault, and some of the best ore at the Whitedelf was near the intersection of the Pugh fault with the Pearl fault. Union of stringers has also given rise to wider seams and lenses of ore on some of the other low-angle thrusts. In general, the structural controls are much the same throughout the district.

Recurrent faulting, with consequent reopening of the mineralized faults, during the period of mineralization has also been an important factor in the distribution of ore and the localization

delf mine was done on the Pearl vein, which occupied a prominent footwall fissure that contained 2 to 29 inches of massive sulfides on the Norquist tunnel level. At one place some feet above the level, the vein bulged to 7 feet 10 inches of massive ore, but in general the thickness of the vein either above or below the tunnel level rarely exceeded 24 inches. In places stringers and disseminated sulfides formed milling ore, but such ore remained unmined until after the mill had been put in operation. Search for milling ore then led to the discovery of other seams along the fault zone. Three were uncovered above the Norquist tunnel level, two of them with 3 feet of high-grade ore and one with much disseminated ore. Two or possibly three seams of compact ore were exposed on the two lowest levels, the one along the footwall apparently being the largest. In the offset segment of the Pearl vein the ore body along the James E. White tunnel was made up of compact masses, bunches, and small connected lenses, which in places made 3 feet of high-grade ore. In much of the fault zone, bordering stringers and minor seams provided stoping widths as much as 6 feet or more. The ore seams along the Pearl vein are not continuous. In places they divide into stringers, particularly where the gouge increases in abundance; elsewhere the ore spreads outward into oblique fractures or ends altogether.

In the lightly mineralized normal faults, including the dike fault at the Hope mine and some strike-slip faults such as the Pugh and the Norquist, the sulfides occur sparingly in small bunches, disseminations, and stringers. These are in gouge, but the sulfides are generally not much crushed, and ramifying nets of stringers remain intact. In only a few exposures are the stringers and other small bodies concentrated into compact seams and lenses, and in only a few places has stoping been attempted.

ORE SHOOTS

The localization of ore shoots is entirely structural, showing no relation whatever to the chemical composition of the enclosing rock. The ore was deposited where openings permitted the circulation of the mineralizing solutions, and such openings were available where the walls of the fractures had separated during the faulting. In both the low-angle thrust faults and the high-angle reverse faults openings developed wherever there was a local flattening of the dip. In the low-angle thrusts the lenticular ore shoots dip less steeply than the less highly mineralized parts of the fault zone, indicating clearly that the hanging wall had been lifted away from the footwall, thereby providing space for the circulation of the ore solutions. Where the dip increases, on the

of pyrite and arsenopyrite may accompany the quartz, particularly the quartz of the silicified zones bordering some of the ore seams. In places along the Pearl vein where sulfantimonites and sulfarsenites are abundant, the fine-grained quartz that generally occurs along the mineralized zones has been permeated by coarser-grained quartz, apparently added during the late silver and antimony metalization.

The alteration has not progressed uniformly; it is especially intense and widespread in certain places and in certain rocks. It appears to reflect more or less directly the intensity of mineralization. Sericite is the most widespread of the secondary minerals but is most abundant near mineralized fractures. Siderite is confined mostly to the rocks close to the mineralized fractures. Secondary quartz is even less widely distributed; it appears to be confined, like pyrite, to the immediate vicinity of the ore. Most of this quartz was deposited just before the early sulfides, but locally some quartz was deposited during the later stage of mineralization.

GENESIS

The localization of the dikes of diabase and prophyry and the lead-silver deposits along the zone of structural weakness controlled by the Hope fault indicates a close relationship between faulting, intrusion, and mineralization. As intrusion and mineralization took place while faulting was still in progress the faulting must have reached to a relatively deep magma reservoir and provided avenues of escape for portions of a differentiating magma and later for mineralizing solutions.

The escape of the mineralizing solution from the magmatic source was not continuous; it was repeatedly interrupted by structural adjustments, some of them small, some of them rather large. When the solutions first reached the levels at which the ore is now found, they apparently were rich in potash. They reacted strongly with the country rock in and along the zones of faulting, extracting lime and silica and enriching the rock in potash, which combined in sericite as the main product of reaction. The mineralizing process may then have been temporarily interrupted by renewed faulting. The solutions that rose subsequently differed in composition from the earlier ones; they carried iron carbonate, which was deposited as siderite in fractures and replaced some of the sericitized country rock. The mineralization was again interrupted by minor faulting movements, during which a little quartz was deposited in fractures and impregnated the bordering walls. Then, in close succession, pyrite and arsenopyrite, sphalerite, tetrahedrite, bournonite(?), galena,

and calcite were deposited in similar fashion. With the deposition of galena and the slightly later calcite, the early cycle of mineralization came to a close.

Mineralization did not everywhere end, however, with the deposition of the galena and associated minerals. Recurrent faulting of somewhat greater intensity reopened the channel ways leading to some of the lead deposits, again permitting movement of ore-bearing solutions. These later solutions, however, were very different from the earlier; for, although they locally carried a little silica, they also carried much silver and antimony and perhaps some lead, together with minor quantities of arsenic and copper, possibly dissolved from the tetrahedrite and arsenopyrite at depth. In the deposits that were reopened there were deposited, largely by replacement of the galena, various complex sulfantimonites and sulfarsenites of lead and sulfantimonites of copper and lead and of silver alone. Some minor faulting continued after the second mineralization, but no more minerals were deposited. The rhodochrosite, which occurs sparingly in the district, may have been deposited at the close of this later period of mineralization.

The absence of any minerals diagnostic of high-temperature origin indicates that the temperatures of the mineralizing solutions while the minerals were being deposited never rose above moderate heights. Sericite, siderite, and quartz in the country rock are commonly associated with mesothermal deposits, and the ore minerals of the early cycle of mineralization in this district are also of species that are deposited at moderate temperatures. During the second metalization the temperatures must have been appreciably lower, for silver and antimony generally become more concentrated as the temperature of the solutions becomes lower, and the complex sulfantimonites and sulfarsenites are commonly regarded as diagnostic of epithermal conditions.

The absence of shearing on the one hand and of intense brecciation on the other indicates that ore deposition took place neither at great depth nor very near the surface. The rather small amount of open space associated with the fissuring and fracturing and the absence of marked banding or crustification and of ore textures that suggest rapid chilling against cold near-surface rocks indicate that the ore was deposited at moderate depths, perhaps a mile or two below the then existing surface. The association of the deposits with hypabyssal intrusive rocks also suggests that the deposits were formed at intermediate depths.

As, for reasons given elsewhere in the report, the faulting and igneous activity are considered to have been affiliated with the

of variable thickness, which permits the ore to be easily detached from the country rock. The compactness of the ore and the ease with which it can be separated from the waste facilitated hand sorting in the early days, when attention was directed only to the main seams and lenses, so that the ore could be cheaply mined and concentrated without the expense of milling.

In each of the bodies on the low-angle overthrusts, much of the ore is concentrated in thin, compact high-grade seams, commonly no more than a few inches wide, along the better-defined wall of the fault zone, which is usually the footwall; but some of the ore forms grains and stringers in the fractured rock above, and in places the stringers join another but smaller seam along the hanging wall. At the Hope mine the width of the main ore seam has averaged about 4 inches and has rarely exceeded 7 inches. During the early operations the seam was mined profitably wherever it was more than 2 inches thick. No attention was then paid to the stringers, but when the mill was placed in operation the stringers as well as the main seam were stoped, and all the ore was saved. In some parts of the mine the stringers have increased the thickness of the high-grade ore to 2 feet or more and have provided stoping widths of 4 and even 6 feet. At the Lawrence mine, also, much of the ore has been mined from a footwall seam that is mostly 2 to 4 inches and locally as much as 8 inches thick. Ore has also been mined from hanging-wall seams and from stringers and disseminated ore in the fractured rock between the hanging-wall and footwall seams, giving stoping widths of 2 to 4 feet. Most of the other low-angle thrust faults possess more or less similar characteristics. In some, however, the ore is in small bunches or pockets or in numerous small stringers in the fractured and brecciated country rock.

Although the ore seams in all these thrusts are remarkably persistent, they are not uniform in thickness; they pinch to knife-edge thinness and swell to bodies several inches thick. To be minable, an ore shoot must be at least 10 feet long. Some shoots have been mined for several hundred feet on the strike and for considerably greater distances on the dip. Some seams instead of pinching break up into thinner rather widely spaced stringers; the splitting as well as the pinching mostly occurs at places that show an increase in the quantity of gouge along the fault zone.

The ore in the steep reverse faults also is largely confined to compact seams or thin lenticular veins; but as much of the faulting movement has taken place on several planes rather than a single plane, there may be several prominent seams, rather than only one, along the fault zone. All of the early work at the White-

structural break also intervened between the deposition of quartz and that of the sulfides, for much of the quartz is cut by healed fractures filled with sulfides, by which the quartz is partly replaced. Some quartz, however, continued to be deposited with the sulfides, which enclose widely scattered crystals of quartz. Barite was locally deposited on the quartz, perhaps before the sulfides.

The first sulfide deposited was either pyrite or arsenopyrite; there is no decisive evidence as to which came first. Again structural adjustments interrupted the process, and both minerals, particularly the pyrite, were fractured. Both minerals were then cemented and partly replaced by the sulfides that followed, first sphalerite and then galena. Rather marked movement also occurred after the deposition of the sphalerite, much of which was shattered before any other sulfides were added. Tetrahedrite was deposited immediately after sphalerite, but much of it was subsequently replaced by galena, locally with an intervening reaction rim of bournonite. Very minor fracturing of the galena and other minerals permitted the introduction of a little calcite. Whether the rhodochrosite was introduced at this point or during the succeeding silver-antimony stage has not been determined, but it appears likely that the deposition of calcite brought the early mineralization to a close. Further faulting served merely to shatter the sphalerite and to deform the galena by flowage, giving much of it a prominent banded or gneissic structure or changing it to fine-grained "steel galena."

Renewed mineralization, which occurred after the deposits on Howe and Middle Mountains had been reopened by vigorous movements, began in at least one place with the deposition of quartz, but generally it began with the deposition of the various complex sulfantimonites and sulfarsenites, which filled fractures and replaced galena. As most of the sulfosalts are intimately associated, they may in part have formed contemporaneously. However, some sulfantimonites and sulfarsenites replace other sulfantimonites and sulfarsenites.

DISTRIBUTION OF THE ORE

Much of the ore comes from compact seams and lenses composed almost entirely of massive sulfides, but some occurs in stringers or forms disseminated grains. The seams and lenses generally lie along the more prominent fractures or fissures of the fault zone, ordinarily along one of the walls, with the stringers and the disseminated grains in the fractured rock alongside. The main ore seams are generally separated from the walls by gouge

Laramide orogeny, of late Cretaceous or early Tertiary time, the associated mineralization must have taken place at about the same time. The ore deposits, like those in Kootenai County along similar zones of structural weakness and igneous intrusion,[10] are believed to have been formed in the early part of the Tertiary.

OUTLOOK

Although the Clark Fork district resembles the Coeur d'Alene district in its stratigraphic and structural setting and in the character of its mineralization, its deposits are neither so numerous nor so large as those of its more famous neighbor. The excellent grade of much of its ore may partly compensate, however, for the smaller size of the deposits, which, if worked economically and on a scale proportionate to their size, may continue to produce for some years to come. As development has only kept pace with mining, the extent of the reserves is unknown, but the geologic conditions suggest that the roots of the ore bodies may extend some distance below the present workings. The apparent decrease in the size and number of the ore shoots with depth may merely reflect local unfavorable structural conditions; the ore, apart from a slight increase in zinc content, shows no definite mineralogic change such as might be expected near the lower limits of the ore bodies. As the controlling structural features presumably extend to depths far beyond any that will ever be reached in mining, the vertical range of the ore is probably determined by physicochemical conditions, of which temperature is most important; and as the character of the mineralization and the wall-rock alteration suggest that temperatures, at least during the early mineralization, were moderate, it is unlikely that there was any abrupt change to higher, less favorable temperatures, such as would be reflected in an abrupt change in the composition of the ore. The increase in antimony and silver with depth, particularly at the Whitedelf mine, complicates the problem of ore persistence, but as these metals favor less heated solutions than those that carried and deposited the galena and associated minerals their increase in depth apparently adds to the likelihood that the ore will continue to deeper levels than have thus far been reached.

Increasing depth is not likely to be attended, however, by a uniform change of conditions either for the better or for the worse. Ore shoots are largely localized along the less steeply dipping parts of the low-angle thrust faults and the high-angle reverse faults, and there is no apparent reason why the steepen-

[10] Anderson, A. L., Geology and metalliferous deposits of Kootenai County, Idaho: Idaho Bur. Mines and Geology Pamph. No. 53, pp. 21-25, 28-31, 43-44, 1940.

ing of the faults and the pinching of the ore bodies in the deeper parts of some of the mines should not give way to the reverse conditions at still greater depth, unless the greatly increased rock pressure should be unfavorable for deeper-seated thrusting and induce a marked change in the character of the faulting. In view of the moderate depth at which the deposits have been formed, the few hundred feet of development can hardly have disclosed the full vertical extent of the structure favorable to mineralization.

Not enough exploration has been carried on at the several mines to make it certain that all the mineralized fractures have been found, and even the known fractures may contain ore bodies hitherto undiscovered.[11] Some of the branch and parallel thrust zones at the Hope mine deserve more attention than they have received. More work might well be directed, for example, along the dike and Norquist fault zones, particularly where they are joined by branch faults or where they cut the mineralized thrusts. There may be zones of fractured rock in or along these faults that have provided channel ways for the movement of ore-forming solutions and room for the deposition of large ore bodies. At the Whitedelf mine additional exploratory work might be carried out to advantage along the Pearl fault and in the country rock southeast of it, especially from the deeper levels of the mine. At the Lawrence mine a number of well mineralized low-angle thrusts have been uncovered. Most of the present limited development has been confined to one of these faults, but some of the others show promise and seem worth prospecting.

Although all the faults in the district show some evidence of the action of mineralizing solutions, only the faults that were of small throw, and therefore not encumbered with heavy gouge, allowed that free movement of the ore-bearing solutions that favored the formation of large ore deposits. Such conditions were best fulfilled by the low-angle thrusts and the high-angle reverse faults, and it is toward the discovery of such faults that search for new ore bodies should primarily be directed. As these faults are not reflected in the topography and are generally very inconspicuous even where they crop out, and as, moreover, they are largely mantled with glacial debris, they are not easily discovered. Their discovery, like that of the Whitedelf ore body, may have to be more or less accidental, unless geophysical methods of prospecting can be effectively applied to deposits similar in size to those already found. Two areas are especially worthy

[11] Diamond drilling by the U. S. Bureau of Mines since 1943 has proved the persistence of the Pearl vein beneath the valley of Lightning Creek and has disclosed an ore body on the Hope property beneath several hundred feet of gravel fill.

apparent relation to the surface or ground-water table, it is probably a product of hypogene rather than supergene enrichment.

The presence of pyrargyrite probably has had much to do with the high silver content of the ore in which it occurs. In much of the Whitedelf ore the silver-lead ratio has been about 1:1 (one ounce of silver to each percent of lead), but in the shoot that contains the pyrargyrite the ratio is commonly 2:1 to 3:1 and goes as high as 6:1. The last two shipments of concentrates in 1941 carried 210.5 and 237.5 ounces of silver per ton and 38.6 and 36.6 percent of lead, respectively. The lead content of these two shipments was considerably below the average for the mine, whereas the antimony content (9.6 and 8.4 percent) was considerably above the average, being indeed the highest ever recorded for the mine. The relatively low lead content and the relatively high antimony and silver content suggest that the ore consisted largely of the lead sulfantimonites.

PARAGENESIS

As many data on mineral succession have been included in the descriptions of the individual minerals, little more than a summary of the paragenesis need be given here. The order in which the minerals were deposited during the first period of metalization is particularly well defined, for wherever the minerals were not deposited as successive crusts in open spaces minor faulting contemporaneous with ore deposition fractured and crushed the earlier minerals, which were then cemented and partly replaced by later minerals. After the major structural break that separated the two periods of metalization, the mineralization-faulting was not so prominent, and the order in which the various sulfosalts were then deposited is not so easily interpreted and has not been entirely worked out.

In all but one of the deposits mineralization was initiated by deposition of siderite in fractures, accompained by replacement of the bordering country rock. The only known exception to the rule occurred in the breccia vein at the old Ralph property, where the first mineral deposited was quartz, which was followed by siderite. In most of the deposits a period of minor faulting occurred next, before other minerals were introduced. Much of the siderite that had been deposited was more or less extensively brecciated by this faulting, after which quartz was introduced closely followed by sulfides, all of which replaced the siderite except where the siderite had only partly filled open spaces and had not been disturbed by the faulting; in that case the quartz and sulfides were deposited on the surface of the siderite crystals. A minor

ment of the Pearl vein, where it forms rather loosely meshed, partly interlocking crystals cemented and in part penetrated by needles and laths of the complex sulfosalts. It forms a very subordinate part of the ore shoot as a whole, and it seems to be absent from all the other deposits in the district.

Semseyite (?).—Semseyite was observed in some of the polished sections of ore from the Pearl vein.

Jordanite (?).—Jordanite was identified in some of the ore from the Hope mine.

Bournonite (?).—Bournonite reappears with the younger minerals in the ore at the Hope and Whitedelf mines, being microscopically visible when the associated minerals have been etched by nitric acid. It then appears distinctly as grayish veinlets and stringers cutting and replacing galena and the various lead sulfosalts.

The presence of late bournonite is apparently responsible for raising the copper content of the ore at both the Hope and Whitedelf mines. In the latter mine most of the ore shipped between 1939 and 1941 inclusive contained 0.01 to as much as 0.5 and some of it as much as 0.8 percent of copper, whereas the ore shipped earlier contained less than 0.01 percent of copper. The increase came when the ore notably rich in the sulfosalts was mined. The ore at the Hope mine likewise has fluctuated between 0.01 and 0.1 to 0.2 percent. The ore at the Lawrence mine, on the other hand, has never carried more than 0.01 percent of copper, and that probably represents, roughly, the percentage of copper in the ore deposited throughout the district during the early stage of metalization, any higher percentage being due to enrichment during the later hypogene stage.

Pyrargyrite.—Pyrargyrite ($3Ag_2S.Sb_2S_3$) has thus far been observed only at the Whitedelf mine and there only in the ore shoot in the southwest segment of the Pearl vein, which was being mined in 1940 and early 1941. It may be present on the deeper levels of the mine (inaccessible in 1940), for the silver content of the ore mined from those levels was unusually high. Pyrargyrite is fairly abundant in the ore shoot in the southwest segment of the Pearl vein, where scattered grains and irregular stringers of it are plainly visible, particularly along fractures that cut the lead sulfosalts and galena. In polished sections it is easily detected without etching as grains and veinlets that cut and replace the sulfosalts and galena. It tends to be distributed along fractures that cut across both sulfosalts and galena and may have been the last mineral to enrich the ore shoots. As pyrargyrite, like the other sulfosalts, appears to increase with depth and has no

of prospecting—that which contains the present producing mines and that which lies between the mines and the Hope fault. Some of the most likely ground may lie beneath the gravel of Lightning, Mosquito, Cascade, and Spring Creeks.

MINES AND PROSPECTS

WHITEDELF MINE

LOCATION AND PROPERTY

The Whitedelf mine is near the southeast end of Howe Mountain, in sec. 34, T. 56 N., R. 2 E. (pl. 6). The property extends entirely across the ridge, but the principal workings and the mill are on the northeast side, along and just above Spring and Lightning Creeks. Other workings, including the James E. White tunnel, are on the southwest side of the ridge, within a hundred yards of United States Highway No. 10–A. Much of the work done in 1940 was in the James E. White tunnel, but since then the development has been transferred back to the main part of the mine, on the Lightning Creek slope. The mine and mill are about 2 miles by road north-northwest of the railroad station at Clark Fork, or 1¼ miles from the center of town.

The mine is owned by the Whitedelf Mining and Development Co., incorporated in March 1926. The property includes 300 acres of patented land, 80 acres of which is held under lease, a fully equipped mine camp, and a 75-ton flotation concentrator. Development comprises nearly 6,000 feet of underground workings in some eight or nine tunnels, six of which were accessible in 1940 and 1941 (pls. 7 and 8). Most of the work has been carried on from what is known as the Norquist tunnel level, which is connected by a steeply inclined shaft with the 100, 200, and 400 levels, and, by a winze from the northeast end of the 400, with the 500 and 600 levels. Above the Norquist is Anderson tunnel No. 1 (now caved). Most of the ore that has been mined has come from above and below the Norquist tunnel, but a considerable quantity has also come from the James E. White tunnel. Other tunnels near the Norquist are the White tunnel on the Middle vein and the Pugh tunnel on the Pugh vein, but no work has been done in either of them for a long time. The Clagg-Reed tunnel is above the James E. White tunnel, high on the southwest slope of the ridge.

HISTORY AND PRODUCTION

The uprooting of a tree during a storm in 1926 is given credit for the discovery of ore on the Whitedelf property. Test

pits had been driven on the Pearl and Pugh fissures as early as 1924 but without disclosing any mineralization of consequence. The ore bared by the uprooting of the tree, though it gave an excellent surface showing, apparently bottomed within a few feet, and work on this vein—the Middle vein—was finally abandoned. The disclosure had, however, prompted work on other fissure zones, including the Pearl, which had been exposed by a road grader not long previously. With comparatively little development, the Pearl vein fulfilled all the hopes that had been so briefly raised by the Middle vein, and it has been the source of practically all the ore that has been taken from the Whitedelf mine. The results of work on other fissure zones, including the Pugh and South veins, have been disappointing.

Mining and shipping of ore from the Pearl vein started almost immediately after the discovery of ore in the Middle vein. As the ore was rich and came to the very surface, little capital outlay was needed; the hand-sorted ore made the mine pay from the surface. When organized in March 1926, the Whitedelf Mining and Development Co. held 160 acres of patented land. Work was pushed rapidly by both company and leasers, and before the end of the year considerable ore had been stoped from above both the Norquist and Anderson tunnel levels. In the summer of 1927 the workings on the Norquist tunnel level were about as extensive as they are today, and by early autumn all the ore except that of milling grade had been stoped to the surface. The mine was then equipped with electric power, and work was started on an inclined shaft about midway between the face and portal of the Norquist tunnel. By the end of the following year the shaft had been sunk about 200 feet below the tunnel level, and drifts had been carried to the northeast and southwest along the Pearl vein on both the 100 and 200 levels. Work was also begun on a 75-ton flotation concentrator, which was completed in the early part of 1929 and placed in operation in July of that year. Mining and development were continued by the company and by leasers through 1929, 1930, 1931, and 1932. During this period the shaft was sunk to the 400-foot level, and drifting was carried northeastward to the present face. In 1933 the mine was closed because of the low price of metals, and except for some work at the mill in 1936 it remained idle until 1937. In that year a search was made for additional ore along and above the Norquist tunnel; some ore was uncovered and some concentrates were shipped. In 1938 the shaft was unwatered, the lower levels were retimbered, and a winze was sunk from the 400 to the 500 and 600 levels. This work continued into early 1940. Some crude ore and considerable quantities of concentrates were shipped from

Lawrence ore and generally 10 to 40 and exceptionally 90 times as much antimony. As indicated by smelter returns, the Lawrence concentrates generally contain less than 0.1 percent but exceptionally as much as 0.3 percent of antimony; the concentrates and ore at the Hope contain 1 to 2 percent (maximum 2.29 percent) of antimony. The concentrates from the upper levels of the Whitedelf mine contain 1 to 4 percent of antimony, and those from the lower levels and the shoot in the southwest segment of the Pearl vein contain 2.5 to 9.6 percent. The concentrates from the Lawrence mine contain about 15 ounces of silver to the ton, those from the Hope 30 to 45 ounces, and those from the Whitedelf 60 to 80 ounces, except in the deeper ore, where returns of 100 ounces are common and as much as 200 ounces per ton has been recorded.

Most of the sulfantimonite and sulfarsenite that make up the additions to the ore form lead-gray to steel-gray granular masses, which may easily be mistaken for tetrahedrite, except in some places where they form fibrous and divergent groups. The minerals occur for the most part as irregular veinlets and masses in the galena, especially in deformational zones near and along the margins of the ore seams. Stringers of them also penetrate and replace fractured siderite, and masses of them cement the marginal sphalerite, apparently by replacing the galena that previously had cemented the sphalerite. Deposition has not, however, been effected by replacement alone; independent stringers of sulfosalts have been observed along some fault zones that contain but little galena. Some of the ore in the southwest segment of the Pearl vein is made up of curved laths and needles of the sulfosalts that penetrate and lie between crystals of quartz.

The late hypogene minerals that may readily be recognized include quartz and pyrargyrite. The others are so much alike that they can be distinguished individually only with difficulty. The minerals identified include semseyite(?) ($9PbS.4Sb_2S_3$), jordanite(?) ($4PbS.As_2S_3$), and bournonite(?) ($Cu_2S.2PbS.Sb_2S_3$). This group of minerals is negative to most etch reagents. All of them react with aqua regia, and all but bournonite respond readily to nitric acid. Most other reagents are negative. The various sulfosalts and their distinctive tests and relationships are discussed in detail in another report.[9]

Quartz.—Quartz apparently belonging to the late stage of metalization was observed only with the ore in the southwest seg-

[9] Anderson, A. L., Lead-silver mineralization in the Clark Fork district, Bonner County, Idaho: Econ. Geology, vol. 41, No. 2, March-April, pp. 112-122, 1946.

remnant grains and crystals of it are enclosed in the sulfides and masses and stringers are cut and replaced by ore. Deposition of quartz apparently just preceded and in part accompanied the deposition of the early sulfides.

Barite.—Barite is exceedingly rare, having been noted in only two places, one in a specimen from a narrow vein on the east slope of Antelope Mountain, the other in a single thin section of the silicified wall rock in the Whitedelf mine. In the first case the barite forms a filling less than an inch thick between walls of coarse white comb quartz; in the second it forms microscopic crystals in or near seams or stringers of quartz. Its relations prove that it is younger than the quartz, but there is nothing to indicate its age with respect to the sulfides. As it is closely associated with quartz, it, like the quartz, may have been deposited before the sulfides.

Calcite.—Calcite, though it generally escapes notice, is more or less widely distributed through the district, chiefly in microscopic stringers that cut the sulfides. Some, however, is visible to the naked eye; in the breccia vein at the Ralph mine tiny flat rhombohedrons of calcite encrust the sulfides, and in some of the ore at the Lawrence mine there are crystalline crusts as much as a fourth of an inch thick in open fractures in the galena. Elsewhere the mineral was recognized only microscopically as fracture fillings in the sulfides. The relations described show that calcite is the youngest of the early-stage minerals, having apparently been deposited just after the last of the galena. Crystalline crusts may be supergene.

LATE HYPOGENE MINERALS

The deposits on Antelope Mountain, which include those of the Lawrence mine, apparently received no additions of late hypogene minerals; the silver-antimony enrichment is confined to the deposits on Middle and Howe Mountains. Hypogene minerals make up a fourth of the ore substance at the Hope mine and almost all of the ore in the deeper levels of the Whitedelf mine and in the offset segment of the Pearl vein to the southwest. Small amounts of these late minerals have also been observed in nearby lightly mineralized faults, including the Pugh, the Norquist, and the dike fault.

Because of the enrichment, the ore at the Hope mine contains about two to three times as much silver and 10 to 20 times as much antimony as the unenriched ore at the Lawrence mine. The ore of the Whitedelf mine is even more enriched; most of it contains 4 to 6 and part of it 10 to 15 times as much silver as the

the main level and the lower levels. Early in 1940 the company suspended operation and leased the mine to James E. White.

Until 1938, all the ore that had been mined had come from the segment of the Pearl vein northeast of the Pugh fault. In that year the segment southwest of the Pugh was discovered and exposed in cuts and shafts across the ridge to the southwest slope (pl. 9). Prospecting of this newly discovered segment was continued in 1939, and some high grade ore was uncovered and mined. In 1940 the Clagg-Reed and the James E. White tunnels were started near the crest and the lower southwest slope of the ridge, and work was continued along them. During the early part of 1940 a body of silver-rich ore was opened along the James E. White tunnel, and ore and concentrates valued at more than $84,000 were taken from it and shipped during the next few months. Early in 1941, the ore shoot above the James E. White tunnel having all been stoped out, development was transferred to a crosscut and drift on the 400 level of the main mine, which were driven southwest to undercut this ore shoot at greater depth. When the property was visited in August 1941 the drift had been driven about 800 feet, but it still lacked several hundred feet of reaching the downward projection of ore. Later the ore shoot was undercut and stoped upward almost to the James E. White tunnel level (pl. 10). The mine was idle in the summer of 1943.

Up to the end of 1942, the operators had shipped 82,702 tons of ore, containing 11,301,107 pounds of lead, 16,061 pounds of copper, 658,318 ounces of silver, and 6.65 ounces of gold. The production by years is given below:

Production of the Whitedelf mine, 1926-42, in terms of gross metal content

[By G. E. Woodward, Bureau of Mines, U. S. Department of the Interior]

Year	Ore (short tons)	Gold (fine ounces)	Silver (fine ounces)	Copper (pounds)	Lead (pounds)	Zinc (pounds
1926	978	0.95	37,795	893	719,844	
1927	2,518		103,163	209	1,774,019	
1928	2,109		64,636	564	1,204,807	
1929	10,464	1.70	66,082	891	1,112,835	
1930	18,955		81,227	2,383	1,844,969	
1931	15,323		61,635	1,900	1,326,270	
1932	9,551		39,736	1,022	820,198	
1933	900		4,574	95	88,295	
1934	70		4,678	100	89,421	
1936	250		1,796		29,936	
1937	2,755		14,480		340,688	
1938	3,465	2.00	26,185		452,041	
1939	3,522	1.00	25,608	519	426,870	
1940	5,136	1.00	46,302	2,400	505,115	
1941	5,006		50,477	3,171	460,431	
1942	1,700		29,944	1,914	105,368	
Total	82,702	6.65	658,318	16,061	11,301,107	

STRATIGRAPHIC AND STRUCTURAL RELATIONS

All of the mineralized fracture and fissure zones at the Whitedelf mine are contained in the Wallace formation, here represented by partly calcareous quartzite that weathers buff but is grayish and greenish when fresh, by shaly quartzite, and by laminated siliceous shale. The country rock as a whole is dominantly quartzitic, the shaly members being rather widely separated and rarely more than 20 to 30 feet thick. In most of the underground exposures the strike of the beds is about N. 25° W. and the dip 25° NE., but locally the strike may range from N. 5° W. to N. 35° W. and the dip from 15° NE. to 35° NE. Wide departures from the average are mostly the result of the drag of the beds along or against faults.

The most significant features of the local geology are the faults. Most of these cut sharply across the bedding, and they deviate but little in passing from quartzite to shale. The distribution and structural relations of the more important faults are shown in plate 9. Included are the Pearl, Middle, and South faults, all apparently high-angle reverse faults, and the Pugh fault, an important high-angle strike-slip fault. The Pugh fault displaces the Pearl, but because of the lack of observable intersections its relations to the other faults have not been determined. All these faults have been mineralized, but, as pointed out earlier, only the Pearl has yielded much ore.

The Pearl is the most persistent of the high-angle reverse faults and has been traced entirely across the lower southeast end of Howe Mountain and even across to the other side of Lightning Creek. Its general trend is about N. 35°–40° E., but because of minor undulations the strike ranges from N. 30° E. to N. 45° E. The dip, which is everywhere to the southeast, usually ranges between 60° and 75°, though it locally attains 80°. The only serious break in the continuity of the Pearl fault occurs where it has been displaced by the Pugh.

The Pearl fault is not a single fissure but a broad zone of fissured and fractured rock 10 to 40 feet wide. Much of the movement has taken place along the footwall, and consequently the lower part of the fault zone resembles a gouge-filled fissure. In places, however, there has been appreciable movement along hanging-wall fractures and along fractures in the broken rock between the hanging-wall and footwall zones. The fissures thus formed are not all well defined. Some die out along the strike, the movement on them being taken up by parallel overlapping fissures, and other split up into gouge-coated fractures of lesser prominence. Only the footwall fissure appears to persist. In

larly in stringers and irregular veinlets in the fractured wall rock and in thin sheets along the walls of the ore seams. These sheets have generally been so brecciated by faulting movements and then so extensively replaced by ore minerals that remnants of siderite are strewn along the marginal parts of the ore seams, forming small, bleblike inclusions, small discontinuous pods and interrupted layers, or mere isolated grains. Siderite is therefore most conspicuous in veinlets and small bunches in the wall rock, beyond the reach of the sulfides.

The extensive replacement of the siderite by sulfides shows it to be an early mineral; it is, in fact the earliest mineral in all deposits except one. In this exceptional instance it forms a layer on quartz, whereas elswhere the veinlets and scattered crystals of siderite in the country rock are penetrated and replaced by quartz as well as by sulfides.

Rhodochrosite.—Rhodochrosite occurs very sparsely in some of the minor slips that cross the ore bodies of the Hope mine. It forms little stringers of no great persistence, which attract attention only because of their pinkish color. As the rhodochrosite was not observed in contact with the ore, its position in the depositional sequence remains in doubt. Unlike the siderite, it is not closely associated with the galena or earlier minerals, and it may be younger than any of these; it may even have been deposited during the subsequent silver-antimony metalizing stage.

Quartz.—Quartz is considerably less abundant than siderite, being indeed scarcely noticeable except in some of the lead-silver sulfantimonite ore along the southwestern segment of the Pearl vein, in the Whitedelf mine. There, however, the quartz appears to be associated with the younger group of minerals. The early-stage quartz, which alone is to be considered here, is more easily distinguished in thin sections and polished sections than in hand specimens, although here and there small stringers and masses in the fractured wall rock and small crystals and grains within the ore itself are visible to the naked eye. White crystals of quartz form drusy crusts on breccia fragments of wall rock, and isolated crystals are enclosed in the sulfides. White granular quartz forms veinlets or small irregular masses, usually along fractures in the wall rock.

The early quartz is not all of the same age. In the breccia vein at the old Ralph property it commonly encrusts fragments of country rock and is encrusted in turn with siderite crystals, whereas elsewhere it has been deposited on siderite crystals or occurs in stringers or masses that cut the siderite. The younger quartz, also, replaces siderite as well as country rock. For the most part, however, the quartz is older than the sulfides, for

the mineralized faults, but only in minute grains and crystals, which as a rule are sparsely disseminated, so that the mineral can ordinarily be detected only under the microscope. It usually occurs in the silicified walls bordering the ore seams, rarely as inclusions in the sphalerite and galena. Enough of it is associated with the ore, however, to have an appreciable effect on smelter returns. Ore from the Lawrence mine contains as much as 0.1 percent of arsenic and ore from the Hope mine 1.0 to 1.5 percent. At the Whitedelf mine the arsenic content has averaged about 0.5 percent, but it has been somewhat higher in late shipments, which included ore that was rich in lead sulfantimonites. As this ore appears to show no increase in arsenopyrite, its increase in arsenic is thought to reflect the presence of lead sulfarsenites. At only one place, in the drift along the dike fault on the No. 3 level of the Hope mine, is arsenopyrite visible to the unaided eye, but that is because the microscopic grains are so abundant and so closely spaced as to impart a distinctly grayish metallic color to the altered shale.

Much of the arsenopyrite forms minute rhombic crystals, but some of the crystals enclosed in sphalerite and galena have indented borders and rather irregular outlines. The crystals apparently were not so easily replaced as those of pyrite. Most of the arsenopyrite, like the closely associated pyrite, impregnated the bordering walls of the ore seams, lying alongside them rather than within them. The association of the arsenopyrite with equally minute crystals of pyrite in the wall rock suggests that both were deposited at about the same time and in advance of the other sulfides.

Siderite.—Siderite is an ever-present but generally not an abundant mineral, being conspicuous in only a few places. It is, however, the most abundant gangue mineral, apart from altered wall rock broken with the ore in mining. In the breccia vein at the old Ralph property it happens to be the most abundant mineral, but elsewhere it is subordinate to the ore minerals, probably because much of that which may have been deposited has been largely replaced by ore. Nowhere is it entirely wanting, although it is somewhat spotty in its distribution and recognizable in some places only under the microscope.

The siderite has a pale buff color that sets it apart from the other minerals. It is manganiferous and yields a black gossan when oxidized. It exhibits a marked tendency to form regular crystals; perfect rhombohedra not uncommonly impregnate the sericitized wall rock and form crusts on rock fragments in breccias. In places these crusts are covered or partly covered with sulfides. The siderite also occurs in more massive form, particu-

many places it is joined by lateral fissures extending to it from the hanging-wall side. Branches also curve outward into the walls and then bend back to rejoin the main fissure. Numerous minor fractures also extend obliquely outward, but only for a short distance. Generally the disturbance extends beyond the fracture zone and is reflected in a prominent thrust drag in the beds, particularly along the footwall side. In general the fault zone contains much gouge; drifts along it remain open only when strongly timbered. The fracture zone tends to be wide where its dip is low and narrow where its dip is high, and it is narrower, as a rule, in shales or shaly quartzites than in more massive rocks.

The Middle fault is not nearly so conspicuous as the Pearl fault zone, and it does not appear to be very long. As its strike is about N. 55° E., the Middle fault would meet or intersect the Pearl fault if it persisted far enough, but it dies out, or at least becomes so inconspicuous as to be unrecognizable, before reaching the Pearl fault. It dips about 80° NW. The disturbed zone is ordinarily no more than 4 feet wide and the main fissuring no more than a few inches wide. The displacement on the Middle fault has apparently been very much less than that on the Pearl fault.

The South fault is somewhat more prominent than the Middle fault but much less so than the Pearl fault. It has been traced underground for more than a hundred feet and may extend over the ridge to the Miller ground just east of the James E. White tunnel. It apparently does not continue far in the other direction, for it is not revealed in surface cuts nor in the long crosscut driven south from the Norquist tunnel. It is parallel to the Pearl fault and lies a few hundred feet southeast of it. Along the short adit drift the strike is N. 50° E. and the dip 70° SE., but both strike and dip are somewhat variable. The fault has at least one clearly defined wall, but the drift has not revealed the entire fault zone. At some places on the Miller ground the fracture zone measures as much as 12 feet wide. Drag in the bordering wall rock indicates that the fault is a high-angle reverse fault.

The Pugh fault is much more conspicuous than the Pearl fault and probably has a considerably larger throw, for it offsets the Pearl fault 110 feet horizontally. Its general trend is about N. 70° E., but in crossing the Pearl fault zone it has been refracted, so that locally it strikes about due east. In most places it dips about 85° S., but in some places it is vertical or even dips steeply to the north. The fault zone is widest where it changes direction in crossing the Pearl fault, being there about 40 feet across. As the fault resumes its normal course the zone of fractured rock

narrows and in most places does not exceed 10 or 15 feet. The various fractures making up the fault zone differ widely in strike and dip, some of them extending along the zone and others cutting obliquely across it. The movement along the fault has produced an enormous amount of gouge as well as of less finely pulverized rock and has also produced intricate drag folds in the rock within as well as alongside the fault zone.

Many lesser faults are exposed in the Whitedelf mine, most of which cut and offset the Pearl and Middle faults. Most of them strike about N. 5° W., dip 65°–70° W., and displace the other faults 2 to 4 feet in a horizontal direction. The displacement is invariably to the south on the west side of the fault. Some of the movement has been premineral and some postmineral.

OCCURRENCE AND DISTRIBUTION OF ORE

Every fault in the Whitedelf mine contains some ore, but apparently none except the Pearl was structurally suited for deposition of ore in any considerable amount. Although the Pearl fault is a broad complex zone of fissuring and fracturing, much of the ore on the Norquist and upper levels formed a vein of massive sulfides along the footwall fissure; in the Norquist tunnel this vein was 2 to 29 inches thick. The vein was mined to the surface between a point near the portal of the tunnel and the Pugh fault and also for a short distance in the offset segment on the other side of that fault. In one place above the Norquist level the ore swelled into a mass 7 feet 10 inches wide, but elsewhere the thickness of the vein rarely exceeded 24 inches and was for the most part considerably less. Its average width along the Norquist tunnel was only about 9 inches. In places, especially where the gouge increased in abundance, the ore broke up into stringers. Stringers also extended outward along fractures, and in places there was considerable disseminated ore. Some of the other fissures, also, along the fault zone contained seams of ore. At one place above the Norquist tunnel there were three separate seams. A seam on the footwall and one on the hanging wall each contained 3 feet of high-grade ore; the third, in the space between, consisted mainly of disseminated ore. Between the Norquist level and the 400, only the footwall seam apparently contained much ore; below the 400, however, ore seams were found along both the footwall and hanging-wall of the fracture zone. In the James E. White tunnel, on the southwest side of the ridge, the distribution of the ore was much like that in the Norquist tunnel. The ore tended to form compact seams and

Bournonite (?).—Bournonite ($Cu_2S.2PbS.Sb_2S_3$) forms widely scattered microscopic grains and irregular masses in the ore at the Hope and Whitedelf mines. Its appearance and reactions are much like those of tetrahedrite, from which it may be distinguished by the rather conspicuous polarization colors that it displays in reflected polarized light. The mineral apparently occurs in both the younger group and the older group of minerals. Only the older bournonite will be described at this point.

The older generation of bournonite forms minute masses enclosed in galena and narrow margins on and tiny veinlets in tetrahedrite also enclosed in galena. These narrow rims of bournonite and tiny veinlets in the tetrahedrite indicate that the bournonite probably was formed during replacement of tetrahedrite by galena, the tetrahedrite contributing the copper, antimony, and some of the sulfur and the lead-bearing solutions contributing the lead and perhaps a part of the sulfur. Its position in the sequence is therefore between tetrahedrite and galena. The younger generation of bournonite, as will be shown later, replaces lead sulfosalts as well as galena.

Pyrite.—Small remnant grains of pyrite are invariably present in the marginal parts of the ore bodies, and scattered crystals of it occur in the bordering wall rock. It is not conspicuous except in some of the fissure and breccia zones that were not impregnated with galena. Locally it is fairly abundant in the fractured rock bordering some of the ore bodies.

The crystals and grains of pyrite are generally minute, but pyritohedral faces can usually be distinguished even on the smaller crystals. Crystal outlines are absent only where the mineral has been partly replaced by sphalerite, galena, and some of the lead sulfantimonites. It forms a few massive granular aggregates, but they are small and relatively inconspicuous. Much of the pyrite in the wall rock is in rather sparsely disseminated crystals. In the zones of brecciated rock not filled with ore the pyrite tends to form thin crystalline crusts on breccia fragments, much of it being in thin patches on the surface of the altered rock.

As pyrite has been engulfed in sphalerite and galena and locally replaced by them, it is clearly older than either; but it is younger than siderite, for minute pyritohedrons encrust crystal faces of siderite and are alined along cleavage planes in siderite. In places pyrite and quartz are closely associated, and one or both fill fractures in siderite or form veinlets replacing siderite. So little pyrite is enclosed in galena as to suggest that the pyrite in the main masses of ore was replaced by the younger ore minerals.

Arsenopyrite.—Arsenopyrite has been identified along all of

upward to 3 percent, and in some of the late shipments the concentrates have contained as much as 5 percent and one as much as 9.5 percent of zinc.

Much of the sphalerite has a reddish-brown color that makes it easy to distinguish from the pale-brownish or buff siderite and the other minerals. The hue of the sphalerite tends to be reddish at the Hope mine and brownish at the Whitedelf. It is extensively brecciated and has locally been crushed to a powder, which coats the surface of the ore. Part of it is confined to small lenses, pods, and bunches, less than an inch to several inches long and a fraction of an inch to an inch wide. Much of it forms scattered granules or small veinlets in the wall rock.

The sphalerite is older than the galena but apparently younger than the pyrite, arsenopyrite, quartz, and siderite. Like the galena it encloses scattered remnants of pyrite and less commonly of arsenopyrite and penetrates and replaces siderite, quartz, and the altered country rock. That which penetrates and replaces the siderite and altered country rock generally forms irregular ramifying veinlets. Where it has been deposited in openings it forms a layer next to the walls, commonly on a base of siderite or quartz crystals. It is confined to the edges of massive ore seams usually as brecciated grains cemented with galena and as wall-rock stringers cut off sharply and penetrated by bands and stringers of galena. Where the ore consists dominantly of massive galena, the sphalerite is mostly restricted to stringers in the bordering wall rock. When the later hypogene antimony-bearing and silver-bearing solutions moved along the deformational zones at the margins of the ore bodies much of the brecciated sphalerite became cemented with sulfantimonites and sulfarsenites, partly because these sulfosalts replaced the galena that originally had cemented the shattered grains of sphalerite.

Tetrahedrite.—Tetrahedrite is present in variable but small quantity in all of the ore, generally as microscopic grains within the galena, less commonly as larger, irregular grains associated with galena and sphalerite. It seems somewhat more abundant in the ore at the Whitedelf mine than elsewhere, but even there it is recognized only under the microscope. The tetrahedrite is presumably argentiferous, and the galena may have acquired a part of its silver content by replacing tetrahedrite. However, such a process can hardly account for more than a very small part of the silver, for, as much of the ore contains no more than .01 percent of copper, the proportion of tetrahedrite in the ores is now and probably always was very small. A little tetrahedrite occurs in fractures in the sphalerite. The mineral is therefore younger than the sphalerite but older than the galena.

masses and to occur in bunches and lenses as much as 12 inches thick. There were also additional seams and stringers, which, added to the main body of ore, formed as much as 3 feet of high-grade and as much as 6 feet of milling ore. The ore was concentrated along footwall and hanging-wall fractures, which locally seemed to be fairly closely spaced.

The distribution of the ore shoots along the Pearl fault is shown in plate 10. The largest shoot was uncovered along the Norquist tunnel level and was stoped continuously to the Pugh fault and upward to the surface. The shoot extended downward to the 100 level with little change, but below that level it split into two branches separated by several hundred feet of barren fissure. One branch lies close to the intersection of the Pearl with the Pugh fault; the other lies at some distance to the northeast. Both plunge steeply to the northeast and appear to decrease in stope length with increasing depth. Below the 100 level the ore body is said to have been more lenticular than above, tending to form relatively thin lenses, rarely more than 40 feet long, separated by thin seams of ore or barren zones 10 to 20 feet long. In some places on the 400 level the lenses are said to have been as much as 3 feet thick. As the winze from the 400 to the 500 and 600 levels was filled with water, first-hand information on the characteristics of the shoots below the 400 was not to be had.

The shoot on the southwest side of the Pugh fault was stoped on the Norquist level for only a short distance. The height to which the stope extended was not learned. The shoot also was cut on the 400 level, when the drift was about 100 feet long, and was stoped to a height of about 130 feet. Like the main ore shoot on the northeast side of the Pugh fault, this shoot plunges steeply northeast.

The ore shoot in the James E. White tunnel had a stope length of about 130 feet and was stoped upward for 200 feet, apparently to the top of the commercial ore. In the Clagg-Reed tunnel above, the ore occurred in compact but very small seams or lenses and the shoots were small. The ore shoot has since been undercut on the 400 level and the ore stoped upward about 215 feet, almost to the James E. White tunnel level (pl. 10). The stope was inaccessible in August 1943.

Although the junctions of seams and the greatly increased fracturing close to the Pugh fault have tended to cause local increases in the amount and thickness of the ore in the ore

shoots, the position of every shoot has been controlled by the angle of dip of the guiding fissure or fracture. The ore shoots occur where there is a local flattening of the dip, and they terminate, laterally and above and below, where the dip increases. As pointed out earlier, upward movement of the hanging wall has separated the walls along the less steeply dipping parts of the reverse faults and has brought them tightly together along the more steeply dipping parts. The gouge produced where the walls have been rubbed together formed an effective seal, which directed the ore-bearing solutions into the more open parts of the fault zone. Above the 100-foot level the fissure that contains the ore dips 60°–70° SE. The splitting of the main ore shoot below the 100 level occurs at a place where the dip locally increases to 75° or 80°. The ore shoot in the James E. White tunnel, also, appears where the dip decreases from 75° or more to 60° and 70° and ends where the dip again increases.

As much as 3 feet of ore appeared in the Middle fault where it was exposed by the uprooting of a tree, but the ore pinched abruptly on both strike and dip, and very little extended to the tunnels below. In the upper tunnel the mineralized zone was mostly less than 6 inches wide, though in places it attained a width of 2 feet. Ore was stoped to the surface but only for a very short length. In the main tunnel below, the mineral-bearing seam was less than an inch thick. The fault dips very steeply and may dip somewhat more steeply below than above. Much of the mineralization is near fault intersections, the premineral offsets by the northward-trending faults providing additional openings for ore. The ore in the Middle fault is not so compact as that in the Pearl.

An ore shoot about 20 feet long, containing as much as 30 inches of better than milling-grade ore, was uncovered in the tunnel or drift on the South fault. One carload of this ore was shipped. The ore shoot dips about 70° SE. and may be in a part of the zone fissure that does not dip as steeply as the remainder.

Although the Pugh fault has not generally been regarded as a mineralized fault, it shows the effects of rather extensive hydrothermal alteration, and in places it contains scattered sulfides, mostly pyrite but locally galena and sphalerite in addition. Some stoping was done on two small shoots in the zone of most intense fracturing, where the Pugh fault changes its course in crossing the Pearl. One shoot is about 60 or 70 feet from the end of the Pearl fault on the Norquist tunnel; the other is 60 or 80 feet beyond. The ore shoots were 20 and 25 feet long, respectively, and 2 to 7 feet wide. The ore was disseminated but of milling

scopic grains of tetrahedrite can hardly account for the presence of all the silver, and the galena must therefore be argentiferous.

Most of the galena shows the effects of rather intense deformation, associated particularly with the movements that reopened the early fillings and permitted the admission of the younger mineral-bearing solutions. Although originally most of it was coarsely cubic, much of it now is mashed or granulated and shows a pronounced gneissic structure. Some, however, has been changed to fine-grained "steel" galena. This deformation is generally most pronounced along the borders of the galena bodies, but where the structural movement has been particularly intense it has affected all the galena. Where the deformation has been relatively slight, as at the Lawrence mine, the mashed zone is only about half an inch wide and passes abruptly into coarsely crystalline cubic galena in which the cleavage is curved or bent. At the Hope and Whitedelf mines the younger sulfantimonites have in large part been introduced along the zones of flowage.

Excepting calcite, the galena appears to be the youngest of the early minerals. It commonly encloses scattered irregular grains of pyrite and even more widely scattered remnants of microscopic grains of arsenopyrite and tetrahedrite. It also cements brecciated masses and grains of sphalerite, and in places it forms tiny veinlets that cut the sphalerite. Where it has been deposited in openings it may form a crust on sphalerite or, if sphalerite is absent, on siderite. Much of it shows a marked tendency to replace siderite, but where siderite is absent or has been largely replaced, seams, ramifying veinlets, and irregular bodies of galena may penetrate and replace earlier quartz or altered country rock.

Sphalerite.—Sphalerite is present in small but variable quantity in all the deposits. Some shipments from the Lawrence mine have contained only traces of zinc, but others have contained 1 to 3 percent, and one contained enough to incur a smelting penalty. The ore of the Hope mine contains a somewhat higher proportion of sphalerite. Shipments from the intermediate and upper levels have contained 2.5 to 5 percent of zinc; those from the lower levels commonly contained a little more than 5 percent, and exceptionally as much as 10 percent. But, although the proportion of sphalerite increases downward in general, it may be far from uniform on a given level; different ore shoots differ widely in their content of sphalerite, the mineral being almost absent from some shoots and relatively abundant in others. The sphalerite at the Whitedelf mine shows a similar distribution, though on the whole it is less abundant than at the Hope mine. Much of the ore that was first shipped contained a trace to 1 percent of zinc, but with increasing depth the zinc content has ranged

beds of the Wallace formation east of Lightning Creek are in the faulted block at the northwest edge of Middle Mountain.

The Striped Peak formation, which consists mainly of sandy and argillaceous materials, has little resemblance to any other division of the Belt series except certain parts of the St. Regis formation, exposed just west of the district. On the lower slopes of Middle Mountain, the formation includes several hundred feet of thin-bedded blackish and bluish-gray shale, somewhat like the shale in the upper part of the Prichard formation. Some of this shale is in beds as thin as paper. The shale is interbedded with more massive beds of banded greenish argillite and with beds of pale-greenish argillaceous quartzite. These rocks grade upward into a great thickness of reddish sandstone and shale alternating with greenish shale, argillite, and quartzite, partly of dull-green and partly of olive-drab hue. The layers of reddish beds range in thickness from a few feet to several hundred feet, and the layers of greenish or olive-drab beds are 50 to 200 feet thick. Calcareous beds are present but are not so conspicuous as on Antelope Mountain, where there are some beds of impure massive limestone several feet thick. The rocks on Antelope Mountain seem to include less of the paper-thin shale and considerably more of the reddish beds than those of Middle Mountain; the upper half of Antelope Mountain has a decidedly reddish tint. On the spur close to the town of Clark Fork, the reddish beds are not so numerous nor so conspicuous as the greenish beds.

Reddish and olive-drab beds are especially characteristic of the formation, but where these are absent the laminated shales are diagnostic. The calcareous beds weather somewhat like those in the Wallace formation, but as they are comparatively few they do not markedly affect the general appearance of the weathered outcrops.

QUATERNARY DEPOSITS

GLACIAL DEPOSITS (PLEISTOCENE)

The glacial deposits include irregular mantles of till, terraces of stratified outwash, and sheets of ponded clay silts. The most widely distributed of these deposits is the till, which conceals much of the bedrock on the northeast slope of Howe Mountain and the lower country across to the base of the Cabinet Mountains, and which also masks much of the bedrock of the foothill country northeast and east of Middle and Antelope Mountains. Isolated patches also occur here and there on Howe, Middle, and Antelope Mountains. Much of that on the mountain slopes forms a thin irregular veneer, but that in the lower country close to

the base of the Cabinet Mountains is many feet thick. The till is entirely unsorted, consisting of small to large rounded and angular boulders in a more or less clayey matrix.

Much of the stratified outwash remains as a terrace along the Clark Fork, particularly southeast of the town, but minor patches are scattered in other parts of the district. The largest remnant is a terrace, a hundred feet or more in height, that skirts the south and southwest base of Antelope Mountain, extending almost to the town of Clark Fork. Smaller remnants lie on the southeast tip of Howe Mountain just above Lightning Creek and others on the lower western slope of Middle Mountain. The material on Middle Mountain consists in part of ponded clays. It is capped by till, which extends for some distance up the mountain slope. Detailed study is likely to prove that the deposits belong to more than one cycle of Pleistocene glaciation.

ALLUVIUM (RECENT)

Deposits made by the present streams cover a considerable part of the district. Alluvium forms a relatively broad strip along the Clark Fork and much narrower ones along Lightning Creek and its tributaries, Spring and Cascade Creeks. Alluvium also covers the floor of the lower valley of Mosquito Creek.

The alluvium along the Clark Fork is composed of the finer flood-plain and delta materials, mostly sand and silt. That along Lightning Creek and its tributaries is coarser, consisting preponderantly of gravel mixed with sand and boulders, and is largely of torrential origin. The town of Clark Fork is built upon a coarse bouldery fan deposited by Lightning Creek. The relation between the alluvial flats and the abrupt valley walls suggests that the alluvium has accumulated to depths of some hundreds of feet, especially along the river.

IGNEOUS ROCKS

The few dikes of diabase and porphyry in the district are members of a "porphyry belt" that stretches in a west-northwesterly direction along the general course of the Hope fault. Clark Fork is apparently near the southeast end of the belt, which may be traced westward for at least 25 miles. The dikes apparently occupy associated fractures on both sides of the Hope fault but are most numerous on the northeast side. They are exposed along the lower steep frontal slope of the Cabinet Mountains, particularly northwest of the district, where they extend to and beyond the Pack River and the town of Hope, and in the hills within and alongside the Purcell Trench. Southeastward, toward the Clark Fork district, the dikes appear to decrease in number

and variety, and a few miles southeast of the district they finally disappear.

In the Clark Fork district these dike rocks are closely associated with faulting and mineralization. They are the only igneous rocks in the region that possess this relationship and are therefore the only ones that need be considered in this report. The dikes are much younger than the Purcell sills (pre-Cambrian), intruded into the Prichard formation northwest of the district; they are younger, indeed, than the bodies of granitic rock, batholiths and stocks, emplaced during late Jurassic or Cretaceous time.[3] The nearest of these bodies, which consists of granodiorite, is at the edge of the valley of Lightning Creek, just north of the map area. The next nearest are no closer than Pack River, several miles northwest of Hope. The dikes are not genetically and structurally related to the batholitic masses, as believed at the time of the reconnaissance, but are independent injections from a younger magmatic source. For reasons presently to be given, the dikes of the "porphyry belt" are believed to have been intruded during early Tertiary time.

EARLY TERTIARY (?) DIKES

Diabase.—Only two diabasic dikes were observed within the district, one in the underground workings at the Hope mine and the other at the Lawrence mine. Both are intruded along premineral faults, and both have been more or less extensively altered by the mineralizing solutions and are locally cut by stringers of ore.

The diabase is medium-grained and is dark gray to black where unaltered. In thin section it is seen to consist mainly of labradorite and augite, mixed with magnetite, ilmenite, and apatite. The grains of labradorite and augite are similar in size, but the labradorite tends to show better developed crystal form, laths of labradorite being cemented and partly enclosed by augite. Large skeleton crystals of magnetite and ilmenite (?) cut through and apparently replace those of augite and labradorite. Some grains of ilmenite and apatite are about as large as those of pyroxene and plagioclase.

Where it is altered, the diabase is light gray to pale green, and thin sections reveal much sericite, chlorite, and calcite. Where the alteration has been exceptionally intense, the rock is thoroughly bleached, the original minerals have been almost completely destroyed, and the primary texture has been almost obliterated.

[3] Anderson, A. L., Geology and ore deposits of the Clark Fork district, Idaho: Idaho Bur. Mines and Geology Bull. 12, pp. 24-30, 1930.

WALLACE FORMATION

Except in a small block along the lower northwest slope of Middle Mountain, all the exposures of the Wallace formation lie west of Lightning Creek. The formation is the country rock of all but the northwest third of Howe Mountain, and it also probably underlies much of the glacially mantled surface between Howe Mountain and the base of the Cabinet Mountains. It is altogether more than 6,000 feet thick. Although the Wallace formation was formerly presumed to underlie the lower western slopes of Middle and Antelope Mountains, the rocks there are now known to belong to the Striped Peak formation.

The Wallace formation is very heterogeneous, but, as it is the only formation containing any considerable amount of limy material, it is rather easy to identify, especially where it is weathered. It is made up of thin-bedded, greenish, partly calcareous shale and argillite, of bluish and dark-grayish banded argillite, of light-gray, yellowish-weathering calcareous quartzite, of pale-green and grayish-white quartzite, and of thin beds of impure limestone. Beds almost identical in character recur at many horizons, and rocks of different kinds grade into one another. Sun cracks and ripple marks occur abundantly throughout the formation. The most distinctive feature of the formation is the way in which it weathers. Weathering of the calcareous members produces peculiar cellular forms recognizable even in small fragments, and most of the rock in the formation assumes upon weathering a brownish-yellow color that is highly characteristic.

The rock forming most of the southeast end of Howe Mountain is largely quartzitic, but interspersed with the more massive beds of quartzite are beds of shale and shaly quartzite a few feet to 20 feet or more in thickness. As a whole the formation is fairly competent, and locally it apparently fractures more readily than it folds.

STRIPED PEAK FORMATION

The Striped Peak formation composes most of Middle Mountain and all of Antelope Mountain; consequently it underlies more of the mapped area than any other formation. It is more widespread near Clark Fork than was formerly supposed. The formation is now known to contain some limy members, which, however, are neither so numerous nor so conspicuous as those in the Wallace formation. During the earlier reconnaissance all rocks containing carbonate of lime were grouped with the Wallace, and the somewhat calcareous strata in the lower western slope of Middle and Antelope Mountains, which are now recognized as Striped Peak, were consequently mapped as Wallace. The only

impressive structural feature being a great transverse earth fracture known as the Hope fault. As bordering subsidiary fractures have provided openings for the intrusion of the igneous dikes and the circulation of ore-bearing solutions, the Hope fault is also the most important element of the local geology from an economic standpoint. Especial emphasis, therefore, is placed on the Hope and the associated subsidiary faults.

STRATIGRAPHY

Of the six formations that represent the Belt series in the Coeur d'Alene district, only three, the Prichard, Wallace, and Striped Peak, are present in the Clark Fork district. The others, the Burke, Revett, and St. Regis (equivalents of the last two grouped as the Blacktail formation by Sampson in the Pend Oreille district)[2], are exposed a little west of the district, but as these formations contain none of the lead-silver deposits of the district they will not be described. The Wallace and Striped Peak formations, on the other hand, which contain all the deposits known at the present time, will be described in some detail, and as the Hope fault has brought the Wallace and Striped Peak formations against the Prichard, a brief description of the Prichard formation is included. The Pleistocene glacial deposits and the Recent stream deposits, grouped together as Quaternary, will receive only brief description.

BELT SERIES

PRICHARD FORMATION

The only exposure of the Prichard formation in the district is in the Cabinet escarpment just northeast of the Hope fault, where, because of the very steep frontal slope of the mountain, the formation tends to stand out in clifflike ledges.

Much of the formation consists of light-gray argillaceous sandstone interbedded with nearly pure quartzite and fairly dark-colored shale. The proportion of shaly material increases toward the top of the formation, the upper 1,500 feet being made up largely of the grayish-blue laminated shale that is typical of the upper part of the Prichard in the Coeur d'Alene district. These particularly shaly rocks appear in the upper part of the escarpment, where they conformably overlie several thousand feet of the locally cliff-forming siliceous beds. Most of the outcrops have a dark rusty color, quite unlike the colors seen in the weathered outcrops of other members of the Belt series.

[2] Sampson, Edward, Geology and silver ore deposits of the Pend Oreille district, Idaho: Idaho Bur. Mines and Geology Pamph. 31, p. 7, 1928.

valley surface 1,000 feet above the present valley bottoms. Extensive remnants of the old valley floor are well preserved north and east of Antelope Mountain and are partly visible in plate 5, *B*.

The town of Clark Fork is on an alluvial fan laid down by Lightning Creek on the flood plain and delta of the Clark Fork River (pl. 5, *A*). In emerging from the Cabinet Mountains, Lightning Creek flows over a broad aggraded valley floor in a braided channel choked with gravel and boulders. The fan deposited by Lightning Creek has crowded Mosquito Creek against the north and west bases of Antelope Mountain. As the lower valley floors have been built up by deposition of stream and river sediments and raised above their original levels, the boundaries between valley floors and steep valley sides are generally sharp.

CLIMATE AND VEGETATION

Although the district is well within the northern Rocky Mountains, its climate is not especially rigorous. The summers are warm but seldom hot, and the winters are not often severely cold. Most of the annual precipitation, which averages about 30 to 35 inches, falls between the beginning of September and the end of June. Snow accumulates to great depth on the higher slopes and lingers until late in the spring, but at Clark Fork the snowfall is moderate and never seriously interferes with mining operations. Little of the snow that falls before December lasts through the winter, and the lower slopes are largely free from snow by late March or early April. With the rapid melting of snows on the higher mountains in late May and June, Lightning Creek and the Clark Fork River become flooded, but later in the summer the water recedes rapidly to low levels.

Because of the considerable precipitation, the countryside supports a rather luxuriant vegetation where slopes are not too steep (see pl. 5). The region was once heavily forested, but much of the original growth of white pine, cedar, hemlock, larch, and fir has been logged off or destroyed by fire. A dense cover of second growth and underbrush remains, which proves a serious handicap to prospecting and impedes travel off the roads and trails. Ample timber for mining purposes is available.

GEOLOGY

Except for a few dikes of diabase and porphyry, the district is underlain by sedimentary strata belonging to the Belt series (pre-Cambrian), which are covered in places by Pleistocene glacial deposits and Recent alluvium. As in the Coeur d'Alene district, the Belt strata have been folded and complexly faulted, the most

formed at moderate depth; the mineralogic features indicate deposition at moderate to fairly low temperatures. The deposits differ from those of the Coeur d'Alene district mainly in size rather than in character.

GEOLOGIC DISTRIBUTION

All active mines are within a mile of the town of Clark Fork, the Whitedelf being near the southeast end of Howe Mountain, the Hope on the lower western slope of Middle Mountain, almost directly across Lightning Creek from the Whitedelf, and the Lawrence on the lower northwest slope of Antelope Mountain. Some of the other deposits are near the crest of Antelope Mountain and on the long ridge that extends toward the edge of town, but most are on the lower slopes, facing Creeks, and fall within a semicircle of 2 miles radius with its center in the town of Clark Fork. The most distant are at the north end of Middle Mountain, the nearest on the lower slopes at the edge of town.

The deposits on Howe Mountain and those at the north end of Middle Mountain are contained in the Wallace formation; all the others are in the Striped Peak formation. The distribution of the ore appears to have little relation to the kind of rock; ore deposition depends chiefly on the presence of favorable structural openings, especially of minor faults related to the Hope fault. These seem to be especially well developed in the vicinity of the town of Clark Fork.

STRUCTURAL RELATIONS

All of the faults exposed underground show evidence of more or less intense hydrothermal alteration or mineralization, but bodies of commercial ore have been found only along the low-angle thrust faults and the high-angle reverse faults. Faults of both these kinds contain less gouge than the other faults in the district, and it is apparently for this reason that they have provided especially favorable openings for the circulation of the ore-bearing solutions. The normal and strike-slip faults, with their thick gouges, have inhibited extensive mineralization, and along them only small and widely scattered bodies of ore have been found. The ore at the Lawrence and Hope mines is all on low-angle thrust faults, although at the Hope mine a little ore has been uncovered locally along the dike fault and stringers of ore have been found along the Norquist. At the Whitedelf mine the ore is on a steep reverse fault, the Pearl. Several other high-angle reverse faults also contain or have contained a little ore. Ore has been stoped from two small shoots along the Pugh strike-

slip fault, but all the deposits found elsewhere, except those on Howe Mountain, are on low-angle thrusts.

The structural relations and characteristics of the various controlling faults have already been given. Additional details will be included in the descriptions of individual properties.

MINERALOGY[8]

GENERAL FEATURES

Except for the added assemblage of complex lead and silver sulfosalts, the ore minerals in the Clark Fork district are those that characterize most of the lead deposits in the Coeur d'Alene district. It is thus convenient to separate the minerals into two groups, the earlier one representing the Coeur d'Alene type of mineralization and the later one consisting of the minerals formed by hypogene enrichment. Some of the minerals tentatively identified in the later group are rare, and their local abundance is one of the most interesting features of the Clark Fork mineralization.

Supergene minerals are of little consequence in the district, because weathering has had time to accomplish little since the Pleistocene glaciers stripped away the former oxidized outcrops. Today the sulfides appear at or just below the surface and are only partly altered to anglesite and cerussite (sulfate and carbonate of lead, respectively) and only partly encased in limonitic and manganese oxides formed by the decomposition of the associated manganiferous siderite.

EARLY MINERALS (COEUR D'ALENE TYPE)

The early minerals include galena, sphalerite, pyrite, arsenopyrite, tetrahedrite, bournonite (?), siderite, quartz, calcite, barite, and possibly rhodochrosite, but only the galena, sphalerite, siderite, and quartz are readily distinguished, some of the others being visible only under the microscope.

Galena.—Galena is the most abundant of the early minerals and, except in certain shoots along the Pearl vein where sulfantimonites predominate, is the principal ore mineral, being the source of most of the lead and of an appreciable part of the silver. The silver-lead ratio in the early assemblage ores of the district as a whole is probably not far from that in the Lawrence mine, where the ore has not received additions of the lead and silver sulfantimonites. There the galena concentrate carries 14 to 15 ounces of silver to the ton, or about 0.20 ounce of silver to each percent of lead. As these concentrates contain less than 0.01 percent of copper and rarely more than 0.15 percent of antimony, a few micro-

[8] The specific identity of some of the sulfosalt minerals is in doubt.

The diabase is identical with that which the writer[4] has studied along the "porphyry belt" in Kootenai County, Idaho, and somewhat similar to that in the Coeur d'Alene district described by Calkins.[5]

Porphyritic dikes.—The porphyritic dikes that were observed within the district extend along the frontal slope of the Cabinet Mountains east of Lightning Creek. They have the composition of diorite, granite porphyry, and granophyre. The porphyritic dikes west-northwest of the district, between Hope and Sandpoint, range in composition from quartz diorite porphyry to granite porphyry. They are accompanied by nonporphyritic dikes having the composition of gabbro, diorite, and monzonite. As all of these dikes have been fully described in the reconnaissance report, only a brief summary description of the porphyry dikes need be given here. These are conspicuously porphyritic, with phenocrysts of andesine, orthoclase, quartz, hornblende, and biotite. Their groundmasses are fine grained and grayish to pinkish and consist for the most part of microspherulitic intergrowths of orthoclase and quartz, which enclose accessory grains and crystals of magnetite, apatite, sphene, allanite, and zircon. The microspherulitic intergrowths appear to be lacking only in the quartz diorite porphyry. Differences in composition are expressed mainly by differing proportions of orthoclase to andesine, the former predominating in the granite porphyries, the latter in the quartz diorite and granodiorite porphyries. Hornblende is the more abundant in the more calcic porphyries and biotite in the granite porphyry, and quartz is more abundant in the granite porphyry than in the others.

The porphyries within the district are less calcic and less conspicuously porphyritic than those elsewhere along the "porphyry belt." The granophyres in particular contain only a few phenocrysts of sericitized feldspar in a white or light-gray groundmass consisting almost entirely of microspherulitic orthoclase and quartz. These dikes are much more altered than the others (apparently by hydrothermal end-stage solutions), and if they ever contained biotite it has been completely replaced by muscovite. An exceptional rock in which the groundmass is not microspherulitic forms a small dike just east of the map area. In this rock phenocrysts of feldspar (largely andesine) and quartz are embedded in a microgranular groundmass of orthoclase and quartz.

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[4] Anderson, A. L., Geology and Metalliferous deposits of Kootenai County, Idaho: Idaho Bur. Mines and Geology Pamph. 53, p. 25, 1940.

[5] Ransome, F. L., and Calkins, F. C., The geology and ore deposits of the Coeur d'Alene district, Idaho: U. S. Geol. Survey Prof. Paper 62, pp. 52-53, 1908. Shenon, P. J., Geology and ore deposits near Murray, Idaho: Idaho Bur. Mines and Geology Pamph. 47, pp. 9-10, 1938 (includes revised descriptions by Calkins).

Age of the dikes.—If, as appears probable, the microspherulitic groundmasses that typify so many of the porphyritic dikes constitute proof of rapid cooling or chilling of the consolidating magma, the dikes must have been intruded into cold rocks comparatively near the surface, and, as the dikes show evidence of as rapid chilling against the granitic rock of the batholithic masses near Pack River and in the Purcell Trench as against sedimentary rocks, they must have been intruded after at least the upper parts of the batholiths had grown cold and presumably after they had been exposed by erosion. Probably, therefore, the dikes were not derived from the same magma as the granitic rock but from magma that was generated later and emplaced at a much higher level in the earth's crust. As the granitic and porphyritic rocks are probably not related, the porphyritic rocks cannot be so old as late Jurassic or Cretaceous, at which time the batholithic masses were emplaced. Further difference of age is indicated by the lack of association between the porphyritic dikes and the Mesozoic structural features.

On the other hand, the dikes show a most intimate structural relationship with the Hope fault. Not only are they concentrated along the Hope fault zone, but they also appear to occupy subsidiary fractures developed at the same time as the main fault. As the Hope fault zone transgresses and is entirely independent of the Mesozoic structures, it is inferred that the faulting along the Hope is a product of the Laramide orogeny (late Cretaceous or early Tertiary). The intimately associated intrusives are probably local manifestations of the widespread igneous activity that occurred through the Rocky Mountain region in early Tertiary time. The dikes have the same structural relationships, and hence presumably the same age, as those of the "porphyry belt" in Kootenai County, which the writer has assigned to the early Tertiary.[6]

STRUCTURE

The structural features of the district are broad open folds, striking nearly north, and the complicated Hope fault zone, whose general strike is about west-northwest. The folding and faulting are believed to be widely separated in time and unrelated in origin. The folding apparently preceded the emplacement of the batholithic masses, which occurred in late Jurassic or Cretaceous time, and was caused by compressive stresses associated with crustal shortening. The zone of transverse faulting, on the other hand, which cuts across the folded strata as well as the batholith, apparently developed in response to horizontal shearing stresses,

[6] Anderson, A. L., op. cit. (Pamph. 53), pp. 21-25.

A. HOWE MOUNTAIN.

Clark Fork delta and Pend Oreille Lake on the left; Cabinet Mountains and intervening trenchlike depression on the right. Town of Clark Fork in left foreground. View from summit of Antelope Mountain, looking west.

B. MIDDLE MOUNTAIN IN THE CENTER, ANTELOPE MOUNTAIN ON THE RIGHT, AND CABINET MOUNTAINS ON THE LEFT.

Part of the trenchlike depression along the course of the Hope fault which extends along the base of the Cabinet escarpment. View from summit of Howe Mountain, looking east.

MOUNTAINS IN THE CLARK FORK DISTRICT.

(see fig. 2). All of them are within 2 miles of the town of Clark Fork, which is in Tps. 55 and 56 N., Rs. 2 and 3 E., Boise meridian, at about 48°10′ north latitude and 116°10′ west longitude. The area here considered is considerably smaller than the one defined as the Clark Fork district in the earlier report. The district is now re-defined as the area, about 24 square miles in extent, that contains the lead-silver deposits around the town of Clark Fork (see pl. 6).

The district is well located with regard to transportation. The main line of the Northern Pacific Railway and United States Highway No. 10–A (oil-surfaced) pass through the town of Clark Fork. Most of the important mines are less than a mile and some of them only a few hundred yards from these routes.

TOPOGRAPHY

The district (see pl. 5) covers only a small part of the steep southwest slope of the Cabinet Mountains proper, which, with summits 6,000 to 7,000 feet above sea level, rise as a southeastward-trending escarpment 4,000 to 5,000 feet above Pend Oreille Lake and the Clark Fork. Between the river and the main range lie three mountains about 2,000 to 3,000 feet lower in altitude, called Howe Mountain, Middle Mountain, and Antelope Mountain. These are separated from the main range by a deep, broad, unevenly-floored trench alined along the course of the Hope fault (pl. 5, *B*). The district includes all of Middle Mountain and parts of its neighbors, together with part of the valley of Lightning Creek and of the flood plain and delta of the Clark Fork.

Howe Mountain, which is separated on the east from Middle Mountain by the fairly broad valley of Lightning Creek, is a steep-sided ridge lying between and partly parallel to the Cabinet escarpment and the Clark Fork (pl. 5, *A*). Its highest point within the mapped area is about 3,000 feet above sea level, or 1,000 feet above the river. Its southeastern base is skirted by Lightning Creek and lies directly across the stream from the town of Clark Fork. Middle and Antelope Mountains, east of Lightning Creek, are separated from each other by Mosquito Creek. Middle Mountain, which is northeast of the town, reaches an altitude of about 3,500 feet, and Antelope Mountain, east of the town, has an altitude slightly above 4,200 feet. Both are roughly circular in outline (pl. 5, *B*) and are bordered in part by nearly precipitous slopes. The west and southwest slopes of all three of these mountains show evidence of deep glacial scour, whereas the opposite slopes are mantled with irregular hillocks of glacial till. Both Middle and Antelope Mountains have bench-like shoulders or spurs that form part of the floor of an old

associated probably with the Laramide disturbance of late Cretaceous or early Tertiary time.

Some faults are associated in origin with the folding and the emplacement of the batholithic rocks, but none of these faults have been recognized within the Clark Fork district as here defined. The early folding is noticeable locally, but the most outstanding structural feature of the district is the great transverse zone of faulting dominated by the Hope fault, an earth fracture of major magnitude recognized and named some years ago by Calkins.[7]

FOLDS (MESOZOIC)

Throughout the Clark Fork district the Belt strata dip toward the east, forming part of the west limb of an open syncline several miles in breadth. The Hope fault cuts directly across the fold, and its northeast side has moved southeastward, the displacement being several miles in relation to the southwest side. Northeast of the fault the beds strike N. 20°–30° E. and dip 15°–20° SE., the dip decreasing toward the east. Southwest of the fault the beds strike N. 20°–30° W. and dip 10°–25° NE. Because of local faulting, the strike of the beds is somewhat different on Howe, Middle, and Antelope Mountains, but the general synclinal structure has not been materially modified.

FAULTS (EARLY TERTIARY)

The Hope fault is accompanied by a great many smaller faults, which apparently were formed at about the same time as the Hope fault and more or less directly in response to the same stresses. These smaller faults are essential components of the transverse zone of faulting dominated by the Hope fault and are generally within a mile or two of the Hope fault itself. This complicated zone of faulting is several miles wide and has been traced for fully 50 miles. The zone may be somewhat broader and may contain more associated faults in the Clark Fork district than in other places along its course. Most of the faults that border the Hope are not parallel to it but diverge from it at small to fairly wide angles.

The Hope fault and many of the associated faults are shown on the geologic map of the district (pl. 6). Some of the associated faults were projected to the surface from underground workings; others were recognized from their topographic expression and from sharp differences in the strike and dip of the

[7] Calkins, F. C., and MacDonald, D. F., A geological reconnaissance in northern Idaho and northwestern Montana, with notes on the economic geology: U. S. Geol. Survey Bull. 384, pp. 52-55, 1909.

beds on their two sides. Because of the glacial deposits that mantle much of the district, the faults hidden from view may be more numerous than those that have been found. Only faults of appreciable displacement have been mapped; countless other fractures of little or no displacement were omitted. For faults visible in underground workings it was generally possible to determine the kind and direction of movement, but these could rarely be determined for those mapped from surface showings alone. For many of the faults not seen underground even the direction of dip was uncertain.

HOPE FAULT

Although the Hope fault has been traced west-northwestward from the district for at least 30 miles and east-southeastward for at least 20 miles, its full extent remains unknown. It closely follows the Clark Fork River downstream to within a few miles of the Idaho line; then, as the river pursues a more westerly course to Pend Oreille Lake, the fault continues along the prominent trench that separates Howe, Middle, and Antelope Mountains from the Cabinet Mountains. Near the town of Hope it passes into an arm of Pend Oreille Lake, but near Sandpoint it emerges from the lake and from beneath the alluvial floor of the Purcell Trench, west of which it may be traced through a deep notch that extends across the Selkirk Mountains. Except where it is concealed beneath the lake waters and the alluvium of the Purcell Trench, this fault is strongly reflected in the topography, particularly by the long abrupt escarpment that forms the southwest border of the Cabinet Mountains and by the great linear trench that extends eastward along the base of the mountains from the town of Hope to a point several miles east of the Montana line. Both the escarpment and the trench along its base are prominent features near the town of Clark Fork (pl. 5).

Where the fault crosses the district its trend is about N. 55°–60° W. Subsidiary fractures indicate that the fault dips to the southwest at a very high angle, probably greater than 70° and perhaps close to vertical. The fault has not been exposed underground, but its trace on the surface is marked in places by a steep-walled erosional trench with walls as much as 100 yards apart. Presumably there is a fault zone of corresponding width in which the rock is thoroughly crushed and in great part reduced to gouge. In places the rocks bordering this zone show evidence of considerable drag.

As already pointed out, the Prichard strata on the north side of the fault abut against the Wallace and Striped Peak on the south, which necessitates a stratigraphic throw of not less than

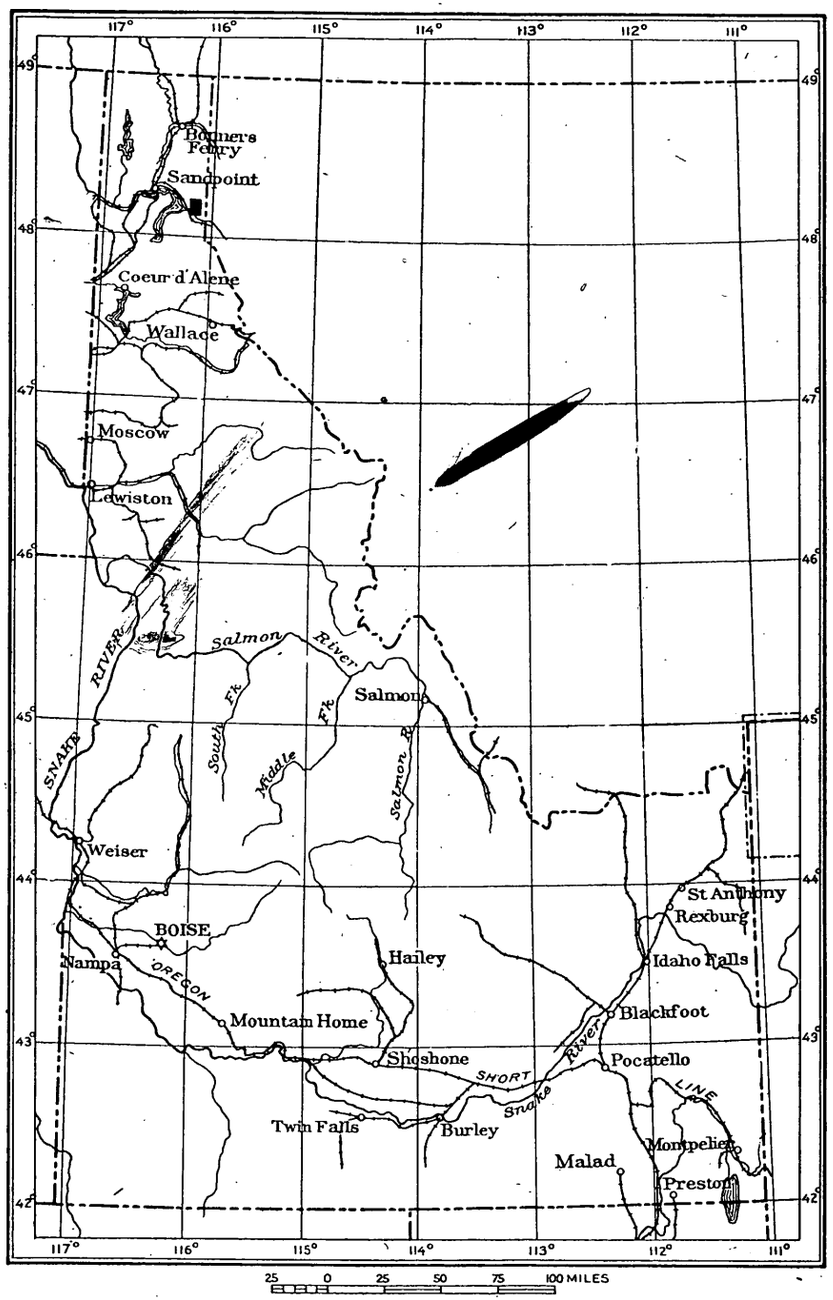

FIGURE 2.—Index map showing the location of the Clark Fork district, Idaho.

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GEOGRAPHY

LOCATION

The lead-silver deposits are on the north side of the Clark Fork of the Columbia River, in Bonner County, about 35 miles by air line northwest of the Coeur d'Alene mining district and 25 miles by road southeast of Sandpoint, the county seat of Bonner County

18,000 feet. The actual displacement, however, is several times as great as that. To restore the synclinal structure cut off and displaced by the fault, the rocks on the northeast side would have to be shifted northwestward in relation to those on the southwest side for a horizontal distance of 12 miles. The Hope fault is therefore a transverse strike-slip fault of the first order of magnitude.

Most of the displacement probably took place during early Tertiary time; since then there has been additional movement, but mainly in a vertical rather than in a horizontal direction. An old erosion surface formed since the early faulting and preserved on the mountain summits now stands 1,500 feet higher on the Cabinet Mountains than on the Coeur d'Alene Mountains, directly to the south.

ASSOCIATED FAULTS

The smaller faults alongside the Hope fault include low-angle thrust faults, high-angle reverse faults, high-angle normal faults, two sets of high-angle strike-slip faults, and a few that have not been classified. These faults were not active quite simultaneously, but they are all believed to have resulted from the same stresses.

Low-angle thrust faults.—Low-angle thrust faults apparently were formed more easily in the weak shaly beds of the Striped Peak formation than in the more competent beds of the Wallace; consequently most of them are on Middle and Antelope Mountains. The only one observed in the Wallace formation is in the block of Wallace strata near the northwest border of Middle Mountain. These faults are very inconspicuous, and were they not exposed in mine workings and in road cuts they might well be overlooked altogether. But, small though they are, they are economically among the most important in the district, for some of the principal lead-silver ore bodies extend along them.

Most of these faults strike north-northeast to northeast, but a few strike northwest. Their dips are mostly 10° to 30° to the southeast or northeast. Neither the strike nor the dip of any one of them is uniform. A fault may be rather sinuous in strike and may also flatten and steepen on the dip, rarely maintaining a constant direction or dip for more than 20 feet. Some of these local variations in attitude may mark the places where the fault crosses beds of different degrees of competency—passing, for example, from quartzite to laminated shale and back again. Although these faults have been called "bedded," they actually cut the bedding of the strata at a considerable angle.

Most of the faults may be traced for several hundred feet and a few for a thousand feet or more. They have caused little displacement, some perhaps a few inches, others a few feet—nowhere enough to produce appreciable offsets in the strata. On many faults the displacement appears to have been localized along a single fracture, emphasized by a thin seam of gouge or a massive seam of ore, but on some the displacement has been distributed along several parallel fractures, the two most prominent of which form the hanging wall and footwall of a zone of shattered rock usually 2 to 3 feet but locally as much as 6 feet wide. In every case the main fracture is bordered by subsidiary fractures, so that the faults are delineated as fault zones rather than as fault fissures. In general the rock of the fault zone is considerably broken, but relatively little gouge has been produced even in the weakest shales, which probably explains why these low-angle thrusts have served so well as channels for the circulation of ore-bearing solutions and have been so favorable to the localization of ore. The movement along these faults has created considerable drag, especially in the weak shales and on the hanging walls. The small drag folds indicate that the hanging wall has been thrust over the footwall and that the thrusting movement has been directed from the southeast. Where drag folds are lacking, the thickening of the ore bodies along the flatter parts of the fault zone and their pinching along the steeper parts afford evidence of the direction of movement.

These are the oldest of the faults associated with the Hope fault. In some places they are cut and offset by normal faults, in other places by strike-slip faults.

High-angle reverse faults.—The high-angle reverse faults appear to prefer the more competent beds of the Wallace formation, and most of those recognized so far cut the Wallace strata on Howe Mountain. Though of much greater throw, they resemble the low-angle thrusts in lacking surface expression and have been observed only in mine workings. They share with the low-angle thrusts the distinction of being the principal ore localizers in the district.

The high-angle reverse faults have about the same trend as most of the low-angle thrusts. The most important one, the Pearl, strikes N. 35°–45° E. and dips 65°–70° SE. Some of the others dip more steeply southeast, and at least one reverses its dip to steeply northwest. They vary somewhat in strike and dip, but far less than the low-angle thrusts.

amounts of sulfantimonites of lead and silver, added during a late stage of hypogene enrichment, a stage that is but meagerly represented in the Coeur d'Alene district. Consequently, the Clark Fork ore in general is notably richer in silver than most of the ore in the Coeur d'Alene district.

FIELD WORK AND ACKNOWLEDGMENTS

The restudy was begun in the early part of July 1940 and continued without interruption until September 10. With the assistance of Mr. Lawrence C. Cassidy, a student at the University of Idaho School of Mines, all surface and subsurface exposures were examined, and the accessible workings of the three largest mines, as well as of some of the more important prospects, were mapped. A geologic map of the area that includes the known lead-silver deposits was also prepared, aerial photographs obtained from the United States Forest Service at Missoula, Mont., being used as a base. Because of unavoidable delay in completing the manuscript it has been possible to incorporate in the report information obtained during a week's study in August 1941 and again in a two-day study in August 1943. During these last two visits the new developments were reviewed and the underground geologic mapping brought up to date.

Unfailing cooperation was given by all operators and others interested in the development of the district. Special courtesies were received from Mr. Albert M. Nash, president-manager of the Hope Silver-Lead Mines, Inc.; from the Honorable Compton I. White, Member of Congress and president of the Whitedelf Mining and Development Co.; from Mr. Joseph Reed, president-manager of the Lawrence Consolidated Mining Co.; and from Mr. James E. White, who had leased the Whitedelf mine from the Whitedelf Mining and Development Co. Mr. J. H. Eby, mining engineer and geologist of Spokane, Wash., also gave freely of his store of information on the Clark Fork district, and Messrs. A. D. Eberly, E. O. Clagg, Lloyd Reed, and others gave material assistance in one way or another during the field investigation. To all these men the writer tenders his grateful appreciation.

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INTRODUCTION

PURPOSE AND SCOPE

The Clark Fork district was examined by me in 1927,[1] shortly after the discovery of rich lead-silver ores near the town of Clark Fork, but, as the development was then just getting under way, the deposits were not adequately exposed and little detailed study could be carried on. Since then mining activity has been almost continuous, and the district has become the most important producer of lead-silver ore in northern Idaho outside the Coeur d'Alene district. In 1940, therefore, I was sent back to the district to make a detailed examination of the deposits and thus complete the study begun as a reconnaissance 14 years before. All the lead-silver mines and prospects were reexamined, and those on which much work had been done were mapped in detail. Particular attention was given the structural features that might have bearing on the distribution of the deposits and on the localization of ore within the deposits. This led not only to a reexamination of all the known faults along the zone of the Hope fault but also to a study of the minor faulting that took place during the period of mineralization. Other geologic features were studied that might bear on the genesis of the deposits and on the question of whether the ore would persist with depth. Some study was given, also, to the country rock, in order to determine whether the formational boundaries established during the reconnaissance could in places be made more accurate.

These new studies confirmed most of the conclusions made at the time of the earlier reconnaissance, but they also made for a better understanding of the genesis and structural control of the deposits. It became evident that the Hope fault had played a far more important part in the control of mineralization than had been realized, and that all the ore was confined to minor faults related to the Hope. The new data showed that the Hope fault was a zone rather than a single plane of weakness, and that faulting, igneous intrusion, and mineralization were closely related events.

In both its structural and its mineralogic features the Clark Fork district has been found to be much like the Coeur d'Alene district. The Hope fault has provided the same kind of structural setting for the ore deposits in the Clark Fork district that the Osburn fault has for those in the Coeur d'Alenes. The two districts are also similar in the character of their mineralization, the only difference of note being the presence of considerable

[1] Anderson, A. L., Geology and ore deposits of the Clark Fork district, Idaho: Idaho Bur. Mines and Geology Bull. 12, 1930, 132 pps.

Some of the faults are only a few hundred feet long, but others may be traced for several thousand feet. On the whole these faults are much more prominent than the low-angle thrusts. They not only are longer but also give evidence of somewhat greater movement. The displacement on the smaller ones is only a few inches; that on the larger is probably some tens of feet. Because of the greater amount of movement, much more gouge has been formed on these faults than on the flat overthrusts, and the disturbed zone, with a multitude of longitudinal and oblique fissures, is in places as much as 40 feet across. Much of the movement apparently has been localized along the footwall of the fault zone, but here and there some has also taken place along hanging-wall fractures. Generally the rock along the footwall is considerably crushed and several inches of it are reduced to gouge, but, despite the relatively abundant gouge, the high-angle faults have not been impervious to the passage of ore-bearing solutions. Drag along many of the faults, particularly in the footwall, shows that the hanging wall has been shoved upward with respect to the footwall, but grooves on some of the slickensided fault surfaces indicate that the movement may have been diagonal rather than directly upward. The fact that ore shoots are localized along the less steeply dipping parts of the fault zones also indicates reverse movement.

In the one place where the low-angle and high-angle reverse faults have been found together, the high-angle faults cut and offset the others, but as both are cut by strike-slip and other faults, there may be no great age difference between them. Their general correspondence in strike and their relation to the local stresses also suggest that they were formed almost at the same time.

High-angle normal faults.—The high-angle normal faults are not restricted to any particular kind of rock, although the most prominent examples are apparently in the Striped Peak formation on Middle and Antelope Mountains. The magnitude of these faults may be about the same as that of the more prominent of the high-angle reverse faults. They ordinarily are not expressed in the topography, but some of them are revealed by the presence of dikes, for these are the faults along which the porphyritic dikes were intruded. Most of them strike about N. 35° W., but at least one strikes about N. 50° W. and another N. 20° W. All of them would, if extended, join or intersect the Hope fault at an acute angle. All dip southwest at angles ranging from 50° to 70°.

One of the greater of these faults is exposed underground in

the Hope mine, where, because it contains a diabase dike, it is known as the "dike fault." Another, also occupied by a diabase dike, has been uncovered at the Lawrence mine, and still another, partly filled with sulfides, on the old Ralph property. The dike fault may be traced for more than a thousand feet underground and for a still greater distance on the surface, where its position is marked by a band of especially luxuriant vegetation. The fault strikes about N. 35°–40° W. and dips 45°–55° SW. The dike is frozen to the hanging wall, but considerable movement has taken place along the footwall, beneath which the rock is extensively fractured, several inches of it being reduced to gouge. The fault zone contains a much larger proportion of gouge than those along the reverse faults, but not a greater thickness of mashed and fractured rock. In places the shattering is intensified where branch faults come into the footwall from the southeast at an acute angle. The rock bordering the dike fault shows considerable drag, and the drag folds indicate that the hanging wall has moved straight down the dip with respect to the footwall. Grooves also indicate movement in a vertical direction. A low-angle thrust fault cut by the dike fault has been dropped about 80 feet. A dike-filled fault at the Lawrence mine locally strikes N. 50° W. and dips 70° SW. It is exposed in a single crosscut, where it appears to resemble the one exposed in the Hope mine, and it has cut and displaced a low-angle thrust fault. A mineral-filled fault on the old Ralph property strikes N. 20° W. and dips 55°–70° SW. It is less prominent than the others, and in the workings it shows simply as a narrow breccia vein incompletely filled with siderite and sulfides.

The fact that these normal faults permitted the injection of magma suggests that they are tensional faults or reflect the tensional components of a shearing stress. Apparently most and perhaps all of the dikes exposed between Hope and Pack River extend in a northwesterly direction along faults of this kind and trend.

As these high-angle normal faults cut and offset the low-angle thrust faults, they are younger. Whether or not they are younger than the high-angle reverse faults cannot be determined by such direct evidence.

Strike-slip faults.—The two sets of strike-slip faults are sharply contrasted in magnitude and trend. One set consists of minor faults, all of which trend in the northwest quadrant; the other consists of much greater faults, all of which trend in the northeast quadrant.

Faults of the first set have been recognized only underground,

GEOLOGY OF THE LEAD-SILVER DEPOSITS OF THE CLARK FORK DISTRICT, BONNER COUNTY, IDAHO

By ALFRED L. ANDERSON

ABSTRACT

This report gives the results of a reinvestigation of the lead-silver deposits of the Clark Fork district, Bonner County, Idaho, which since the late twenties have been the most important producers of lead-silver ore in northern Idaho outside of the Coeur d'Alene district, their production up to the end of 1941 having been more than $1,200,000.

The deposits closely resemble those in the Coeur d'Alene district. They are fillings and replacements along minor low-angle thrust and high-angle reverse faults, which genetically are related to the Hope fault, a great transverse earth fracture, which provides the same sort of structural background for this district that the famous Osburn fault does for the Coeur d'Alene district. The deposits are contained in the Wallace and Striped Peak formations, members of the pre-Cambrian Belt series, and are closely associated with faulting and igneous activity that is probably of early Tertiary age.

The mineralization has not been so extensive as in the Coeur d'Alene district, but the deposits, though comparatively small, are rich. Much of the ore is in compact seams and lenses a few inches thick, but stringers of ore and subordinate fractures along which grains of sulfide are disseminated extend across zones that are commonly 2 to 4 feet and exceptionally as much as 8 feet in width. The ore is mainly sulfide ore of the Coeur d'Alene type, consisting dominantly of galena, which is accompanied by lesser quantities of siderite, quartz, and sphalerite and by still smaller quantities of pyrite, arsenopyrite, tetrahedrite, and calcite. Some of the deposits, however, have been substantially enriched by the addition of hypogene silver and antimony minerals, so that much of the ore being mined has a higher silver content than any of that in the Coeur d'Alene district. The hypogene minerals include lead sulfantimonites and sulfarsenites, copper-lead sulfantimonites, and ruby silver. These minerals are absent from only one of the mines, and in one of the mines they form the bulk of the ore that is now being taken out. The high silver content of some of the ore is due in part to the presence of pyrargyrite ($3Ag_2S.Sb_2S_3$).

The deposits apparently were formed at moderate depths and at moderate temperatures. It is believed that the ore will persist to depths appreciably greater than those yet reached in mining. The district has not yet been adequately explored, and undiscovered ore bodies may remain hidden beneath glacial and other surface debris.

being especially noticeable at the Hope mine. These faults have about the same strike and dip as the Hope fault, to which they seem to be subsidiary. The known displacement on most of these faults is generally but a few inches, or at the most a few feet. As shown by striations and grooves on slickensided surfaces and by offsets, the displacement is, as for the Hope fault, everywhere horizontal, the northeast side having moved relatively southeastward. At the Hope mine, these faults have caused repeated offsets of the low-angle thrust fault, but the offsets have nowhere been sufficient to interfere with the mining of the ore localized along the main low-angle thrust. In some places slickensided and grooved surfaces on the ore show that some of the movement was postmineral, but, as some of these slips also contain ore minerals, much of the displacement probably took place before the mineralization.

The strike-slip faults of northeasterly strike are much more prominently expressed in the topography than any faults yet described except the Hope. Their outcrops are marked by alined gulches, valleys, and saddles, eroded along wide zones of fracturing and crushing, a fact suggesting that these faults are of greater magnitude than the high-angle reverse and normal faults. These strike-slip faults are not restricted to any one formation, being as prominent in the Wallace rocks on Howe Mountain as in the Striped Peak rocks on Middle and Antelope Mountains. Some of them have been examined underground in mine workings, others have been identified from surface relations.

Among the larger of these faults are the Pugh fault at the Whitedelf mine, the Norquist fault at the Hope mine, and several faults on and between Middle and Antelope Mountains. All of these strike about N. 70° E. and are nearly vertical. Their attitude therefore does not conform with that of any other group of faults, but their relation to the Hope fault and to the northwestward-striking strike-slip faults may be significant, for if they were extended they would meet the Hope fault nearly at right angles, as if they were complementary to it.

The Pugh and Norquist faults are marked by zones of intensely crushed and mashed rock, which are for the most part 10 to 15 feet wide but are locally 40 feet wide, with considerably more gougy material than there is along any of the high-angle normal or reverse faults. The fault zones are structurally complex, being made up of numerous fractures diverse in trend, some of which appear to be tensional fractures that extend obliquely across the fault zone. The Pugh fault has displaced the Pearl high-angle reverse fault about 110 feet measured in a horizontal direction,

with the offset northeastward on the northwest side. The Norquist, which is supposed to be a continuation of the Pugh, has offset the low-angle thrust at the Hope mine, but the offset segment has not been uncovered on the upper levels but may be on the lowest where the displacement locally is but a few feet. These two faults are apparently not so large as the others of the group; though visibly reflected in the topography, they are not so prominently expressed as the others on Middle and Antelope Mountains, and they have smaller stratigraphic displacement.

Those with the more prominent topographic expression show marked horizontal stratigraphic offsets, with the apparent displacement invariably to the right on the far side of the fault if the offsets are viewed along the strike of the beds. The fault along Mosquito Creek appears to have offset certain of the red beds of the Striped Peak formation on Middle Mountain about half a mile in relation to the same beds on Antelope Mountain. Other faults on Middle Mountain show considerably smaller stratigraphic offsets, but the displacement is invariably to the right in the sense just defined.

Another large fault that probably belongs with this set has brought the beds of the Wallace and Striped Peak together near the northwest tip of Middle Mountain. This fault has a northeasterly trend and is marked by a prominent saddle where it crosses a ridge. It is also revealed in a long road cut that skirts the lower west side of Middle Mountain. There the disturbed zone is more than 100 yards wide and is made up in considerable part of crushed gougy rock. The stratigraphic throw may be several thousand feet. Beds on either side of the zone of faulted rock show large-scale drag, with indications of a prominent strike-slip component of movement. This fault is apparently by far the greatest of those in the northeastward-striking group.

The faults of this group are definitely younger than the low-angle thrust and high-angle reverse faults, which they displace. Their relation to the high-angle normal faults of northwest trend is not entirely clear, but they seem to be at least in part somewhat younger. Air photographs suggest that the dike fault at the Hope mine does not continue directly across the Norquist fault. The Norquist fault, on the other hand, apparently has not been displaced by the dike fault, for the Norquist has been found in the No. 9 level where its projection from the No. 6 and higher levels indicates it should be. The strike-slip faults are apparently among the youngest in the district.

Other faults.—There are a few minor faults that do not conform in trend with those that have been described. Among them

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are some northward-trending faults at the Whitedelf mine and several at the old Ralph property. These have displacements of a few inches to a few feet. They may be high-angle normal faults that differ slightly in trend from most of the others because of the influence of other faults nearby.

ORIGIN OF THE FAULTS

As the Hope fault has a horizontal component of movement of some 12 miles, it has been classed as a strike-slip fault of the first order of magnitude and accounted for as a product of horizontal shearing stresses, with the active stress on the south side directed to the west-northwest and that on the north side to the east-southeast. Similar stresses, acting in part less directly, could account for all the other faults in the district.

The early-formed low-angle thrust faults and high-angle reverse faults, with their general north-northeasterly trend and southeasterly dip, have the position and relations that would associate them with the compressive components of the west-northwesterly shearing stress, the low-angle thrusts having been developed in the weak shaly members of the Striped Peak formation and the high-angle reverse faults in the more competent quartzitic beds of the Wallace formation. The low-angle thrusts that strike northwest may have responded to the compressive components of the stress associated with the complementary shearing that acted at about right angles to the main shearing—in association, that is, with the northeastward-striking strike-slip faults.

The high-angle normal faults also fit into the pattern as products of the tensional components of the shearing. Their north-northwest trend and their relation to the Hope fault are precisely those demanded by the shearing stresses, and the fact that the faults are commonly occupied by intrusive rocks tends to confirm the belief that they formed in response to tension.

The two sets of strike-slip faults appear to have formed in direct response to the shearing, for they are alined along the directions of maximum shear. The minor strike-slip faults parallel to the Hope fault are apparently subsidiary slips, which, like the Hope fault, developed in response to the main shearing stresses. The larger strike-slip faults, on the other hand, that strike east-northeast, nearly perpendicular to the Hope fault, are apparently shear faults complementary to the main west-northwest shearing.

Thus all the faults—strike-slip, normal, thrust, and steep reverse—may be interpreted as reflecting the action of the major

horizontal shearing stresses, acting locally in a west-northwest direction, together with the subordinate complementary shearing stress directed to the east-northeast. Initial failure apparently occurred in response to the compressional components of the stress, but it was soon followed by failure due to tension and then by failure due to shear. Failure due to shear apparently continued for the longest time and produced the greatest results.

The origin of the stresses responsible for the Hope fault and its associated fractures is not definitely known; the stresses apparently originated far outside the district. As the igneous activity associated with the faulting, and hence the faulting itself, is probably early Tertiary, the faulting probably bears a close relation to the Laramide orogeny, of late Cretaceous or early Tertiary time. It is possible that the zone of complicated faulting reflects the differential transmission of stress through the relatively strong rocks of the region against the trough of weak sedimentary rocks on the east (Laramide or Rocky Mountain geosynclinal trough of sedimentation), which was then undergoing deformation by folding and faulting, with the formation especially of great low-angle overthrusts.

ORE DEPOSITS

HISTORY AND PRODUCTION

Lead-silver ore was first uncovered on Antelope Mountain, but just when was not learned. Records show that some of the ore was shipped in 1903, but the shipments were not impressive and the district did not attract much attention until about 10 years later, when the Lawrence Mining and Milling Co., Ltd., later called the Lawrence Consolidated Mining Co., installed a 50-ton gravity concentrator and began to make small shipments of rich lead concentrates.

No other discoveries were made until 1923, when the small but rich Elsie K vein was uncovered on the lower western slope of Middle Mountain and began to be worked in the Elsie K mine, later renamed the Hope. Shipments of rich hand-sorted lead-silver ore began almost immediately, but the new mine, though it proved profitable from the surface, was almost as little noticed as the Lawrence mine had been 20 years before. Not until 3 years later, when the uprooting of a tree near the southeast end of Howe Mountain uncovered a body of rich lead-silver ore, was general interest aroused. The discovery of ore by the uprooting of a tree during a storm received widespread publicity, and the Whitedelf soon became one of the most talked-about mines in

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fault could be interpreted either as a horizontal movement of 240 feet or as a vertical movement of 80 feet, but grooves indicate that the displacement has been in a vertical direction. Drag folds show that the hanging wall of the dike fault moved down relative to the footwall. Much of the displacement along the fault probably took place before mineralization, for the dike zone everywhere shows strong evidence of hydrothermal action. In places the stringers of ore in the gougy matrix along the fault zone have not been disturbed, but the presence of crushed sulfides in some of the gouge gives evidence of moderate movement since mineralization.

The Norquist fault, which cuts the low-angle thrusts in the southwest part of the mine, strikes N. 70°–80° E. and dips 75°–80° SE. It thus draws closer to the dike fault as the mine gains depth, and the two faults should intersect not far ahead of the face of the No. 7 level. The Norquist fault has produced a zone of heavy broken ground as much as 15 feet wide. The rock along it has been much softened by hydrothermal alteration and will not stand without support. Small, somewhat broken masses of sulfides have been found in the soft gouge of the fault zone. The amount of displacement on this fault is unknown. Crosscuts to the east and west on the southwest side of the fault on the No. 3 level have not uncovered the displaced segments of the thrusts, although diamond drilling in each crosscut has revealed lightly mineralized fractures some distance out in the country rock. If the Norquist fault is a continuation of the Pugh fault, then the thrusts should be offset to the southwest, perhaps as much as 100 feet. The continuation apparently has been found on the No. 9 level (pl. 12), but the displacement is much less than 100 feet.

The air-raise fault is less conspicuous than either of the other two. It strikes about N. 65° W. and dips 60°–80° SW. On the upper levels it appears to have split into two branches separated by 15 to 40 feet of more or less broken rock. On lower levels there is but a single fissured zone. The fault has displaced the low-angle thrusts on the several levels of the mine 10 to 40 feet horizontally and perhaps 3 to 14 feet vertically. The displacement apparently decreases with depth. The fault has the same strike as the great Hope fault, as do also the many minor strike-slip faults exposed here and there throughout the mine. Although the air-raise fault contains no ore and shows little evidence of hydrothermal alteration, it may be premineral, for there is a little ore in faults of similar strike and dip that are exposed on the No. 6 and No. 7 levels northeast of the dike fault.

Northeast of the dike fault there are several well-marked faults that strike N. 70°–80° W. and dip 60°–80° SW. These may be branches of the dike fault, or they may be earlier faults cut off by it. The most prominent one is exposed in long drifts on the No. 4 and No. 5 levels, where it may be traced outward directly from the dike fault. The zone of disturbed rock is locally as much as 10 feet across. At one place the wall rock shows a drag that indicates a reverse movement, but the relations are not wholly clear. The rock along the fault has been bleached and contains some ore—enough in one place to have prompted the driving of a small stope. Faults of similar trend may be seen elsewhere in the workings, but they are not so conspicuous nor so persistent as the one just described, and they have not been traced from one level to another. Some of them are mere slips and are not mapped. Those on the No. 6 and No. 7 levels displace the low-angle thrust fault to the northwest on the southwest side of the faults. Some but not all of these faults are bordered by hydrothermally altered rock.

OCCURRENCE AND DISTRIBUTION OF ORE

Although much of the faulting has been premineral, the only considerable bodies of ore have been found along the low-angle thrusts, the others having apparently been too much clogged with gouge. Much of the ore in the overthrusts forms narrow, compact, high-grade seams a fraction of an inch to 5 or 6 inches wide, sharply separated from one of the walls by slickensides and thin sheets of gouge. In the upper stopes the average width of the ore seam was about 4 inches, and the minimum thickness that permitted profitable recovery and concentration by hand sorting was 2 inches. The seam showed some tendency to pinch and swell and to form lenticular shoots a dozen to a hundred feet long, but these lenses were so closely spaced that the ore southwest of the dike fault was mined continuously, for about 600 feet on the strike, from the No. 3 level to the surface. Some of the best ore in the upper workings was near the dike fault; there the ore was 6 to 7 inches thick. This unusual thickness apparently was caused by movement along the normal fault that had increased the distance between the walls of the older overthrust, thus facilitating the circulation of ore-bearing solutions. Another favorable zone for mineralization was between the air-raise and Norquist faults, where the high-grade ore measured 6 to 32 inches in thickness, though not all of it was in a single compact seam. Stringers in the fractured rock bordering the ore seams increased the stoping width of the mill feed. The stoping ore commonly attained a thickness of 3 or 4 feet, and at

one place on the No. 6 level northeast of the dike fault, where the thrust was notably flat, it was 6 feet thick. In August 1941 milling ore as much as 2 feet thick, containing some high-grade seams, had been uncovered on the No. 8 and No. 9 levels. The main body of ore on the No. 9 level proved to be close to the Norquist fault (pl. 12).

The size and distribution of the ore shoots are indicated by the outlines of the stoped areas shown on the mine map (pl. 11). The stopes, and therefore the ore shoots, appear to become somewhat smaller, more widely separated, and more lenticular with increasing depth. The ore shoots occur where there was a local flattening of the dip of the thrust plane, which, as just pointed out, favors the separation of the walls and thus provides the space needed for the circulation of the ore-bearing solutions and the deposition of ore. Conversely, pinching occurs where there is a steepening of the dip and an increase in the amount of gouge. In some places the quantity of ore has increased where more steeply dipping seams along the footwall of the thrust zone have joined the hanging-wall seam, or where steeply dipping seams have come into the footwall from below, perhaps along diagonal fractures. These fractures, after joining the thrust zone, have continued parallel with, and close to, the footwall seam along the main thrust. In places the footwall seams have swelled out into some of the largest and richest shoots. Character of country rock, also, may have played a part in localizing the favorable structural zones, for in entering the weak laminated shales the thrust zones have flattened to conform more closely with the bedding, and consequently have widened out. Most of the stopes in the upper part of the mine are in these laminated shales, though most of those at depth are in more massive rock. Perhaps this change in the character of the rock has had something to do with the smaller size of the shoots in the deeper levels; but that decrease may have been partly due to the fact that the thrust faults steepen downward, particularly in the more massive beds.

As the ore has been considerably disturbed by recurrent faulting both parallel to and across the ore seams, it is more or less broken and is easily detached from the country rock, a condition that has greatly facilitated both hand sorting and the driving of drifts and stopes. On the No. 6 level, however, the slips and cross faults have handicapped mining because of their large number and close spacing, and one of the shoots below that level was abandoned, at least temporarily, because of heavy

alteration, and most of them contain at least a few stringers of ore.

The low-angle thrusts have a northeasterly trend, which diverges rather widely from that of the Striped Peak strata. Northeast of the dike fault the thrusts generally strike N. 10°–20° E., but in places they strike due north. The dip is usually eastward at angles of 18° to 22°, but the inclination may rise to 26° or decrease to 10°. At one place on the No. 6 level the dip is practically flat or is even slightly to the northwest. Southwest of the dike fault the strike averages about N. 30° E., but it ranges from about due north to about due east. The average dip is somewhat steeper than it is northeast of the dike fault—about 20° or 25° SE.; it is also more variable, ranging from 15° to 35° SE. These marked local variations in the strike and dip show up well on the geologic map of the underground workings. (See pl. 12.)

Northeast of the dike fault only one zone of thrusting has been uncovered, but between the dike and the Norquist faults there are three overlapping thrusts, apparently linked to one another by diagonal branches. These relations are most evident on the No. 4 level, where two thrust faults are exposed at the south winze. The lower fault is followed southeast by the drift to a point midway between the air-raise fault and the Norquist fault, where it passes into the left wall (pl. 12). A short distance ahead a third thrust enters the drift from the right and is followed to the Norquist fault. These thrust faults are somewhat divergent in trend, and the third, which is also exposed on the No. 3 and No. 5 levels, strikes more nearly north than the others.

The displacement along the faults is small—a few inches to a few feet. In many places the beds show striking evidence of drag, and the drag relations indicate that the movement was directly up the dip, the stress having been applied from a southeasterly direction. The fracture zones along the thrusts are generally 2 to 3 feet wide but locally are as much as 6 feet wide. Ordinarily one wall is more distinct than the other and is marked by a fairly thick sheet of gouge. Fractures extend upward in places for considerable distances into the wall, and some steeply dipping fractures join the thrusts from the under side.

The dike fault strikes N. 35°–40° W. and dips 45°–55° SW. It is marked by considerable gouge and shattered ground. The dike lies along the hanging wall of the fault and in most places is frozen tightly to the wall. The fault apparently continued active after the intrusion of the dike. The movement was along the under side of the dike, for beneath it there is a fracture zone as much as 20 feet wide. The displacement of the low-angle thrust

RALPH

The Ralph property is on the lower north slope of Antelope Mountain, near the northeast corner of sec. 1, T. 55 N., R 2 E., about half a mile east of the Lawrence mine. It is developed by two tunnels, one about 100 feet vertically above the other. The lower has 262 feet of workings, including a 130-foot crosscut, from which a 34-foot drift extends to the southwest and an 85-foot drift to the northeast about 27 feet from the face. There is also a drift extending 88 feet northeast from a point 56 feet from the portal, and a drift extends 30 feet westward from a point 6 feet farther out. The upper tunnel is about 65 feet long but is blocked a short distance from the portal by an open winze.

Several mineralized faults have been exposed in the workings, but only the main one has been much prospected. All are in the laminated blackish and dark-gray shales of the Striped Peak formation. The beds strike a little west of north and dip about 15° E., but otherwise the formation has been little disturbed except by the faults, most of which are of small throw. Drag on some of the faults indicates that they are reverse faults, but the most prominent one is apparently normal. This fault strikes about N. 20° W. and dips 55°–70° SW.; the others strike N. 10° W. to N. 5° E. and dip 65°–90° W. All of them are slightly mineralized, but only the normal fault has invited much attention.

The vein along the normal fault is as much as 2 feet wide in the upper tunnel and 1 to 4 feet wide along the drifts in the lower tunnel. Much of it may be described as a breccia vein with 6 to 12 inches of gouge on the hanging wall. The filling consists largely of a rubble of little-altered fragments of country rock, partly cemented with quartz and siderite, accompanied in places by a little pyrite, sphalerite, and galena. The minerals show banding by crustification, and drusy surfaces in unfilled openings. As the siderite is far more abundant than all the other minerals combined, the vein may be classed as a sideritic breccia vein. No commercial ore has been uncovered.

Breccia veins 2 to 12 inches wide, with quartz as the only cementing material, are exposed in the lower workings.

ANTELOPE

The Antelope property, on the long spur that extends eastward from the town of Clark Fork to Antelope Mountain, includes three claims along the crest and upper north slope of the spur. It is owned by the Whitedelf Mining and Development Co. Development consists of a number of open cuts and trenches and a 15-foot tunnel alined along the otherwise concealed outcrops of two mineralized zones. This tunnel and seven of the cuts, which follow the lower zone, are spaced at intervals of 30 to 200 feet in an easterly direction along the upper slope of the spur; the others, which follow the upper zone, are near the crest and are alined in a northeasterly direction. The mineralized zones are apparently localized along low-angle thrusts of little displacement. In most places the cuts have not penetrated the oxidized parts of the outcrops, so that structural and mineralogical relations are rather obscure.

The most westerly of the cuts on the lower zone, a 50-foot trench, exposes limy quartzites of the Striped Peak formation, slightly stained in one place with iron and manganese oxide. The beds strike N. 6° E. and dip about 20° E.; the strike and dip of the thrust have not been closely determined. In the second cut, a 60-foot trench about 36 feet from the first, the thrust zone is exposed for about 50 feet, and there appears to strike about N. 55°–60° E. and to dip 15° SE. It is mostly 8 to 12 inches wide, but locally its width is as much as 24 inches. It consists of black, iron-stained and manganese-stained rock, which at one spot shows a little partly oxidized pyrite and siderite disseminated in silicified shaly quartzite. The third cut, about 70 feet east of the second, apparently missed the thrust and exposes only weathered quartzite, which strikes N. 25° E. and dips 10° SE. In the fourth cut, 210 feet farther east, about 8 inches of black limonitic and manganese-stained rock is exposed, and about the same width of iron-stained and manganese-stained rock is also shown in the fifth cut, 30 feet beyond. The tunnel, which lies 30 feet beyond the fifth cut, exposes about 2 feet of fractured rock, stained with oxides of iron and manganese, beneath a 2-inch layer of gouge. Two additional cuts, one 40 feet east and the other 80 feet east of the tunnel, afford similar exposures of the thrust zone.

The upper mineralized zone is exposed in the main cut near the crest. It shows the same black manganese staining as the one below and appears to strike N. 60° E. and to dip 15° SE. The country rock strikes N. 7° W. and dips 17° E. A number of other cuts are alined in a northeasterly direction, but no manganese-stained rock is shown in any of them.

No sulfides other than the partly oxidized pyrite have been found, nor have oxidation structures been observed that might suggest the presence of galena below the shallow oxidized zone. The limonitic iron and the black manganese oxides appear to have been largely formed by oxidation of rather scanty siderite deposited in the fractured rock along the thrusts.

PIER AND CADY

The Pier and Cady property, originally the Whitcomb, is on the lower south slope of Middle Mountain, in sec. 35, T. 56 N., R. 2 E., about half a mile north of the town of Clark Fork. The development on the property includes three tunnels, only one of which was open in 1940. The work was begun in 1926 or 1927, and in 1927, when the property was first examined, the lengths of the tunnels totaled 365 feet. Some work was done in 1928, but during most of the time since then the property has been idle. The tunnel open in 1940 was the intermediate tunnel, a 137-foot adit drift with a 45-foot crosscut near the face. The lower tunnel, which had a length of 225 feet in 1927, had then been closed off and converted to a reservoir for storing water. The output from the property has been negligible. In 1937 some leasers shipped 3,208 pounds of ore, which netted $27.83.

A low-angle thrust and a high-angle fault have been exposed in the workings. Both cut laminated black and dark-gray shales of the Striped Peak formation. In the mine the beds generally strike N. 25°–30° E. and dip 10°–20° SE., but drag has modified the strike and dip along the faults. The low-angle thrust strikes N. 25°–30° E. and dips 25°–30° SE., having in large part the same strike as the beds but a steeper dip. The high-angle fault, which strikes about N. 55° E. and dips 60° NW., is much more conspicuous than the thrust. Its gouge is so heavy that drifts along it do not remain open unless heavily timbered. This fault is marked on the surface by a straight, sharp gulley. The low-angle thrust lies east of and close to the high-angle fault, which it approaches in the far end of the workings. The zone of fractured rock along the thrust is mostly 2 to 3 feet wide but is locally as much as 6 feet wide.

The only significant bodies of ore lie on the low-angle thrust. The drifts were started along a 6-inch seam of massive galena, but the seam split into half a dozen branches too small to be minable distributed over a zone about 5 feet wide. Near the portal of the intermediate adit is a compact seam of sulfides about an inch thick, but a short distance inward this seam, also, breaks up into thin, rather widely spaced stringers. Small thin lenses appear here and there along the drift, but these too repeatedly break up into stringers, especially along the more gougy parts of the thrust zone. Near the face there are two minor seams about 6 feet apart, joined by thin stringers of ore. The rock along the high-angle fault has been somewhat bleached, and in places it is cut by thin seams and stringers of sulfides.

The ore consists mainly of galena, but it also contains tetra-

feet above and fall steeply to the bottom of Mosquito Creek valley, perhaps a thousand feet below. The mine is reached by trail from the Mosquito Creek road. Development comprises two adit drifts, one about 60 feet above the other. The lower is 96 feet long, and crosscuts from it extend 67 feet to the west and 28 feet to the east. The upper tunnel is 90 feet long and has a shallow winze at the end of a 30-foot crosscut.

The drifts extend along a mineralized low-angle thrust in the Striped Peak formation. The beds strike about N. 30° E. and dip 14° SE.; the thrust strikes N. 20° E. and dips 20° SE. The rocks in the cliffs just above the mine are thin-bedded reddish sandstone and shale, but the rock in the mine is laminated grayish shale, which is more or less bleached, being nearly white where most intensely altered by the mineralizing solutions. Other faults also have been uncovered underground. One, exposed in the far end of the lower adit, strikes N. 55° W., and dips 70° SW.; it is normal and has displaced the thrust fault 4 feet vertically. Another fault exposed in the winze from the east crosscut on the same level strikes N. 30° E. and dips 65° SE. This is a reverse fault, which also has cut the thrust, though the offset has not been exposed. The rock adjacent to it has been considerably fractured and bleached and has been lightly mineralized.

The thrust zone is 4 to 6 feet wide. Both walls are sharply delineated by narrow bands of gouge. Much of the ore is next to the gouge on each side, but some occurs in fractures, parallel and diagonal to the walls, in the rock between. In the lower adit there are two narrow ore seams, which are generally about 4 feet apart but which in places join and increase in thickness. At the face a seam along the hanging wall dipping 5° is joined by a seam dipping 25° that extends from the footwall and also by a seam of ore along a diagonal fracture. The ore seams are generally no more than an inch or two thick, and only a little stoping has been done, principally along a shoot about 40 feet long.

The ore seams consist of massive sulfides, dominantly of galena, but there are minor stringers of sphalerite in the bordering rock. Some calcite is visible in the ore, but neither quartz nor siderite, although siderite at least is probably present, for the shallow, oxidized parts of the deposit are iron stained. High silver values are reported by the owners of the property. An assay report dated September 27, 1939, showed 46 percent of lead and 63.3 ounces of silver per ton, and another, dated January 8, 1940, showed 65 percent of lead and 84 ounces of silver. No late hypogene sulfosalts were observed in polished sections.

include two mineralized low-angle thrusts and one high-angle fault, all in the shaly and siliceous beds of the Striped Peak formation, which locally strike N. 5° E. and dip 10° SE.

The mineralized thrust in the lower adit strikes N. 40°–45° E. and dips 20°–25° SE. The displacement along it has apparently been but a few inches. In places the fracturing virtually disappears, but in several places the fracture zone is as much as 3 feet wide, and in one place it contains 4 inches of massive sulfides. Along much of the drift, however, mineralization is represented by mere bleaching of the country rock. Most of the visible ore is exposed in a number of cuts that extend diagonally southwest up the slope for a distance of several hundred feet. These cuts commonly show 1 to 2 inches, and locally 4 inches, of massive ore extending along one of the walls of the fault zone.

The thrust in the middle adit strikes N. 5° W. to N. 20° E. and dips 5°–12° E. At the face of the adit the thrust is cut off by a fault, marked by a broad zone of gouge, that strikes about N. 30° W. A winze inclined about 30° SW. has been sunk on the fault. Much gouge has run into the adit despite heavy timbering. Near the fault the thrust contains 1 to 2 inches of massive sulfides, and scattered stringers appear near the portal. At some places between the fault and portal the main sulfide seam is roughly paralleled, at a distance of 2 or 3 feet, by a second discontinuous seam. The fracture zone does not anywhere appear to be more than 3 or 4 feet wide. Movement has been sufficient to produce thin bands of gouge on some fractures. In a cut 100 feet to the southwest the fractured rock is stained with manganese oxides.

A high-angle fault, which strikes N. 50° W., is exposed in the 40-foot adit far up the gulch. It contains 2 to 3 feet of mashed rock and coarse-grained calcite bordered by less extensively fractured rock.

Except in the steep fissure up the gulch, the ore consists of cubic galena, partly oxidized to anglesite in the outcrops. Neither pyrite nor sphalerite appears to be present in the specimens of galena that were collected for study. The presence of limonitic oxides, in part darkened by manganese oxides, suggests the presence of some primary siderite.

RED CLIFF

The Red Cliff mine is in sec. 6, T. 55 N., R. 3 E., on the north side of Antelope Mountain, 1½ miles due east of Clark Fork. The slopes there rise precipitously to the summit several hundred

hedrite, sphalerite, pyrite, arsenopyrite, siderite, quartz, and sulfantimonites. The ore shipped in 1937 carried 24.8 ounces of silver to the ton, 37.38 percent of lead, 0.6 percent of zinc, 0.26 percent of arsenic, and 0.2 percent of antimony.

BLAIR AND COLLINS

The Blair and Collins property is on the lower northwest slope of Middle Mountain, near the junction of Cascade and Lightning Creeks, in sec. 26, T. 56 N., R. 2 E. It lies about 2½ miles by air or 3 miles by road north of Clark Fork. No work appears to have been done on the property since 1927, and most of the short tunnels that had been driven on the slope were only partly accessible in 1940.

Mineralization is confined to a low-angle thrust fault that strikes about N. 20° W. and dips 25°–30° NE. The fault cuts limy beds of the Wallace formation, which locally strike about N. 10° W. and dip about 25° NE. The Wallace formation has here been brought against the Striped Peak formation along one of the major northeastward-striking strike-slip faults, which is only a short distance south of the low-angle thrust.

The thrusting has produced a brecciated zone 2 to 3 feet wide, along either the foot or the hanging wall of which, in places, there is a vein of massive galena ½ to 2 inches thick, accompanied by minor stringers of galena in the fractured rock between the walls. In some parts of the thrust zone the ore tends to form small pockets or lenses rather than continuous seams, and here and there it consists of stringers in the brecciated rock. As the thrust lies parallel to the mountain slope and is generally within a short distance of the surface, the ore is somewhat oxidized. The galena, however, has been little changed except for incipient alteration to anglesite, though it as well as the bordering rock is rather heavily stained with black manganese oxides. Neither pyrite nor sphalerite was noted in the partly oxidized ore.

MILLER

The Miller property is on the lower southwest slope of Howe Mountain, about 400 feet east of the portal of the James E. White tunnel, in sec. 34, T. 56 N., R. 2 E. It contains two open cuts and two tunnels, which are, respectively, about 40 feet and 145 feet long. Most of the work on the property was done in 1927 and shortly thereafter. Some small shipments of hand-sorted ore were made.

The property covers the southwestward extension of the South vein of the Whitedelf property. This vein extends along a high-angle reverse fault, which cuts thin-bedded shales and massive

quartzites of the Wallace formation, well exposed in cliffs near the portals of the tunnels. The beds strike N. 30° W. and dip 30° NE., except within and immediately along the fault zone. The fault, which has not offset the beds more than a foot or two, strikes N. 30°–50° E. in the upper tunnel and N. 50°–55° E. in the lower. Its dip is generally about 80° SE., but in places it decreases to 75°, and in the lower tunnel it increases to 90°. In the cut above the upper tunnel the fault zone, there about 12 feet wide, is limited on the footwall by a prominent fracture and contains several minor fractures extending toward and along the hanging wall. The beds between the fractures are considerably crumpled, but the entire displacement across the disturbed zone probably does not exceed 2 feet. In the tunnel just below the cut the footwall and hanging wall are marked by well-defined slips 4 to 6 feet apart, between which lies a block of moderately folded and fractured country rock. In the lower tunnel the disturbed zone is 2 to 3 feet wide and shows a little gouge along fractures cutting and bordering the more or less crumpled beds.

The fault zone shows evidence of hydrothermal alteration, and some of the fractures contain a little siderite, quartz, pinkish carbonate, sphalerite, and lead sulfantimonites, and possibly a little galena. The ore minerals now visible in the exposures are sparsely and rather irregularly distributed, in part as a network of narrow stringers. There is less evidence of mineralization in the lower tunnel than in the upper, where the dip is not quite so steep. There, in the ore that was stoped, the sulfides formed small pod-like nests, and veinlets that are generally no more than an inch thick.

EBERLY

Considerable prospecting has been done by A. D. Eberly on land of the Daugherty estate, north of the Whitedelf property, on the northeast side of Howe Mountain. The work includes several tunnels and cuts, which have exposed fault zones otherwise concealed by the glacial drift that covers the lower slope of the mountain and the low country to the north. These openings reveal that the country rock represents the Wallace formation, with the same character and attitude as on the southwest side of the ridge. Both reverse and strike-slip faults, conforming in pattern to those on the Whitedelf ground, have been uncovered.

Most of the tunnels and cuts are on a fault that strikes N. 40° E. and dips 70°–75° SE. This fault contains, in places, as much as 12 inches of gouge. Drag in the beds alongside indicates that the hanging wall has moved relatively upward. The fault has been traced for more than 150 yards by cuts, drifts, and tunnels,

MINERALOGY

As the ore of the Lawrence mine has not been enriched with late hypogene silver and antimony, it consists predominantly of massive galena, accompanied by generally inconsequential amounts of sphalerite, tetrahedrite, pyrite, arsenopyrite, siderite, quartz, and calcite. Statements as to the silver, antimony, arsenic, and lead in the ore have been given on pages 64-65, 68, and 70-71. The 14 ounces of silver per ton of concentrate is apparently divided between argentiferous galena and scattered microscopic grains of tetrahedrite. Sphalerite is not readily detected in the ore, but in places the zinc content ranges between 1 and 3 percent. The zinc appears to be distributed very irregularly. Pyrite is not readily visible except in the more lightly mineralized zones, but microscopic remnants of it are enclosed in the galena. Neither siderite nor quartz is conspicuous, and both may in places be absent; outcrops, however, are rather heavily stained with iron and manganese oxides. Calcite locally forms crystalline crusts that line openings in the ore.

OUTLOOK

Although the ore shoots are relatively small, there are many of them, and they occur along several of the thrust faults. Altogether there are seven known mineralized thrusts, most of which have been but little explored. Because of the locally widespread mineralization, the property may be worthy of more development than it has received.

LITTLE SENATOR

The Little Senator property is on the steep lower northwest slope of Antelope Mountain, just southwest of the Lawrence, in sec. 1, T. 55 N., R. 3 E., a mile due east of Clark Fork. The property comprises the Little Senator group of four claims, on which there are three short tunnels and several cuts. Most of the recent work has been in a 230-foot adit drift near the foot of the mountain. There is a 180-foot drift on the slope about 200 feet higher and a 40-foot adit well up the gulch, but no work seems to have been done in them recently. Each adit is on a separate mineralized zone. Most of the cuts are alined along the outcrop of the mineralized zone exposed in the lowest adit.

Five or six mineralized faults are said to cross the Little Senator group; some of them are extensions of those on the Lawrence group. Those prospected on the Little Senator group

eral hundred feet northeast of the main workings, the ore measured 12 inches, 8 inches of it consisting entirely of massive sulfides. Ore was stoped for 60 feet on the strike, and up to the surface 20 feet above. In another opening still farther northeast, the band on the footwall measured 4 to 6 inches, but, because of numerous veinlets in the hanging wall, the total thickness of ore was commonly 2 feet and locally as much as 4 feet. Ore was followed for a horizontal distance of 55 feet. The ore body is on the segment of the thrust northeast of the diabase dike. Other workings above the main tunnel have stopes about 60 feet long. Surface as well as underground exposures show that the thrust is mineralized for many hundred feet and that the cross faults have generally produced but minor offsets in the main thrust. The continuation of the thrust beyond the cross fault in the southwest part of the mine (pl. 13) has not been found, but the fault may have raised the thrust above the tunnel level.

Another mineralized thrust, striking N. 35° E. and dipping 16°–18° SE., had been penetrated in 1941 by a short tunnel about 500 or 600 feet up the slope from the portal of the main tunnel. It shows as much as 8 feet of fractured rock, with ore distributed in small stringers, pods, and veinlets along the fractures. The ore exposed appears to be low-grade mill feed. Three other closely spaced mineralized thrust faults had been uncovered in the new road to the portal of the short tunnel just mentioned. These faults strike N. 35°–40° E. and dip southeast at low angles. The ore is contained in narrow seams and stringers.

A thrust fault that strikes N. 55° W. has received considerable attention. It lies several hundred feet above the one in the main workings and at some distance to the northeast. These two faults should intersect east of the present workings, probably near the base of the slope. The northwesterly-striking fault has been exposed in several tunnels, including the one shown in figure 3, and in a long series of cuts on the northeast side of the gulch extending out toward the main valley of Mosquito Creek. As shown in this tunnel (fig. 3) and in a tunnel and stope about 60 feet above, the ore occurs in stringers along a fracture zone 2 to 4 feet wide. The cuts show that the fault is not persistently mineralized but contains only scattered lenses of ore. Along the upper tunnel ore has been stoped upward about 25 feet.

The ore in all the thrusts has been little affected by postmineral movement except along cross faults, and there is rarely more than a thin selvage of gouge. Walls stand remarkably well, needing little support except in the vicinity of cross faults.

one of which is 110 feet long. In one of the upper tunnels a drift has been carried along a fault striking N. 70° E. and apparently dipping about 45° S., which appears to end abruptly against the one that strikes N. 40° E. The fault striking N. 70° E. is marked by numerous fractures and badly crushed and gougy ground. Drag in the bordering beds suggests that the movement along it has been diagonally upward from the southwest. This fault is also exposed in a cut about 100 yards to the west, where it shows 1 to 2 feet of gouge along a fracture that dips about 50° S., and there again pronounced drag along the hanging wall indicates a shove from the southwest at a fairly low angle.

Both faults display evidence of hydrothermal action and contain a little sulfide. In places the reverse fault contains small scattered pods and stringers of lead sulfantimonites and stringers of quartz and carbonate. The second fault contains, in addition, small scattered pods and stringers that contain a little siderite, galena, sphalerite, and lead sulfosalts, stringers of a white carbonate, and stringers of quartz that seems to be older than the quartz-siderite seams. The rock along both fault zones has been somewhat sericitized and silicified and locally chloritized.

OTHER PROPERTIES

Whitedelf Property

A tunnel known as the Clagg-Norquist, at or near the Daugherty-Whitedelf property line, has exposed two faults. A tunnel has been driven along one of the faults, which is somewhat mineralized. This fault, which contains little gouge, strikes about N. 75° W.; in some places it dips steeply south and in other places steeply north. Near the face of the tunnel it appears to be cut off by a fault of variable trend, which strikes about due east to southeast. This second fault dips about 75° N. and shows grooves that are inclined about 35° E. A few stringers containing pyrite, quartz, and a carbonate are scattered along the fault that strikes N. 75° W.

Several minor low-angle thrusts in red beds of the Striped Peak formation have been uncovered on the south slope of Middle Mountain, across from the Lawrence mine, but without revealing significant showings of ore minerals. The faults strike about N. 20° E. and dip about 25° SE.; the bedding locally strikes N. 30° W. and dips 15°–18° NE. One of the short tunnels shows, within a vertical distance of 6 feet, three small low-angle thrusts that contain some small stringers of siderite. Another tunnel has been driven along a fault that strikes N. 45° E. and dips 80° NW. This fault has 8 inches of gouge.

be several hundred feet long. The subordinate as well as the main fractures contain ore, a good deal of which has been deposited by replacement of the bordering rock.

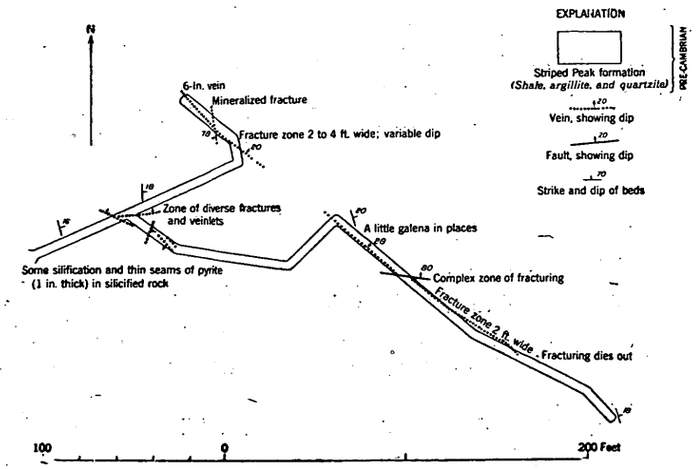

FIGURE 3.—Geologic map of vein of northwest trend at Lawrence mine.

The distribution of the steep faults is shown in plate 13. These faults cut the overthrusts, offsetting them several feet in places. They have a general easterly trend and dip either north or south. A high-angle normal fault containing a diabase dike about 6 feet wide is exposed in a drift east of the main workings. The fault strikes N. 50° W. and dips 70° SW. Its wall rocks have been considerably fractured and somewhat altered. The vein followed by the drift ends against the dike but is known to continue beyond the dike, on which it has been offset an undetermined but probably no great distance.

OCCURRENCE AND DISTRIBUTION OF ORE

The low-angle thrust faults are mineralized for great lengths, but the ore in them is restricted to relatively short but numerous lenticular shoots along the recurring flatter parts of the fault zones. In these shoots the ore is largely concentrated in a sheet, an inch to several inches wide, along one or both of the walls, and numerous veinlets and stringers and some disseminated ore are found in the fractured rock between the walls. In the principal thrust zone, exposed in the main part of the mine, the bands of ore measured 2 to 4 inches where they were seen, but locally they may have been wider. As shown in plate 13, the ore has been stoped for 250 feet on the strike and at least 300 feet on the dip. In one of the openings on the same thrust, sev-

STRATIGRAPHIC AND STRUCTURAL RELATIONS

The ore at the Hope mine is contained in faults that cut the Striped Peak formation, which locally is represented by dark-gray, almost black laminated shale together with more massive and lighter-colored siliceous shale and quartzite. Along the mineralized zones the rock has been considerably altered, and the color has been changed to light gray or pale green, but despite the bleaching the strata are easily recognized as Striped Peak by their closely spaced partings. Higher on the slope are the alternating reddish and greenish sandstones, shales, and argillites that make up the more conspicuous and even more diagnostic members of the formation. Exposed in the mine is a diabase dike 4 to 40 feet wide intruded along one of the faults. This dike has been considerably altered by hydrothermal solutions, which have largely changed its original dark-gray to black color to light gray and pale greenish gray, much like that of the altered shale.

The beds have a northerly trend and rather low to moderate easterly dips. Near the portal of the No. 3 tunnel the bedding strikes N. 5°–10° E. and mostly dips 5°–12° E., though in places the dip steepens to 20°. Through most of the mine, however, the strike is N. 20°–25° W., increasing to N. 30° W. or more near faults, and the dip is usually 5° to 15° E., though it is locally as much as 30° E. Minor flexing of the beds is plainly visible in places, and at some points the bedding is horizontal. Small drag folds appear along some of the faults.

The stratified rocks have been cut by numerous faults, some of moderate throw but others of negligible throw. These faults include low-angle thrusts—or zones of closely spaced overlapping thrusts—a high-angle normal fault, and many high-angle strike-slip faults, two of which are prominent. The main thrust contains the Elsie K vein. The high-angle normal fault, which contains the diabase dike, has been designated the dike fault. One of the major strike-slip faults exposed in the far south end of the workings on the fourth, fifth, sixth and ninth levels is known as the Norquist. It has been regarded by some observers as a continuation of the Pugh fault on the Whitedelf property. A smaller fault between the Norquist fault and the dike fault has been called the air-raise fault. Many faults of lesser magnitude have been recognized but not named. The thrust faults are cut and displaced by all the other faults, with offsets of a few inches to many feet, apparently always to the northwest on the southwest side of the fault. All the faults except some of the very small ones are premineral, but all show evidence of postmineral movement. Few of them fail to show the effects of hydrothermal

ground. The ore body near the southwest end of the No. 6 level is not far from the Norquist and air-raise faults, and the one near the northeast end is near and in line with the oblique west-northwest faults that extend out from the dike fault. The increased shattering may be associated with the closer spacing and nearness of these larger faults.

Small bunches and stringers of ore minerals have been uncovered along the Norquist fault, and some ore has been found along the dike fault. Nets of ramifying stringers that cross broad zones of gougy rock have been found along the dike fault; locally these stringers are grouped in zones a dozen feet across. On the No. 3 level a lens of ore several inches thick was found along the footwall of the dike fault in the drift, and additional stringers were found in the fractured rock alongside, but on the No. 4 and No. 5 levels no ore worth stoping was found.

MINERALOGY

The ore at the Hope mine has not been so generously enriched in silver as the ore at the Whitedelf, but there is otherwise little difference except in the number and relative proportions of the late hypogene minerals. Galena is the most abundant and most widely distributed of the ore minerals in the Hope mine, but it is invariably accompanied by considerable quantities of some of the lead sulfantimonites, by minor quantities of sphalerite and pyrite, and by microscopic grains of tetrahedrite. Lead sulfantimonites are visible throughout the mine; in places they make up fully a third of the ore. They seem to be at least as abundant on the lower levels of the mine as on the higher levels, but their abundance differs considerably in different shoots. The lead sulfantimonites also make up a large part of the ore minerals scattered along the Norquist fault, the dike fault, and other mineralized faults. Sphalerite appears to become somewhat more abundant in the lower levels of the mine, where it forms 5 to 10 percent of the ore, but even there it is generally so scarce that it is penalized rather than paid for. It is distributed rather sporadically, some ore shoots containing very little and others a good deal. Pyrite and arsenopyrite are fairly abundant along parts of the dike fault and in some of the minor faults in which no galena was deposited, but otherwise they occur largely as microscopic grains, visible in polished sections of the ore and in thin sections of the bordering wall rock. There is enough arsenopyrite in the ore to make the concentrates shipped to the smelter contain 1 to 1.5 percent of arsenic.

The gangue minerals include minor quantities of siderite and quartz and in places a little rhodochrosite. Much of the siderite forms small bleblike inclusions in the sulfides and discontinuous seams between the ore minerals and the wall rock. Some occurs, also, in stringers and irregular masses along fractures in the wall rock. The quartz is not readily seen except in polished sections and thin sections, where it is found to be closely associated with the sulfides. The rhodochrosite is confined to a few small stringers along some of the minor cross slips on the No. 6 level and to widely scattered stringers along the Norquist and dike faults.

SUGGESTIONS FOR PROSPECTING

As shown by the geologic map of the Hope workings (pl. 12), the mineralized thrust fault did not end near the face of the No. 3 and No. 4 levels in the northeast part of the mine, but was lost when the drifts were driven into the foot wall. Unless the drifts are continued on the thrust, it cannot be known whether the end limits of the commercial ore bodies have been reached. The map shows, also, that ore bodies on two distinct thrust zones have been worked in the southwestern part of the mine but have been only partly explored. Additional crosscuts judiciously spaced and driven into both the hanging and footwalls would not only explore both of the thrusts but might even lead to the discovery of others. For example, a layer of sulfides is visible in the roof of the drift on the No. 4 level, at the point where the drift crosses the older of the two winzes in the southern part of the mine, and this layer may represent a mineralized thrust that is not exposed elsewhere. If the layer is persistent it would be reached by crosscuts driven into the hanging wall from any of the main drifts in the southwestern part of the mine. Only by adequate crosscutting can it ever be determined whether the thrust faults in the mine make up a complex system or a series of relatively short but overlapping fractures. The rather extensively faulted ground on and below the No. 6 level also deserves further attention, for the faulting at that locality suggests nearness to the Norquist and dike faults.

Because of the generally small size of the ore bodies, the lower limit of mining is likely to be determined by increased mining costs rather than disappearance of ore with depth. Although sphalerite seems to become more abundant on the lower levels (Nos. 7, 8, and 9) than on the higher levels, it probably does not herald any abrupt change in the character of the ore. The ore bodies that had just been exposed on the No. 8 and No. 9 levels in August 1941 contained a greater proportion of sphalerite than those on the higher levels, but they were as large as

ment and the shipments of hand-sorted ore. In 1931 a mill was erected on the property. Except for the few months between August 1932 and May 1933, the mine remained in almost continuous operation until 1935, but much of the work done was development work. By 1933 much of the ore above the No. 3 level had been stoped, and work had started at lower levels.

In 1935 the mine was taken over by the Hope Silver-Lead Mines, Inc., incorporated September 23, 1935. Some of the older workings were reopened and some ore of milling grade recovered from them, but much of the work was carried on at levels below the No. 3. A second winze was sunk on the vein at a point nearer the portal, after which the use of the old winze for hoisting purposes was abandoned. By 1940 all the known ore above the No. 6 level had been stoped, and in that year work was begun on the No. 7 level. In 1941 the winze was deepened and work started on the No. 8 and No. 9 levels. Work continued on these lower levels until March 1944, when because of a manpower shortage the mill was forced to shut down from lack of ore. Work was then started on a vertical 750-foot 2½ compartment shaft to open up the ore body on the Pearl vein which had been discovered through the activities of the United States Bureau of Mines in its exploratory diamond-drill work in the valley of Lightning Creek.

The production by years is given in the table following.

Production of the Hope (Elsie K) mine, 1925-43, in terms of gross metal content

[By G. E. Woodward, Bureau of Mines, U. S. Department of the Interior]

Year	Ore (short tons)	Gold (fine ounces)	Silver (fine ounces)	Copper (pounds)	Lead (pounds)	Zinc (pounds)
1925	122		5,663		148,976	
1926	161		7,043		193,954	
1927	294	0.20	12,289		321,679	
1928	374		9,825		255,854	
1929	1,000		21,273	25	602,297	
1930	227		4,733	104	139,421	
1931	6,122		27,207	870	715,500	
1932	2,420		12,979	245	353,392	
1933	5,514	.60	19,229	664	497,112	
1934	6,562	.50	17,670	350	482,367	
1935	4,735	.80	12,440	226	366,253	
1936	10,000	2.80	35,366		1,138,422	
1937	21,000	14.00	36,979		1,284,500	
1938	9,000	2.00	20,073		802,850	
1939	8,574	3.00	22,236	1,078	745,462	
1940	7,547	2.00	16,274		593,461	
1941	4,500	1.00	7,236		256,100	
1942	10,320	2.00	17,128		638,122	700,000
1943	11,120		13,593		542,121	74,300
Total	109,592	28.90	319,236	3,562	10,077,843	774,300

695456—47—5

HOPE MINE

LOCATION AND PROPERTY

The Hope mine is on the lower western slope of Middle Mountain, almost directly across from the Whitedelf mine, in secs. 26 and 36, T. 56 N., R. 2 E. The mill and main operating level are just above Lightning Creek, about 2 miles by road due north of the railroad station at Clark Fork, or about 1¼ miles from the center of town (pl. 6).

The mine is now owned by Hope Silver-Lead Mines, Inc. The property includes a considerable acreage of patented farm land, 14 unpatented mining claims, a complete mine plant, and a 150-ton flotation concentrator. In 1941 the development comprised more than 9,000 feet of underground workings on nine levels (pl. 11). The levels above the No. 3 (the present haulage level) have been abandoned and are no longer accessible. The levels below are connected with the No. 3 by two inclined shafts or winzes, one going to the bottom of the mine and the other to the No. 6 level. The levels are spaced at intervals of about 150 feet measured on the incline, the slope of which is about 22°. Several tunnels that formerly connected with the two upper levels are now only partly open. Their portals are at and just above the road that skirts Middle Mountain several hundred feet above the creek.

HISTORY AND PRODUCTION

The discovery of ore at the Hope (then called the Elsie K) in 1923 was not nearly so spectacular as the discovery of ore at the Whitedelf 3 years later. A sack of ore dug from an old cut along the road that circles the lower slope of Middle Mountain attracted the attention of Purdy and Jensen, leasers from the Coeur d'Alene district, who thereupon obtained an operating lease from the owner of the homestead on which the ore had been found. These men began work along the roadway, and within a short time they were making carload shipments of high-grade hand-sorted ore. By 1927, the vein on which the discovery was made had been opened by more than 600 feet of drifts from short crosscuts driven at the level of the road. Much of the ore had then been stoped above the road level, and preparations were under way to drive the No. 3 tunnel from near the level of the creek. In the meantime the leasers had negotiated for purchase of the mine, and before long they had paid for the mine from earnings. Wishing to mine on a larger scale, the new owners organized the Hope Mining Co., which was incorporated November 19, 1927, and continued the deeper develop-

grade. The fact that there were also thin unbroken stringers cutting the gouge indicated that the ore was not drag picked up from the Pearl fault.

MINERALOGY

The ore at the Whitedelf mine has been known especially for its high silver content. Much of the ore mined in the early days carried about 1 ounce of silver to each percent of lead, and the silver content has increased with depth, some of the more recent shipments having contained as much as 6 ounces of silver to each percent of lead. This mine illustrates better than any other the enrichment in silver by late hypogene solutions.

The chief minerals are galena and various sulfantimonites and sulfarsenites; these are accompanied by such minerals as sphalerite, pyrite, tetrahedrite, and arsenopyrite, but the sphalerite and pyrite occur in negligible quantity, and the tetrahedrite and arsenopyrite are visible only under the microscope. The gangue minerals include siderite and quartz, but neither is conspicuous. In most parts of the mine, especially in the upper levels, galena stands out as the most abundant mineral, but close inspection generally reveals a more or less generous admixture of masses and grains of sulfantimonites and sulfarsenites. Along and above the Norquist level the sulfosalts made up a tenth to a fourth of the ore, but the proportion seemed to increase with depth, and in some of the ore from the 500 and 600 levels galena was subordinate rather than predominant; there some of the ore consisted almost entirely of the sulfosalts. Galena was subordinate, also, in the ore shoot exposed in the James E. White tunnel, where it appeared only in small bunches and stringers, generally alongside of the main bodies of lead sulfantimonites and related sulfosalts. Pyrargyrite was the only one of the sulfosalts that could be recognized megascopically.

Much of the ore along the Pearl fault has been shattered by postmineral movement, and in places a large part of it has been mashed and ground up in the gouge. Slickensided surfaces along and across the ore are common.

The ore along the Middle fault consists mainly of galena, which is mixed with brecciated siderite and sprinkled with granules of reddish sphalerite and crystals of pyrite. In the lower tunnel the fault zone contained only scattered grains of galena and here and there a little pyrite. The ore in the South vein is chiefly galena. The Pugh fault zone contains scattered grains of pyrite, but the minerals in the two small shoots included galena, sphalerite, and small quantities of the sulfosalts.

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☆ U. S. GOVERNMENT PRINTING OFFICE: 1947—695456

Production of the Lawrence mine, 1913-43, in terms of gross metal content

[By G. E. Woodward, Bureau of Mines, U. S. Department of the Interior]

Year	Ore (short tons)	Gold (fine ounces)	Silver (fine ounces)	Copper (pounds)	Lead (pounds)	Zinc (pounds)
1913	4,746	0.26	4,877	111	510	
1914	324	.21	1,326	40	121,579	
1915	457	.08	1,455	74	163,014	
1916	454		943	160	111,228	
1917	762	.08	2,254	159	197,271	
1918	772		2,195		199,753	
1919	144		518		56,514	
1922	94		1,458		146,695	
1923	36		535		51,506	
1925	102		417		51,187	
1926	183		922		99,827	
1927	216		1,209		106,386	
1929	333	1.00	1,167		95,584	
1931	71		708	24	105,922	
1932	21		390		28,852	
1933	41		416	51	60,806	
1934	68				93,707	
1935	29		273		26,968	
1937	51		747		70,278	
1938	126		1,062		91,777	
1939	39		511		60,465	
1940	76		703		96,600	
1941	110		1,034		125,336	
1942	57		665		69,130	
1943	46		426		64,881	
Total	9,358	1.63	26,211	619	2,806,471	

STRATIGRAPHIC AND STRUCTURAL RELATIONS

The country rock of the Lawrence mine belongs to the Striped Peak formation. It includes thin-bedded to fairly massive grayish to greenish argillaceous and calcareous quartzite and shale, together with some highly bleached but originally reddish sandstone and shale. The beds strike N. 3° W. to N. 12° W., and they dip 12°–22° NE., except along zones of faulting, where drag may locally increase or decrease the dip. Although their variations in strike and dip are small, the beds have been disturbed by several kinds of faults, chiefly by minor low-angle thrusts but also by high-angle normal, strike-slip, and reverse faults. All the faults cut the bedding at fairly large angles.

The low-angle thrust faults, of which there are at least seven on the property, have all been more or less extensively mineralized. Most of them strike about N. 40° E. and dip about 20° SE., but at least one strikes N. 55° W. and dips 20°–28° NE. (fig. 3). The northeasterly strikes vary considerably, however, within short distances, ranging from N. 25° E. to N. 55° E., and they are associated with dips of 13° to 25° SE. (See pl. 13.) The zone of fracturing associated with the thrusts is commonly 2 to 4 feet wide but may locally be as much as 8 feet wide. It appears to be widest where the dip is lowest and to narrow as the dip increases. Most of the fracturing is on the hanging-wall side of a footwall fissure. Some of the thrust faults are known to

the higher ore bodies and richer in the lead-antimony minerals—two facts that augur well for continuation of good ore to greater depth.

LAWRENCE MINE

LOCATION AND PROPERTY

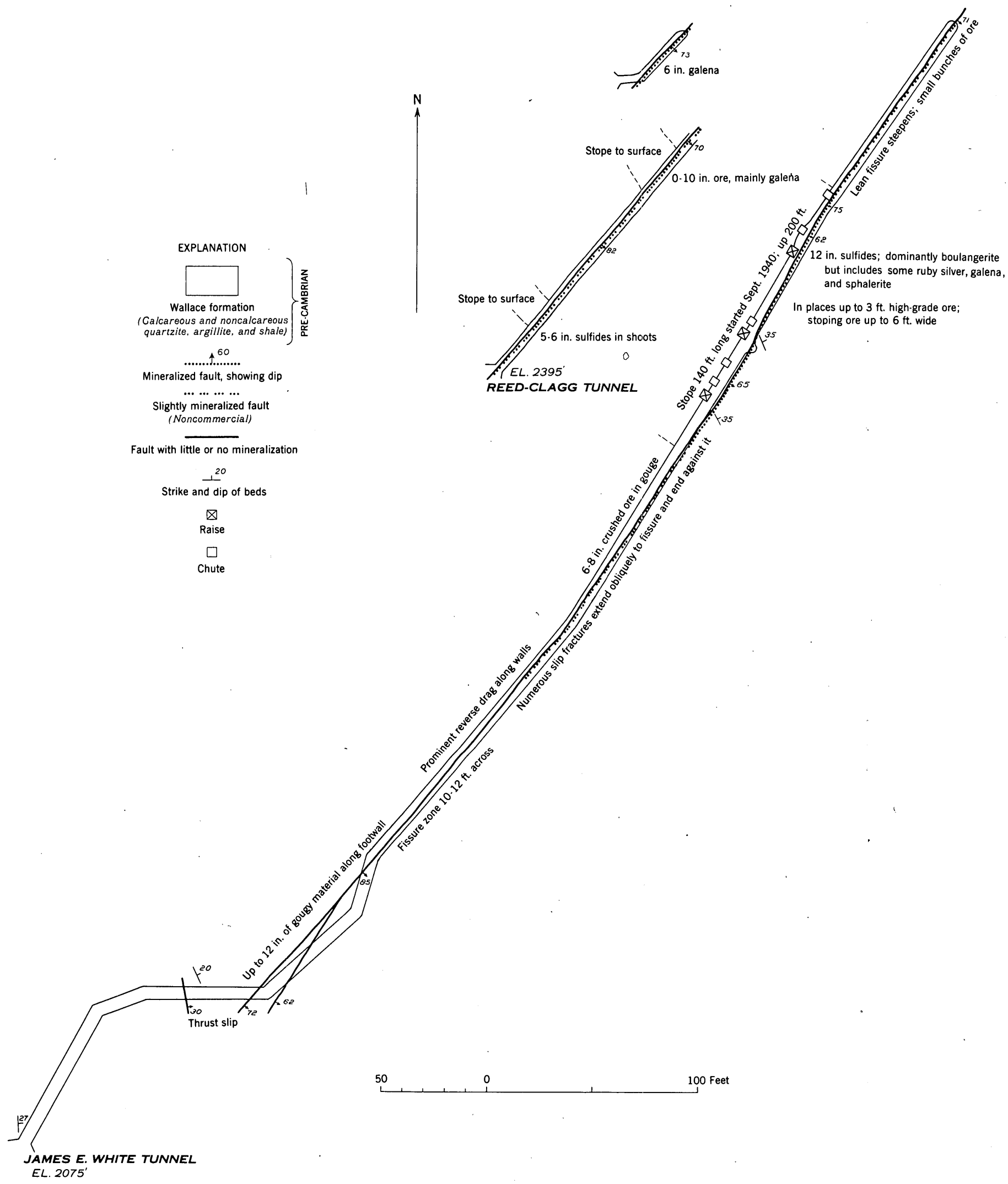
The Lawrence mine is on the lower northwest slope of Antelope Mountain, in sec. 1, T. 55 N., R. 2 E., about a mile due east of the town of Clark Fork, or 2 miles by road from the railroad station. The mill and portal of the main tunnel are just above Mosquito Creek; other workings are scattered well up the slope of Antelope Mountain.

The mine is owned by the Lawrence Consolidated Mining Co. The property includes 12 unpatented claims, complete mining equipment, and a 50-ton gravity concentrator (rolls, tables, and jigs) operated by a small Pelton wheel, water for which is flumed from Mosquito Creek. Development comprises more than 5,500 feet of underground workings, divided between 8 or 9 tunnels but extending in greater part from the tunnel shown in plate 13. This tunnel, a 900-foot crosscut, extends diagonally across the vein about midway between the portal and the face. In the drift just northwest of the intersection of the crosscut and the vein, an inclined shaft has been sunk 180 feet, and drifts have been carried along the vein on the 150-foot level. Stopes extend from the bottom level to the surface.

HISTORY AND PRODUCTION

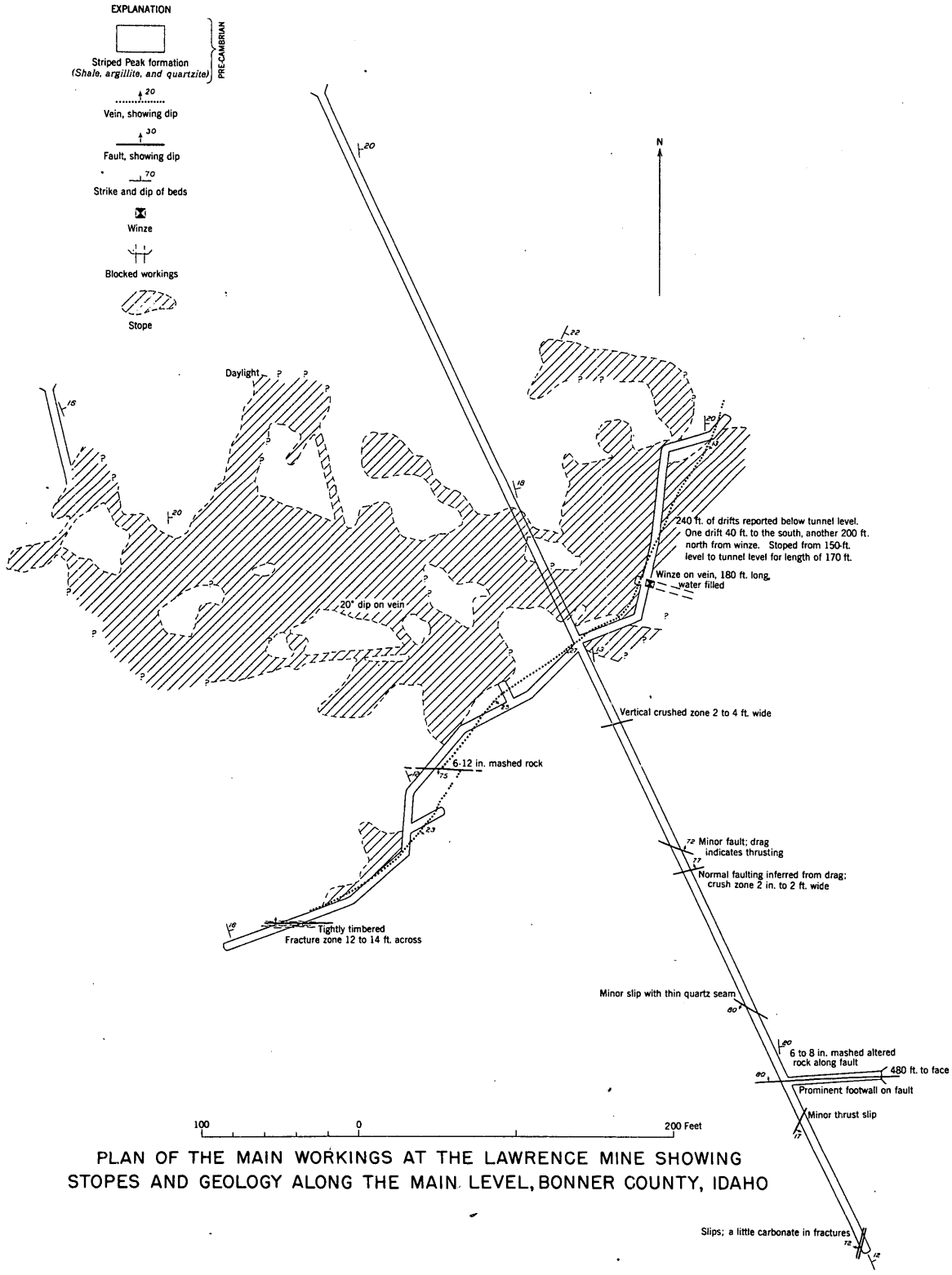
As pointed out earlier, the mine made its first shipments of ore in 1903, but there was little activity between that year and 1913, when the Lawrence Mining and Milling Co. installed the present 50-ton gravity concentrator. The company operated the mine and mill continuously, or nearly so, for the next 6 years. Since then the mine has been operated only intermittently, much of the work being done by lessers, mostly in tunnels above and to the side of the main tunnel. The Lawrence Consolidated Mining Co. was incorporated in 1923.

The production of the mine by years is given in the table following. Shipments from 1903 to 1942 amounted to 9,358 tons of ore containing 1.63 ounces of gold, 26,211 ounces of silver, 619 pounds of copper, and 2,006,471 pounds of lead. According to company records, 13.2 tons shipped in 1903 contained 211 ounces of silver and 19,669 pounds of lead, and 23.4 tons shipped in 1912 contained 274 ounces of silver and 33,599 pounds of lead.



PLAN OF WORKINGS ON SOUTHWEST SEGMENT OF THE PEARL VEIN AT WHITEDELF MINE SHOWING GEOLOGY ON LEVELS, BONNER COUNTY, IDAHO

695456 O - 47 (Inside pocket) No. 8



PLAN OF THE MAIN WORKINGS AT THE LAWRENCE MINE SHOWING STOPES AND GEOLOGY ALONG THE MAIN LEVEL, BONNER COUNTY, IDAHO

695456 O - 47 (Inside pocket) No. 13

Part of application

OFFICIAL BUSINESS

15

1201 N. Division St.
Spokane 2, Washington

December 17, 1954

Whitedelf Mining & Development Co.
401 Empire State Building
Spokane, Washington

Re: Contract Idm-E189
Docket No. DMEA 255X
Monthly Operating Report
for November 1954.

Gentlemen:

The subject monthly operating report has been processed and forwarded to the Disbursing Officer in Portland, Oregon, for payment.

This is to inform you that payment could not be made in the full amount claimed. The amount deleted is explained in the attached copy of a memorandum to the Field Team from the DMEA Certifying Officer, Region II.

By Field Team, Region II

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

cc: DMEA (2)
USGS (2)

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

DMEA Field Team, Region II

December 17, 1954

DMEA Certifying Officer Region II

Whitedelf Mining & Development Co., Monthly Operating Report for November 1954 . Contract Idm-E189.

The subject monthly report has been processed for payment.

An amount of $0.41 has been deducted from the amount claimed by the operator. This represents an error in figuring the payroll taxes.

Myrtle Purdy

cc: DMEA
USGS

XXXXXXXXXXXXXXXXXX
1201 N. Division St.
Spokane 2, Washington

December 13, 1954

Att
Betty

Whitedelf Mining & Development Co.
401 Empire State Building
Spokane 1, Washington

Re: Contract Idm-E189
Monthly Operating Report
for October 1954

Gentlemen:

The subject monthly operating report has been processed and forwarded to the Disbursing Officer in Portland, Oregon, for payment.

This is to inform you that payment could not be made in the full amount claimed. The amount deleted is explained in the attached copy of a memorandum to the Field Team, Region II, from the DMEA Certifying Officer.

By Field Team, Region II

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

cc: DMEA
USGS

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

DMEA Field Team, Region II

December 13, 1954

DMEA Certifying Officer, Region II

Contract Idm-E189, Whitedelf Mining & Development Co.
Monthly Operating Report for October 1954.

The subject report has been received and processed for payment.

One deletion in the amount of $0.52 was made. This amount was deducted because of an error in figuring the payroll taxes.

Myrtle Purdy

cc: DMEA ✓
USGS

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

December 10, 1954

Mrs. Myrtle Purdy
Certifying Officer
DMEA Field Team, Region II
1201 N. Division Street
Spokane 2, Washington

Re: Docket No. DMEA 255 (lead)
Whitedelf Mining & Development Co.
Bonner County, Idaho
Contract No. Idm-E189

Dear Mrs. Purdy:

The Operator has submitted crosscutting on his invoices whereas the contract authorizes only drifting. The short crosscuts that were submitted for payment were necessary for switch points to facilitate the tramming.

You are hereby authorized to pay for the crosscuts as submitted and for any future crosscuts that are authorized by the Field Team representatives.

Sincerely yours,

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

cc: DMEA (2)
USBM (2)

all

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
NOV 8 1954

11/12/54. Received by [illegible]

XXXXXXXXXXXXXXXXXX
1201 N. Division St.
Spokane 2, Washington

November 5, 1954

Whitedelf Mining & Development Co.
401 Empire State Building
Spokane 1, Washington

Re: Contract Idm-E189
Monthly Operating Report
for September 1954
Docket DMEA 255X

Gentlemen:

The subject operating report has been processed and forwarded to the Disbursing Officer at Portland, Oregon, for payment.

This is to inform you that payment could not be made in the full amount claimed. Deletions are explained in the attached copy of a memorandum to the Field Team from the DMEA Certifying Officer, Region II.

By Field Team, Region II

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

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

cc: DMEA (2)
USGS (2)

DMEA Field Team, Region II

November 4, 1954

DMEA Certifying Officer, Region II

Contract Idm-E189, Whitedelf Mining & Development Co.
Monthly Operating Report for September 1954.

The subject report has been processed and forwarded to the Disbursing Officer at Portland for payment. Net deletions totaling $168.91 have been made from the amount of $3,399.65 claimed by the operator. Deletions and reinstatements are explained below.

Wages of Harold Rounsville

August 1954:

Claimed						
80	hours	@	$1.7925	$143.40		
96	"	"	1.85	175.60* ($177.60)		
6	hrs. O.T.	@	2.6925	14.15* (16.15)		
1	hr. O.T.	@	2.78	2.78	$335.95	
Approved						
80	hrs.	@	1.7925	$143.40		
96	hrs.	@	1.7925	172.08		
7	hrs. O.T.	@	2.6925	18.85	334.33	
Difference						$ 1.60

September 1954:

Claimed					
160	hours	@	1.85	$296.00	
Approved					
160	hours	@	1.7925	286.00	
Difference					9.20

Payroll tax adjustment on above deletions	1.01
Power deletion - prorated at $3.00 per foot of advance	162.00
Total Deletions	$173.81
Reinstated - amount over $46/ft. of advance which was deducted from July 1954 MF-104	4.90
Net Deletion - September 1954 MF-104	$168.91

*Mathematical errors in amount claimed.

cc: DMEA (2)
USGS (2)

Myrtle Purdy

xxxxxxxxxxxxxxxxxx
So. 157 Howard Street
Spokane 4, Washington

OCT 21 1954

October 15, 1954

Mr. Compton I. White, Jr.
Whitedelf Mining & Development Co.
Clark Fork, Idaho

Re: Docket No. DMEA-255 (Lead)
Whitedelf Mine
Bonner County, Idaho
Contract No. Idm-E189

Dear Mr. White:

We have noted that your monthly reports have not included either engineering or geologic maps of the month's work. Your contract does not specify that such maps be a part of the monthly report; however, it would greatly facilitate administration of your contract if such maps were submitted by you.

As you know, a final report including adequate engineering and geologic maps is required from each Operator. Preparation of the final report might be greatly simplified if maps of the engineering and geologic work were kept current.

By DMEA Field Team, Region II

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

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

: DMEA (2)
USBM (2)
USBM (AD)
Nickelson

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

[illegible]

[illegible]

Betty

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

The amount claimed in the report was $4,874.14, the amount deleted was $799.00, and the difference or amount approved for payment was $4,075.20.

By Field Team, Region II

[illegible] Heinzenberg, Executive Officer
U. S. Geological Survey

[illegible] Gray, Director
U. S. Bureau of Mines

cc: IMEA (2)
USBM (2)
Certifying Officer
Nickelson

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

June 11, 1954

Certifying Officer, DMEA
Field Team, Region II
1201 North Division
Spokane, Washington

Re: Docket No. DMEA-255
Whitedelf Mining & Development Co.
Bonner County, Idaho
Contract No. Idm-8189

Dear Sir:

Reference is made to a memorandum by W. S. Anderson, Bureau of Mines, dated June 3, 1954, in which he recommends that certain deletions be made to the cited contract invoices submitted for the month of April.

After carefully examining Mr. Anderson's memorandum, I find that his recommended deletions are valid and should be made, inasmuch as many of the deleted items were purchased for the purposes of mining and not exploration, and as certain items would require an amendment to the contract before the DMEA could participate in their costs.

Please process the applicant's invoice for payment making the deletions recommended by Mr. Anderson.

Sincerely yours,

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

cc: USBM (2)
DMEA (2)

800

Talbert

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

JUN - 8 1954

Mr. Robert M. Hull
DMEA Auditor
1201 N. Division Street
Spokane 2, Washington

AIR MAIL

Re: Contract Idm-E189, Docket DMEA-255
Whitedelf Mining & Development Co.

Dear Mr. Hull:

Receipt is acknowledged of your letter dated June 4, 1954, enclosing a copy of a memorandum dated June 3, 1954, from W. S. Anderson, Mining Engineer, to the DMEA Field Team, Region II, regarding the April, 1954, MF-104 submitted by the referenced Operator.

It is noted that you question specifically whether a memorandum from the engineer is sufficient authority for a deletion by the "certifying officer". I presume that you are aware that this Division has no jurisdiction over the certifying officer and, accordingly, cannot instruct him as to the basis on which exceptions should be taken. However, it is a primary requisite of the certifying officer's administrative examination that, if any doubt exists as to the validity or propriety of any claim submitted, appropriate exceptions should be taken prior to certification for payment.

This contract is listed in your latest Work Lead Report as being scheduled for audit during June. Your actual site audit, followed by the required consultations with the engineer assigned to the project and with the Executive Officer of the DMEA Field Team, should result in determinations as to the validity and propriety of the costs claimed on the April, 1954, MF-104. Undoubtedly, some of the charges are improper, particularly the first two items noted in the fourth paragraph of the engineer's memorandum. On the other hand, the track, as far as I can determine from the docket file, is not included in the "operating equipment purchased", for which liquidation of the Government's equity is provided by article 6 of Amendment No. 6. (It should be noted, however, that the costs incurred for any track, pipe, timber, explosives, or other supplies uninstalled or unexpended under the contract prior to Amendment No. 6 must be given appropriate consideration in any determination of footage costs.)

In regard to the second paragraph of your letter, as well as the second paragraph of the engineer's memorandum, the fact that the Operator did not claim his costs currently or on an accrual

R.C.B.

basis has no bearing on whether they are properly allowable as "incurred" costs. The Operator may be billing on a cash rather than an accrual basis. Your site audit will disclose the basis for the Operator's claims, as well as any duplications of charges, and your subsequent consultations with the engineer and Executive Officer should result in determinations as to the reasonableness and necessity of the individual items.

Sincerely yours,

SIGNED

E. D. Talbert, Acting Chief
Contract Administration
and Audit Division

EDTalbert/ama
June 8, 1954

Copy to: Docket
Admr. Reading File
Mr. Chambers

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

May 12, 1954

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

Re: Docket No. DMEA-255X (lead)
Whitedelf Mining & Development Co.
Bonner County, Idaho
Contract No. Idm-E189

Dear Mr. Selfridge:

Enclosed are the original and two copies of Amendment No. 6 to the cited contract. Distribution of the other copies has been made in the usual manner.

As per your letter of May 6, we have contacted the operator and have determined the Government's equity in operating equipment purchased for the contract prior to Amendment No. 6 to be valued at $1,045. Payment for this equity will be deducted from future vouchers from the operator at the rate of $1 per foot of advance. We have also obtained newly signed Owner's Consent to Lien, copies of which are attached to the amendment. As specified in Item 5 of Amendment No. 6, this agreement is to serve in lieu of the Landlord's Subordination Agreement dated October 10, 1951, attached to the contract.

Sincerely yours,

Thor H. Kiilsgaard

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

Enclosure
cc: Finance Office w/encl.
USBM (2)
Nickelson

File Copy
Surname

500 J.W. Allen
Swensel
Chandler
Selfridge
Y.E. Johnson

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

MAY 6 - 1954

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

Re: Docket No. DMA-255X (Lead)
Whitedelf Mining & Development Company
Whitedelf Mine
Bonner County, Idaho
Contract No. Idm-X189

Dear Mr. Weissenborn:

We are enclosing the original and five copies of Amendment No. 6 to the cited contract, signed by this office for the Government. This amendment was requested in your letters of February 3, 1954 and April 14, 1954.

Before the amendment can be executed, it will be necessary to obtain and attach the Owner's Consent to Lien referred to in Item 5 of the amendment.

Also, please note that in Item 6 of the amendment, the value of the Government's equity in equipment purchased to date has been left blank. To avoid the nuisance of making disposal of such equipment after the project termination, we suggest that you come to an agreement with the Operator as to a fair value, and that thereafter such sum be returned to the Government by deducting an amount per foot which you will determine so that when about 75 per cent of the work has been done, the Government's property account will have been amortized. We can realize that these problems of equipment disposal must be an endless source of annoyance to you and, when possible, we shall try to eliminate them in the future.

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

If the amendment meets with your approval, kindly present it to the Operator for approval and signature and, when completed, distribute in the usual manner. In the event that the amendment is not satisfactory and cannot be amended within your delegated authority, return all copies with your recommendation concerning any modification.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (JHB)

Enclosures 6

APPROVED:

J. H. Hedges (JHB)

Member, Bureau of Mines

Philip W. Guild (JHB)

Member, Geological Survey

JWAlt/bjl (5/4/54)

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

If the additional work is carried on in conjunction with any other operations, or if labor, supervision, services, materials, supplies, equipment, facilities, or other requirements for carrying on the additional work are also used in connection with other operations, the costs shall be segregated and accounted for on a basis and by methods and accounts that are satisfactory to and approved by the Government.

c. In Amendment No. 2, Exhibit "F," paragraph numbered 2, change the estimated total cost of the project from "$163,950.00" to "$232,950.00" and the aggregate total of sums to be paid by the Government from "$81,975.00" to "$116,475.00."

2. In Article 3 of the contract form, delete the completion date "not later than April 19, 1954," provided by Amendment No. 5, and substitute "to bring the project to completion not later than May 1, 1955."

3. In Annex I attached to Amendment No. 5, delete the period "eleven years" and substitute "twelve years."

4. Annex II attached hereto is made a part of this contract.

5. As a part of the consideration for this amendment, a new Owner's Consent to Lien is attached to this Amendment No. 6, in lieu of the Lessee's Subordination Agreement dated October 19, 1951, attached to the contract.

Executed in duplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By

Administrator, Defense Minerals Exploration Administration

Rubin
Hoffman
Chandler

MINING AND
COMPANY

FILE COPY
Base Metals Div.
DMEA

Griswold

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
WASHINGTON 25, D. C.

MAY - 5 1954

N. S. in R. R.

PRS No. 2856

My dear Mr. White:

I have your letter of April 24, 1954, with reference to your application for additional exploration funds on your project, Docket No. DMA-255, Contract No. Idm-X189.

I have checked with the Defense Minerals Exploration Administration, and have been advised that they expect to complete action on your application within the coming week. Therefore, you should be advised in the very near future.

Sincerely yours,
(sgd) Felix E. Wormser
Assistant Secretary of Interior

Mr. Compton I. White
608 North Carolina Avenue, S. E.
Washington, D. C.

WRGriswold/bjl (4/29/54)

Copy to: Secy's R. File
Secy's File
DMEA File
Admr. R. File (DMEA)
Base Metals (DMEA)
Mr. Wormser (2)
Mr. Imhoff
Chron.

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
MAY 3 - 1954

April 28, 1954

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

Re: Docket No. DMEA-~~155~~ 255 (lead)
Whitedelf Mining & Development Co.
Bonner County, Idaho
Contract Idm-E189

Dear Mr. Selfridge:

Enclosed are two copies of a letter dated April 22, 1954, received from Mr. Compton I. White, Secretary-Treasurer of the Whitedelf Mining & Development Co. In this letter Mr. White reaffirms a previous request for additional work, submitted in a letter dated January 18, 1954, which was forwarded to your office under cover of a Field Team letter dated February 3, 1954. Additional comments on Mr. White's proposal were forwarded to you under cover of a Field Team letter dated April 1, 1954.

The present letter requests an additional 1,500 feet of drifting and crosscutting to be done on the 800 level of the Whitedelf mine. An estimated 1,100 feet of this work is to be to the south to explore the downward projections of the southern ore bodies mined on overlying levels, and 300 feet of the drift is to be a continuation of the present DMEA north drift to further explore the northeast limit of the ore body found in this drift. One hundred feet of the development is to be used for switches and crosscuts.

An interesting point in Mr. White's letter is that the south drift currently being driven on the Pearl vein has recently intersected a mineralized section of the vein. A picked sample from this section is reported to have assayed 2.7 percent lead and 10.4 ounces of silver per ton. Mr. White reports that muck from the face is currently being milled. We have not had the opportunity of examining the south drift recently and, therefore, have no comments to offer on this reported occurrence of ore.

Copies of the letter are being forwarded for your consideration.

By Field Team, Region II

Wing G. Agnew, Acting Executive Officer
U. S. Bureau of Mines

Thor H. Kiilsgaard, Acting Member
U. S. Geological Survey

cc: USBM (2)
Nickelson

COMPTON I. WHITE
SECRETARY-TREASURER
CLARKS FORK, IDAHO

COMPTON I. WHITE, JR.
PRESIDENT
CLARKS FORK, IDAHO

E. O. CLAGG
VICE-PRESIDENT
CLARKS FORK, IDAHO

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 3 - 1954

WHITEDELF MINING AND DEVELOPMENT CO.

MINE OFFICE
CLARKS FORK, IDAHO

FISCAL OFFICE
401 EMPIRE STATE BLDG.
SPOKANE 1, WASHINGTON

EASTERN OFFICE
608 NORTH CAROLINA AVE. S. E.
WASHINGTON, D. C.

April 22, 1954.

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

Subject: Request for amendment to existing DMEA Contract to further explore the Pearl Vein on the 800 foot level of the Whitedelf Mine.

Gentlemen:

Under the existing contract Idm-E189 (Docket No. DMEA 255) the major portions of the project have been completed. The mine shaft has been extended from the 400 to the 800 foot level; the mine station on the 800 foot level has been finished and is in use and 1320 feet of drift have been driven on the 800 foot level of the Whitedelf Mine. 1040 feet of this drifting has been expended in exploring the Pearl Vein north of the Pugh Fault from the 800 foot station to the North Ore Body. The remaining 280 feet has been driven to explore the Pearl Vein south of the Pugh Fault in the direction of the South Ore Body. The unit cost for this exploration drifting has been $45.90 per foot to date.

This exploration drifting has resulted in disclosing the ore contents of the Pearl Vein in the explored section and the existence of two minor ore shoots before reaching the North Ore Body. The North Ore Body has been further explored within a raise and a stope opened along the vein for a distance of approximately 60 feet. This stope is producing very good mill feed from which several shipments of concentrates have been made to date. The exploration drifting to the south along the Pearl Vein has shown a wide shear zone in the first 250 feet of the drift to the south and the vein in place and mineralized in the last thirty feet to the

present face. A picked sample from this mineralized section of the vein assayed 2.7% lead and 10.4 ounces of silver per ton. A channel sample taken along the vein for a distance of six feet and ten inches in width assayed 0.1% lead and 2.0 ounces of silver per ton. The drift has been further extended fifteen feet to the south since these samples were taken and mineralized section of the vein has increased in width and enriched mineral content.

In order to further explore this section of the Pearl Vein and to reach and open the downward extensions of the ore bodies which were mined above the 400 foot level, it is felt that additional drifting is warranted on the 800 foot level to explore the Pearl Vein to the South Ore Body. It is also felt that additional drifting is warranted to the north from the present face of the north drift to the second U. S. Bureau of Mines diamond drill hole, where considerable lead-silver mineralization was disclosed.

It is therefore proposed that an additional 1500 feet of drifting be allowed under our present contract, to be expended as follows:

1100 feet of drift to explore the south portion of the Pearl Vein and the South Ore Body;

300 feet of drift to further explore the north portion of the Pearl Vein from the present north face on towards the second U. S. Bureau of Mines diamond drill hole;

100 feet of drift to be used for necessary crosscuts and switches.

It is estimated on the basis of our present costs and the outlined drifting program that the following funds will be necessary:

1500 feet of drifting at $45.00 per foot	$67,000.00
Blower and vent line	1,500.00
Contingencies for unforseen expenditures	6,500.00
	$75,000.00

We, therefore request that our present contract be amended to include this work described above at the above listed costs.

Sincerely,

WHITEDELF MINING AND DEVELOPMENT CO.,

Compton J. White

Managing Secretary-Treasurer

Defense Minerals Administration
RECEIVED
APR 30 1954

XXXXXXXXXXXXXXXXX
Spokane, Washington
April 26, 1954

Whitedelf Mining and Development Co.
401 Empire State Building
Spokane, Washington

Subject: Docket DMEA 255X
Contract Idm-R189
Monthly operating report
for March 1954

Gentlemen:

The subject invoice has been received and processed. However, a portion of the payment is being withheld until an audit of your records is made by a representative of the Contract and Audit Division of the Defense Minerals Exploration Administration.

This is standard procedure for all contracts as the project nears completion. We are obliged to withhold a portion of the Government's contribution to the cost pending disposition of jointly-owned equipment, receipt of a final engineering report, and final accounting.

By Field Team, Region II

Wing G. Agnew, Acting Exec. Officer
(U. S. Bureau of Mines)

Thor H. Kiilsgaard, Acting Member
(U. S. Geological Survey)

cc: DMEA Wash. (2)
USGS (2)
Engr.
AD

4/27/54

COMPTON I. WHITE
SECRETARY-TREASURER
CLARKS FORK, IDAHO

COMPTON I. WHITE, JR.
PRESIDENT
CLARKS FORK, IDAHO

E. O. CLAGG
VICE-PRESIDENT
CLARKS FORK, IDAHO

2856

WHITEDELF MINING AND DEVELOPMENT CO.

MINE OFFICE
CLARKS FORK, IDAHO

FISCAL OFFICE
401 EMPIRE STATE BLDG.
SPOKANE 1, WASHINGTON

EASTERN OFFICE
608 NORTH CAROLINA AVE. S. E.
WASHINGTON, D. C.

SECRETARY'S
MAIL CENTER
APR 28 1954
INTERIOR DEPT.
DMEA

April 24th 1954

Dma-255

Mr Felix Wormser
Assistant Secretary of Interior
Washington D C.

Dear Mr. Secretary,-

Enclose copy of the Whitedelf Mining Cos application for the advance of additional funds to complete the exploration of the ore deposits on the 800 foot level.

We have reached and opened the north ore body on the 800 foot level and cut two additional ore shoots in the vein before reaching our objective.

Enclose smelter settlements for shipments of concentrates being made from tthe north end of the mine while we are d riving the tunnel on the vein south of the fault to reach and open the downward extention of the three ore bodies mined above the 400 foot level.

We are nearing the completion of the original exploration project covered by the provisions of Idm-189 which will be finished before we have reached and opened these important ore shoots in the south end of the mine.

You will note from the enclosed copies of smelter settlements That regular payments are being made on the D M A Contract and also that the galena ore that we have opened in the mine is exceptionally rich in both lead and silver Now that wehave the shaft down and the station in use no doubt you will agree that it will be to the advantage of all concerned to open all the ore in the vein on the 800 foot level and put the mill on a three shift basis to expedite the repayment of our D M A loan

I hope you will use your good offices to assist us in securing the additional funds required to complete the exploration of ore deposits in the vein on the 800 foot level.

Sincerely

Compton I. White

Compton I. White.

MINER PM 592 6M 11 52

BUNKER HILL SMELTER

P. O. Address: KELLOGG, IDAHO
R. R. Station: BRADLEY, IDAHO

BUNKER HILL & SULLIVAN MINING & CONCENTRATING COMPANY

In Account With

2856

Name of Mine _____ Mine Lot No. _____ Smelter Lot No. _____

Location _____ R. R. Shipping Point _____ Class _____

DATE OF ARRIVAL _____ DATE OF SAMPLING _____ DATE OF SETTLEMENT _____

Car Initial	Car No.	H_2O	Weight, lbs.

TOTAL GROSS WEIGHT	
____ Sacks. Weight of Sacks	
GROSS WEIGHT OF ORE	
Moisture Pounds	
DRY WEIGHT OF ORE	

Metal Assay

Gold		Oz. P. T.
Silver		Oz. P. T.
Copper		% P. T.
Lead		% P. T.
Iron		% P. T.
Insol.		% P. T.
Lime		% P. T.
Sulphur		% P. T.
Zinc		% P. T.
Antimony		% P. T.
Arsenic		% P. T.
Bismuth		% P. T.

QUOTATIONS Date _____

Silver _____ Per Oz.

Lead _____ Per Lb.

Copper _____ Per Lb.

Zinc _____ Per Lb.

Antimony _____ Per Lb.

SMELTING AND REFINING DEDUCTIONS — PER TON

Base Smelting Charge _____ $ _____

Plus _____ % Wet Pb. under _____ % @ _____ $ _____

Credit _____ % Iron over (_____ % Zinc x 1.8) @ 40c a unit $ _____

Debit _____ % Iron under (_____ % Zinc x 1.8) @ 40c a unit $ _____

Credit _____ % Silica over (_____ % Iron x) @ 8c a unit $ _____

Debit _____ % Silica under (_____ % Iron x) @ 8c a unit $ _____

Credit _____ % Lime over (_____ % Iron x) @ 10c a unit $ _____

Debit _____ % Lime under (_____ % Iron x) @ 10c a unit $ _____

TOTAL SMELTING DEDUCTIONS . . . . . $ _____

Silver charge over _____ oz. per ton @ _____ c per oz. $ _____

Arsenic charge over _____ % @ _____ per unit $ _____

Bismuth charge over _____ % @ _____ per pound $ _____

Moisture charges over _____ % @ _____ per unit $ _____

Sulphur charge over _____ % @ _____ per unit $ _____

_____ % @ _____ per unit $ _____

TOTAL SMELTING AND REFINING DEDUCTIONS . . . . $ _____

PAYMENT FOR METALS — VALUE PER TON

Gold _____ Oz. @ _____ Per Oz. $ _____

Silver _____ Oz. _____ % @ _____ Per Oz. $ _____

Lead _____ % _____ % @ _____ Per Lb. $ _____

Copper _____ % _____ % @ _____ Per Lb. $ _____

Zinc _____ % _____ % @ _____ Per Lb. $ _____

Antimony _____ % _____ % @ _____ Per Lb. $ _____

Gross Value $ _____

LESS SMELTING AND REFINING DEDUCTIONS . . $ _____

NET VALUE PER TON . . . . . $ _____

TOTAL OUNCES SILVER IN THIS SHIPMENT _____

SETTLEMENT

DRY WEIGHT _____ POUNDS = _____ TONS @ $ _____ PER TON EQUALS $ _____

Less Freight from Shipping Point to Bradley, Idaho

Gross Weight _____ Pounds = _____ Tons @ $ _____ per ton equals $ _____

$ _____

$ _____

$ _____

$ _____

$ _____

$ _____

$ _____

$ _____

$ _____

$ _____

$ _____

$ _____

NET PROCEEDS $ _____

MINER FM 592 9M 11 52

BUNKER HILL SMELTER

BUNKER HILL & SULLIVAN MINING & CONCENTRATING COMPANY

P. O. Address: KELLOGG, IDAHO
R. R. Station: BRADLEY, IDAHO

In Account With

Name of Mine _____ Mine Lot No. _____ Smelter Lot No. _____

Location _____ R. R. Shipping Point _____ Class _____

DATE OF ARRIVAL _____ DATE OF SAMPLING _____ DATE OF SETTLEMENT _____

Car Initial	Car No.	H_2O	Weight, lbs.

TOTAL GROSS WEIGHT	
____ Sacks. Weight of Sacks	
GROSS WEIGHT OF ORE	
Moisture Pounds	
DRY WEIGHT OF ORE	

Metal Assay

Gold		Oz. P. T.
Silver		Oz. P. T.
Copper		% P. T.
Lead		% P. T.
Iron		% P. T.
Insol.		% P. T.
Lime		% P. T.
Sulphur		% P. T.
Zinc		% P. T.
Antimony		% P. T.
Arsenic		% P. T.
Bismuth		% P. T.

QUOTATIONS Date _____

Silver _____ Per Oz.

Lead _____ Per Lb.

Copper _____ Per Lb.

Zinc _____ Per Lb.

Antimony _____ Per Lb.

SMELTING AND REFINING DEDUCTIONS

		PER TON
Base Smelting Charge _____	$	
Plus ____ % Wet Pb. under ____ % @ ____	$	
Credit ____ % Iron over (____ % Zinc x 1.8) @ 40c a unit	$	
Debit ____ % Iron under (____ % Zinc x 1.8) @ 40c a unit	$	
Credit ____ % Silica over (____ % Iron x) @ 8c a unit	$	
Debit ____ % Silica under (____ % Iron x) @ 8c a unit	$	
Credit ____ % Lime over (____ % Iron x) @ 10c a unit	$	
Debit ____ % Lime under (____ % Iron x) @ 10c a unit	$	
TOTAL SMELTING DEDUCTIONS	$	
Silver charge over ____ oz. per ton @ ____ c per oz.	$	
Arsenic charge over ____ % @ ____ per unit	$	
Bismuth charge over ____ % @ ____ per pound	$	
Moisture charges over ____ % @ ____ per unit	$	
Sulphur charge over ____ % @ ____ per unit	$	
____ % @ ____ per unit	$	
TOTAL SMELTING AND REFINING DEDUCTIONS	$	

PAYMENT FOR METALS

			VALUE PER TON
Gold ____ Oz.	@ ____ Per Oz.	$	
Silver ____ Oz.	% @ ____ Per Oz.	$	
Lead ____ %	% @ ____ Per Lb.	$	
Copper ____ %	% @ ____ Per Lb.	$	
Zinc ____ %	% @ ____ Per Lb.	$	
Antimony ____ %	% @ ____ Per Lb.	$	
	Gross Value	$	
LESS SMELTING AND REFINING DEDUCTIONS . .		$	
NET VALUE PER TON		$	

TOTAL OUNCES SILVER IN THIS SHIPMENT _____

SETTLEMENT

DRY WEIGHT _____ POUNDS= _____ TONS @ $ _____ PER TON EQUALS $ _____

Less Freight from Shipping Point to Bradley, Idaho

Gross Weight _____ Pounds= _____ Tons @ $ _____ per ton equals $ _____

$ _____

$ _____

$ _____

$ _____

$ _____

$ _____

$ _____

$ _____

$ _____

$ _____

$ _____

$ _____

NET PROCEEDS $ _____

MINER FM 992 8M 11 52

BUNKER HILL SMELTER

BUNKER HILL & SULLIVAN MINING & CONCENTRATING COMPANY

P. O. Address: KELLOGG, IDAHO
R. R. Station: BRADLEY, IDAHO

In Account With

[illegible]

Name of Mine [illegible] Mine Lot No. _____ Smelter Lot No. [illegible]

Location [illegible] R. R. Shipping Point [illegible] Class [illegible]

DATE OF ARRIVAL [illegible] DATE OF SAMPLING [illegible] DATE OF SETTLEMENT [illegible]

Car Initial	Car No.	H_2O	Weight, lbs.
[illegible]		[illegible]	[illegible]

TOTAL GROSS WEIGHT	[illegible]
____ Sacks. Weight of Sacks	
GROSS WEIGHT OF ORE	[illegible]
Moisture Pounds	
DRY WEIGHT OF ORE	[illegible]

Metal Assay

Gold		Oz. P. T.
Silver	[illegible]	Oz. P. T.
Copper	[illegible]	% P. T.
Lead	[illegible]	% P. T.
Iron	[illegible]	% P. T.
Insol.	[illegible]	% P. T.
Lime		% P. T.
Sulphur	[illegible]	% P. T.
Zinc	[illegible]	% P. T.
Antimony	[illegible]	% P. T.
Arsenic	[illegible]	% P. T.
Bismuth		% P. T.

QUOTATIONS Date [illegible]

Silver [illegible] Per Oz.

Lead [illegible] Per Lb.

Copper [illegible] Per Lb.

Zinc [illegible] Per Lb.

Antimony [illegible] Per Lb.

SMELTING AND REFINING DEDUCTIONS

	PER TON
Base Smelting Charge	$ [illegible]
Plus ____ % Wet Pb. under ____ % @ ____	$
Credit ____ % Iron over (____ % Zinc x 1.8) @ 40c a unit	$
Debit ____ % Iron under (____ % Zinc x 1.8) @ 40c a unit	$
Credit ____ % Silica over (____ % Iron x) @ 8c a unit	$
Debit ____ % Silica under (____ % Iron x) @ 8c a unit	$
Credit ____ % Lime over (____ % Iron x) @ 10c a unit	$
Debit ____ % Lime under (____ % Iron x .) @ 10c a unit	$
TOTAL SMELTING DEDUCTIONS	$
Silver charge over ____ oz. per ton @ ____ c per oz.	$
Arsenic charge over ____ % @ ____ per unit	$
Bismuth charge over ____ % @ ____ per pound	$
Moisture charges over ____ % @ ____ per unit	$
Sulphur charge over ____ % @ ____ per unit	$
____ % @ ____ per unit	$
TOTAL SMELTING AND REFINING DEDUCTIONS	$ [illegible]

PAYMENT FOR METALS

				VALUE PER TON
Gold	Oz.	@	Per Oz.	$
Silver	[illegible] Oz.	[illegible] % @ [illegible]	Per Oz.	$ [illegible]
Lead	[illegible] %	[illegible] % @ [illegible]	Per Lb.	$ [illegible]
Copper	%	% @	Per Lb.	$
Zinc	[illegible] %	[illegible] % @ [illegible]	Per Lb.	$ [illegible]
Antimony	[illegible] %	[illegible] % @ [illegible]	Per Lb.	$ [illegible]
			Gross Value	$ [illegible]
LESS SMELTING AND REFINING DEDUCTIONS . .				$ [illegible]
NET VALUE PER TON				$ [illegible]

TOTAL OUNCES SILVER IN THIS SHIPMENT [illegible]

SETTLEMENT

DRY WEIGHT [illegible] POUNDS= [illegible] TONS @ $ [illegible] PER TON EQUALS $ [illegible]

Less Freight from Shipping Point to Bradley, Idaho

Gross Weight ____ Pounds= ____ Tons @ $ ____ per ton equals $ ____

[illegible] $ [illegible]

[illegible] $ [illegible]

[illegible] $ [illegible]

[illegible] $ [illegible]

[illegible] $ [illegible]

[illegible] $ [illegible]

[illegible] $ [illegible]

[illegible] $ [illegible]

[illegible] $ [illegible]

[illegible] $ [illegible]

[illegible] $ [illegible]

[illegible] $ [illegible]

NET PROCEEDS $ [illegible]

FORM S 104

BUNKER HILL SMELTER

P. O. Address: KELLOGG, IDAHO
R. R. Station: BRADLEY, IDAHO

BUNKER HILL & SULLIVAN MINING & CONCENTRATING COMPANY

In Account With

WHITEDELF MINING & DEVELOPMENT CO.

Name of Mine: Whitedelf Mine Lot No. ____ Smelter Lot No. 152

Location: Clarks Fork, Idaho R. R. Shipping Point: By Truck Class: Flot

DATE OF ARRIVAL: 4/7/54 DATE OF SAMPLING: 4/7/54 DATE OF SETTLEMENT: 4/13/54

Car Initial	Car No.	H_2O	Weight, lbs.
1 Truck		7.6	11500

TOTAL GROSS WEIGHT	11500
____ Sacks. Weight of Sacks	
GROSS WEIGHT OF ORE	874
Moisture Pounds	
DRY WEIGHT OF ORE	10626

Metal Assay

Gold		Oz. P. T.
Silver	79.4	Oz. P. T.
Copper	.08	% P. T.
Lead	65.9	% P. T.
Iron	3.7	% P. T.
Insol.	9.0	% P. T.
Lime		% P. T.
Sulphur	15.2	% P. T.
Zinc	2.9	% P. T.
Antimony	1.4	% P. T.
Arsenic	.53	% P. T.
Bismuth		% P. T.

QUOTATIONS Date 4-7-54

Silver .90 Per Oz.

Lead

.13750-.01459 = .12291 Per Lb.

Copper

Per Lb.

Zinc

.10250 @ 25% = .02563 Per Lb.

Antimony .28500 @ 50% = .14250

.14250 - .13750 = .00500 Per Lb.

SMELTING AND REFINING DEDUCTIONS

	PER TON
Base Smelting Charge	$ 8.000
Plus ____ % Wet Pb. under ____ % @ ____	$
Credit ____ % Iron over (____ % Zinc x 1.8) @ 40c a unit	$
Debit ____ % Iron under (____ % Zinc x 1.8) @ 40c a unit	$
Credit ____ % Silica over (____ % Iron x) @ 8c a unit	$
Debit ____ % Silica under (____ % Iron x) @ 8c a unit	$
Credit ____ % Lime over (____ % Iron x) @ 10c a unit	$
Debit ____ % Lime under (____ % Iron x) @ 10c a unit	$
TOTAL SMELTING DEDUCTIONS	$
Silver charge over ____ oz. per ton @ ____ c per oz.	$
Arsenic charge over ____ % @ ____ per unit	$
Bismuth charge over ____ % @ ____ per pound	$
Moisture charges over ____ % @ ____ per unit	$
Sulphur charge over ____ % @ ____ per unit	$
____ % @ ____ per unit	$
TOTAL SMELTING AND REFINING DEDUCTIONS Min.	$ 11.000

PAYMENT FOR METALS						VALUE PER TON
Gold	____ Oz.		@ ____	Per Oz.	$	
Silver	79.4 Oz.	95 %	@ .90	Per Oz.	$	67.887
Lead	65.9 %	92 %	@ .12291	Per Lb.	$	149.036
Copper	____ %	%	@ ____	Per Lb.	$	
Zinc	2.9 %	50 %	@ .02563	Per Lb.	$	.749
Antimony	1.4 %	70 %	@ .00500	Per Lb.	$	.098
				Gross Value	$	217.764
LESS SMELTING AND REFINING DEDUCTIONS					$	11.000
NET VALUE PER TON					$	206.764

TOTAL OUNCES SILVER IN THIS SHIPMENT 421.83

SETTLEMENT

DRY WEIGHT 10626 POUNDS = 5.313 TONS @ $ 206.764 PER TON EQUALS $ 1098.54

Less Freight from Shipping Point to Bradley, Idaho

Gross Weight ____ Pounds = ____ Tons @ $ ____ per ton equals $ ____

Frt. on 6443 load lbs. paid @(24.97-17.35)	$	24.55
	$	1073.99
5% Royalty to: Treasurer of the United States - U.S. Dept. of Interior - Mr. A. E. Weissenborn - South 157 Howard St. - Spokane 4, Wash.	$	53.70
For Whitedelf Mining & Development Co., - C/o C. I. Kulto, Jr., Pres. Clark Fork, Idaho	NET PROCEEDS $	1020.29

April 22, 1954.

Mr. A. [illegible] Weissenborn,
Executive Officer
[illegible]A Field Team, Region II,
South 157 Howard Street,
Spokane 1, Washington.

Subject: Request for amendment to existing [illegible]A Contract to further explore the Pearl Vein on the 800 foot level of the Whitedelf Mine.

Gentlemen:

Under the existing contract Idm-2103 (Docket No. [illegible]A 256) the major portions of the project have been completed. The mine shaft has been extended from the 400 to the 800 foot level; the mine station on the 800 foot level has been finished and is in use and 1320 feet of drift have been driven on the 800 foot level of the Whitedelf Mine. 1040 feet of this drifting has been expended in exploring the Pearl Vein north of the Hugh Fault from the 800 foot station to the North Ore Body. The remaining 280 feet has been driven to explore the Pearl Vein south of the Hugh Fault in the direction of the South Ore Body. The unit cost for this exploration drifting has been $[illegible].00 per foot to date.

This exploration drifting has resulted in disclosing the ore contents of the Pearl Vein in the explored section and the existence of two minor ore shoots before reaching the North Ore Body. The North Ore Body has been further explored with a raise and a stope opened along the vein for a distance of approximately 50 feet. This stope is producing very good mill feed from which several shipments of concentrates have been made to date. The exploration drifting to the south along the Pearl Vein has shown a wide shear zone in the first 250 feet of the drift to the south and the vein in place and mineralized in the last thirty feet to the

present face. A picked sample from this mineralized section of the vein assayed 2.7% lead and 10.4 ounces of silver per ton. A channel sample taken along the vein for a distance of six feet and ten inches in width assayed 0.1% lead and 2.0 ounces of silver per ton. The drift has been further extended fifteen feet to the south since these samples were taken and mineralized section of the vein has increased in width and enriched mineral content.

In order to further explore this section of the Pearl Vein and to reach and open the downward extensions of the ore bodies which were mined above the 400 foot level, it is felt that additional drifting is warranted on the 800 foot level to explore the Pearl Vein to the South Ore Body. It is also felt that additional drifting is warranted to the north from the present face of the north drift to the second U. S. Bureau of Mines diamond drill hole, where considerable lead-silver mineralization was disclosed.

It is therefore proposed that an additional 1500 feet of drifting be allowed under our present contract, to be expended as follows:

1100 feet of drift to explore the south portion of the Pearl Vein and the South Ore Body;

300 feet of drift to further explore the north portion of the Pearl Vein from the present north face on towards the second U. S. Bureau of Mines diamond drill hole;

100 feet of drift to be used for necessary crosscuts and switches.

It is estimated on the basis of our present costs and the outlined drifting program that the following funds will be necessary:

1500 feet of drifting at $45.00 per foot	$67,000.00
Blower and vent line	1,500.00
Contingencies for unforeseen expenditures	6,500.00
	$75,000.00

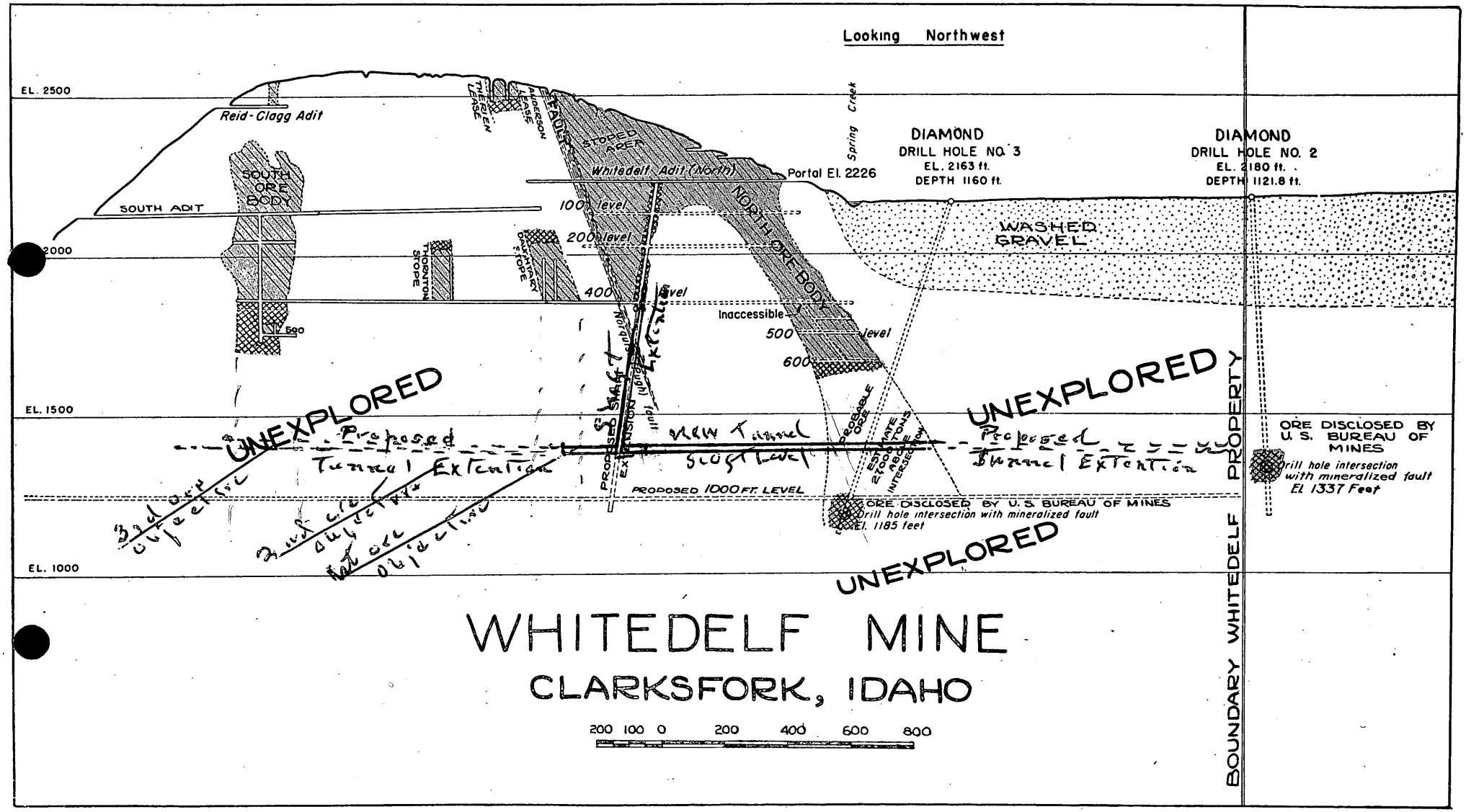
COPY

Dear Felix

In looking over my desk just now since mailing you the letter about the Whitedelf Mining and Devlopment Co ED TM A Application I find I have left our the last and signed page Page so I hastene to mail this so it can be a ded to the original letter or copy of letter sent you

Best wishe s

Campbell



WHITEDELF MINE

CLARKSFORK, IDAHO

We, therefore request that our present contract be amended to include this work described above at the above listed costs.

Sincerely,

WHITELEF MINING AND DEVELOPMENT CO.,

Managing Secretary-Treasurer

(Whitelef Mine D M A Application)

COPY

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

April 23, 1954

Memorandum

To: The Administrator
Through: Mr. W. R. Griswold

From: Chief Counsel

Subject: Whitedelf Mining and Development Company
Docket No. DMA-255X - Lead - Contract Idm-E189

Attached in satisfactory legal form for execution is Amendment No. 6 to the above-captioned contract, subject to the attachment of the Owner's Consent to Lien referred to therein.

There is a recital in the contract indicating that the Operator's interest in the land is subject to a RFC loan in the amount of $25,000. By letter to the Administrator dated October 14, 1951, the RFC indicated that it would protect the Government's interest in royalties. This office has made no inquiries of RFC (now in process of liquidation) as to the status of the Operator's relations with the Government through that agency. I assume that DMEA is satisfied concerning the previous obligations to RFC and considers them no obstacle to extending its aid under this contract.

J. L. Hofflund
Chief Counsel

Attachments

NOTE: April 27, 1954

Referring to the matter of "previous obligations" advanced in above memo by Mr. J. L. Hofflund, it is believed that the letter in the docket, dated October 12, 1951, from the R.F.C., adequately covers the point in question.

W. R. Griswold

IN REPLY REFER TO:

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

April 14, 1954

Memorandum

Re: IMEA-255
Whitedelf Mine
Clark Fork District
Bonner County, Idaho
$163,950
Lead-zinc-silver

To: Mr. W. R. Griswold, IMEA

From: E. L. Newcomb, USGS

Subject: Amendment for additional funds to complete exploration on 800 level

The applicant requests additional funds ($40,000) to extend the 800 level drift about 1,500 feet in order to complete exploration for downdip extensions of oreshoots which were mined on the 400 and 500 levels.

The field team has recommended that the proposed work be approved.

The exploration to date has not discovered a substantial amount of ore, but two small orebodies were encountered which have produced some ore and royalties have been paid on this production. Although a considerable amount of money has been spent on this project, a large part of the total expenditures have involved shaft sinking in preparation for actual exploration work on the 800 level.

The field team's contention, that remaining ore targets should be explored at this time while the mine is still accessible, is well taken. The cost of doing this work is not large in terms of total contract expenditures and there is still a good chance that a significant discovery will be made by the proposed drifting.

I concur with the field team's conclusions and recommend the additional funds be approved.

E. L. Newcomb

E. L. Newcomb
Geologist

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

April 1, 1954

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

Re: Docket No. DMA-255X (lead)
Whitedelf Mining & Development Co.
Whitedelf Mine
Bonner County, Idaho
Contract No. Idm-E189

Dear Mr. Selfridge:

This is in reply to your letters of March 1 and March 10, 1954, on the subject docket. Our letter of February 3, 1954, forwarding the applicant's request for the allocation of funds to do additional exploration at the Whitedelf property, did not attempt to justify this request but merely asked whether it would be possible to obtain these additional funds under then-existing regulations. We felt that it would be pointless to present arguments attempting to justify additional work on the property until we found out whether such a request would be acceptable to DMEA. Your letter of March 1 did not answer the original question but stated that in your opinion the work done to date did not justify further Government participation. Our original question, however, has now been answered by the reinstatement of lead-zinc and other commodities to the DMEA list of minerals eligible for exploration assistance. We will, therefore, attempt to go into some further detail as to the justification of the project.

In your letter of March 10 you point out some apparent discrepancies between the large scale plan map (1 inch to 20 feet) of the 800 level submitted by Nickelson and the longitudinal section submitted by Compton White. As you point out, plotting the advance of the DMEA drift on the longitudinal section indicates that the northeast heading is barely touching the downward projection of the north ore body, and has not penetrated through it, as indicated on Compton White's section. We think the difficulty lies in the fact that Mr. White's section, although presenting the essential picture correctly enough, is not accurate as to detail. Our plotting of the position of the northeast end of the DMEA heading, which is based on our own measurement and on the longitudinal section of the Pearl vein by A. L. Anderson and published as plate 10 of USGS Bulletin 934 (The lead-silver deposits of the Clark Fork district, Bonner County, Idaho) indicates that the DMEA heading has reached a point well past the

intercept of Bureau of Mines drill hole 3 and the oreshoot. According to our plotting, the heading should be well into the downward projection of the northeast ore body, but it still lacks about 150 feet of penetrating through the probable downward extension of the entire ore zone. The contract provided that both downward extension of the north ore body and what Mr. White has called on his section the second ore objective (the downward projection of the ore found in the Dougherty stope) should be tested. There was insufficient footage in the contract to continue the drift through the entire downward projection of the north ore body and to test the second ore objective as well. Since the 800 northeast drift had reached the point above the ore intercepted in drill hole 3 and was well into the north part of the ore zone, the operator chose to use the remaining footage to test this second ore objective to the southwest. We frankly could not protest this as one objective appeared as good as the other, but we are in accord with you that the contract should be extended so that the northeast 800 drift is carried through and beyond the probable downward projection of the north ore body. We think that an additional 300 feet of drifting would surely accomplish this result. In our letter of February 3, in which we suggested an additional 1,500 feet of drifting, it was our intention that 300 feet of this would be utilized to extend the 800 level to the northeast. As mentioned previously we did not go into any detail on the justification of the proposed extension as we preferred to wait until we received a policy decision.

We also believe, now that lead and zinc have been restored to the list of minerals eligible for DMEA assistance, that serious consideration should be given to Compton White's proposal to extend the 800 level to the southwest under the supposed oreshoots shown on the upper levels in White's longitudinal section. Although the results of the Whitedelf exploration have been to a considerable degree disappointing, yet some ore has been found, and a number of shipments have been made. We think there is a reasonable chance that one of the three oreshoots southwest of the shaft might continue down to the 800 level. In the past we may have been guilty of underplaying the Clark Fork area, as it is of course greatly overshadowed by the neighboring Coeur d'Alene and Metaline districts. Nevertheless, according to A. L. Anderson (USGS Bulletin 944b) the district produced a little over a million ounces of silver, 24 million pounds of lead, and three-quarters of a million pounds of zinc between the years 1913 and 1943. Quoting from an earlier report by Anderson ("Geology and ore deposits of the Clark Fork district"; Idaho Bureau of Mines and Geology Bulletin No. 12, March 1930) we find that the Whitedelf mine began shipping in July 1926 and that during the last five months of 1926 and in the twelve months of 1927, production was 134,000 ounces of silver and 2,305,423 pounds of lead. An additional 63,645 ounces of silver and 1,160,891 pounds of lead were produced in 1928, according to the same source. This information is quoted merely to show that the oreshoots of the Whitedelf mine, although small by comparison with

the Coeur d'Alene's, have been high grade, and a considerable amount of metal has been obtained in a short time from a relatively small amount of ore. We think it is evident that there are remaining a number of worthwhile exploration project targets southwest of the shaft. If any one of these targets should develop into an ore body as good as the ore bodies that have been mined in the past, the chances of a profitable operation would be very good and the possibility of repayment of the money invested by the Government would be greatly increased.

As was stated in our previous letter, we believe that as money has been invested to reach the 800 level, and as the workings are in good condition and the necessary equipment is on the property, now would be an appropriate time to do this exploration. We realize, of course, that there is a limit to how much money can be poured into a property, yet, on the other hand, we very much dislike to pull out of a property leaving a number of favorable targets untested, provided that these can be tested at reasonable cost. If we do, there will always be a question as to whether any ore remains in the mine, and almost surely at some future period of emergency the mine will be reopened and these targets sought for. It is not unlikely that the Government would again be involved in some manner or another in this exploration. Therefore, it seems to us that the logical thing to do would be to continue the drifting to the southwest to test the three targets southwest of the shaft while workings are still open and while the operator is able and willing to finance his share of the costs. Additional drifting should also be done to the northeast to be sure that the downward extension of the north ore body has not been missed. On this basis we ask reconsideration of the operator's request for additional funds.

If the Operating Committee believes that the Operator's request for additional drifting is excessive in view of the negative results of the drifting to date, rather than deny the Operator's request for additional work as a whole, we strongly recommend that at least an additional 300 feet of drifting to the northeast be allowed. This drifting should adequately explore the downward projection of the north ore body.

In our opinion the work as herein proposed would either find other ore bodies, thereby increasing the chance for repayment to the Government, or would indicate that further exploration of any presently known objective on the 800 level is not warranted.

By Field Team, Region II

A. E. Weissenborn, THK

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

Thomas E Howard
for: Wing G. Agnew, Member
U. S. Bureau of Mines

cc: USBM (2)
Nickelson

FILE COPY
SURNAME:

500

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

MAR 1 0 1954

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

Re: Docket No. DMA-255X (Lead)
Whitedelf Mining & Development Co.
Whitedelf Mine
Bonner County, Idaho
Contract No. Idm-7159

Dear Mr. Weissenborn:

Referring to our letter of March 1, 1954, regarding the Whitedelf project, a review of the work shows that an error exists somewhere. There is either an error in one of the maps recently submitted to us, or else we are in error in our understanding of the status of the project.

The large scale plan map (1 inch to 20 feet) which accompanied the memorandum of Mr. Howard L. Nickelson, dated February 12, shows a total amount of work on the level in question of 1197 feet. Of such total there is shown 290 feet of crosscutting and 30 feet of reverse drifting near the northeast end, giving a total of 320 feet. Deducting this from the over-all total, we have a net of 877 feet of effective drifting.

If we project the bottom of the shaft into the plane of the vein, we find that, from such projected shaft location, 155 feet of drifting is southwesterly and the balance, 722 feet, is northeasterly.

Yet the longitudinal section sent us with your letter of February 3 shows the northeast drift as having reached a point about 300 feet farther ahead of where our calculation shows it to be. We enclose a copy of this section to illustrate the above.

If our assumption is correct, and if the northeast heading is where we believe it to be, the heading is barely touching the downward projection of the north ore body. Hence, obviously an amendment should be given to permit an additional 300 feet of drift in this area.

R.C.G. 3-11-54

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee

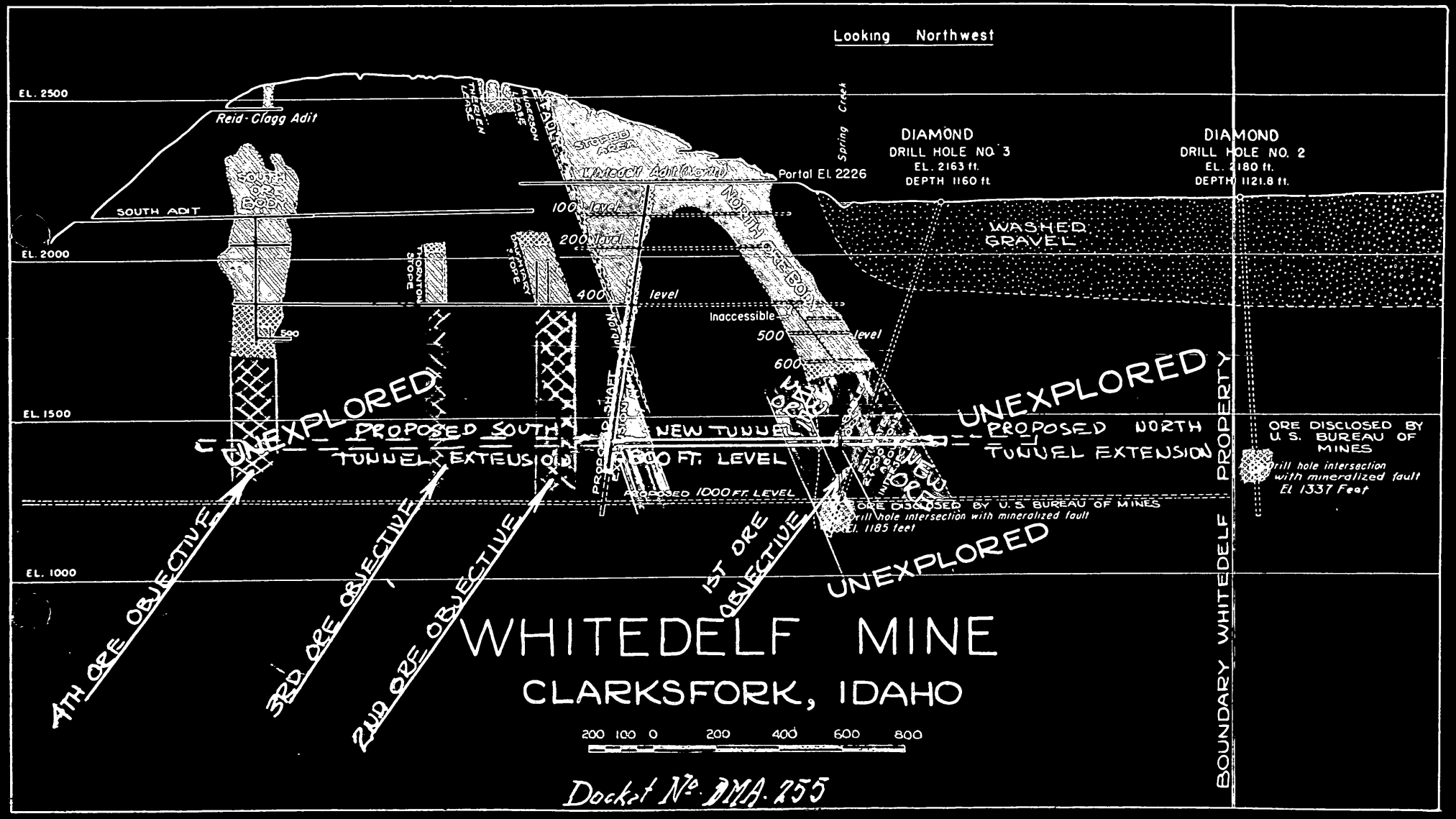
WRGriswold/JWAlt/bjl (3/9/54)

APPROVED:

J. H. Hedges (J.H.H.)
Member, Bureau of Mines

D. M. Larrabee (D.M.L.)
Member, Geological Survey

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


Looking Northwest
EL. 2500
EL. 2000
EL. 1500
EL. 1000
Reid-Clagg Adit
SOUTH ADIT
SOUTH ORE BODY
THORNTON STOPE
PITCHER STOPE
ANDERSON LEASE
STOPING AREA
WINDOCH Adit (North)
Portal EL 2226
Spring Creek
100 level
200 level
400 level
Inaccessible
500 level
600
NORTH ORE BODY
DIAMOND
DRILL HOLE NO. 3
EL. 2163 ft.
DEPTH 1160 ft.
DIAMOND
DRILL HOLE NO. 2
EL. 2180 ft.
DEPTH 1121.8 ft.
WASHED GRAVEL
UNEXPLORED
PROPOSED SOUTH TUNNEL EXTENSION
NEW TUNNEL
800 FT. LEVEL
PROPOSED 1000 FT. LEVEL
UNEXPLORED
PROPOSED NORTH TUNNEL EXTENSION
ORE DISCLOSED BY U. S. BUREAU OF MINES
Drill hole intersection with mineralized fault
EL. 1185 feet
ORE DISCLOSED BY U. S. BUREAU OF MINES
Drill hole intersection with mineralized fault
El 1337 Feet
BOUNDARY WHITEDELF PROPERTY
4TH ORE OBJECTIVE
3RD ORE OBJECTIVE
2ND ORE OBJECTIVE
1ST ORE OBJECTIVE
UNEXPLORED
WHITEDELF MINE
CLARKSFORK, IDAHO
200 100 0 200 400 600 800
Docket No. DMA-255

Whitedelf

C. C.	Diff.
10	105'
47	18'
186	47'
12	51
25	32'
10	91'
20' reversed diff.	45'
320'	98'
	90'
	200'
1197'	55'
	40'
	877'

155' - South of Shaft
722' - North of Shaft.

1100
800

850

1100, 800 ; 850 ; 2050

850
8
1100) 8800 (6,
66
2000

South 167'

185'
100'
12'
97'
37'
46'
68
24
37
90

55'
40'
32'
12'
171'

240
700
700

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

So. 157 Howard Street
Spokane 4, Washington

3/18/54 - Received by [illegible]
[illegible]
Betty

March 9, 1954

Mr. Compton I. White, Jr.
Whitedelf Mining & Development Co.
Clark Fork, Idaho

Re: Docket No. DMEA-255 (lead)
Whitedelf Mining & Development Co.
Bonner County, Idaho
Contract No. Idm-E189

Dear Mr. White:

The Form MF104 submitted for the month of January by the Whitedelf Mining & Development Company was processed on March 8, 1954, for payment. Of the amount submitted, a deletion of $2.70 was made under Item 7, Payroll Taxes. This deletion resulted from a mathematical error.

It was also necessary to delete the costs of 30 feet of drifting to the southwest on the footwall strand of the Pearl vein, as measured from USBM Tag 341 + 142 feet. This drifting might conceivably be called exploration; however, based on results obtained from drifting on the Pearl vein and from long-hole drilling, it would seem to be more in the nature of development. Inasmuch as the existing DMEA program is intended for exploration and not for development, it seems advisable to delete the costs of this work which is of questionable benefit insofar as exploration is concerned. However, we wish to point out that you can apply the 30 feet of drifting to the drift you are currently driving southwest of the shaft.

In calculating the amount to be deleted, we used the average cost of drifting for the month of January. This cost amounted to $40.56 per foot, which, when multiplied by 30 feet, totaled $1,216.80, which was the amount deleted.

By Field Team, Region II

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

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

cc: DMEA (2)
USBM (2)
Kindman

J. W. Alt
Swinwold
O. R. Bishop
Selfridge
Kinkel
Withecombe

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

MAR 1 1954

Mr. [illegible] Weissenborn
Executive Officer
[illegible] Field Team, Region II
South 157 Howard Street
Spokane 4, Washington

Re: Project No. [illegible]-2557 (Lead)
Whitewolf Mining & Development Co.
Whitewolf Mine
Bonner County, Idaho
Contract No. [illegible] - 19

Dear Mr. Weissenborn:

In reply to your letter of February 3, 1954, requesting the allocation of funds to do additional exploration work on the above contract, we wish to advise you that in our opinion the work done to date does not justify further Government participation.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee (JWB)

APPROVED:

J. H. Hedges
Member, Bureau of Mines (JWB)

A. R. Kinkel, Jr.
~~Philip W. Guild~~
Member, Geological Survey (JWB)

JWAlt/bjl (2/25/54)

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

R.C.S.
3-1-54

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

1201 N. Division St.
Spokane 2, Washington
February 23, 1954

MEMORANDUM

To: DMEA Field Team, Region II

From: W. S. Anderson, Mining Engineer, U. S. Bureau of Mines

Subject: Whitedelf Mine, Bonner County, Idaho
Docket No. DMA 255X (lead), Contract Idm-E189

In his January MF-104 the Operator submitted as work completed under the contract 30 feet of drift to the southwest on the footwall of the Pearl vein at USBM #341 + 142 feet. In the opinion of the writer this advance is more in the nature of development work rather than exploration. was it approved in contract

If in the opinion of the U. S. Geological Survey the drift is justified for geologic reasons, a memorandum to this effect will be sufficient to justify Government participation in the aforementioned drift.

The January MF-104 will be processed for payment upon receipt of the memorandum stating the work is justified.

W. S. Anderson
W. S. Anderson

Orig. & 3 cys - Wash.
USGS (2)
DMEA
AD
WSA/he

J. W. Alt.

500

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

H. S. in R. R.

February 23, 1954

Docket copy

Memorandum

To: Administrator

From: Chief, Base Metals Division

Subject: Docket No. DMA-255X (lead-zinc), Contract No. 16m-7189, Whitedelf Mining & Development Co., Whitedelf Mine, Bonner County, Idaho

The Operator of the above contract requests that the current contract be allotted an additional $40,000, such funds to be used in extending the 800 level to the south and to do some additional drifting to the north to confirm complete penetration of the north ore body. Please refer to A. E. Weissenborn's letter of February 9, 1954, and to the Operator's letter of January 18, 1954.

A project summary report is contained in the docket.

Mr. Weissenborn suggests that if a unit cost of $46.50 per foot be used for the proposed 1500 feet of drifting, the contract would have to be increased $69,750.00. Government participation at 50 per cent would be $34,875.00

In a teletype of February 12, 1954, Mr. Weissenborn states: "No claim should be made of important discovery but some form certification recommended as Operator has benefited and should pay royalty on ore mined from ground explored."

The Field Team approves of this additional exploration work, stating that three ore shoots were stoped above the 400 level south of the Pugh fault and two other small ones are reported, though not stoped, that the proposed exploration would test the downward extension of these shoots.

Mr. Weissenborn states: "The question of whether the contract can be expanded to include additional work must, therefore, be considered in terms of policy. If funds can be allotted for extension of a lead-zinc contract, this would appear to be logical exploration."

As the target of the contract has been reached and it has been proved that the ore shoots exposed on the 400 level north of the Pugh fault did not extend to the 800 level, we can see no reason to extend this contract to do additional drifting. We are inclined to doubt if the ore shoots exposed on the 400 level south of the Pugh fault will extend to the 800 level.

JWAlt/bjl
Copy to: Docket, Base Metals,
Chron.

/S/
W. R. Griswold

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
FEB 1 7 195[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

The attached geologic map and memorandum by Mr. Nelson describes the results of the project as of February 5 and will bring you up to date. The geologic map depicts the situation quite clearly and should make further description unnecessary.

By John Field Perry, Region [illegible]

A. [illegible] Weissenborn, Exec. Officer
(U. S. Geological Survey)

King G. Agnew, Acting Member
U. S. Bureau of Mines,

Enclosures
as: [illegible](2)
[illegible]elson

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 17 1954

[illegible]

ale
Betty

DMA

[illegible]

Concentrates previously shipped have amounted to [illegible] tons which have paid [illegible] royality to the [illegible]. These concentrates were obtained from development ore saved from the [illegible] drifting. The grade of the ore as received at the mill is not available.

[illegible] was advised to swing the southwest drift to the south to intersect the hanging wall strand of the pearl vein. The southwest drift has been driven through an area of broken and crushed argillite lying [illegible] of the vein.

Enclosure - 1
Distribution:
[illegible] A(h) ✓
[illegible](2)
[illegible]clat
[illegible]kelson

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 15 1954

FEB 19 2 00 PM '54
COMMUNICATIONS

178 WA SP /I-GS-G/

SPOKANE WASH 2-12-54 1034

GEORGE C SELFRIDGE CHAIRMAN

OPERATING COMMITTEE DMEA DEPT INTERIOR WA

RECTEAINDOCKET DMA-255, WHITEDELF MINING AND DEVELOPMENT COMPANY, CONTRACT IDM-E-189. ORE FOUND DMEA 800 LEVEL DRIFT IS IN SHORT NARROW HIGH GRADE LENSES. SOME DOUBT THIS CAN BE MINED PROFITABLE BUT OPERATOR ACTUALLY STOPING THIS ORE. WIT ALSO GAIN ACCESS TO KNOWN ORE ON 600 LEVEL BY RAISING FROM DMEA DRIFT. NO CLAIM SHOULD BE MADE OF IMPORTANT DISCOVERY BUT SOME FORM CERTIFICATIONRECOMMENDED AS OPERATOR HAS BENEFITED AND SHOULD PAY ROYALTY ON ORE MINED FROM GROUND EXPLORED. LATEST MAP 800 LEVEL AND SUMMARY RESULTS TODATE GOING FORWARD AIR MAIL.

A E WEISSENBORN EXECUTIVE OFFICER REGION II SP

DMA 255 IDM-E189 800 600 800

AC 1036

FEB 12 3 40 PM '54

BUREAU OF MINES
MAIL ROOM
WASHINGTON D C.

FILE COPY
SURNAME:

J.K.C. Alt
Simmons
Selfridge
Whitenday

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

AGENCY: DMEA

Originator: J. Alt/bjl
Ext. 3669 Rm. 4058

Date: February 12, 1954

To: A. F. Weissenborn, Executive Officer, DMEA Field Team, Region II, Spokane, Washington

Re Docket DMA-255, Whitedelf Mining and Development Company, Contract Idm-1189. Please advise as to your recommendation for certification of discovery on this project based on results to date.

George C. Selfridge
Chairman, Operating Committee (245)

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

R.C.S.
2-12-54

TELETYPE MESSAGE

AGENCY: DMEA

ORIGINATOR: JWAlt/bjl
Rm: 4058 Ext.: 3669

Date: February 11, 1954

To: A. E. Weissenborn, Executive Officer, DMEA Field Team, Region II, Spokane, Washington

Re Docket DMA-255, Whitedelf Mining and Development Company, Contract Idm-E189. Please advise ~~if this property can be certified on basis of discoveries to date~~ as to your recommendation for certification of this mining on the project based on results to date.

~~(Discuss recommendations above to appropriately [illegible] by [illegible] wire.)~~

JEG

Chairman, Operating Committee

E COPY
SURNAME:

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

J. W. Good.
Signature
Selfridge

AGENCY: DMEA

ORIGINATOR: JWAlt/bjl
Rm: 4058 Ext.: 3669

Date: February 11, 1954

To: A. F. Weissenborn, Executive Officer, DMEA Field Team, Region II, Spokane, Washington

Re Docket DM-255, Whitedelf Mining and Development Company, Contract Idm-1189. Please advise if this property can be certified on basis of discoveries to date.

Chairman, Operating Committee

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

2/10/54. Received by

February 3, 1954

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

Re: Docket No. DMEA-255 (lead)
Whitedelf Mining & Development Company
Whitedelf Mine
Bonner County, Idaho
Contract No. Idm-E189

Dear Mr. Selfridge:

Enclosed are four copies of a letter signed by Messrs. Compton I. White and Compton I. White, Jr. In this letter it is requested that the current Whitedelf DMEA contract be allotted an additional $40,000, such funds to be used in extending the 800 level to the south and to do some additional drifting to the north to confirm complete penetration of the North ore body. Accompanying the White's letter is a longitudinal section map showing the downward extension of three oreshoots that would be explored by the proposed southern drifting on the 800 level.

DMEA drifting to the north on the 800 level has been disappointing. Some ore has been encountered but the ore is in lenses which have but little strike length, although some of them have been of fairly good grade. Few of these lenticular bodies have exceeded 10 feet in length. The latest DMEA inspection report dated January 4, 1954, shows a fairly continuous body of submarginal ore at the northern end of the level. This body is almost directly above the Bureau of Mines diamond drill hole which intersected a good grade of ore on a somewhat lower level. The operator, at his own expense, is driving some raises in the northern end of this drift in the hope that the ore showings will improve upward and connect with the ore mined on the 600 level.

On a strictly geologic basis the Field Team must agree that the operator's proposal to drift to the south is sound exploration, for having spent a considerable sum to sink the shaft to the 800 level it only makes sense that all reasonable exploration possibilities be tested while the level is still accessible. Three oreshoots were stoped above the 400 level south of the Pugh fault and two other small ones are reported, though not stoped. The proposed exploration would test the downward extension of these shoots.

As a matter of fact, exploration to the south was discussed at the time the original contract was negotiated and the Field Team probably would have recommended it at that time but the operator preferred, logically enough, to explore first to the north where a Bureau of Mines drill hole had cut ore.

The proposed exploration may fail, of course, and result in the expenditure of additional funds without return. On the other hand, if even one of the oreshoots opened up into a good ore body, recovery of a substantial part of the DMEA's share of the total cost of exploration would follow.

The question of whether the contract can be expanded to include the additional work must, therefore, be considered in terms of policy. If funds can be allotted for the extension of a lead-zinc contract, this would appear to be logical exploration. If, on the other hand, funds cannot be expended in the continuation of existing lead-zinc contracts, then the operator's request must, of necessity, be denied.

We are not submitting a detailed cost breakdown of the operator's proposed work at this time nor are we presenting all the available geologic evidence. We prefer instead to wait until we know whether his proposal will be accepted in principle. Drifting costs for DMEA work on the 800 level have averaged about $46.50 per foot. If the contract is extended we recommend that it be on a unit-cost basis. The operator has commenced mining and unless he receives a unit-cost contract it will be very difficult for us to verify costs submitted on monthly vouchers as exploration costs. In the event a unit-cost contract is given the operator it should be for about $46.50 as this is very close to what his drifting costs have been.

In the operator's letter it is suggested that the contract be allocated $40,000 to do 1,500 feet of drifting. Presumably the operator wants $40,000 from DMEA or a total contract increase of $80,000. If the suggested unit cost of $46.50 is used, the contract would have to be increased by $69,750.00.

By Field Team, Region II

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

Thomas E. Howard, Acting Member
(U. S. Bureau of Mines)

Enclosure
cc: USGS (2)
Nickelson

COMPTON I. WHITE
SECRETARY-TREASURER
CLARKS FORK, IDAHO

COMPTON I. WHITE, JR.
PRESIDENT
CLARKS FORK, IDAHO

E. O. CLAGG
VICE-PRESIDENT
CLARKS FORK, IDAHO

WHITEDELF MINING AND DEVELOPMENT CO.

MINE OFFICE
CLARKS FORK, IDAHO

FISCAL OFFICE
401 EMPIRE STATE BLDG.
SPOKANE 1, WASHINGTON

EASTERN OFFICE
608 NORTH CAROLINA AVE. S. E.
WASHINGTON, D. C.

January 18, 1954

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

Contract No. Idm 189
Docket No. 255 X

Dear Mr. Weissenborn:

Further reference is made to the completion of the Whitedelf exploration and mine development project, covered by DMEA Contract No. 255X - Idm 189.

Doubtless you Know the Whitedelf shaft has been extended from the 400 foot level to the 800 foot level where the mine station has been finished and is in use. The tunnel on the 800 foot level has been extended to the first ore objective, i.e., the north ore body previously proven by the deep diamond drill hole No. 3 of the Bureau of Mines.

Now that we have reached and opened our first objective, the north ore body, it is vitally important that we drive the tunnel on the vein south to open our three ore objectives in the south end of the mine, namely the downward extension of the Daugharty Stope, the Thornton Stope and the South ore body, to block out the ore between the 800 and 400 foot levels, which will enable the Whitedelf Company to supply the ore to put the mill in operation on a three shift basis and thereby expedite the repayment of the DMEA loan.

As we are nearing the exhaustion of the DMEA funds allocated for this exploration contract without reaching the three ore objectives in the south end of the mine, we respectfully request an additional allocation of DMEA funds on the same terms as the original grant to drive the tunnels on the 800 foot level a distance of 1500 which will require an additional allocation of approximately $40,000.00 money that will enable the Whitedelf Company to finish blocking out its ore above the 800 foot level and start repaying the DMEA loan.

Sincerely,

Compton I. White, Secretary-Treasurer

Compton I. White, Jr., President

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

1201 N. Division St.
Spokane 2, Washington
January 21, 1954

Whitedelf Mining & Milling Co.
401 Empire State Building
Spokane 1, Washington

Re: Docket No. DMEA 255 (lead)
Contract Idm-E189
Whitedelf Mining & Milling Co.
Bonner County, Idaho

Gentlemen:

Your attention is directed to the method of computing Government percentage royalty due on production from the Whitedelf mine. Particular reference is made to Lots No. 142, 143 and 145, having net smelter returns of $1409.63, $268.12 and $1271.85, respectively, or total net proceeds of $2949.60. We note from your January 15, 1954 letter that the cost of hauling to the smelter, amounting to $88.00, was deducted from the net proceeds before computing the Government's percentage royalty.

According to Annex I, paragraph c., Amendment No. 5, royalties are computed on net smelter returns. Paragraph c. is quoted in part as follows:

"c. Definitions.--As here used, 'net smelter returns', 'net concentrator returns', and 'other net amounts realized from the sale or other disposition', mean gross revenue from sales."

Your attention is also directed to paragraph e. of Annex I, part of which is quoted below:

"e. Notice to Purchasers.--The Operator shall notify any purchaser of the production of the Government's royalty interest, and shall authorize and direct the purchaser to pay the royalty directly to the Government and to furnish the Government with copies of the settlement sheets; . . ."

As used in paragraph c. above, "net smelter returns" is defined as the net amount received by the shipper after all smelter deductions. The Government's percentage royalty is properly computed on the net proceeds for the three lots, or $2949.60, instead of $2861.60, as the cost of haulage may not be deducted. The balance due the Government on the three lots of concentrates is 5 percent of $88.00 or $4.40.

On any future shipments please notify the purchaser of the Government's royalty interest, in compliance with paragraph c. of Annex I.

All checks should be drawn in favor of the Treasurer of the United States and forwarded to Mr. A. E. Weissenborn, Executive Officer, DMEA Field Team, Region II, South 157 Howard Street, Spokane, Washington.

By Field Team, Region II

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

Thomas R. Howard, Acting Member
(U. S. Bureau of Mines)

cc: DMEA, Wash. (2)
USGS (2)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

RECEIVED
DEC 18 1953

December 14, 1953

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

Re: Docket No. DMEA-255 (lead)
Whitedelf Mining & Development Co.
Bonner County, Idaho
Contract No. Idm-E189

Dear Mr. Selfridge:

Enclosed are the original and two signed copies of Amendment No. 5 to the above contract.

Distribution of this amendment is being made in the usual manner.

Sincerely yours,

A. E. Weissenborn

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

Enclosure

cc: Finance Office w/encl.
USBM (2)
Nickelson

12-18

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

[illegible]

Defense Minerals Administration
RECEIVED
DEC [illegible] 1953

[illegible]

FILE COPY
SURNAME:

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

J. W. Alt
Martin
Hedges

NOV 24 1953

11-24

Mr. . . eissenborn
xecutive Officer
Field Team, Region II
outh 157 Howard Street
pokane 4, ashington

Re: Docket No. 255 (Lead)
Whitedelf Mining & Development Co.
Bonner County, Idaho
Contract No. Idm-E189

ear Mr. eissenborn:

We are enclosing the original and five copies of amendment No. 5 to the above contract, signed by this office for the Government, together with Annex I. This amendment was requested by you in your letter of October 30, 1953.

If the amendment meets with your approval, kindly present it to the Operator for approval and signature, and when completed distribute in the usual manner. In the event that the amendment is not satisfactory, and cannot be amended within your delegated authority, return all copies with your recommendation concerning any modification.

Sincerely yours,

W. S. Martin
ACTING Chairman, Operating Committee

Enclosures 6

APPROVED:

J. H. Hedges
Member, Bureau of Mines

A. R. Kinkel, Jr.
Member, Geological Survey

JWAlt/hmj (11-20-53)
CC to: Docket
Adm. R. File
Op. Committee
Base Metals
Mr. Kinkel
Mr. Bishop
Chron.

R.C.G. 11-24-53

FILE COPY
SURNAME:

500

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

N.S. in R.R.

November 17, 1953

J. W. Alt
Counsel

Memorandum

To: Chief Counsel

From: Base Metals Division

Subject: Amendment to allow the Operator an extension of time to complete the work of the contract -- Docket No. DMEA-255, Whitedelf Mining & Development Company, Contract No. Idm-E189, Bonner County, Idaho.

The attached Amendment No. 5 has been prepared by the Field Team of Region II. Will you please review this amendment and make any corrections you think necessary.

J. W. Alt

JWAlt/bjl (11/17/53)

Copy to: Docket
Base Metals
Chron.

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
NOV 9 1953

October 30, 1953

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

Re: Docket No. DMEA-255 (lead)
Whitedelf Mining & Development Co.
Bonner County, Idaho
Contract No. Idm-E189

Dear Mr. Selfridge:

This will acknowledge your letter of October 26 calling our attention to the fact that the completion date of the Whitedelf contract is October 19, 1953, which date if two years from the date of the contract. On October 22, we wrote you a letter, which evidently had not reached you at the time you wrote your letter of October 26, commenting on the same matter and requesting the extension of the contract to 30 months.

Enclosed is Amendment No. 5, with justification, for approval by the Administrator, which will achieve this objective. With the extension of time this will also affect the repayment period, which has been incorporated in the amendment.

Sincerely yours,

A. E. Weissenborn, THK.

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

Enclosure

cc: USBM (2)
Nickelson

Division Copy

EXPLORATION PROJECT CONTRACT
WHITESELF MINING AND DEVELOPMENT COMPANY
DOCKET NO. DME-[illegible]

AMENDMENT NO. [illegible]

It is agreed this 4th day of November, 1953, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, and the Whiteself Mining and Development Company, that Contract DME-[illegible] (Docket No. DME-[illegible]) dated October 19, 1951, as amended, is further amended, effective October [illegible], 1953, as follows:

1. In Article [illegible] of the contract form, delete the words "within a period of twenty-four (24) months from the date of this contract," and substitute the words "not later than April 1, 1954."

2. Annex 1, attached hereto, is substituted for that part of Article 15 which precedes the colon, and the period "eleven (11) years" is substituted for the period "ten years" in Article 15.

This amendment shall not be construed to increase the estimated total cost of the project nor the aggregate total amount which the Government may be required to contribute.

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By _____
Administrator, Defense Minerals
Exploration Administration

WHITESELF MINING AND DEVELOPMENT COMPANY

By _____

WHITEDELF MINING AND DEVELOPMENT COMPANY
EXPLORATION PROJECT CONTRACT
DOCKET NO. DMEA-255

ANNEX I

The following provisions are in lieu of all of the first paragraph of Article 15 which precedes the colon:

If the Government considers that a discovery or development from which production may be made has resulted from the exploration work, the Government, at any time not later than six months after a sufficient, complete, final report and final account referred to in the contract has been rendered, may so certify in writing to the Operator. Such certification shall describe broadly or indicate the nature of the discovery or development. The Operator, or his successor in interest, shall pay to the Government a royalty on all minerals mined or produced from the land described in Article 2, as follows: (1) Regardless of any certification of discovery or development, from the date of the contract until the lapse of the time within which the Government may make such certification of discovery or development, or until the total net amount contributed by the Government, without interest, is fully repaid, whichever occurs first, unless the Government waives its right to a royalty; or (2) if the Government makes a certification of discovery or development, for a period of ten years* from the date of the contract, or until the total net amount contributed by the Government, without interest, is fully repaid, whichever occurs first. Said royalty shall be a percentage of the net smelter returns, the net concentrator returns, or other net amounts realized from the sale or other disposition of any such production (including any bonuses), in whatever form disposed of, including ore, concentrates, or metal, as follows:

* The period "eleven (11) years" is substituted for the period "ten years."

WHITEHELF MINING AND DEVELOPMENT COMPANY
Bonner County, Idaho
Contract No. Idm-2189 Docket No. NMEA 255 (lead)

Justification of Amendment No. 5

There is approximately 322 feet of drifting remaining to be completed under the exploration project contract to reach the target areas as outlined in the contract. The drift on the Pearl vein will have to be advanced approximately 200 feet NE to intersect the ore body which was intersected by UMM DDH #3. The Operator will need additional time to complete the drifting both to the NE and the SW on the Pearl vein as allowed under the contract.

W. S. Andersen

FILE COPY
SURNAME: 500

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

OCT 2 6 1953

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

Re: Docket No. DMEA 255 (Lead)
Whitedalf Mining and Development Co.
Bonner County, Idaho
Contract No. Idm-K189

Dear Mr. Weissenborn:

We wish to call to your attention that the completion date of the above contract, as fixed by Amendment No. 2, is October 19, 1953, which date is two years from the date of the contract. As that date has passed, and as an extension beyond that date requires the approval of the Administrator, you should prepare and submit an amendment extending completion date, if you are of the opinion that it should be extended.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee

APPROVED:

J. H. Hedges
Member, Bureau of Mines

T. P. Thayer
Member, Geological Survey

JWAlt/hmj (10-22-53)
CC to: Docket
Adm. R. File
Op. Committee
Mr. Kinkel
Mr. Bishop
Base Metals Division
Chron.

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

1201 N. Division St.
Spokane 2, Washington
October 22, 1953

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

Subject: Docket No. DMEA 255 (lead)
Whitedelf Mining & Development Co.
Bonner County, Idaho
Contract No. Idm-E189

Dear Mr. Selfridge:

The exploration project contract with the Whitedelf Mining and Development Company dated October 19, 1951 was to be completed 24 months from the date of the contract, and as this time has now expired it is advisable to extend the completion date from 24 months to 30 months so that the target will be reached.

The 24-month schedule for completion was not achieved because rehabilitation work in the shaft required more time than was anticipated, delaying the start on the actual exploration work. Upon completion of the shaft, the Operator has maintained a satisfactory rate of advance in his drifting on the Pearl vein but this drift still must be advanced approximately 200 feet northeast to reach the ore intersected by USBM diamond drill hole #3. There is approximately 322 feet of drifting left in the contract. Footage remaining after the drill hole target is reached can be used to drive to the limit of the ore body or for drifting to the southeast to intersect the projected downward extension of the Dougherty ore shoot.

As the objectives of the exploration project contract have not yet been reached it is recommended that the Operator be given additional time to complete his contract. With your approval, an amendment will be made to extend the completion date of the contract to 30 months.

By DMEA Field Team, Region II

M. E. Volin, Acting Exec. Officer
U. S. Bureau of Mines

J. J. Quinlan, Acting Member
U. S. Geological Survey

cc:USGS(2)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

May 26, 1953

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

Re: Docket No. DMEA-255 (lead)
Whitedelph Mine
Bonner County, Idaho
Contract Idm-E189

Dear Mr. Selfridge:

Attached are the original and two signed copies of Amendment No. 4 to the subject contract, with attached justification.

Copies of this amendment have been distributed in the usual manner.

Sincerely yours,

Thor H. Kiilsgaard

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

Attachment

cc: USBM (2)
Nickelson

RECEIVED
JUN 12 1953
GENERAL COUNSEL
DEFENSE MINERALS
ADMINISTRATION

255

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS ADMINISTRATION

WASHINGTON 25, D. C.

1201 N. Division St.
Spokane 2, Washington
February 25, 1953

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 16 1953

Mr. J. H. Eby
E. 28 Sinto Avenue
Spokane, Wash.

Subject: Whitedelf Mine
Docket No. DMEA 255 (lead)
Contract Idm-E189

Dear Mr. Eby:

This will acknowledge your letter of February 20, 1953, directed to the Bureau of Mines and the Geological Survey at this address.

Your letter gives certain opinions of the DMEA project currently underway at the Whitedelf mine, these opinions being based upon your many years of experience at that mine and the adjoining Hope property.

We are glad to have the benefit of your opinions and thank you for your interest in bringing them to the attention of this office. Your letter is being added to the file of information we have on the Whitedelf mine.

Sincerely yours,

M. E. Volin, Member
DMEA Field Team
Region II

cc: DMEA, Wash. (2)
USGS (2)

C
O
P
Y

Spokane, Wash.
Feb. 20th 1953.

U.S.B.M.-D.M.A.-U.S.G.S.
Spokane, Wash.

Dear Sirs;-

The work first handled by the U.S.B.M. has been expanded so that all those agencies are now involved so I adress you all. It was first when I seen it at work under the Bureau of Mines and had not part in financing any of the prospects it worked on but just gave the owners the results of their findings.

My first contact was at Clark's Fork when they U.S.B.M. diamond drilled to find the extension of the Pearl Vein. It was a hard job. I had been intimately familiar with the geology from 1923 before the over turned tree roots had shown Galena which made Compton I. White the Congressman from the first Cong Dist of Idaho. I had followed that up and when the U.S.B.M. started diamond drilling to find the Pearl vein in the bottom I made trip every month to watch the progress.

They choose to drill the holes in the bottom along Lightning and Spring creeks. From my knowledge of the Whitedelf and Hope mines it was certain that the vein extended continuously across the bottom. That was a certainty and had advised the White Delf of it and that they churn drill along Spring creek, not diamond drill to determine the depth of the glacial gravels and possibly later on diamond drill from the bottom of the holes. Likewise I advised Nash of the Hope mine to do the same but not to try to drift over under that gravel. It was a waste to try to get out under the bottom as the vein at 460;ft. depth extended out under but was impossible to mine because of the water.

The U.S.B.M. started a diamond drill, hole along Lightening Creek and it was a slow hard job and expensive work but finally cut the Pearl Vein showing high grade Galena. Then they moved the drill to the Spring Creek side and repeated the performance. They found just exactly what I had indicated. The working in the Whitedelf not over 500 ft. from the D.D.H. had five feet of the richest ore in the mine but the water drove them out.

Neither the Hope or Whitedelf were advised that to get at the ore found in the drill holes they would have to make a caisson of the working and to mine would be hopeless. But the Hope sank a shaft and drove a cross cut to reach the ore cut by the drill and went broke. Now the Whitedelf is planning to drive from the bottom of their extended shaft, to cut that ore shown by the drill.

You have given them false hopes and never should have allowed them to try to reach the ore cut by the drilling for it was certain that it would be impossible to mine it. Did not have to drill the holes to know that I told them it could not be done. The result is that the Hope is in the bed wasted thousands of dollars and it seem that the Whitedelf plans the same.

In the future seek to keep prospects from such actions and let them know what is ahead of them. Those two drill holes cost more than drilling five times the footage in bed rock and all they did was known without them and lead to a waste of money.

Very truly,

/s/ J. H. Eby

Docket Copy

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

January 16, 1953

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 19 1953

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

Re: Docket DMEA-255X (Lead)
Contract Idm-E189
Whitedelf Mining &
Development Company

Dear Mr. Selfridge:

Attached are the original and two signed copies of Amendment No. 3 to the subject contract, with attached justification.

Copies of the amendment have been retained by the Operator, the Finance Officer, and the Field Team office.

Sincerely yours,

A. E. Weissenborn

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

Attachment

cc: USBM (2)
Fryklund

Coe
1-19-53

RECEIVED
JAN 30 1953
GENERAL COUNSEL
DEFENSE MINERALS
ADMINISTRATION

Microfilmed material

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
~~WASHINGTON 25, D.~~ C.
1201 North Division St.
Spokane 2, Washington

December 22, 1952

Whitedelf Mining and Development Co.
Clark Fork, Idaho

Subject: Amendment No. 3
Contract Ida-E149
Docket No. DMEA 255X (lead)

Gentlemen:

Enclosed herewith are 7 copies of Amendment No. 3 to your Exploration Project Contract, which have been signed by the Executive Officer, DMEA Field Team, Region II. If the amendment meets with your approval please have an authorized official of your company sign all copies, retain the copy marked "Operator's Copy" and return the remaining copies to this office.

Sincerely yours,

Thomas E. Howard
Chief, DMEA Section
Bureau of Mines, Region II

Enclosures

cc: DMEA - Wash - 2
USGS - 2
DMEA
EGE
D/F

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
DEC 22 1952

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

1201 N. Division St.
Spokane 2, Wash.
September 8, 1952

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
SEP 15 1952

Mr. Frank Johnson, Chairman
Operating Committee
Defense Minerals Exploration Admin.
Department of the Interior
Washington 25, D. C.

Subject: Amendment No. 2, Contract Idm-E189
Whitedelf Mining & Development Co.
Docket No. DMA 255 (lead)

Dear Mr. Johnson:

Transmitted herewith are the original and two copies of the subject amendment and the justification, both prepared in the Washington office.

A copy of this amendment has been forwarded to the Fiscal Officer at Albany, Oregon, and a copy has been retained by the Operator and the Field Team.

By Field Team, Region II

A. E. Weissenborn, Exec. Officer

M. E. Volin, Member

Enclosures

cc: DMEA, Wash. (2)
USGS (2)
Fiscal Officer, Albany (w/encl.)

RECEIVED
SEP 23 1952
GENERAL COUNSEL
DEFENSE MINERALS
ADMINISTRATION

9/16/52

FILE COPY
SURNAME:

500

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

Mr. Mathes
Chandler
Chrone
Hoffman
Selfridge

AUG 8 1952

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

Re: Docket No. DMA-255 (Lead-Zinc)
Contract No. Idm-E189
Whitedelph Mining and Development Company
Bonner County, Idaho

Dear Mr. Weissenborn:

Enclosed are six copies of the proposed Amendment No. 2 to Exploration Project Contract No. Idm-E189, dated October 19, 1951, which have been signed by the Government.

We have changed the amendment proposed by you in your memorandum of July 10, 1952, to the extent of allowing a total of $10,602.45 for Contingencies rather than providing for contingencies only for deepening the existing winze, and we also included the equipment provided for under Amendment No. 1 under "Equipment to be Purchased".

If this amendment meets with your approval and that of the Operator, kindly obtain his signature and return the original and two copies to this office and distribute one copy to the Operator and Finance Officer and retain the other for your files.

Sincerely yours,

S. C. Selfridge 8/22

ACTING Chairman, Operating Committee (NB)

Enclosures 6

HFKeller/mb/bjl (written 8/7/52)

APPROVED:

C. N. Johnson
Member, Bureau of Mines (NB)

D. M. Lemmon
Member, Geological Survey (NB)

Copy to: Docket
Admr. R. File
Operating Committee
H. F. Keller (2)
Mr. Bishop
Mr. McKnight
Chron.

FILE COPY
SURNAME:
800

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

AUG 13 1952

Mr. Robert M. Hull
c/o Mr. A. E. Weissenborn
South 157 Howard Street
Spokane 8, Washington

n. s. in R. & R.

Dear Bob:

Please refer to Contract No. Idm-E189, Docket No. DMA-255, Whitedelph Mining and Developing Company of Clarkefork, Idaho, and to the numbered paragraph 7 of the subcontract thereunder between the above named operator and R. S. McClintock.

For payment purposes the 12½% allowed the contractor (in paragraph 7 (b)) "to cover contractor's overhead", must be applied only to labor, materials and supplies and direct supervision of labor, and not to any general overhead items. In other words the 12½% fee is the general overhead cost.

Sincerely yours,

(Signed) J. L. Chambers

Jay L. Chambers, Chief
Contract Administration and
Audit Division

JLChambers/wb
Au ust 13, 1952

Copy to: Mails & Files
Admr. Reading File
Mr. Weissenborn
Mr. Rogers GAO
Mr. Chambers
Mr. Brading
Mr. Finch

FILE COPY
SURNAME:

500

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

August 7, 1952

Memorandum

To: Acting Administrator

From: Acting Chief, Base Metals Division

Subject: Justification of Amendment No. 2, to Contract No. Idm-E189, Docket No. EMA-255, Whitedelph Mining and Development Company

Enclosed is a memorandum from Mr. Weissenborn, dated July 10, in which he furnishes the data on which the revised cost estimates used in Amendment No. 2 were calculated. I concur with Mr. Weissenborn's recommendation that the amendment be approved.

Apparently estimated costs of the contract were not sufficiently high to cover all the actual costs of the project and it was therefore necessary to make an amendment to provide the additional funds that would be necessary to complete the project at the higher estimated unit costs. I have revised the suggested amendment which Mr. Weissenborn enclosed in his memorandum so as to provide a contingent fund for all the items of the project rather than only for deepening the winze as was done in the amendment proposed by Mr. Weissenborn.

I recommend the approval of this amendment and that the copies of the amendment attached to the letter to Mr. Weissenborn be signed by the Government.

H. F. Keller
Acting Chief, Base Metals Division

Attachments:

HFKeller/bjl/mb
August 7, 1952
cc to: Docket
Adm. Reading File
Operating Committee
Mr. Keller (2)
Mr. Bishop
Mr. McKnight
Chron

OFFICE OF THE ADMINISTRATOR

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

1201 N. Division St.
Spokane 2, Wash.
July 10, 1952

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUL 15 1952

MEMORANDUM

To: Chairman, Operating Committee, DMEA, Washington, D. C.

From: Field Team, Region II

Subject: Whitedelf Mining & Development Co., Contract Idm-E189, Docket No. DMEA 255 (Lead)

In discussions with Mr. Moulds and others of the Lead-zinc Branch regarding approval of the subcontract between the Whitedelf Mining & Development Co. and R. F. McClintock for winze deepening, it was recognized that additional costs not included in the subcontract were involved and that a contract amendment would be required. This is in accord with prior discussions with Mr. Mittendorf, who, in response to the Field Team's belief that winze deepening could not be carried to completion with the funds already allotted, stated that sufficient funds would be made available.

A realistic cost estimate for the winze deepening together with a revised estimate of drifting costs from the completed winze has been prepared by H. T. Reno, Mining Engineer, Bureau of Mines. On the basis of these estimates, attached, a suggested contract revision is forwarded herewith for consideration.

Although this revision implies a substantial increase in the contract's total cost, it is based on current information and the Operator's past performance. The only cost item possibly subject to question is the 15% ($27.00 per foot) allowance for contingencies in sinking the winze. It is believed, however, that this item should be covered to avoid a request for additional funds should the sinking job meet with unanticipated difficulties.

By Field Team, Region II

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

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

Enclosures 1 (in dup.)

cc: USGS, Spokane

ESTIMATE OF
WHITEDELF EXPENSE FOR SINKING
Docket No. 255, Contract Idm-E189

Assume 5 feet of advance per 2-shift day
Average 125 feet per month

	Cost/ft.
Depreciation on air compressor - $133.33/mo.	$1.10
Timber $\frac{63,200 \text{ fbm at } \$50}{400}$ =	8.00
Supervision - $500/mo.	4.00
2 surface workers - $25/day	5.00
Power (estimate)	3.00
Repairs to camp, hoist, pumps, and fan (estimate)	2.00
Hoist signal devices (pull bell and electric bell) $1/ft. for 800 ft.	2.00
R. S. McClintock subcontract	155.00
Subtotal	$180.10
+ 15 percent contingency (Item 5 - subcontract)	27.00
Total	$207.00

ESTIMATE - SHAFT REHABILITATION

Expended to June 1, 1952 (auditor's estimate)	$14,000.00
Less $2,400 (timber erroneously charged)	2,400.00
Shaft rehabilitation to June 1, 1952	$11,600.00
McClintock Co. estimate to complete + 12½ percent	6,000.00
Total	$17,600.00

Docket No. 255, Contract Idm-E189

ESTIMATE - DRIFTING

Assume timbered drift
4 feet of advance per shift, 100 ft/mo.

Labor - contract		$11.00
1 hoistman @ $13.50		
1 cager @ 13.20		
2 trammers @ 26.00		
$\frac{52.70}{4}$ = $13.20		13.20
		$24.20
+ 10% Compensation, Soc. Sec. & unemployment ins.		2.42
		$26.62/ft.
+ 8-1/3% overtime		2.20
Powder and caps - 15#/ft @ $22.50		3.65
Timber - 8x8 - lag top		1.85
Bits		2.00
Steel		.70
Hose		.18
Pipe - 3" and 2"		1.14
Fan pipe - 12"		.95
Rail and ties		.87
Small tools and misc.		.25
Supervision		2.50
Power		3.75
Maintenance and repair		2.65
Lamps		.08
Depreciation		3.27
Total		$52.66
	SAY	$52.50

Suggested

AMENDMENT NO. 2

It is agreed this 1st day of June 195 2, between the the United States of America, acting through the Department of the Interior, Defense Minerals Administration and Whitedelf Mining and Development Co., Clark Fork, Idaho (Docket No. 255 - lead)

each acting in consideration of the agreement of the other to the terms hereinafter set forth, that the Exploration Project Contract Idm-E189 of Oct. 19 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 June 1 195 2.

~~This amendment is made by authority granted the Executive Office, DMA Field Team, Region II in Order No. 2684 by the Acting Secretary of the Interior.~~

~~This amendment shall not be construed to increase the estimated total cost of the project, the amount of the Government's contribution, or any item of allowable cost which is expressly designated "Allowable Maximum".~~

Executed in sextuplicate the day and year first above written.

_____ (Operator)	The United States of America
By _____	By _____ ~~A. E. Weissenborn, Exec. Officer DMEA Field Team, Region II~~

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUL 15 1952

WHITEDELPH MINING AND DEVELOPMENT COMPANY
Docket No. 255 - Lead
Exploration Project Contract Idm-E189

Amendment No. 2

Exhibit "F"

Changes and modifications

1. In paragraph 3, Exploration Project, change the time allowed to bring the project to completion from 12 months to 24 months.

2. In paragraph 13, Payment to the Operator, change the estimated total cost of the project from $120,250.00 to $163,950.00 and the aggregate total of sums to be paid by the Government from $60,125.00 to $81,975.00.

3. In Exhibit "A" of the contract under Estimated Cost of Project, delete items 1, 2, 3, 4, and 5.

4. In Exhibit "A" of the contract under Operating Equipment - To be Purchased, delete:

Pipe for water column	$700

5. In Exhibit "A" of the contract under Estimated Cost of Project, add:

(1)	Deepening existing winze 400 feet at $207 per foot		$82,800
(2)	Drifting 1,100 feet at $52.50/ft.		57,750
(4)	Equipment to be purchased:		
	1 Sinking pump	350.00	
	1 Deep well type pump for lift of 800 ft. - 200 gpm	1,800.00	
	1 Blower and pipeline for ventilation	1,100.00	
	1 Hoisting rope 1000 ft. 7/8 in. diameter	550.00	3,800
(5)	Rehabilitation and repairs to existing winze		17,600

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

July 9, 1952

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

Re: DMEA-255, Lead-Zinc
Contract Idm-E189
Whitedelf Mining & Development

Dear Sir:

Enclosed are three copies of approval for a subcontract between the subject company and Mr. R. S. McClintock. This approval is for the performance of work under conditions described in the contract.

Sincerely yours,

K. H. Gray

Kathryn Gray
For: A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region II

Enclosures

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUL 14 1952

To: Whitedelph Mining and Development Co.

That certain contract, or proposed contract, a copy of which you have submitted with your request for approval, dated May 29, 1952, between you and R. S. McClintock for the performance of some part of the work described in an Exploration Project Contract dated October 19, 1951, Idm-E189, Docket DMEA-255, is hereby approved by the United States of America, subject to the following terms and conditions:

1. The Government shall not be nor be considered to be a party to said independent contract, and the Government's right to terminate the exploration project under any of its provisions shall not in any manner be affected by reason of said independent contract.

2. Regardless of the provisions of said independent contract, the Government will participate in the payments to the independent contractor only on account of work actually performed and that conforms with the provisions of the exploration project contract, and only to the extent that the Government deems the unit prices or costs for the work under the independent contract to be reasonable and necessary.

3. The said independent contract shall not have the effect of increasing the estimated total cost of the exploration project contract nor the maximum amount which the Government will pay as provided in the exploration project contract.

Dated: June 25, 1952

THE UNITED STATES OF AMERICA

By A E Wassenberg

Docket Copy
DMEA-255
Lead, Zinc
Idm-E189

THIS AGREEMENT, Made this 29th day of May, 1952, by and between R. S. McCLINTOCK, an individual, party of the first part, hereinafter called the "Contractor" and WHITEDELF MINING AND DEVELOPMENT CO., a Deleware corporation, party of the second part, hereinafter called the "Owner",

WITNESSETH:

That the Contractor and the Owner agree as follows:

1. The contractor agrees to sink the shaft of the owner's mine located near Clarksfork in Bonner County, Idaho, from the present 400' level to the sump below the 800' level, at a price of $155.00 per linear foot, to be paid as hereinafter provided. The shaft is to be a continuation of the present shaft at a 70° incline and is to be approximately 7' x 12' outside of the timbers and lagging, two compartments to be 4½ ft by 4½ ft in the clear.

2. The owner agrees to furnish (and operate if specified) at its own cost, the following items, all without cost to the contractor:

(a) Sufficient electric power to supply all the contractor's needs.

(b) Air from a compressor plant furnished and operated by the owner sufficient for all the contractor's operations in connection with the work.

(c) A hoist plant and hoist cable, said hoist plant to be equipped with sufficient signaling devices as are required by the laws of the State of Idaho.

(d) A water pumping plant at the 400' level.

(e) Ore cars.

(f) Ventilation fan and ventilation line to be operated by the owner.

(g) All rough timbers and rough lagging requested by the contractor for the completion of the work.

3. The contractor agrees to commence work ten days after notice to proceed, and to diligently proceed therewith until completed, except as

otherwise provided for in Paragraph 6 (d). If the contractor be delayed or unable to proceed with the work by reason of strikes, unusual delays in transportation, unavoidable casualties, acts of God, unforseen and unusual natural formations encountered in the shaft, or by any other cause beyond the contractor's control, then the time for completion shall be extended by the period of any such delay.

4. The contractor agrees to complete the work in a good and workmanlike manner and in the performance thereof agrees:

(a) To furnish all work, labor and materials required to complete the work with the exception of those items to be furnished (and operated if required) by the owner.

(b) To furnish and install a 4" standard water line and a 3" air line from the present 400' level to the bottom of the completed shaft or to the 1,000' level, whichever is the shorter, and to connect said lines at the 400' level.

(c) During the performance of the work to pump all water in the shaft to the reservoir at the 400' level.

(d) To comply with the provisions of the Workman's Compensation Act of the State of Idaho and to pay Government Social Security and Withholding Tax.

(e) To furnish a payment bond guaranteeing the payment of all labor and materials used in the work and a performance bond for the full amount of the contract.

(f) To furnish a public liability policy with limits of $100,000 for any one injury and $300,000 for any one accident.

5. It is agreed that if the contractor should encounter any unusual or unforeseen natural formations in the sinking operations, making it necessary to spile or to pump an excessive amount of water or to use other than conventional sinking methods, the owner will pay to the contractor, in addition to the contract price herein specified, the actual cost of such additional work.

6. The owner agrees to pay for the work at the rate of $155.00 per linear foot, payment to be made as follows:

(a) On or before June 10th, 1952, the owner will deposit the sum of $20,000.00 cash in escrow in the main office of The Bank of North Idaho, Priest River, Idaho, hereinafter called the "Escrow Agent".

(b) At the end of each calendar month the contractor will prepare an invoice itemizing all charges due the contractor for work performed during said month, which invoice shall be approved by the owner. Upon presentation of such approved invoice by the contractor to the escrow agent, the escrow agent shall pay from the funds in its possession the sum specified in said invoice.

(c) Within ten (10) days thereafter the owner shall make a deposit in cash with the escrow agent equal to the lesser of the following amounts: (1) a sum sufficient to restore the balance in escrow to $20,000.00; or (2) a sum which, when added to the balance in escrow will be sufficient to pay the balance of the contract price for the work herein agreed to be performed, the contractor's determination of the amount thereof to be final.

(d) Upon the failure of the owner to make the deposit required by sub-paragraphs (a) and (c) above, or to approve the invoice rendered by the contractor as provided in sub-paragraph (b) above, the contractor may forthwith cease all further work until the payments shall have been made and the invoices approved.

(e) Upon the completion of the contract and the delivery to the escrow agent by the contractor of a statement that the contractor has received payment in full, the escrow holder shall deliver to the owner all funds remaining in its hands.

(f) The charges of the escrow agent shall be borne equally by the parties.

7. In addition to the foregoing agreement to sink the shaft, the contractor and owner further agree:

(a) That the contractor shall rehabilitate the collar of the existing shaft and the shaft itself to the bottom of the sump, if necessary, including the cleaning out of the sump, all for the purpose of restoring the collar and the shaft to a good condition of repair; and

(b) That the owner will pay to the contractor therefor an amount equal to the actual cost of said work to the contractor, plus 12½% thereof to cover the contractor's overhead, payment to be made upon the presentation of invoices to the owner.

IN WITNESS WHEREOF the parties hereto have caused this instrument to be executed by the proper officers and their corporate seals to be hereunto affixed the day and year first above written.

R. S. MC CLINTOCK

R. S. McClintock

Party of the First Part.

WHITEDELF MINING AND DEVELOPMENT CO.

By Compton Jeffries President

Attest: E. Flaus Secretary

500
FILE COPY
SURNAME:

Moulds
Talbert

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

JUN 16 1952

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

Re: Docket No. DMEA 255
Whitedelf Mining and
Development Co.
Idm-E189, Lead

Dear Mr. Weissenborn:

With reference to your letter of May 29, 1952 concerning the approval of subcontract between R. S. McClintock and the Whitedelf Mining and Development Company; we are transmitting herewith a written form of approval to be used and attached to the original and each copy of the exploration contract along with a copy of the subcontract to which the approval relates.

Approval of this contract is contingent upon a maximum allowable amount of $6,000 for all expenses, including percentage under Item 7 of the subject agreement. Any costs applicable to this Item in excess of the above maximum will be for Company account only. The necessity of a signed acceptance of this condition by the Whitedelf Mining and Development Company has been left to your discretion. The right to disapprove payment of any of the subcontract costs is, of course, inherent in Item 2 of the approval form.

We are returning the copy of the agreement for your reference, and as previously stated, a copy of the subcontract and executed approval must be supplied for attachment to each copy of the contract.

Sincerely yours,

(NS)

Chairman, Operating Committee
Defense Minerals Exploration
Administration

6-16-52

Enclosures

APPROVED:

Charles N. Merrill (NS)
Member, Bureau of Mines

D. M. Lemmon (NS)
Member, Geological Survey

DEMoulds/mef
6/12/52
cc to: Adm. R. File
Op. Comm.
Docket
Mr. Moulds
Mr. Lyons
Mr. Bishop
Region II

140

FILE COPY
SURNAME:

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

June 11, 1952

Memorandum

To: Acting Administrator
Through: D. E. Moulds

From: Chief Counsel

Subject: Whitedelph Mining and Development Co. — Docket No. DMA-255, Contract No. Idm-F189

Reference is made to Mr. Mould's memorandum to me of June 6 to which is attached for approval a proposed subcontract between R. S. McClintock and the Operator for the performance of some parts of the work described in the contract. The subcontract has already been signed by the parties, and there appears to be urgency in putting it into effect.

The subcontract may be approved provided that the attached written form of approval is used. A copy of this attached form of approval should be sent to the Operator and duplicate executed copies should be attached to all file copies of the exploration contract together with copies of the subcontract to which the approval relates.

I have not objected to the subcontract although there are two provisions in it, Articles 5 and 7, that provide for payments to the subcontractor on the basis of actual cost without any definition whatever as to what "actual cost" may consist of. The approval form will take care of this by enabling the Government to refuse to participate in any payments to the subcontractor, whether on the basis of actual cost or otherwise which it deems to be unreasonable.

n. s. in R. v R.

J. L. Hofflund
Chief Counsel

Attachments

JLHofflund/bjl

Copy to: Mails & Files
J. L. Hofflund
D. E. Moulds
Chroh.

500

FILE COPY
SURNAME:

Moulds
Talbert

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

June 6, 1952

Memorandum

To: Mr. John L. Hofflund

From: D. E. Moulds, Base Metals Division

Subject: Approval of subcontract to Contract Idm-E189

N.S
R+R

Attached hereto is a subcontract between R. S. McClintock and the Whitedelf Mining and Development Co. and a letter from Mr. A.E. Weissenborn relative thereto.

The contract appears to be in order from the cost and engineering basis and will expedite completion of this contract by placing this phase of the work in competent hands. To date the work has progressed slowly under Company crew and supervision. The cost as indicated in Mr. Weissenborn's letter will exceed the estimated cost by a maximum of $7 per foot. The total cost of the project will depend upon factors yet to be determined in the sinking and drifting and, therefore, an increase in the amount of the contract is not proposed at this time.

You will note that under Item 7 of the subcontract, the cost of necessary rehabilitation of the existing shaft (winze) is to be done on an actual cost-plus percentage basis. Previously two subcontracts were approved covering work of this nature in the definite amounts of $1500 and $1100 respectively. Consultation with Mr. Weissenborn and Mr. Reed of the Spokane Office indicated that rehabilitation of the winze to the safety standards of the Bureau of Mines has cost $11,343 up to May 1, 1952 with an additional $2,500 estimated expense in May. The cost of the work to be done under Item 7 of this subcontract is estimated at ~~$58,000~~ $6,800 including the 12½%.

The field team are preparing an amendment to cover the cost of rehabilitation in excess of the $12,000 stated in the exploration contract. This is necessary in view of Government's commitments to participate in extra costs to correct certain features of the winze to conform with USBM safety regulations.

It is the recommendation of this Division that the subcontract between R. S. McClintock and Whitedelf Mining and Development Co. be approved by the Region II Executive Officer subject to a maximum allowable amount of $6,000 for all expense under Item 7.

We are submitting this matter to you for consideration and necessary action.

DEMoulds (mef)

DEMoulds/mef
cc to: Docket
Mr. Moulds

Attachments

D. E. Moulds

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUN 2 1952

So. 157 Howard Street
Spokane 4, Washington

May 29, 1952

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

Re: Docket DMEA 255X
Contract Idm-E189, Lead
Whitedelf Mining and
Development Company

Dear Mr. Johnson:

In your letter of May 19, you expressed your approval in principal of the idea of attempting to bring the management of the Hope and Whitedelf mines together for the purpose of negotiating an agreement which would permit the exploration of Whitedelf ground through the Hope shaft and workings. We have had several conferences with the Whitedelf management and although there are a number of obvious technical advantages to the idea, there are also some other disadvantages and it has not been possible for the two companies to reach an agreement. Meanwhile the work has been nearly at a standstill, due to the inability of the Whitedelf Company to obtain competent shaftmen, according to Mr. Compton I. White, Sr. We have been much concerned and have urged the company to take some action, although the difficulty of obtaining skilled shaftmen is very real.

The Whitedelf Company has made an alternate proposal to enter into a firm contract with R. S. McClintock to sink the shaft. The contract price of $155 per foot compares favorably with the $165 per foot estimated in the DMEA exploration contract. Other expenses which must be borne by Whitedelf may bring the cost to as high as $172 ~~or~~ which still is not out of line with the $165 estimate. These extra costs will depend in part on ground conditions so no upward revision of the total amount of the DMEA contract is proposed at this time, although because expenses have been high to date some revision may be necessary. As a matter of fact, in previous correspondence this possibility had been discussed and it was agreed that the contract could be increased if necessary to insure its completion. It seems in our opinion that financially speaking the proposed sub-contract with McClintock will be a happy solution to a vexing problem.

Messrs Reed and Reno of the Bureau of Mines have carefully reviewed the proposed sub-contract in draft form and a number of the provisions in the final form, including the performance bond, were included at their suggestion.

R. S. McClintock is a well-known contractor in this area; we consider him competent and reliable and we therefore recommend that the sub-contract be approved.

It is within the authority of the Executive officer to approve sub-contracts, but in view of your letter of May 19, it was felt that I should phone Mr. Mittendorf on this matter. Mr. Mittendorf suggested that in view of some recent difficulties that had been encountered in a similar sub-contract for the Bullfrog (?) shaft that I submit the sub-contract for Washington approval to be sure that there would be no legal or fiscal difficulties. A copy is enclosed.

Work on the project is now nearly at a standstill. Inasmuch, as we have been pressing the company for more action, we request that the approval of the sub-contract be given urgent consideration and that we be advised by phone or wire so that work can begin. After all our efforts to produce action, we want to follow through and see the project begin to move.

Sincerely yours,

A. E. Weissenborn

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

Enclosure

CC: USBM, Spokane

50E COPY
SURNAME:

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

Moulds
Whitedelf

MAY 19 1952

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

Re: Docket No. DMEA 255X
Contract Idm-E189, Lead
Whitedelf Mining & Development Co.

Dear Mr. Weissenborn:

With reference to your memorandum of April 18, 1952, concerning the subject contract, the Hope shaft and workings was the initially recommended approach to the area of exploration. The use of the winze was approved only when access by the Hope shaft appeared unobtainable.

In view of the comparative advantages of safety, expediency and economy of the Hope shaft over the winze, as presented in Mr. Magill's memorandum of April 3, 1952 and, also, previously presented data, it appears that the possibility of an agreement to use the Hope facilities should be explored at the earliest possible opportunity. While the preparatory work connected with the winze has progressed very slowly and the expense has been moderate thus far, the method of accomplishing the proposed exploration should be definitely established in order to avoid any unnecessary expense to the Operator and to the Government.

The present conclusion of this office is that the Whitedelf management should be requested to initiate negotiations with the Hope people toward an agreement to use the Hope facilities. In event a satisfactory agreement is reached between the two parties and upon presentation of sufficient data, a new contract can, and should be, drawn to cover the expense incurred under the present contract and the new proposal. A new contract is recommended in view of the drastic changes indicated, which would render the present contractual arrangements obsolete.

The interest of the Operator and the Government in achieving the exploration objective of this project efficiently and expeditiously appears, in this instance, to require modification of the initial contract, and we, therefore, see no objection to alteration of the original plan when a definite proposal is presented.

APPROVED:

M. E. Hedges (HB)
Member, Bureau of Mines

D. M. Lemmon (HB)
Member, Geological Survey

Sincerely yours,

5/19

(signed) FRANK E. JOHNSON (HB)
Chairman, Operating Committee
Defense Minerals Exploration Administration

DEMoulds/hmj 5-15-52

CC to: Adm. Reading File, Docket File Copy, Operating Committee, Mr. Bishop, Mr. McKnight, Region II, Mr. Moulds

SUBORDINATION AGREEMENT

KNOW ALL MEN BY THESE PRESENTS:

WHEREAS, the undersigned is the owner of an undivided five (5) percent interest in the mineral rights on that certain property described as the [illegible] of SE[illegible] of Section 34, T. 56 N., R. 2 W., Boise Meridian, Bonner County, Idaho; and

WHEREAS, the Whitedelph Mining and Development Company, the owner of the other ninety-five (95) percent interest in said property proposes to enter into an Exploration Project Contract with the United States of America providing for Government interest in the conduct of exploration for minerals upon the said property;

NOW, THEREFORE, the undersigned does by these presents subordinate all of his right, title, and interest in and to said property to all rights of the United States which shall arise as a result of such Exploration Project 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 _____ day of _____, 195___.

_____

Compton I. White

_____

Josephine S. White

IN REPLY REFER TO:

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

May 9, 1952
Re: DMA-255X
Whitedelf Mining and Development Company
Bonner County, Idaho
Contract Idm-E189
$120,250
Lead

Memorandum

To: Mr. D. E. Moulds

From: Edwin T. McKnight

Subject: Field team recommendation on radical revision of subject ~~docket.~~ contract.

The field team is suggesting that DMEA consider the possibility of abandoning the present contract in view of the difficulties encountered and small progress made to date, and entering into a new contract for performing essentially the same exploration from an extension of workings in the Hope mine. The details of working out a deal with the Hope mine would have to be left with the Whitedelf Company and a workable plan between the 2 companies may not be feasible. The field team raises the question as to whether DMEA would approve such a radical change which should be decided in advance of any negotiations between the 2 companies.

At the time of the original field team report, the preferred recommendation was that the exploration on the Whitedelf be done through the Hope workings. At that time, the Whitedelf management was very much opposed to any such plan. The application came in during the last few days of Otto Herres tenure as Chief of the Lead-Zinc Branch of DMA. He had pretty much decided that, in view of the fact that the Whitedelf proposition was only moderately promising as an exploration project, DMA should give the Whitedelf Company the privlege of negotiating a deal with the Hope mine, in which case DMA would go along with the proposed exploration. If such a deal could not be made, he felt that the Whitedelf proposal should be denied.

The negotiation with the Whitedelf Company on this docket fell to Mr. Herres' successor and the final solution was essentially a recommendation for approval of the applicant's original proposal whose imperfections had been previously pointed out by the field team.

The decision to be made in answer to the current field team proposal of April 18, 1952, involves a mining procedure rather than any question of geology or reserves. However, I am in complete agreement with this field team memorandum. A proposal could be worked out with the Hope Mining Company that would allow exploration of essentially the same target but under much more favorable mining conditions and,

therefore, as pointed out by the field team, at a much lower cost.

E. T. McKnight

E. T. McKnight
Geologist

FFICE OF THE ADMINISTRATOR

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS ADMINISTRATION

WASHINGTON 25, D. C.

1201 No. Division
Spokane, Washington

May 1, 1952

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 8 1952

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

Dear Sir:

Enclosed are the original and two copies of an approval for a subcontract granted by the Executive Officer, DMEA, Region II, to the Whitedelf Mining and Development Company, Clarks Fork, Idaho, Exploration Project Contract Idm-E189.

It will be noted from perusal of the Whitedelf contract that a similar approval for a subcontract between the Whitedelf Company and Mr. Ivor Anderson dated January 15, 1952, is already in effect. That contract was for a certain amount of timbering to be done at the head-frame of the winze above the adit level, whereas the present subcontract is for a certain amount of repair and rehabilitation work from the collar of the winze downward, and also for some additional work.

Sincerely yours,

M. E. Volin
Acting Executive Officer
DMEA Field Team, Region II

Enclosures

cc: USGS

500
FILE COPY
SURNAME:

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

April 25, 1952

Memorandum

To: Frank E. Johnson

From: D. E. Moulds

Subject: Whitedelf Mining & Development Co., Contract Idm-E189
Docket DMA 255 Amendment No. 1.

The item "auditing - $100.00 per month seems to be a rather loose term. Undoubtedly this is an office expense or bookkeeping service. The contract does not provide for any such expense, and in view of the magnitude of the project, appears reasonable. The pump and ratchet hoist are also reasonable items.

The Amendment No. 1 is, therefore, approved but possibly the term "auditing" should be avoided in other cases.

D. E. Moulds EPJ.

D. E. Moulds

DEMoulds/hmj
4-25-52
CC to: Adm. Reading File
Docket File Copy
Mr. Moulds

OFFICE OF THE ADMINISTRATOR

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS ADMINISTRATION

WASHINGTON 25, D. C.

1201 N. Division St.
Spokane 4, Wash.
April 18, 1952

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
APR 28 1952

MEMORANDUM

To: Chairman, Operating Committee, DMEA, Washington, D. C.

From: DMEA Field Team, Region II

Subject: Whitedelf Mining & Development Co., Docket No. DMA 255X, (lead), Contract Idm-E189, Bonner County, Idaho

Attached is a memorandum from E. A. Magill, Bureau of Mines, referring to the subject exploration contract and reviewing the aspects of reaching the objective through the shaft of the adjacent Hope mine. An attached copy of a letter from Mr. John R. Reynolds, mining engineer of Kellogg, Idaho, gives additional information on the Hope shaft and the possibility of performing the Whitedelf exploration through it.

The Field Team's letter of June 29, 1951, in discussing the original application for the Whitedelf exploration project mentioned the alternative of utilizing the workings of the Hope mine to reach the objective, and pointed out that there would be many advantages in exploring and also operating the Whitedelf and Hope properties as one unit. This alternative was discussed at length with the applicant at the time the application was submitted but it did not seem attractive to him.

You have copies of routine Field Team examination reports describing the progress under Contract Idm-E189. The latest report dated March 18, 1952, by E. A. Magill, aptly describes in the last paragraph the present status as follows:

"Attention is brought to the fact that the contract has been in effect for almost five months with only a very small portion of the work being partially completed. At the present rate it will take over twice the twelve months allowed in the contract for completion. The operator still does not have a clear, well-developed plan for rehabilitation of the winze and other work to be done."

At this time it is not too late to reconsider the use of the Hope shaft for reaching the Whitedelf exploration target. As shown by estimated costs in Mr. Magill's memorandum of April 3, 1952,

Reviewed by
DMEA OPERATING COMMITTEE

5-7-52
(date)

the Hope shaft offers the most practicable, lowest cost approach. The Field Team reiterates its statement in a memorandum to you dated January 25, 1952, that rehabilitation of the Whitedelf winze and deepening of it to provide an effective working entry is an undertaking of doubtful success.

The matter has been discussed informally with Compton I. White, Jr., and he agrees that there are a number of technical advantages to the use of the Hope shaft. He has some objection on other grounds but has expressed his willingness to undertake exploratory conversations with the Hope people. Mr. White must on his own volition reach a satisfactory agreement with the Hope people, and the Field Team must avoid even any appearance of forcing him into an agreement against his will. The Field Team would, however, recommend the plan on a technical basis, and on the assumption that an agreement mutually satisfactory to the Whitedelf and the Hope people can be reached. The purpose of this memorandum is to advise you of the situation and to ask informally if you would approve a change which involves a drastic alteration of the original plan but still retains the objective of the exploration. Unless you approve in principle there seems little point in further discussion between the two companies.

By Field Team, Region II

A. E. Weissenborn

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

M E Volin

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

Enclosure

cc: USGS, Spokane

M. E. Volin, Member, DMEA Field Team, Reg. II April 3, 1952

E. A. Magill, Mining Engineer, Bu eau of Mines

Exploration of Whitedelf Mine, Bonner County, Idaho, by use of Hope Lead-Silver Mine workings.

A letter from Mr. John R. Reynolds dated March 31, 1952, (copy attached) has again brought up the question of exploring the Whitedelf North oreshoot from the Hope workings.

At present the Whitedelf company has an exploration project in the amount of $120,250 to rehabilitate their winze, sink it an additional 400 feet, drift northeasterly 900 feet to intersect the North oreshoot and drift 200 feet southwesterly to intersect the Daugherty oreshoot; the North oreshoot being the principal target.

As brought out in Mr. Reynold's letter, it is possible to reach the North oreshoot through the Hope mine. From the maps which we have available, it appears that this would take about 900 feet of crosscutting from the Red vein drift to intersect the North oreshoot. However, what appears to be more feasible from an exploration standpoint is to drift on the Pearl vein from the Hope workings, suggested as one of the alternatives in the Examining Team's memo of June 28, 1951, to DMA Field Teams, Region II. To continue this drift through the downward projection of the North oreshoot would entail about 1,600 feet of drifting. This drift would intersect the ore body 45 feet vertically above the proposed drift from the Whitedelf winze. A cost comparison of the different alternatives is as follows:

1.	Crosscut from Red vein 900 feet at $35 per foot	$31,500
	Drift 300 feet on North oreshoot at $35 per foot	10,500
		$42,000
2.	Drift on Pearl vein 1,600 ft. at $35/ft	$56,000
3.	Present Whitedelf Exploration Contract	$120,250

Alternatives 1 and 2 would achieve the same results as far as the exploration of the North oreshoot is concerned, with the possibility of Alternative 2 developing unknown oreshoots on the Pearl structure. The only advantage of Alternative 3 is the 200 feet of exploration on the extension of the Daugherty oreshoot and the fact that the intersection on the North oreshoot would be 45 feet lower in elevation. In other words, it is costing $64,250 for 45 feet of depth on the North oreshoot.

This 45 feet is estimated to contain approximately 2,500 tons of ore with a value of $33 per ton at present price, giving a gross valuation of $82,500 (using figures given in report on Hope and Whitedalf mines, June 8, 1950, by John R. Reynolds)

It is obvious that from an economic standpoint it would be much more feasible to explore the Whitedalf North oreshoot from the Hope workings. The Hope mine is well equipped with an excellent 2½-compartment vertical shaft. The Whitedalf inclined winze is small, crooked, and will never provide an efficient working entry. Any future mining operations could be carried on much more efficiently and economically through the Hope workings.

E. A. Magill

Orig. to files
cc: U.S.G.S.
2 Washington
1 Albany
1 EAM

106 SIDNEY BUILDING

PHONES: OFFICE 508: RES. 700-W-1

PRESTON AND REYNOLDS

MINE ENGINEERING & GEOLOGICAL SERVICE

P. O. BOX 622

KELLOGG, IDAHO

March 31, 1952

Mr. A. E. Weissenborn
U.S. Geological Survey
Spokane, Washington

Mr. M. F. Volin
U.S. Bureau of Mines
Spokane, Washington

Gentlemen:

I spent two days at the Hope Mine, near Clark Fork, Idaho, last week and while there I caught up the surveying todate. I am enclosing a pencil overlay showing the results of this survey so that you can post the data on your maps.

In going over the maps today I notice that the Red vein is striking a little more to the south than I had originally projected it. This will shorten the distance to the Pugh-Norquist fault a little and also decrease the length of the Red vein in Whitedelf ground. It is also interesting to note that from the Red vein intersection with the Pugh-Norquist fault it is only about 800 feet to the downward projection of the Whitedelf orebody, approximately 350 feet vertically below the Whitedelf 400 level. It would seem a lot more practical to cross-cut 800 feet than to sink the Whitedlf incline shaft down through the Pugh fault, if Mr. White could only be made to see the light.

We are diamond drilling from near the 700 shaft station in order to find out if the Red vein crosses the dike before we go ahead with any deep drilling.

Very truly yours,

John R. Reynolds

OFFICE OF THE ADMINISTRATOR

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

So. 157 Howard Street
Spokane 4, Washington

April 16, 1952

APR 18 1952

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

Re: Contract Idm-E189
Whitedelf Mining & Development Co.
Bonner County, Idaho

Dear Sir:

Enclosed are three copies of Amendment No. 1 to the subject contract. This amendment is concerned with changes in operating equipment to be purchased and labor and classification.

Sincerely yours,

K. N. Gray
Kathryn Gray
For: A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region II

Enclosures.

OFFICE OF THE ADMINISTRATOR

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

So. 157 Howard Street
Spokane 4, Washington

April 7, 1952

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
APR 10 1952

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

955

Re: Contract Idm-E189
Whitedelf Mining and Development Co.
Bonner County, Idaho

Dear Sir:

Enclosed are three copies of an approval given to the Whitedelf Mining and Development Company under the subject contract to furnish the timber required in the contract.

Sincerely yours,

Kathryn Gray
For: A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region II

Enclosures.

RECEIVED
APR 16 1952
GENERAL COUNSEL
DEFENSE MINERALS
ADMINISTRATION

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
233 Federal Office Building
Seattle 4, Washington

Region II
Health and Safety Division

February 25, 1952

Mr. J. J. Forbes, Director
U. S. Bureau of Mines
New Interior Building
Washington 25, D. C.

Dear Mr. Forbes:

Please refer to the safety inspection report on the Whitedelf mine, Whitedelf Mining and Development Company, Clark Fork, Idaho, by Mr. Yopes and the undersigned, which was forwarded to you last week. This report and inspection was made at your request mainly for the purpose of determining if the hoist installation was adequate.

The attached copy of letter from the Coeur d'Alene Hardware & Foundry Co., Wallace, Idaho, contains additional information regarding the hoisting installation at the Whitedelf mine, which may be of interest.

Very truly yours,

L. H. McGuire

L. H. McGuire

encl.
cc - Mr. Fene
Mr. Ash
Mr. Shelton, Region II
Mr. Volin, Spokane, Wash.

MAR 3 10 15 AM '52

BUREAU OF MINES
MAIL ROOM
WASHINGTON, D.C.

O
P
Y

COEUR D'ALENE HARDWARE & FOUNDRY CO.
Box 969
Wallace, Idaho

February 20, 1952

Mr. L. H. McGuire
U. S. Bureau of Mines
233 Federal Office Building
Seattle 4, Washington

Dear Mr. McGuire:

As requested in your telephone conversation with our Mr. L. A. James last Monday, we wish to discuss the Whitedelf hoisting problem as follows:

At the time of supplying your present 21 cu. ft. skip, our organization probably did not know that the Whitedelf shaft has two different angles of incline. Otherwise the upper guide shoe would not have been placed at middle of skip.

One or more upper rope sheaves are of course necessary where shaft changes incline, and there would be interference between these and any middle guide.

As we visualize the operation, upper guide wheels would come into action principally in making this turn, and otherwise would serve only as safety guards in the 70-degree portion to prevent accidental derailment. For such a purpose we would recommend a simple 1-1/2" square axle bolted across top of skip body and provided with plain bored cast iron wheel 6" to 7-1/2" in diameter, held on by cotters and washers. Endwise of skip this pair of wheels would be located about midway between the track trucks, and would engage two timber guides about 3-1/2" thick.

Price of such a pair of guide wheels and axle would be about $45.00 f.o.b., Wallace.

Regarding the 40 hp. "Junior" hoist, it is perfectly feasible to swing the motor around 180 degrees and mount it on a base to the right of operator. However, in this case it would be necessary for us to supply a new pinion with bore tapered from end opposite to standard. Price for new pinion would be $85.00 f.o.b., Wallace. However, we are unable to promise a definite delivery date. We have a stock of pinions on order but can hardly expect delivery from gear manufacturers before June 1, perhaps later.

The right hand drum flange (next to brake) is at present 4" deep and the left hand one 3" deep. They could be made higher by bolting on steel plate flanges. At the right the plate would have to be bolted on drum side, but at the left could be attached outside of present flange. According to the Idaho regulations 2" flange projection above last layer of rope is sufficient for hoisting men.

Yours very truly,
COEUR D'ALENE HDWE. & FDRY. CO.
/s/ H. G. Coulson
Chief Engineer

HGCoulson:mb

RECEIVED
MAR 3- [illegible]
BUREAU OF MINES,
Office of Director.

FILE COPY
SURNAME:

1(a)

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

Memorandum

February 14, 1952

To: Mr. D. E. Maulds
Acting Chief, Base Metals Division

From: C. O. Mittenderf
Acting Administrator

Subject: Whitedelf Mining and Developing Company - DMA-255, Idm-K109 (Lead). Weissenborn memorandum dated January 25, 1952.

Following our discussion of this case I took up the matter with Hoffland and the Operating Committee to determine what course of action we should support. Although all of us felt that the Government had the right, under the terms of the exploration contract, to terminate the project, it was our unanimous opinion that we should not take such steps without first informing the company in detail exactly what operating conditions must be corrected in order to avoid the termination of their contract. It was thought best to serve such a notice on the operator and to inform him that, provided corrections were not made within a stated period, the contract would then be terminated. The members of the Operating Committee and I recognized that the Field Team was in a tight spot and deserved all the support we could give. We agreed that a good solution would be to have a safety engineer of the Bureau of Mines make an inspection of the Whitedelf Mine in the company of a mining engineer attached to the Regional Office.

I discussed the case with Jack Forbes, Director of the Bureau of Mines, and he offered to cooperate to any extent possible. He immediately phoned his Regional Chief at Albany, Oregon, and gave instructions for Mr. McGuire, safety engineer stationed at Seattle, Washington, to contact Mr. Weissenborn at Spokane and to proceed with an investigation of the mine at the earliest convenience of Mr. Weissenborn.

I informed Mr. Weissenborn by telephone, and he appeared quite pleased with the arrangement. I asked Al if he wished me to write the operator directly, to advise him of the complaints which had been received and of the impending inspection. Al did not favor such a course of action at this time. During our conversation we both recognized the possibility of having to approve additional sums of money in order to carry on the project in a workmanlike manner. Al stated that he might be faced with the situation where it would be more practicable to terminate the present project for deepening the existing winze in favor of an alternate project which would entail the use of an adjoining mine shaft. At this point we shall sit tight until we receive the recommendations of the inspection team.

C. O. Mittenderf (for)

S.H. 2-18-52

COMittenderf/fw
cc: Operating Committee
Mr. Weissenborn
Admr. Reading File
Mr. Bishop
Mr. McKnight
Docket file

OK

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 2 0 1952
Dmea 255
Lead.

January 25, 1952

Reviewed by
DMEA OPERATING COMMITTEE
2-1-52
(date)

MEMORANDUM

To: Operating Committee, DMEA, Washington 25, D. C.

From: Field Team, Region II

Subject: Whitedelf Mining and Developing Co., Bonner County, Idaho
DMEA Idm-E 189

Routine progress examination reports, four copies attached, of the subject exploration project by E. A. Magill of the Bureau of Mines, point out certain problems that have been thoroughly discussed by the Field Team and considered to be of such importance as to require your attention.

Review of the Field Team letter, dated June 29, 1951, transmitting the application for the subject exploration contract, will show that we were cognizant of the unusual problems involved and critical of the quality of management. The Examining Teams memorandum of June 28, 1951, estimated that at least $20,000, and possibly as much as $25,000 would have to be expended to rehabilitate the existing 400 feet of winze necessary for access to perform the proposed exploration. The Field Team therefore recommended that if a contract be let, the old winze should be abandoned and a new shaft sunk. The contract,as prepared in the Washington office after a visit there by Compton I. White, Sr., provided for deepening the old winze and allowed only $12,000 for its rehabilitation.

Mr. Magill's two memoranda clearly outline and discuss the problems that have come up and the way the project work is developing. The most fundamental problem is lack of intelligent planning. Adequate assistance in this respect by the Field Team would be too much of an undertaking and besides, it is doubtful that the operators would take our advice. Rehabilitation of the winze as an effective working entry is, even with good technical direction, an undertaking, the success of which is in doubt. With the present attitude of the operators toward efficient planning, failure seems a certainty along with resulting waste of Government funds.

Safety conditions will become of great importance as the work progresses. The Field Team has considered calling in the Idaho State Mining Inspector on this matter, but for various reasons believes that such a move would be ineffective. Calling in the Bureau of Mines Health and Safety group would provide valuable advice, but would give no assurance that recommendations would be carried out. Later on, it is entirely possible that the Field Team will have to take the position that the mine is not safe enough for examining engineers and geologists to enter, thus preventing further routine checks of progress under the contract.

Possibly the best recommendation in this matter is to terminate the contract on the basis of incompetent performance. This course certainly would have political reverberations. An alternative will be to require competent technical planning and direction, but this may not have much effect unless enough money is made available to do a good job on the rehabilitation of the winze. Furthermore, there is no assurance that the operator would accept competent advice even if he hired a competent engineer. As stated above, even with competent direction and additional funds, an effective working entry cannot be guaranteed. A third alternative would be to return to the Field Teams' original recommendation to sink a new winze, which would, of course, require additional funds, and would also require proper technical supervision.

We think it only fair to point out that the rehabilitation of the winze, which is the principal cause of our present trouble, is contrary to the Field Teams' specific recommendation. Cancellation of the contract will certainly bring a storm around our heads--and around the DMEA also, which will be increased because we may also have to cancel Mr. White's Clarinda contract on the basis of the discouraging showings of the first stages of the work. Because most of the trouble is not of our own making, we are very anxious to have the Washington organization share the responsibility in this matter and are passing it to you for your advice and decision. A prompt reply is requested inasmuch as the situation is not improving rapidly.

By DMEA Field Team, Region II

A. E. Weissenborn

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

M. E. Volin

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

Enclosures
cc: USBM, Spokane
USBM, Albany

To: M. E. Volin, Member, DMEA Field Team, Reg. II Jan. 21, 1952

From: E. A. Magill, Mining Engineer, Bureau of Mines

Subject: Progress examination of Whitedelf Mine, Bonner County, Idaho, under exploration project contract Idm-E189.

A visit was made to the subject property on January 16, 1952, to discuss some of the deficiencies and problems noted in the examination of January 12.

The problems which are listed in my memo of January 14 were discussed with Compton White and Compton White, Jr. Their present plans for the problems listed in the January 14 memo are:

1. "No safety provisions for skip as required by Idaho law."

   They plan on putting in guides on either side of the winze with spring activated clutches to act in case of rope failure.

2. "No provision made for automatic chair to catch skip in case of overwind."

   They maintain that very few shafts or winzes are provided with such safety devices although Idaho law requires them.

   It was pointed out to them that their installation should be able to pass inspection by the State Mine Inspector.

3. "No provisions are being made to attempt to realign the winze in order to reduce the number of idlers now necessary to prevent the cable from cutting the timbers."

   Their present plans call for no realignment; they plan on using rubber covered idlers to cut down wear. They agreed to relocate their head sheave so that there would be no idlers above the collar of the winze (see attached sketch).

4. "It is questionable whether present hoist is large enough for depth of winze proposed."

   They intend to use their present hoist. In order to wind sufficient cable it will be necessary to build up the flanges on the hoist drum. The hoist is equipped with no special safety devices. There is a hand-operated brake on the drum and a hand operated brake on an extension shaft from the motor.

Subject: Progress examination of Whitedelf Mine, Bonner County, Idaho, under exploration project contract Idm-E189

5. "Computations have not been made to determine proper sheave wheel or cable diameter."

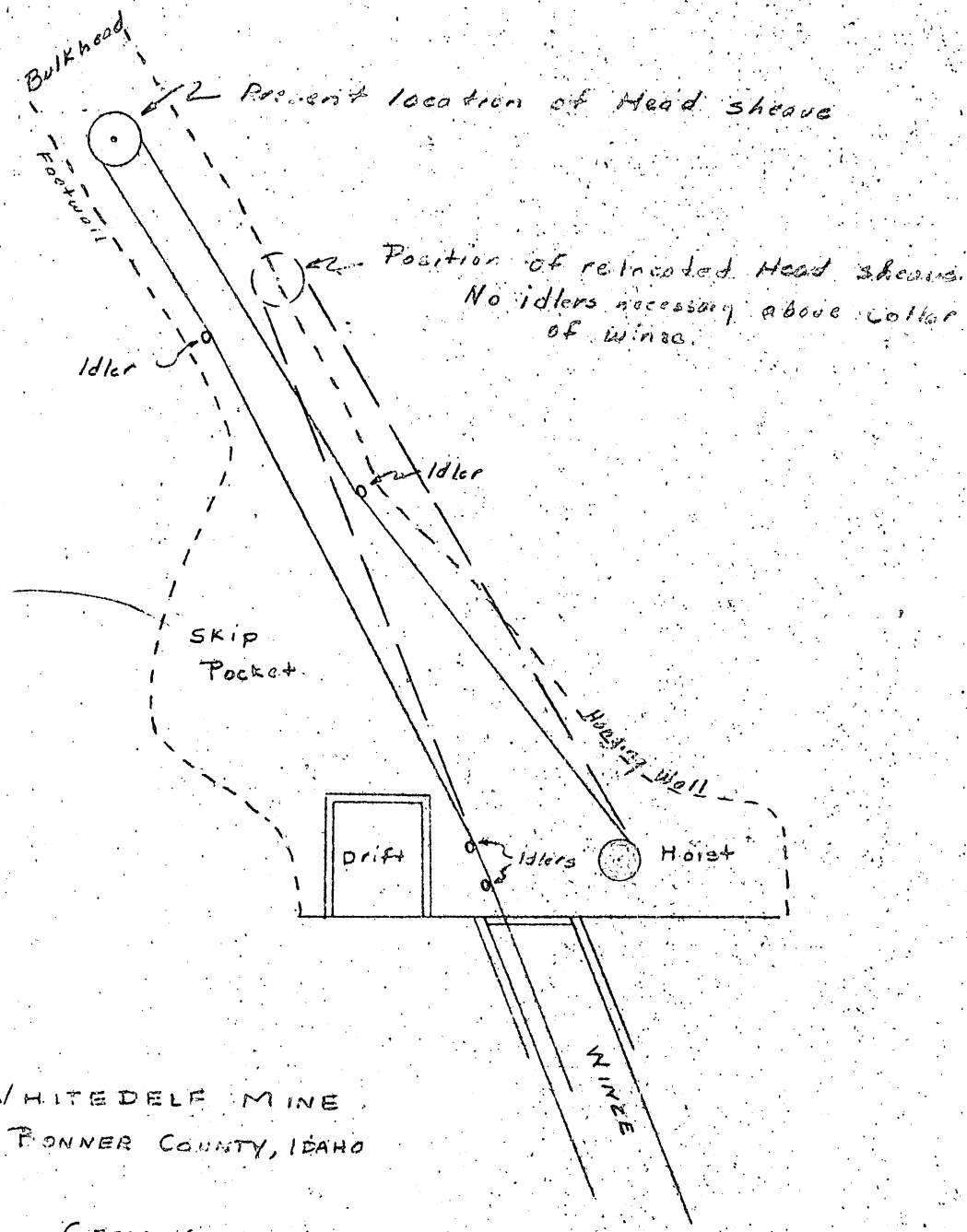
The operators propose to regroove the present sheave wheel. They were advised that 3/4" cable (size now on drum) was the minimum size that would meet safety standards.

It is evident from talking to the operators that their intentions are to meet problems as they arise rather than attempt to work out a detailed plan before commencing the job. When suggestions are made to the operators for improving the installation and present winze they maintain that insufficient money ($12,000) has been allotted for its rehabilitation. In the memorandum, dated June 28, 1951, from the examining team to the DMA Field Team, Region II, I quote from page 3:

> "To the applicant's proposed program and costs must be added an additional $20,000 to $25,000 for rehabilitation of the present 400 feet of incline shaft (winze) . . .The present inclined winze is crooked, small, and would take extensive rehabilitation. It is doubtful even after rehabilitation that it would allow an efficient operation to be carried out through it."

E. A. Magill

cc: USGS, Spokane



WHITEDELF MINE
BONNER COUNTY, IDAHO

CROSS-SECTION
OF
HOIST INSTALLATION
Scale 1" = 10'

EAM Jan 17, 1952

E-1750

MF-500

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

REFERENCE SLIP

DATE 2-4-52

REFERRED TO:

1. CODE 500-RM. 2614
2.
3.
4.

FOR: See Forbes

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

McGuire

REMARKS:

Cite what is defective — give notice & cancel if non compliey.

Check (X) before the items needing attention.

Adams (AA)
Initials of sender.

GPO 16—63815-1

Lones McGuire

223 Fed Office Bldg

Seattle 4

Wash

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

Re: Docket No. DMA 255X
Exploration Project Contract
Idm-E189
Whitedelph Mining & Development Co.
Clark Fork, Idaho

Gentlemen:

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

Also, enclosed for your information is a copy of letter from the Reconstruction Finance Corporation to this office relative to the subject project.

Sincerely yours,

C. O. Mittendorf, Director
Production Expansion Division

Enclosure-2

DEMoulds/meh
11/20/51
cc to: Acting Administrator
Reports and Records
Messrs. Mittendorf, Olund
Mr. Moulds
Docket

OFFICE OF THE ADMINISTRATOR

DEFENSE MINERALS ADMINISTRATION
DEPARTMENT OF THE INTERIOR
WASHINGTON, D. C.
NOV 15 AM '51

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

DEPARTMENT OF THE INTERIOR
RECEIVED
NOV 20 1951
Defense Minerals Administration,
Production Expansion Division.

So. 157 Howard Street
Spokane 4, Washington

November 15, 1951

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

Re: Docket DMA 255x
Contract Idm-E189

Dear Mr. Mittendorf:

Enclosed are the original and three signed copies of a modified subordination agreement signed by Compton I. White, Sr., applicant for the Whitedelf Mining and Development Company, Contract Idm-E189. One copy of the agreement was retained by the applicant and one by this office.

These copies of the subordination agreement are being returned to your office as per your letter of October 26.

Sincerely,

Thor H. Kiilsgaard
for A. E. Weissenborn
Executive Officer, DMA
Field Team, Region II

Enclosures as indicated.

cc: USBM, Spokane

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 Bonner, State of Idaho, described in a certain Exploration Project Contract dated _____, 195__, between WHITEDELF MINING & DEVELOPMENT COMPANY, the Lessee of said property, and the United States of America;

NOW, THEREFORE, the undersigned, as Lessor of said property under lease dated _____, 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 25 day of JULY, 1951.

Compton I White

U. S. GOVERNMENT PRINTING OFFICE 16—64582-1

DEPOSIT AGREEMENT

This Agreement is executed by the undersigned, herein called "Borrower", and delivered to Reconstruction Finance Corporation, herein called "RFC", as part of the consideration and security for a second loan of not to exceed $30,000, by RFC to Borrower, to aid Borrower to develop certain mining property described in an Instrument of Security and Chattel Mortgage executed by Borrower and delivered herewith, and is executed by the undersigned Bank, herein called "Depositary", in consideration of the deposit with it of the moneys from time to time.

1. Borrower agrees that the proceeds of said loan, and of operation of said mining property, including all receipts for ores and minerals or other products sold, shall be deposited in said Depositary in a special demand trust deposit, designated "Whitedelf Mining and Development Company-RFC Account", and subject to withdrawal in the manner and only in the manner herein provided.

2. The Depositary is authorized and instructed to honor checks or drafts drawn against said Account: (a) by Borrower in amounts and payable to parties specified in requisitions presented by Borrower, bearing or accompanied by written approval of the Chief, or Acting Chief, Self-Liquidating Division of RFC (herein called "Division Chief"), by a Supervising Engineer of RFC or by a representative of RFC designated by the Division Chief; (b) by said Depositary in amounts and payable to parties specified in written instructions of the Division Chief in the event Borrower neglects or refuses to present such checks or drafts and/or requisitions and the Division Chief certifies to said Depositary that in his opinion it is necessary or desirable to make payment of specified expenses or obligations in connection with the project, including payment of principal and interest on the loan; (c) by said Depositary for the full amount payable to such parties or in such manner as the Division Chief shall direct, upon receiving a written statement from the Division Chief that in his opinion the development work theretofore performed by Borrower on said project is not accomplishing and further development work is not likely to accomplish the purposes for which said loan was authorized, and the Division Chief may thereupon require Borrower to turn over to RFC all equipment purchased with loan funds.

3. The Depositary agrees (a) to accept said proceeds from time to time, place them in said Account, and disburse them only in accordance with this Agreement; (b) to notify RFC immediately of any proceedings to which the Depositary is a party, which attempts to subject said Account to any other purpose or dispose of it in any other manner than herein provided, and (c) to render a detailed report, by the 10th day of each month, of all transactions for the preceding calendar month concerning said Account, said report to be in duplicate, one copy to be mailed to Supervising Engineer and one copy to Division Chief.

4. Further assurances will be given by Borrower or Depositary as may be requested by RFC from time to time.

This Agreement shall bind the respective parties and their successors and assigns, and may not be modified or rescinded without the written consent of the Division Chief.

IN WITNESS WHEREOF, the undersigned have executed this Agreement this 16 day of July, 1943.

(SEAL) WHITEDELF MINING AND DEVELOPMENT COMPANY

ATTEST: /s/ Josephine C. White, Secretary

By /s/ Compton White, Vice President

(SEAL) THE BONNER COUNTY NATIONAL BANK OF SANDPOINT

ATTEST: /s/ H. Reeves Cashier

By /s/ W. W. Von Canon, Pres

EXHIBIT "C"

Mr. Thomas

NS WA CP /E-GS-C/

SPOKANE 11-7-51 403

FRANK E. JOHNSON

ACTING ADMINISTRATOR

PRODUCTION EXPANSION DIVISION

DEFENSE MINERALS ADMIN

DEPT. INTERIOR

WA /25/

GENERAL SERVICES ADM.
PUBLIC BLDGS. SERVICE
BMD - COMMUNICATIONS

REURLET OCTOBER 26 ON WHITEDELFT MINE, DMA DOCKET 255X. WHITE HAS NOT RECEIVED THE 7 COPIES OF SUBORDINATION AGREEMENT. SUGGEST THEY WERE LOST IN TRANSIT. PLEASE ADVISE.

THOR H. KIILSGAARD

FOR - A E WEISSENBORN

EXECUTIVE OFFICER, DMA FIELD TEAM, REGION II

CORRN - FIFTH WD FIRST LINE SHD BE WHITEDELF, RPT WHITEDELF

26 255X 7

EC 405

Thor H. Kiilsgaard 11/8/51
dictated subordination agreement.

FILE COPY
SURNAME:

390

Johnson
McKnight
Bishop

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

NOV 7 1951

DMA-255
Whitedell [illegible]
Clearwater, Idaho

Hon. [illegible] Sabath
House of Representatives
Washington, D. C.

My dear Mr. Sabath:

Your letter of October 31, 1951 addressed to Mr. Otto Herres, Chief, Lode-Mine Branch regarding the subject application has been brought to my attention. Mr. Herres is no longer connected with Defense Minerals Administration, having resigned in order to return to his former duties with the Combined Metals Reduction Company.

From inquiry I find the current status of this application as follows: A contract has been drawn and sent to Mr. A. A. Weissenborn, Executive Officer, Region II, with instructions that it be executed by the parties concerned.

If there is anything further I can do for you in this matter, please let me know.

Sincerely yours,

(signed) FRANK E. JOHNSON (for)

Acting Administrator

S.F. 11-7

G.E.JOHNSON:ks
11/5/51

cc: Administrator
Docket File DMA-255
2 copies to Mr. Weissenborn Region II
Bishop
McKnight
G.E.Johnson

FILE COPY
SURNAME:
400

Moulds
Johnson

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

NOV 6 1951

Mr. Compton I. White, Sr.
c/o Whitedelph Mining & Development Co.
Clark Fork, Idaho

Re: Docket No. DMA/255X
Whitedelph Mine

Dear Mr. White:

Please find herewith seven copies of a subordination agreement which are required to cover the 5% excluded interest in the property deeded to the Whitedelph Mining and Development Company.

Kindly sign six copies and forward to Mr. A. E. Weissenborn, Executive Officer, Region II, South 157 Howard Street, Spokane 8, Washington.

The approved contract which you signed while in Washington bearing effective date of October 19, 1951 has been forwarded to Mr. Weissenborn who will present the contract to the Company and any necessary instructions as soon as the subject subordination agreements are attached.

Sincerely yours,

11/6
(fw)

(signed) FRANK E. JOHNSON

Acting Director
Production Expansion Division

Enclosures-7
DMMoulds/meh 10/19/51
cc to: Adm. Reading File
Mr. Mittendorf, Olund
Reports and Records
Mr. Moulds
Mr. Billings
Mr. McKnight
Mr. Mote
Region II (2)
Docket

EIGHTY-SECOND CONGRESS

A. J. SABATH, ILL., CHAIRMAN

E. E. COX, GA.
HOWARD W. SMITH, VA.
WILLIAM M. COLMER, MISS.
RAY J. MADDEN, IND.
JOHN E. LYLE, JR., TEX.
JAMES J. DELANEY, N. Y.
HUGH B. MITCHELL, WASH.

LEO E. ALLEN, ILL.
CLARENCE J. BROWN, OHIO
HARRIS ELLSWORTH, ORE.
HENRY J. LATHAM, N. Y.

House of Representatives, U. S.
Committee on Rules
Washington, D. C.

10 South LaSalle St.
Chicago, Illinois

Oct. 30, 1951.

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

Re: IMA-255X
Whitedelf Mine
Clarks Fork, Idaho

Dear Mr. Herres:

I wrote you in June relative to the Whitedelf Mining Co. which is controled by my ex-colleague, Compton I. White.

In reply to my inquiry you stated that the Bureau of Mines had been requested to give you a report on the property and that as soon as the report is received, prompt action would be taken on the application.

I will greatly appreciate if you will let me know what the investigation has shown and what, if anything is being done to aid Mr. White. Mr. White has the utmost confidence in his mine but needs additional funds to proceed with deepening the shaft in order to reach what he maintains is the heart of the lead and silver deposits.

I hope I will hear from you shortly with the information I seek.

Sincerely yours,

A. J. Sabath

A. J. Sabath, M/C.

AJS:E.

OCT 31 1951

FILE COPY
SURNAME:

400

Moulds
Johnson
A Mason

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

OCT 26 1951

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

Re: Docket No. DMA 255X
Contract Idm - E 189
Whitedelph Mining & Development Co.

Dear Mr. Weissenborn:

Enclosed please find two copies of the subject exploration project which have been signed by Mr. Compton I. White, Sr. for the Company and by this office for the Government, with effective date and register number shown.

The certification of ownership of the S½ of the NE¼ by Compton I. White shows that he has excluded 5 percent of the mineral rights which has been ruled as requiring a subordination. We have sent Mr. White the forms to be signed as per enclosed copy of the letter.

We are sending you the contracts for the operator and your files so as to expedite delivery of the contract upon receipt of subordination and also any instructions you may desire to give to the company.

Return the other four copies of the subordination, and the copy of the contract requested by the Regional Finance Office will then be sent directly by the Washington Finance Section.

Sincerely yours,

(signed) FRANK E. JOHNSON (for) F.J. 10-26

Acting Director
Production Expansion Division

Enclosures - 2

APPROVED: SIGNED

Chairman, Coordinating Committee

Member, Bureau of Mines

Member, Geological Survey

DEMoulds/hmj
Typed 10-19-51
cc to: Reports and Records
Adm. Reading File
Mr. Mittendorf, Olund
Mr. Moon
Mr. Moulds
Mr. Billings
Mr. Mote
Mr. McKnight
Docket
Region II

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

October 18, 1951

Memorandum

To: Director, Production Expansion Division

From: General Counsel

Subject: Whitedelph Mining and Development.Co., exploration contract -- Docket No. DMA-255X

We are unable to approve the proposed exploration contract in this case, submitted to us on October 12, 1951, for the following reasons:

1. The description of the property in Article 2 indicates that applicant is the owner of the entire interest in the S½ of the property but the certificate accompanying the proposed contract states that Compton I. White owns 5% of the mineral rights in this tract.

See letter re White

2. There is no subordination agreement from White covering the foregoing interest.

We note in the file the letter of October 12, 1951 from RFC stating that it will approve requisitions covering payment of royalties due under the exploration contract out of the account into which all proceeds of operation of the property are now paid.

Your file is returned herewith.

J. L. Hofflund
General Counsel

Attachment

RECONSTRUCTION FINANCE CORPORATION

VIA SPECIAL MESSENGER

WASHINGTON 25, D. C.

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

Dear Mr. Mittendorf:

In your letter of October 5, 1951, you indicate that Defense Minerals Administration has under consideration approval of an Exploration Project Contract in the total sum of $120,250 in connection with the development of mining property operated by Whitedelf Mining and Development Company, in the County of Bonner, State of Idaho.

In order to promote further production of strategic and critical minerals, this Corporation is anxious to co-operate with any agency of the Government involving mining properties against which the Corporation holds a lien for loans advanced for respective mining projects. Accordingly, we desire to co-operate with Defense Minerals Administration as to the proposed contract. As you know, this Corporation has a lien against the mining property in question, securing payment of a loan of $25,000, with interest at the rate of 4% per annum from July 1, 1951. Our lien consists of a mortgage on certain equipment owned by Whitedelf Mining and Development Company, together with a lien upon all proceeds from operation. Our agreement with this Company provides that all proceeds from operation shall be placed in a special demand trust deposit, designated "Whitedelf Mining and Development Company - RFC Account," in The Bonner County National Bank of Sandpoint, Idaho. I am enclosing a conformed copy of the deposit agreement so that you may be advised of our control over the proceeds from operation.

In the event the proposed contract is entered into with the Company, it seems to us that it would be inadvisable to relieve the Company from placing the proceeds from operation, if and when received, in said special account. If the account is used, this Corporation would approve requisitions in payment of the royalties as contemplated by your Exploration Project Contract, or arrangements could be made to have royalty payments made direct to the Government. We would not attempt to direct any mining operations, but we assume that the lien of this Corporation would be and remain in effect except as modified regarding payment of royalties. Accordingly, the Corporation has no objection to the proposed contract, subject to the foregoing.

You may be assured that we will co-operate with Defense Minerals Administration and if the arrangement suggested is not satisfactory, please advise.

Very truly yours,

Enclosure

Edward J. Singer
Assistant Secretary

FILE COPY
SURNAME:

140

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

Hoffland
Mr. Leo
Whitendorf

OCT 5 1951

Mr. Leo Nielson, Secretary
Reconstruction Finance Corporation
Washington 25, D. C.

My dear Mr. Nielson:

There is pending in this office an application (Docket No. DMA-255X) of Whitedelph Mining and Development Co., for a grant from the Government to assist it in carrying out an exploration project upon certain property in the State of Idaho, County of Bonner, in Sec. 34, T 56 N., R. 2 E Boise Meridian Idaho. It is my understanding that this property is encumbered as security for a loan from Reconstruction Finance Corporation in the amount of $25,000.

The application for a grant for exploration is made under Mineral Order 5 of Defense Minerals Administration and if granted, the contract would be made on MF-200, "Exploration Project Contract," copies of which are attached. The estimated total cost of the exploration project is $120,250, of which sum the Government would contribute 50 per cent, or $60,125. This sum would be repayable to the Government only if the Government considers and certifies "that a discovery or development has resulted from the work from which commercial production of ore may be made" (Article 15 of the contract form), and the Government takes a lien upon the property and upon such production to secure this repayment.

Ordinarily, Defense Minerals Administration would require the subordination agreement of an encumbrancer as a prerequisite to entering into such an exploration project contract, except that where the encumbrancer is an agency of the Government, in this case the Reconstruction Finance Corporation, it seems unnecessary to require any subordination. However, I believe that the interest of Reconstruction Finance Corporation should be considered before entering into any such exploration project contract, and the purpose of this letter is to give you notice of the pending transaction.

Please advise at your earliest convenience if you have any objection to the proposed contract. We would also appreciate having any suggestions or comments which you would care to make.

Sincerely yours,

C. O. Mittendorf (J.L.H.) 10/5

C. O. Mittendorf, Director
Production Expansion Division

Enclosures 2

JLHofflund/em
written 10/4/51

Copy to: Records & Reports
C. O. Mittendorf
J. L. Hofflund
chron.

Whitedelph Mining and Development Co.
Clark Fork, Idaho
Exploration Contract

Exhibit "A"
Page 1 of (3) pages and 1 illustration.

Exploration Project

Est. time.
in months

2. Rehabilitation of existing winze to make it safe for operation

4. Deepen existing winze 400 feet from present 400 level sump to the 800 level allowing for similar sump and skip loading pocket on that level.

5. Drift 900 feet northeasterly along the pearl fissure zone to the projected position of the north orebody.

Drift 200 feet southwesterly along the pearl fissure to intersect the projected position of the Daugherty orebody.

The applicant proposes that Compton White Jr. shall have complete charge of its part of the project, and in the event that he cannot act, someone satisfactory to the Government will be employed.

Estimated Cost of Project.

1.	Deepening existing winze 400 feet at $165.00 per foot	$ 66,000.00
2.	Installing skip loading pocket on 800 level	2,000.00
3.	Drifting 1100 feet at $32.50 per foot	35,750.00
4.	Equipment to be purchased	4,500.00
5.	Rehabilitation and repairs to existing winze.	12,000.00

Unit cost estimate includes labor, supervision, pipe, vail air, water, tools, sampling, assaying, and all operating expense.

Fixtures and Improvements

None

Whitedelph Mining and Development Co.
Clark Fork, Idaho
Exploration Contract

Exhibit "A"
Page 2 of (3) pages and 1 illustration.

Operating Equipment

To be rented

None

To be purchased

Description	Estimated Cost.
1 Sinking pump	$ 350.00
1 Deep well type pump for lift of 800 feet - 200 gpm	1,800.00
Pipe for water column	700.00
1 Blower and pipeline for ventilation	1,100.00
1 hoisting rope 1000 feet 7/8 inch diameter	550.00
	$ 4,500.00

To be supplied by operator

Description	Value	Monthly Deprec. Allowed
2 Sinker rock drills	$ 800.00	$ 13.33
2 Drifter " "	2,000.00	33.33
1 Loader	3,000.00	50.00
1 Storage-battery locomotive complete with batteries and charger	6,600.00	110.00
1 Air compressor 750 CFM with motor	8,000.00	133.33
1 Dump truck	2,500.00	41.67
2 Sump pumps - air driven	700.00	11.67

Depreciation allowed only for months during which equipment is actually used.

Whitedelph Mining and Development Co.
Clark Fork, Idaho
Exploration Contract

Exhibit "A"
Page 3 of (3) pages and 1 illustration.

Labor and Supervision

Classification	Rate per 8 hour shift
Miners	$ 14.00
Surface Laborers	12.50
Hoistman	14.00
Mechanic	15.00

	Maximum Salary per Month
Mine Superintendent	$ 500.00
Engineer (part time)	100.00

The above rates are subject to lawful overtime payments and revision of pay scale under union contracts.

Shaft miners may be employed on a bonus basis providing the total direct underground shaft labor cost does not exceed $75.00 per foot.

Rehabilitation and Repairs

Repairs to the existing winze to render it safe for operation $12,000.00

This is to certify that the Whitedelph Mining and Development Company owns the S½ of the NE¼ of Sec. 34 T 56 N, R 2 E, Boise Meridian, Bonner County, Idaho, except 5% of the mineral rights which are held by Compton I. White.

Whitedelph Mining and Development Company

Date Oct. 5, 1951 By Compton I. White

Compton I. White, Sr.
Secretary - Treasurer

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

Billings
McKnight
Brakop

SEP 25 1951

Memorandum

To: Production Expansion Division

From: Lead-Zinc Branch

Not stripped in RTR.

Subject: Whitedelf Mining and Development Company
Clark Fork, Idaho
Docket DMA-255X

Recently this application was reviewed by Production Expansion Division and recommended for denial. Before going to the Production Expansion Division, the Lead-Zinc Branch had reviewed the application and offered an alternative proposal substantially reducing the first proposal of exploration by the applicant. This alternative proposal was been accepted by the engineer assigned to the review in your department as the most logical program. However, his recommendation for denial was based upon information received from the field team which questioned the competency of ex-congressman White of Idaho having charge of the exploration work to be done. Otherwise it was accepted as a favorable project.

Mr. White has a son in his early thirties, a mining engineer with considerable operating experience who is in charge of the operation of this property. It appears that the old gentleman, Mr. White, interferes considerably with the son as to the operation.

On the 14th of this month Mr. White visited me and in the presence of Mr. Peifler I discussed again this project and as diplomatically as possible explained to Mr. White that before a contract could be completed covering this application I wanted a verbal understanding from him that he would give full authority to his son to carry on the work under the exploration team and without any interference on his part. The field team has reported favorably on the competency of Mr. White's son. Mr. White is a man along in years and indicated his health was not good and appears to realize his son should carry the ball. Further, Mr. White praised his son highly in every respect and especially commented on his experience as a mining engineer and competency to efficiently perform the mine work required under this project.

I, therefore, recommend a contract be drawn and have discussed it with Mr. Peifler and returned the docket to him for processing.

A.P.C.

TPBILLINGS:ks
9/21/51

T. P. Billings, Chief
Lead-Zinc Branch

cc: T. Lyon
Administrator
Mote
McKnight
Billings

APPROVED:

Tom Lyon

Tom Lyon, Director, Supply Division

Docket File DMA 255X

DMA 255X

Whitedelph

Hansen's recommendations are reasonable except that Billings and Weissenborn agree that the amount for reconditioning the existing wings should be as recommended by the field team ($20,000 to $25,000 instead of $4200 recommended by Hansen

Include a statement to the effect "The applicant proposes that Compton White Jr have complete charge of its part of the project. If he cannot act, someone else satisfactory to the Government will be employed.

DMA 255X 9/19/51

Increase allowance wings for recondit. to amount recommended by Field Team per conference with Billings

SF.

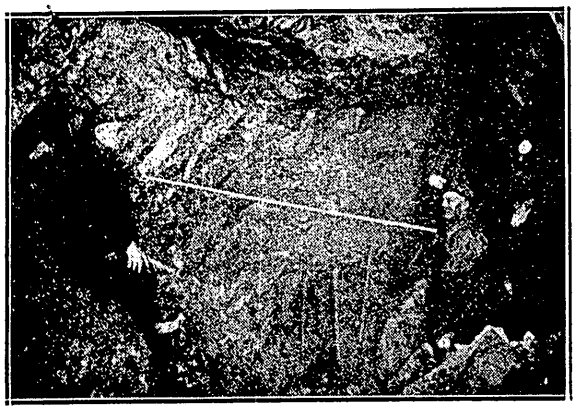
August 18, 1951

Notes and Reminders

Hope Mine, Hope and Whitedelf Properties in Montana

Note to Mr. Billings that Mr. Mound of the Production Expansion Division called friday and asked me to see a Mr. Fietler late in the afternoon and after he had outlined his thoughts on this project I suggested that if Tom Billings were back monday that by all means Tom Billings was the one who would handle the situation with the applicant and had made some suggestions lately to it that ought to be discussed with PED. Mr. Fietler said he would be glad to do that.

WHITEDELF MINING AND DEVELOPMENT CO.



MEASURING 7 FEET 10 INCHES SOLID LEAD AND SILVER ORE
SHARPE STOPE IN THE WHITEDELF MINE

W. W. VON CANNON
PRESIDENT

MINE LOCATED AT
CLARKS FORK, IDAHO

COMPTON I. WHITE
MANAGING VICE PRESIDENT
608 NORTH CAROLINA AVENUE, S. E.
WASHINGTON 3, D. C.

WHITEDELF MILL AND ORE CONCENTRATING PLANT

RECEIVED
SEP 5 1951
Defense Minerals Administration,
Production Expediter Division

Hoo

Clarks Fork, Idaho
August 27th 1951

DMA 255X

Mr T. P. Billings, Chief
Lead Zinc Branch
Defence Minereal Administration
Department of Interior
Washington D C.

Dear Mr Billings

Making further reference to the application of the Whitedelf Mining and Development Co for an exploration loan and the copies of the leasing agreement formerly requested/ Certified copies of these agreements have been obtained from the Bonner County records and forwarded to your Spokane Office.

As some time has elapsed since this application has been filed and revised we would be very pleased to leann what progress has been made towards favorable consideration.

The whited mine is in operation and making shipments of high grade lead concentrates to the smelter

Sincerely

Compton I. White

See Tracer

SEP 5 1951

MINE [illegible] OF 12M 6 50

BUNKER HILL SMELTER

BUNKER HILL & SULLIVAN MINING & CONCENTRATING COMPANY

P. O. Address: KELLOGG, IDAHO
R. R. Station: BRADLEY, IDAHO

In Account With

WHIT[illegible] MNG. & DEV. CO.

Name of Mine: Whitdelf Mine Lot No.: _____ Smelter Lot No.: 131

Location: Clark Fork, Idn. R. R. Shipping Point: By Truck Class: Flot

DATE OF ARRIVAL: 7/31/51 DATE OF SAMPLING: 7/31/51 DATE OF SETTLEMENT: 8-4-51

Car Initial	Car No.	H_2O	Weight, lbs.
1 Truck		4.0	13190

TOTAL GROSS WEIGHT	13190
____ Sacks. Weight of Sacks	
GROSS WEIGHT OF ORE	
Moisture Pounds	133
DRY WEIGHT OF ORE	12547

Metal Assay

Gold		Oz. P. T.
Silver	51.6	Oz. P. T.
Copper	.16	% P. T.
Lead	65.0	% P. T.
Iron	1.9	% P. T.
Insol.	6.4	% P. T.
Lime		% P. T.
Sulphur	15.3	% P. T.
Zinc	2.4	% P. T.
Antimony	3.8	% P. T.
Arsenic	.94	% P. T.
Bismuth		% P. T.

QUOTATIONS

_____ Per Oz.

_____ Per Oz.

Silver 7-31-51 = .9016 Per Oz.

Lead 7-31-51

.17000-.01566 = .15434 Per Lb.

Copper

_____ = _____ Per Lb.

Zinc

_____ = _____ Per Lb.

SMELTING AND REFINING DEDUCTIONS

PER TON

Base Smelting Charge _____ $ _____

Credit ____ % Iron over (____ % Zinc x 1.77) @ 40c a unit $ _____

Debit ____ % Iron under (____ % Zinc x 1.77) @ 40c a unit $ _____

Credit ____ % Silica over (____ % Iron x .886) @ 8c a unit $ _____

Debit ____ % Silica under (____ % Iron x .886) @ 8c a unit $ _____

Credit ____ % Lime over (____ % Iron x .979) @ 10c a unit $ _____

Debit ____ % Lime under (____ % Iron x .979) @ 10c a unit $ _____

TOTAL SMELTING DEDUCTIONS . . . . . $ _____

Silver charge over ____ oz. per ton @ ____ c per oz. $ _____

Antimony charge over ____ % @ ____ per unit $ _____

Arsenic charge over ____ % @ ____ per unit $ _____

Bismuth charge over ____ % @ ____ per pound $ _____

Moisture charges over ____ % @ ____ per unit $ _____

Sulphur charge over ____ % @ ____ per unit $ _____

TOTAL SMELTING AND REFINING DEDUCTIONS Min. . $ 11.000

PAYMENT FOR METALS

VALUE PER TON

Gold	____ Oz.			@ ____	Per Oz.	$ _____
Gold	____ Oz.			@ ____	Per Oz.	$ _____
Silver	51.6 Oz.	95	%	@ .9016	Per Oz.	$ 44.196
Lead	65.0 %	92	%	@ .15434	Per Lb.	$ 193.110
Copper	____ %		%	@ ____	Per Lb.	$ _____
Zinc	____ %		%	@ ____	Per Lb.	$ _____

Gross Value $ 237.306

LESS SMELTING AND REFINING DEDUCTIONS . . . . . $ 11.000

NET VALUE PER TON . . . . . $ 226.306

TOTAL OUNCES SILVER IN THIS SHIPMENT 323.71

SETTLEMENT

DRY WEIGHT 12547 POUNDS= 6.2735 TONS @ $ 226.306 PER TON EQUALS $ 1419.73

Less Freight from Shipping Point to Bradley, Idaho

Gross Weight ____ Pounds= ____ Tons @ $ ____ per ton equals $ _____

Frt. on 70% lead lbs paid (22.05-17.35) $ _____ 21.98

$ _____

$ _____

$ _____

$ _____

$ _____

$ _____

$ _____

[illegible] Fork, Idaho NET PROCEEDS $ 1397.75

FILE COPY
SURNAME:

400

Feitler
Mittendorf (for)

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

August 24, 1951

MEMORANDUM

To: Thomas P. Billings, Chief (Via Mr. Lyon)
Lead-Zinc Branch
Supply Division, DMA

a.e.c.

From: C. O. Mittendorf, Director
Production Expansion Division

Subject: Docket DMA ~~227~~ 255
Unitedelph Mining & Development Co.
~~Bonner County, Idaho~~
Exploration $150,000.00

A review of this application indicates that although it might otherwise be granted a borderline approval, the Field Team report states that the operating experience and background of the applicant are not favorable for a successful operation.

The subject docket is being returned for review with a recommendation for denial.

C. O. Mittendorf (S.N.)

Attachments

SAFeitler/meh
cc to: Adm. Reading File
Reports and Records
Messrs. Mittendorf, Olund
Feitler
Docket

a.e.c

Tom Lyon

Would be pleased to discuss this case with you anytime

Mitt

FILE COPY
SURNAME:

Feitler

400

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

Memorandum

TO: C. O. Mittendorf, Director
Production Expansion Division

FROM: S. A. Feitler, Mining Engineer

SUBJECT: Docket DMA ~~225X~~ 255
Commodity--Lead
Exploration Request $150,000.00 ($98,900.00)
Whitedelph Mining and Development
Bonner County, Idaho

Conclusions: Operating experience and background of applicant not favorable for a successful operation. On the other criteria a borderline approval would be indicated.

Recommendation: Application should be denied.

Applicant's proposal:

Applicant proposes to deepen the shaft 600 feet and explore the Pearl vein with 1000 feet of drifts and crosscuts.

His estimated costs are as follows:

1. 600 feet of shaft at $180.00 per foot	$108,000.00
2. Station and ore pocket	10,000.00
3. 1000 feet of drifts and cross cuts at $25.00 per foot	25,000.00
4. Equipment repairs and reserve	7,000.00
	$150,000.00

The Field Team favors exploration at depth in this district partly because of a similarity, in certain geological characteristics, to the Coeur d'Alene district about 50 miles southwest. The broader program set up by the Field Team is as follows:

FILE COPY
SURNAME:

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

1. Sinking 2½ compartment shaft 1000 feet at $160.00 per foot	$160,000.00
2. Crosscutting 200 feet at $30.00 per ft.	6,000.00
3. Drifting 2300 feet at $32.50 per foot	74,750.00
4. Cut station on 1000 level	3,000.00
5. Fixtures and improvements	10,000.00
6. Equipment to be purchased	22,000.00
Total cost of project	$275,750.00

The Field Team reports that it believes the Pearl vein structure warrants further exploration but that an initial expenditure of $275,000.00 is too great. Further, the examiners indicate that there are real doubts about the competence of the management to carry this program to a satisfactory conclusion.

The Supply Division has prepared, in contract form, a third proposal. This modifies the plan of the Field Team both as to depth and lateral scope as follows:

1. Sinking two-compartment shaft 400 feet at $165.00 per foot (This would deepen a 400 foot winze 400 feet on the incline)	$66,000.00
2. Installing skip-loading pocket on 800 level	2,000.00
3. Drifting 700 feet at $32.50 per foot	22,750.00
4. Equipment to be purchased	3,950.00
5. Rehabilitation and repairs to existing shaft	4,200.00
Total	$98,900.00

The exploration recommended by the Supply Division would merit a borderline approval on the geological possibilities, but the deficiency of the management makes a successful operation improbable. For this reason it is recommended that this Docket DMA ~~225X~~ 255 be returned to the Supply Division for denial.

S. A. Feitler

SAFeitler/bjs
8/24/51
cc to: Reports & Records
Mr. Feitler
Docket
Chron. copy

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

So. 157 Howard Street
Spokane 4, Washington

August 13, 1951

Mr. Landon F. Strobel
Executive Secretary
Defense Minerals Administration
Washington 25, D. C.

Re: Whitedelf Mining and Development Co.
Bonner County, Idaho
DMA Dooket No. 255 X

Dear Mr. Strobel:

Enclosed are two certified copies of a lease of the north half of the northeast quarter of section 34, T. 56 N., R. 2 E., B.M., and a second instrument reducing royalty payments. These were sent us by Compton I. White, Jr.

Very truly yours,

Verne C. Fryklund, Jr.

Verne C. Fryklund, Jr.
For: A. E. Weissenborn
Executive Officer, DMA
Field Team, Region II

Enclosures

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
AUG 17 1951

STATE OF IDAHO }
County of Bonner } ss.

I, ~~Alex J. Bossak~~ Wayne Hagadone, County Recorder in and for the County and State aforesaid, do hereby certify the within and foregoing to be a full, true and correct copy of the whole thereof, of AGREEMENT BETWEEN COMPTON I. WHITE AND JOSEPHINE WHITE, his wife, AND WHITEDELF MINING AND DEVELOPMENT COMPANY, a corporation of Delaware

as the same appears on record in my office in book 11 of Miscellaneous at page 26

In testimony whereof I have hereunto set my hand and affixed my official seal

this 8th day of August, 19 51

Wayne Hagadone
County Recorder, Bonner County, Idaho

By Mrilla Wilson Deputy

©GOES ECLIPSE PRINTERY - SANDPOINT, IDAHO

No. 9 3 0 8 7

THIS INDENTURE, Made and entered into this 3rd day of May, 1937, by and between Compton I. White and Josephine White, his wife, parties of the first part, and the Whitedelf Mining and Development Company, a corporation organized and existing under the laws of the State of Delaware, party of the second part, Witnesseth That:

WHEREAS, Heretofore, to wit, on the 6th day of May, 1936, the said Compton I. White did sign and deliver unto the party of the second part a paper writing in words and figures as follows: "May 6th, 1936.

"Whitedelf Mining and Development Company,
Clarks Fork,
Idaho.
Dear Sirs:

"I hereby agree to reduce the amount of royalty payments payable to me as a result of arrangements now existing between you and myself from fifteen (15%) percent to a five (5%) percent basis.

"I further agree to execute and deliver such other instrument or instruments as may be necessary to effectuate such reduction as a matter of public record.

"Very truly yours,
(Signed) Compton I. White
Compton I. White"

AND WHEREAS It is the desire of the party of the second part that the proposed reduction to the basis of five percent, intended by said last-mentioned paper writing, be made manifest by public record:

NOW, THEREFORE, THIS INDENTURE WITNESSETH that, for and in consideration of the sum of One Dollar in hand paid by the party of the second part to the parties of the first part, the receipt of which by the parties of the first part is hereby acknowledged, the parties of the first part do hereby ratify and confirm the aforesaid agreement, mentioned in said paper writing dated the 6th day of May, 1936, to reduce the amount of royalty payments to the said Compton I. White, as a result of arrangements then existing between the parties of the first part and the party of the second part, from fifteen percent to a five percent basis; and the parties of the first part do hereby reduce and release their royalties on the mining operations of

the Northeast Quarter (NE 1/4) of Section 34, Township 56 North, Range 2 East of the Boise Meridian, situated in the County of Bonner in the State of Idaho,

from fifteen percent, as heretofore provided for, to five percent; the parties of the first part, however, expressly reserving for themselves, their legal representatives, heirs or assigns, their aforesaid right, title, interest and ownership to the extent of such five percent.

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

Witness Eliza W. Merrill — Compton I White (Seal)

Witness Hilma Johnston — Josephine White. (Seal)

DISTRICT OF COLUMBIA, SS:

On this 3rd day of May, 1937, before me, Eliza W. Merrill, a Notary Public in and for said District, personally appeared Compton I. White, known to me to be the person whose name was subscribed to the above and foregoing instrument, and acknowledged to me that he executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in the certificate first above written.

(Notarial Seal)

My commission expires December 28, 1938.

Eliza W. Merrill
Notary Public
for the District of Columbia

STATE OF IDAHO,
SS:
County of Bonner,

On this 7 day of May, 1937, before, W. E. Johnston Clarks Fork Idaho a Notary Public in and for the County and State aforesaid, personally appeared Josephine White, known to me to be the person whose name is subscribed to the above and foregoing instrument, and acknowledged to me that she executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in the certificate first above written.

(Notarial Seal)

My commission expires Dec 5-1940.

W E Johnston
Notary Public for Idaho,
Residing at Clarks Fork Idaho.

STATE OF IDAHO,)
) SS
County of Bonner,)

Filed for record at the request of Compton I White on the 7 day of May 1937 at 3:30 o'clock P M, and recorded in Book 11 of Miscellaneous on page 26.

Robt. S. McCrea, County Recorder. By Chas E Selle, Deputy. Fee $1.75

- -

McKnight
Billings
6/5/51
O'Leary
(Com Note)

7-27-51

Defense Minerals Administration

Review of Application for Exploration Assistance

Docket No. DMA 255X

To: Production Expansion Division

Commodity Lead

From: Director, Supply Division

Total Amount $98,900.00

Govt. Participation $49,450.00

1. Name and Address of Applicant Whitedelf Mining and Development Company
Clark Fork, Idaho

2. Location of Property Clark Fork, Bonner County, Idaho

3. Mineral or metal lead Is it listed in Section 9 of MO-5?

If not, application will be rejected.

4. Geologic probability of discovery—based on data in application (question #16, 17, 18, 20 and 22)*

Mines or Survey reports, etc., do you rate chances:

a) Good X See field team report

b) Poor

c) None

d) Don't know—needs field examination

e) Is there an alternative and favorable project?
(If so, attach an explanation)

5. Is the applicant's right to the property clearly stated? Yes
(question 5, 6, 7)*

6. If applicant is a lessee, is a copy of the lease attached? No

Does the lease have sufficient time to run to cover a future

productive period?

*question numbers are those of MF-103

7. Are subordination agreements necessary? Yes

a) MF-201? _____

b) MF-202 Six copies attached hereto.

8. From the data presented, does the proposed project appear feasible from the point of view of:

a) Available manpower Yes

b) Equipment and supplies Yes
(Question 14 plus general knowledge of availability)*

c) Accessibility (question 12)* Yes

d) Water (question 13)* Yes

e) Power (question 13)* Yes

Is a field check needed on any of these points? Has been examined

9. Does the experience of the applicant appear to be adequate to assure that he can properly conduct the proposed project? (question 4)* Yes

_____

Is a field check needed on this point? _____

10. Exhibit A. (questions 21 and 22)*

a) Is the project adequately described? See exhibits attached to contract Form MF-200

If not, are there sufficient data given so that you can describe the project? _____ If so, attach a draft.

b) Is there an adequate map or sketch of the proposed work? Yes

Attached to contract Form MF-200

c) Is the proposed work "exploration" under the definition of Section 8, MO-5? Yes

~~If not, what part of it is?~~ Contract proposal as sent in by field team has been modified and a new contract drawn up.

Is this part a worthwhile exploration project?_____

d) Are the cost estimates detailed? Yes

Can they be summarized, as on page 2 of Procedural Instruction 5-A, from the available data?_____ If so, attach a draft.

e) Are the cost estimates reasonable? Yes

f) Should more information be requested from applicant?_____

g) Is a field examination necessary to complete Exhibit A?_____

11. Exhibit B (question 23-d)*

a) Is it applicable? No

b) If so, are sufficient data furnished?_____ If so, attach a draft.

c) Is a field check needed?_____

12. Exhibit C (question 23-e, f and g)*

a) Is it applicable? Yes

b) Sufficient data? Yes If so, attach a draft. Refer to contract Exhibit "C"

c) Are rents and charges reasonable? Yes

d) Is a field check needed? No

13. Exhibit D (question 23-a, b)*

a) Are there sufficient data? Yes

b) Is the schedule adequate for the work proposed? Yes

c) Is the schedule excessive for the work proposed? No

d) Are the proposed wages and salaries reasonable? Yes

e) Is a field check needed? No

14. Exhibit E (question 23-c)*

a) Is it applicable? Yes

b) Sufficient data? Yes

c) Reasonable? Yes

d) Field check needed? No

15. In your judgment, can the proposed work be done in the proposed time? Yes

(All exploration must be completed within two years)

16. If field examination is not needed, attach your recommendation.

17. If field examination is needed, do you have any special instructions for the field team not indicated by your answers to the foregoing question? Field team suggested modified program, increasing amount of loan requested by applicant. Field team proposal has been scaled down and is here presented as Exhibits attached to new contract form.

Reviewed by: F.W. Hanson DMA
Mining Engineer

Date 7-27-51

approved
Jm Lyon

INT.-DUP. SEC., WASH., D.C. 99009

FILE COPY
SURNAME:

Billings
McKnight
McKnight

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

July 25, 1951

DMA-255X

Whitedelf Mining and Development Company
Clark Fork
Idaho

Gentlemen:

In your application for an exploration loan it is stated that the property is held under lease from Compton I. White, Sr., for a period of fifty years.

Before consideration of your request can be completed it will be necessary that you provide us with four copies of this lease agreement. These should be certified from the office where they were recorded. In your reply please refer to DMA docket 255X and address it to Defense Minerals Administration, Production Expansion Division for the attention of Mr. H. E. Olund.

Very truly yours,

L. F. Billings, Chief
Lead-Zinc Branch

FWHANSON
~~TFBILLINGS~~:ks

cc: Reports & Records
Mote
McKnight
Billings
Files
HEOlund

Docket 255

[illegible]

[illegible] 72,702 [illegible]

Preliminary 586,816 [illegible]

[illegible] 137 [illegible]

Brown's Tables Page 6.

[illegible]

[illegible] estimated

[illegible] [illegible]

[illegible] 1851 [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

by the [illegible].

[illegible]

[illegible] 100 ft [illegible] [illegible]

[illegible]

500 ft [illegible]	$108,000
[illegible]	[illegible]
1000 ft [illegible] @ $5/ft	[illegible]
[illegible], [illegible], & [illegible]	[illegible]
	$[illegible]

[illegible]

[illegible]	$[illegible] – $[illegible]
[illegible]	
[illegible]	$[illegible]
1000 ft, [illegible], [illegible] & [illegible] Level (27%)	$[illegible]
	$[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

2. Barrels, 10 [illegible]

[illegible]

[illegible]

3. Bank [illegible] will [illegible] [illegible]

[illegible]

[illegible]

[illegible] @ 160	50,000
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	10,000
[illegible]	[illegible]
	[illegible]

DMA-255X

1-21-51

Comparison of Schedules

As proposed by Field Team:

Time 24 months

Sinking new shaft, 1000 ft.	$160,000.00
Crosscutting to vein	6,000.00
Drifting 2300 ft	74,750.00
Station 1000 Level	3,000.00
Fixtures and Improvements	10,000.00
Equipment to be purchased	22,000.00
Total Cost	$275,750.00

As proposed by U.S.G.S. to work through Hope mine:

Time 16½ months

Drifting 1300 ft.	$42,250.00
Sinking 300 ft to 1000 Level	49,500.00
Fixtures & Improvements	—
Cutting Shaft Station	2,000.00
Equipment to be purchased	14,700.00
Total Cost.	$108,450.00
Rental of Hope mine facilities	???

As proposed by DMA.

Time 8½ months.

Extending existing shaft 400 ft. to 800 Level	66,000.00
Station - pocket 800 Level	2,000.00
Drifting 700 ft on 800 Level	22,750.00
Equipment to be purchased	3,950.00
Rehabilitation, existing shaft	4,200.00
Total Cost	$98,900.00

Whitedalf Mining and Development Company
Bonner County, Idaho.

Exploration Project Contract.

EXHIBIT "A"

Time Schedule

Months

1 Rehabilitation of existing ~~winze~~ shaft to render it safe for operation. This to include re-blocking of any loose timbers, replacement of broken or rotted timbers, repair of skipway and skip pocket.

4 Sink the existing ~~winze~~ shaft 400 feet from its present 400-level sump, on same dip to the 800-level, allowing for similar sump and skip-loading pocket on that level.

3 Drift 600 feet northeasterly along the Pearl fissure zone to the projected position of the north orebody

1½ Drift 100 feet southwesterly along the Pearl fissure zone to intersect the projected position of the Daughtery orebody.

This schedule contemplates a minimum expenditure of time and funds for rehabilitation of the existing shaft and is based on the fact that the winze is now in use by lessees who are operating in the mine.

Estimated Cost of Project

1. Sinking two-compartment shaft 400 feet @ $165.00 per foot	66,000.00
2. Installing ship-loading pocket on 800 Level	2,000.00
3. Drifting 700 feet @ $32.50 per foot	22,750.00
4. Equipment to be purchased	3,950.00
5. Rehabilitation and repairs to existing shaft	4,200.00
Total cost of project	$98,900.00

Unit costs above are to include labor, supplies, engineering, power, water, and other items enumerated in the contract.

Exhibit "B"

Fixtures and Improvements.

None contemplated.

6600000
2000000
2275000
3950000
4200000

9890000*

Exhibit "C"

Operating Equipment

To be rented: none.

To be purchased:

1. Pump, centrifugal, sinker for lift in 100-foot stages, 100 g.p.m., including motor $350.00

2. Pump, centrifugal, deep-well type, for total lift, 800-foot head, 200 g.p.m. $1800.00

3. Pipe for water column 700.00

4. Blower and pipe line for ventilation 1100.00

$3950.00

To be supplied by operator:

	Estimated Replacement Value.	Monthly Rental Allowance
2 Sinker rock drills	$800.00	$30.00
2 Drifter " "	2,000.00	62.00
1 Loading machine	3,000.00	105.00
1 Storage-battery locomotive with two batteries and charger	6600.00	231.00
1 Air-Compressor, 750 c.f.m. with electric drive	8000.00	250.00
1 Dump truck	2500.00	88.00
2 Sump pumps, air driven	700.00	26.00

No rental to be charged during months when any of this equipment is not in use.

Exhibit "D"

Labor and Supervision

Classification	Rate per 8-hour shift
Miners	$14.00
Surface Laborers	12.50
Hoistman	14.00
Mechanic	15.00
	Maximum Salary per month
Mine superintendent	$500.00
Engineer (part time)	100.00

The above rates are subject to lawful overtime payments and revision of pay scale under Union contracts.

Shaft miners may be employed on a bonus basis providing the total direct underground shaft labor cost per foot does not exceed $75.00 ~~per foot~~.

~~Exhibit~~ ~~Schedule~~ "E"

This project allows, for the purpose of exploration only, a minimum of repairs to the existing shaft, including re-blocking of any loose but sound timbers, replacements of broken or rotted timbers, repair of skipway and skip pocket, in order to render it safe for operation, at an estimated cost of $4,200.00

Project to work through to Hope mine DMA-255X

Whitedelf Mining and Development Company
Bonner County, Idaho
Exploration Project Contract
Exhibit "A"

Exploration Project Time Schedule

Months	
* 7	Drift 1300 feet (partly in Hope property) along Pearl fissure from existing face of Hope mine 700 Level (5'x7' cross section)
3½	Sink 2-compartment shaft 300 feet to approximate elevation for Whitedelf 1000 Level
2½	Drift northeasterly about 400 feet along Pearl fissure, 1000 Level
3½	Drift southwesterly about 600 feet along Pearl fissure, 1000 Level

(Project as planned to work through Hope Mine)

DMA-255 X

Whitedelf Mining and Development Company
Bonner County, Idaho.

~~Explanation Project Contract~~

Estimated Cost of Project

1. Drifting 1300 feet (partly on Hope property) on Hope 700 Level @ $32.50 per foot $42,250.00
2. Cutting winze station on same level 2,000.00
3. Sinking 2-compartment winze from 700 Level to Whitedelf 1000 Level 300 feet @ $165.00 49,500.00
4. Fixtures and improvements, none unless necessary for operation of Hope shaft and hoist ———
5. Equipment, to be purchased 14,700.00

Total cost of project $108,450.00

Exhibit "B"

Fixtures and Improvements

None contemplated unless necessary for operation of Hope shaft and hoist.

Exhibit "C"

Operating Equipment

To be rented: none

To be purchased:

1. Pump, centrifugal, sinker, 60 HP. motor, 325-ft. head, 600 g.p.m.	$1,500.00
2. Pump, centrifugal, station, 100 HP motor 500-ft. head, 600 g.p.m.	3,200.00
3. Hoist for new underground shaft, 50 HP motor with controls, for 3000-pound pull, 200 f.p.m. speed, including 450 feet rope.	5,000.00
4. Skip and other accessories for shaft	1,000.00
5. Blowers, ventilation, pipe, etc.	3,000.00
6. Contingencies	1,000.00
	~~$14,900.00~~
	$14,700.00

To be supplied by operator:

	Estimated Replacement Value	Monthly Rental Allowance
2 Drifter rock drills, ~~auto~~-feed	$2000.00	62.00
2 Jack hammers	750.00	30.00
1 Loading machine	3000.00	105.00
1 Storage-battery locomotive with two batteries and charger	6000.00	200.00
1 Air compressor, 750 c.f.m. with electric drive	8000.00	250.00
1 Dump truck	2500.00	88.00
2 Sump pumps, air-driven	700.00	26.00

No rental to be charged during months when this equipment or any part thereof is not in use.

Exhibit "D"

Labor and Supervision

Classification	Rate per 8-hour shift
Miners	$14.00
Surface Laborers	12.50
Hoistmen	14.00
Mechanics	15.00
	Salary per month
Mine superintendent	$500.00
Engineer (part time)	100.00

Exhibit "E"

No repairs or rehabilitation are planned on existing facilities, installations and buildings

Note:- This project estimate does not include any cost for rental or use of facilities ~~of~~ and equipment of the Hope mine property.

[illegible] High Ages Mine N.P.-255 X
Exhibit

Exploration Project

Time Schedule
Months

7 — Drift 1300 feet along East Lissner from [illegible] Hope mine 900 level [illegible] cross-section

8½ — Sink the compartment winze 325 feet to the depth indicated by USBM drill hole, approximately 1300 level

[illegible] if [illegible] warrant further exploration of East Lissner extension

2½ — Drift northeasterly about 400 feet to cross-cut ~~the [illegible]~~

3½ — Drift northwesterly about [illegible] feet to cross the projected position of the Norquist High fault

Exhibit "B"

Features and Improvements

None included [illegible] necessary for operation of Hope Mine [illegible]

(Space [illegible] Hope Mine)

Estimated Cost of Project

1. Drifting [illegible] Hope 700 Level. @ $32.50 ft. [illegible]

2. Cutting wings & station in same level. 2,000.00

3. Linking 1-½ compartment wings from Hope 700 Level to Winkler 1000 Level 300 feet, also 25 feet to reach indicated position of USBM drill hole in the vein 325 feet @ $125/ft. 40,000.00

4. Airlines and improvements, none unless necessary for operation of Hope shaft and level.

5. Equipment, to be purchased 14,700.00

$98,700.00

[illegible]

To be installed: ... none

To be purchased:

1. Pump, centrifugal, plain, 50 HP motor, 325-foot head, 500 g.p.m. $1000.00

2. Pump, centrifugal, station, 30 HP motor, 150-foot head, 200 g.p.m. $2200.00

3. Hoist, for wings, 50 HP motor with controls for 3000-pound ropes, 200 ft. per minute, including pipe $5800.00

4. Skip and other [illegible] for wings [illegible] $1000.00

5. Blower, ventilation pipe, etc. $3000.00

6. Contingencies $1000.00

$11400.00

To be supplied by operator:-

	Estimated Replacement Value	Monthly Repair Allowance
6 Drifters, mitre feed	$2000.00	$32.00
9 Jackhammers	750.00	30.00
1 Loading Machine	3000.00	105.00
1 Storage Battery Locomotive with two batteries and charging apparatus	6000.00	230.00
1 Air Compressor, 750 cu. ft. with electric drive	5000.00	250.00
1 Drum Hoist	2500.00	88.00
2 Sump Pumps, air-driven	700.00	25.00

(over)

Exhibit "D"

Labor and Supervision

Classification	Rate per 8-hour shift
Miners	$14.00
Surface Labor	12.50
Foreman	14.00
Mechanic	15.00

	Salary per month
Mine Superintendent	500.00
Engineer (part time)	130.00

Exhibit "E"

No repairs or rehabilitation are planned to existing facilities, installations and buildings

9-21-51

Comparison of [illegible]

As proposed by Field Plan:
Time 24 months

Sinking new shaft, 1000 ft.	$160,000.00
Crosscutting to vein	6,000.00
Drifting 2300 ft	11,750.00
Station 1000 level	3,000.00
Fixtures and Improvements	10,000.00
Equipment to be purchased	22,000.00
Total Cost	$275,750.00

As proposed by U.S.B.M. to work
through Pope mine:
Time 11½ months.

Sinking 1300 ft.	$42,250.00
Linking shaft to 1000 level	49,500.00
Fixtures & Improvements	
Cutting shaft Station	2,000.00
Equipment to be purchased	14,700.00
Total Cost	$108,450.00
Rental of Pope mine facilities	???

As proposed by D.M.A. (Hanson) [illegible]
Time 8½ months.

Extending existing shaft 400 ft to 800 level	66,000.00
Station - pocket 800 level	2,300.00
Drifting 700 ft on 800 level	22,750.00
Equipment to be purchased	[illegible]
Rehabilitation, existing shaft	4,200.00
Total Cost	$98,900.00

(Hope Properties) DMA-225X

Whitedelf Mining and Development Company
Bonner County, Idaho
Exploration Project Contract
Exhibit "A"

Exploration Project - Time Schedule

Months

X 7 Drift 1300 feet (partly in Hope property) along Pearl fissure from existing face of Hope mine 900 Level (5'x7' cross-section)

3½ Sink 2-compartment shaft 300 feet to approximate elevation for Whitedelf 1000 Level

2½ Drift northwesterly about 400 feet along Pearl fissure, 1000 Level.

3½ Drift southwesterly about 600 feet along Pearl fissure, 1000 Level.

(Project as planned to through Hope)

DNA-255 X

Whitedelf Mining and Development Company
Bonner County, Idaho.

~~Estimated Cost of Project~~

Estimated Cost of Project

1. Drifting 1300 feet (~~partly in Hope property~~) on Hope 700 Level @ $32.50 per foot — $42,250.00
2. Cutting storage station in pay ore level — 2,000.00
3. Linking 2-compartment winze from 700 Level to Whitedelf 1000 Level 300 feet @ $65.00 — 19,500.00
4. Fixtures and improvements, none unless necessary for operation of Hope shaft and winze. —
5. Equipment, to be purchased — 14,700.00

Total cost of project — $108,450.00

Exhibit "B"

Fixtures and Improvements

None contemplated unless necessary for operation of Hope shaft and hoist.

Exhibit "C"

Operating Equipment

To be rented: none.

To be purchased:

1. Pump, centrifugal, vertical, 60 HP. motor, 250-ft. head, 600 g.p.m.	$1,500.00
2. Pump, centrifugal, vertical, 100 HP motor, 500-ft. head, 600 g.p.m.	3200.00
3. Hoist for new underground shaft, 50 HP-motor with controls, for 3000-pound pull, 200 f.p.m. speed, including 450 feet rope.	3,000.00
4. Skip and other accessories for shaft	1,000.00
5. Blowers, ventilation fans, etc.	3,000.00
6. Contingencies	1,000.00
	~~$ [illegible] 700.00~~
	$14,700.00

To be supplied by operator:

	Estimated replacement value	Monthly rental allowance
2 Drifter post drills, air-feed	2000.00	62.00
2 Jack hammers	750.00	30.00
1 Loading machine	3000.00	105.00
1 Storage battery locomotive with two batteries and charger	6000.00	200.00
1 Air compressor, 750 c.f.m. with electric drive	8000.00	250.00
1 Dump truck	2500.00	88.00
2 Sump pumps, air-driven	700.00	26.00

No rental to be charged during months when this equipment is in any particular of it not in use.

Exhibit "D"

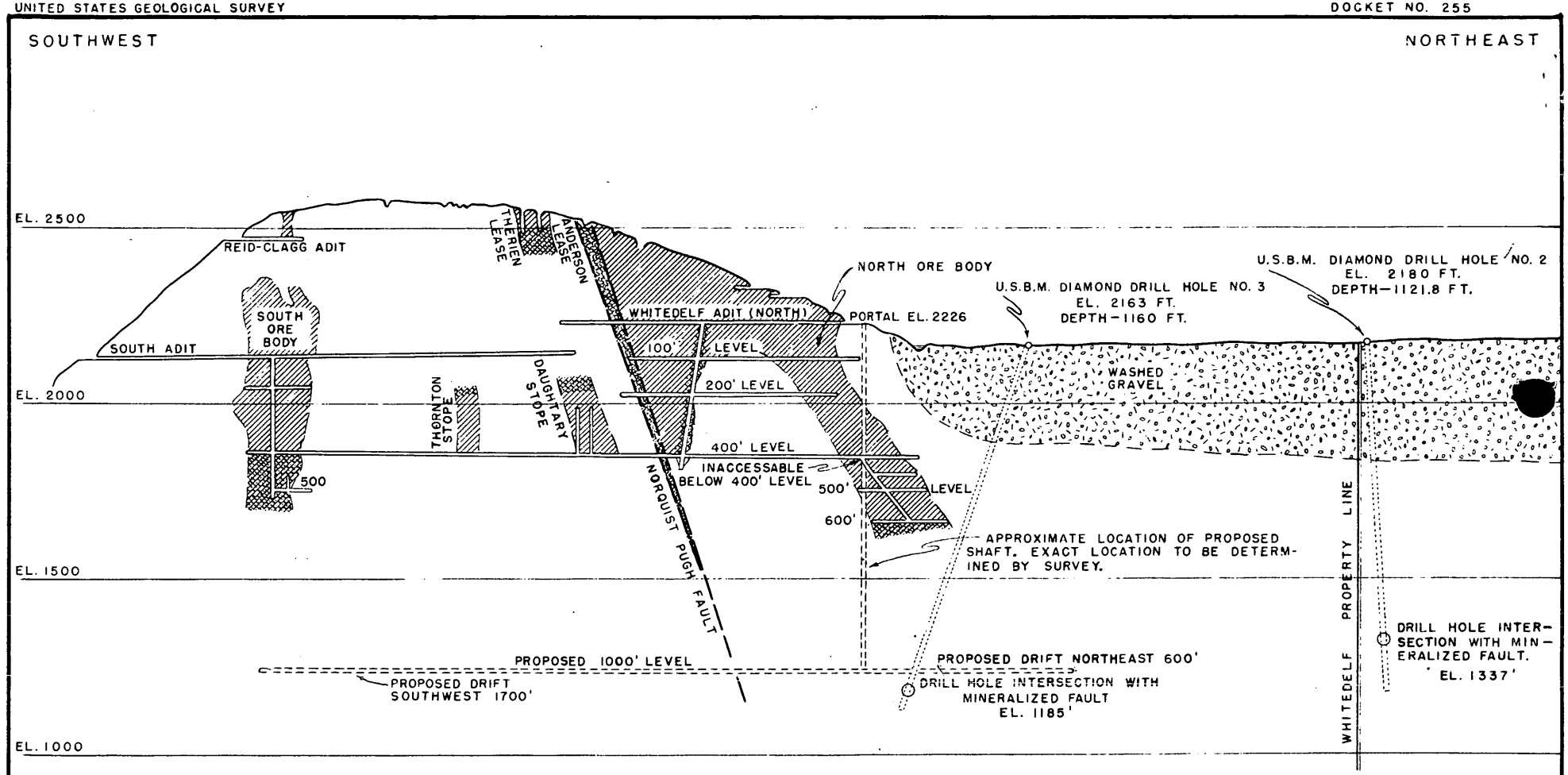
Labor and Compensation

Classification	Rate per 8-hour shift
Miners	$14.00
Standard helpers	12.50
Hoistmen	14.00
Mechanics	15.00
	Salary per month
Mine superintendent	$500.00
Engineer (part time)	100.00

Exhibit "E"

No repairs or rehabilitation are planned on existing facilities, installations and buildings.

Note:- This proposal particular does not include any cost for rental or use of facilities and equipment of the Japs prior property.



PROPOSED EXPLORATION PROGRAM - WHITEDELF MINE

CLARKSFORK, IDAHO

SCALE

200 100 0 200 400 600 800

AFTER WHITEDELF MINING AND DEVELOPING COMPANY

UNITED STATES CONGRESS

COMMITTEE ON IRRIGATION AND RECLAMATION

HOUSE OF REPRESENTATIVES

July 2oth, 19

Dear Mr Billings

That you may have authentic information in the files of Whitedelf Mining and Development P M A application No 255X

There is enclosed a Telegram from Compton I. WhitedJr Mine Supintendent of the Whitedelf mine

You will note that due to the increased water flow in the underground working of the Hope Mine it is necessary to raise the Hope Mine Pumping capacity to 500 G P M

Sincerely

Compton I. White

Whitedelf mining & Dev Co

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable symbol above or preceding the address.

WESTERN UNION

1201

(15)

W. P. MARSHALL, PRESIDENT

SYMBOLS

DL = Day Letter

NL = Night Letter

LC = Deferred Cable

NLT = Cable Night Letter

Ship Radiogram

The filing time shown in the date line on telegrams and day letters is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

WZ27 NL PD DUPLICATE OF TELEPHONED TELEGRAM=CLARKSFORK IDA

JUL 17= 1951 JUL 18 PM 12 21

COMPTON I WHITE=

DLR SOON AS POSSIBLE=608 NORTH CAROLINA SOUTHEAST=

HOPE MINE PUMPS 240 TO 260 GPM WITH 135 HORSE POWER DURING MAXIMUM RUN OFF THIS FIGURE REDUCES TO 150 GPM AT MINIMUM RUN OFF AT PRESENT HOPE MINE IS INSTALLING A 500 GPM 250 HORSE POWER PUMP HORIZONTAL INGERSOLL=

COMPTON WHITE JR=

240 260 135 150 500 GPM 250=

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

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

July 2, 1951

Memorandum

To: Mr. Otto Herres, Chief
Lead-Zinc Branch
Defense Minerals Administration

Through: L. F. Strobel

From: Field Team, Region II

Subject: Whitedelf Mine, Clark Fork, Idaho
Docket DMA 255

Enclosed is docket material sent to Field Team, Region II, for field examination of the Whitedelf mine.

The contract and the Field Team's recommendations were air mailed to Washington on June 29, 1951.

J. J. Quinlan
J. J. Quinlan
For: A. E. Weissenborn
Executive Officer, DMA

Enclosure

cc: M.E. Volin

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUL 9 - 1951
L. F. STROBEL
Executive Secretary

255X

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

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

ON-SITE Report.

June 29, 1951

DMA 255

Memorandum

To: Otto Herres, Chief, Lead-Zinc Branch

From: Field Team, Region II

Subject: Whitedelf Mining and Development Company, Bonner County, Idaho.

Attached are four copies of a report by E. A. Magill, U.S.B.M., and J. J. Quinlan, U.S.G.S., on the subject docket. Also enclosed are six copies of a proposed exploration contract complete with exhibits.

The Whitedelf property is the largest mine in the Clark Fork district and has had a moderate production of high-grade lead silver ore from a relatively narrow vein. Since 1942 it has had only minor production from leasing operations.

2nd intersection 17 feet 6" of ore

The reserve possibilities are based entirely on a Bureau of Mines drill hole intersection about 400 feet below the lowest working. The Bureau estimate of 7,500 tons of ore, assaying 15 percent lead and 30 oz. of silver, is only a guess, and the real possibilities of the property must be considered in relation to the strength of the Pearl structure and past production from the property. It is known that several companies have seriously considered the Whitedelf as an exploration project. In our opinion, the difficulties of reaching a satisfactory agreement with the owner, rather than technical considerations, have deterred favorable action. It seems certain that sooner or later exploration more or less as proposed in the contract will be undertaken.

The applicant originally proposed to sink the main Whitedelf incline 600 feet from the present 400 level and drift 1,000 feet northeast on the Pearl structure to the vicinity of the drill hole intersection. The company cost-estimate for this work is $150,000. We concur with the opinion of the Examination Team that this will not adequately explore the ore possibilities; moreover, to the applicant's

JUL 3 1951

cost-estimates must be added at least $25,000 to rehabilitate the inclined shaft and $55,000 for 1,500 feet of additional drifting on the 1,000-foot level to adequately explore the structure, bringing the total cost to $230,000. Furthermore, the Whitedelf winze would not be a satisfactory working shaft, and the cost of the exploration might be increased over the estimate because of the difficulty in handling the broken rock from the exploratory workings.

Alternative proposals were discussed with the applicant. One was to utilize the workings of the adjacent Hope mine to reach the original objective. This would require 1,300 feet of drifting and a 300 winze on the ore. Actually there would be many advantages to operating the Whitedelf and Hope properties as one unit, but this alternative was not satisfactory to the applicant for the following reasons:

1) Possibility of serious water flow from the Hope workings which are only 350 feet below Lightening Creek.
2) Present unstable financial condition of the Hope Company.

A second alternative of rehabilitating the Whitedelf winze and the 400 level east to the north ore shoot and sinking 600 feet in that shoot has only the advantage of sinking in ore, but would have high operating costs because it would require doubling handling of broken ore and rock.

A third alternative is to sink a new vertical shaft from the surface to a depth of 1,000 feet in the hanging wall of the Pearl structure. This, with the necessary drifting on the 1,000-foot level, would cost $275,000. In our opinion it is the most practicable of the various proposals, and a contract has been prepared for it.

The exploration cost is high in relation to the 7,500 tons of ore that have been inferred on the basis of the single drill hole intersection, but there appears to be no other satisfactory alternative unless the Whitedelf and Hope properties can be consolidated. Moreover, there is a possibility that other ore shoots which are exposed on the 400 level will be picked up in the 1,000-foot level. Furthermore, there is geologic reason to believe that the ore shoots will continue below the 1,000-foot level; the new shaft would put the mine in such condition that this could be tested at reasonable cost at a later date. Lastly, the new shaft would obviously permit the lowest possible cost of raising the ore to the surface.

Under the management of Compton I. White Sr., development has been neglected, and the property has obviously not been operated in the most efficient manner. If proper management can be assured, we would recommend that the exploration contract be granted. It is believed that Compton White, Jr., if given a free hand, may be able to satisfactorily direct the work.

By Field Team, Region II

A. E. Weissenborn

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

M E Volin

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

Enclosures

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

1207 N. Division St.
Spokane 2, Wash.

June 28, 1951

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

DMA 255

MEMORANDUM

To: DMA Field Team, Region II

From: E. A. Magill, U.S.B.M., and J. J. Quinlan, U.S.G.S.

Subject: Exploration project contract, Whitedelf Mining and Development Co., Bonner County, Idaho

The Whitedelf Lead-Silver mine is 2 miles north of Clarks Fork, Idaho, in the Clarks Fork mining district. Geology of the Whitedelf mine is described in detail by A. L. Anderson in U.S.G.S. Bulletin 944—B. In 1944-46 the U. S. Bureau of Mines drilled three diamond drill holes to intersect the Pearl structure, (the principal ore producing structure of the Whitedelf mine). These holes indicated that the lead mineralization in the structure continued at least 450 feet vertically below the deepest Whitedelf workings.

A. L. Anderson in his report states, "It is believed that the ore will persist to depths appreciably greater than those yet reached in mining. The district (Clark Fork) has not yet been adequately explored, and undiscovered ore bodies may remain hidden beneath glacial and other surface debris." 1/

S. H. Lorain in his report states, "The Pearl fault is the one ore fissure of definite commercial importance which has been found in the Clark Fork district. It is an ore fissure of remarkable strength and persistence. Its mineralized strike length has been proved, or strongly indicated, to be at least 3400 feet." 2/

The production from the Whitedelf mine, from 1926 to 1942, amounts to 82,702 tons of ore containing 658,318 ounces of silver and 11,301,107 pounds of lead. Leasing operations have produced a minor amount of ore since 1942.

1/ Anderson, A. L., Geology of the Lead-silver Deposits of the Clark Fork District, Bonner County, Idaho, U.S.G.S. Bulletin 944B, p. 37, 1947.

2/ Lorain, S. H., Exploration of the Clark Fork District (Project 15-166), Bonner County, Idaho, Confidential Section, U.S.B.M. Report, p. 4, 1946.

Memorandum June 28, 1951

Subject: Exploration project contract, Whitedelf Mining and Development Co., Bonner County, Idaho

There are no measured ore reserves in the Whitedelf mine. It is estimated that 7,500 tons of inferred ore exists in the north ore shoot between the 600 level and the ore discovered by the U.S.B.M. diamond drill hole No. 3. The U.S.B.M. calculates the grade of this ore to be 15 percent lead and 30 ounces of silver per ton, having a gross value of about $600,000 at present prices. The Bureau further states that "the data on this area is, however, so meager that any estimate of ore reserves would be little more than a guess." 3/ There is the definite possibility, however, that the ore shoots on the Pearl structure to the southwest may extend to the 1000 level, giving additional reserve tonnage.

The Whitedelf mine is equipped with a 50-ton per day bulk flotation concentrator and necessary equipment for mining. Some of this equipment is old (1928) and a number of items would require extensive repairs or replacement in order to carry out an efficient mining and milling operation.

The Whitedelf Mining and Development Company proposes to sink the main Whitedelf incline shaft (winze) from the present 400 level to the 1000 level a distance of 600 feet on the incline. A station and pocket are to be cut at the 1000 level. From this station 1000 feet of drifting on the Pearl structure to the northeast to cut the downward extension of the Whitedelf north ore body as disclosed by the U. S. Bureau of Mines Diamond Drill hole No. 3. The Whitedelf Mining and Development Company estimates the cost of the proposed project as follows:

600 feet of shaft at $180 per foot	$108,000
including station and ore pocket	10,000
1000 feet of drift & crosscut	25,000
Equipment, repairs, and reserve	7,000
Total	$150,000

3/ Lorain, S. H., op. cit.

Memorandum June 28, 1951

Subject: Exploration project contract, Whitedelf Mining and Development Co., Bonner County, Idaho

This proposal, in the opinion of the Examination Team does not allow sufficient funds to intersect the objective, or to adequately explore the structure on that level. To the applicant's proposed program and costs must be added an additional $20,000 to $25,000 for rehabilitation of the present 400 feet of incline shaft (winze), $18,000 for 100 feet of additional sinking to bring them to the approximate level of the U.S.B.M. drill hole intersection and about $55,000 for 1500 feet of additional drifting on the lower level. This additional necessary work would run the costs up to about $240,000. The present inclined winze is crooked, small, and would take extensive rehabilitation. It is doubtful even after rehabilitation that it would allow an efficient operation to be carried on through it.

A number of alternative programs were considered, among them were:

1. Drifting on Pearl structure from Hope mine (property adjoining to the northeast) to intersect the Whitedelf north ore shoot. This would entail some 1300 feet of drifting plus a 300 foot winze on the ore shoot to reach the depth asked for in the original proposal.

This alternative was discussed with the applicant who stated, he did not wish to have his mine workings connected with those of the Hope on that level due to the possibility of excessive water flow (Hope level is only 350 feet below the gravels of Lightning Creek). The applicant also stated that the company did not wish to be dependent upon the facilities of the Hope mine for its future operations inasmuch as the future operating status of the Hope is questionable.

It is the opinion of the Examination Team that the applicant has two very good points in the above statement. This alternative would probably be satisfactory strictly from an exploration standpoint, but it would make for a difficult and expensive mining operation.

2. Rehabilitate present winze, the 400 level east to the north ore shoot, and sink 600 feet of winze in the north ore shoot.

The only advantage of this alternative is the possibility of sinking on ore. If any extensive exploration were to be undertaken from this winze on the lower levels, it would make for impractical handling of the ore or waste.

3. Sink a 2-1/2 compartment vertical shaft to a depth of 1,000 feet, in the hanging wall of the Pearl structure so as to intersect the structure at about the 1,000 level. Its collar to be near the present mill. From the 1000 foot level 2500 feet of drifting on the Pearl structure is proposed.

This proposal was worked out with the applicant and contract written. The Examination Team is of the opinion that this alternative is the most practical of all considered, although the cost is $30,000 more than if the present winze was rehabilitated. This $30,000 would soon be absorbed in the saving made in handling of any ore developed.

The Examination Team believes that the Pearl structure warrants further exploration. However, it feels that an initial expenditure of $275,000 for an exploration program is too great. There does not appear to be any other satisfactory alternative unless the Whitedelf and Hope mines could be consolidated.

The present management has allowed this mine to degenerate to a point where it will take an exploration program of the type proposed to adequately explore and determine if there are sufficient ore reserves necessary to make a profitable operation.

Previous operations at the Whitedelf mine under the present management indicate that to efficiently carry out the proposed exploration program it will be necessary to bring in competent personnel to assume complete charge of the project.

E. A. Magill

E. A. Magill, U.S.B.M.

J. J. Quinlan

J. J. Quinlan, U.S.G.S.

FILE COPY
SURNAME:

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

Herres
Mote
McKnight

June 11, 1951

DMA-255X
Whitedalf Mine
Clarks Fork, Idaho

Rev. A. J. Sabbath
10 South LaSalle Street
Chicago, Illinois

My dear Mr. Sabbath:

I have your letter of June 7 requesting information concerning the application of your former colleague, Compton I. White, for Government assistance to his Whitedalf Mine in Idaho. I have discussed the property and its possibilities several times with Mr. White and regret greatly to learn from your letter that he has been ill.

We are considering his application under the exploration program of the Defense Minerals Administration. The United States Geological Survey and Bureau of Mines field team has been requested to give us a report on the property. As soon as this report is received we will act promptly on the application. I am hopeful that the report will prove eminently favorable and that we shall be able to assist Mr. White with his venture.

Sincerely yours,

Otto Herres

OTTO HERRES, Chief
Lead-Zinc Branch

OHERRES:ks

cc: Strobel
Mote
McKnight
Herres
Files

EIGHTY-SECOND CONGRESS

A. J. SABATH, ILL., CHAIRMAN

E. E. COX, GA.
HOWARD W. SMITH, VA.
WILLIAM M. COLMER, MISS.
RAY J. MADDEN, IND.
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HUGH B. MITCHELL, WASH.

LEO E. ALLEN, ILL.
CLARENCE J. BROWN, OHIO
HARRIS ELLSWORTH, ORE.
HENRY J. LATHAM, N. Y.

House of Representatives, U. S.
Committee on Rules
Washington, D. C.

10 South LaSalle St.
Chicago, Illinois

June 7th, 1951.

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

Re: Whitedelf Mine, Bonner County
Idaho.

Dear Mr. Herres:

My former colleague, Compton I. White, who controls the Whitedelf Mine, Bonner County Idaho, has spoken to me several times about his mine and it's richness.

Although I understand he could have leased or sold the majority of the stock and had enough money to sink the shaft, he does not wish to lose control. He has operated it himself with his son, and I feel is entitled to assistance.

He has been ill for the last three or four weeks, I understand, therefore I do not know what has been done with his application. He informed me in the middle of April that the Government had finally realized that if there is one mine deserving of aid it is his, and I believe this to be so.

Therefore, I would appreciate hearing from you as to what has been done for him, realizing that his mine contains a great deal of vital material.

Sincerely yours,

A. J. Sabath, M/C.

AJS:E.

WHITE
REASURER
ORK, IDAHO

W. W. VON CANON
PRESIDENT
SANDPOINT, IDAHO

COMPTON I. WHITE, JR.
VICE-PRESIDENT
CLARKS FORK, IDAHO

WHITEDELF MINING AND DEVELOPMENT CO.

MINE OFFICE
CLARKS FORK, IDAHO

FISCAL OFFICE
416 EMPIRE STATE BLDG.
SPOKANE 8, WASHINGTON

EASTERN OFFICE
608 NORTH CAROLINA AVE. S. E.
WASHINGTON, D. C.

Clarkfork, Idaho
June 4, 1951

AMENDMENT
DMA 255X
Whitedelf Mine
Application

Mr. A. E. Wisenborn
Defense Minerals Administration
S. 159 Howard Street
Spokane, Washington

Dear Mr. Wisenborn,

Reference is made to application DMA 255X of the Whitedelf Mining and Development Company for Mine Exploration Assistance.

We find that a typographical error was made in sections 21 and 23 in filling out form MF 103. The application should read "one thousand (1000) feet of drift"instead of 2000 feet as set forth in section 21 and also one thousand (1000) feet instead of 10,000 feet as set forth in section 23.

We desire to correct this error with this amendment. There is submitted herewith 4 copies of this amendment which we request be attached to the form MF 103 Application, DMA 255X, heretofore filed with the Defense Minerals Administration.

Your Assistance in expiditing the consideration of the application in question will be greatly appreciated.

Sincerely,

Whitedelf Mining and Development Co.

Compton I. White

Compton I. White Sr., Secty-Treas.

AMENDMENT DMA 255X

Form MF 103

Section 21.

"and one thousand (1000) feet of drift"

This drift will be driven along the vein for 1000 feet from the station to be cut on the 1000 foot level to the north ore shoot which was penetrated by the U. S. Bureau of Mines Diamond Drill Exploration Hole No. 3 as shown in the Lorain Report and the vertical section map exhibit.

Section 23.

"1000 feet of drift"

(1000) ft. at $25.00 per foot $25,000

Complied with Section 23
Liberty Treasurer
Colorado Mining & Dev Co

FILE COPY
~~SURNAME~~

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

File sent to
5/23/51

Lyons
McKnight
Strobel

May 23 1951

Re: Docket DMA-255

Mr. A. E. Weissenborn
Geological Survey
S. 157 Howard Street
Spokane 8, Washington

Dear Mr. Weissenborn:

The Lead-Zinc Branch has reviewed the application submitted by Compton I. White on behalf of the Whitedelf Mining and Development Company for a loan to explore the Whitedelf mine in Bonner County, Idaho.

The mine, which is operating at present, apparently obtains its production from the Pearl vein which is a mineralized fault fissure in rocks of the Belt Series. The Bureau of Mines had an exploration project on the Whitdelf and adjoining properties during the period from 1944 to 1946. Mineralization was found in the drill holes on the Whitedelf property at about the 1000 ft. level, 600 ft. below the present lowest level of the mine.

The company proposes to deepen the present shaft 600 ft. to the 1000 ft. level and thendrive 10,000 ft. of drifts and crosscuts. Estimated total cost of the project is $150,000.

The Lead-Zinc Branch recommends that the application be reviewed by the field team to determine if the project is acceptable from the geologic viewpoint and if the methods, costs, rental value of equipment owned by the company, etc. are reasonable. If the decisions in these matters are favorable, as many of the negotiations as are possible to complete the contract should be entered into.

Very truly yours,

Tom Lyon
Tom Lyon, Chairman
Coordinating Committee

Approved:

Lowell B. Moon
Member, Bureau of Mines

Olaf N. Rove
Member, Geological Survey

EJLyons:emp G 5/18/51
Copies to: Chief, Lead-Zinc Br.
E. T. McKnight 4204 GSA
L. B. Moon
R. H. Mote
L. F. Strobel
Tom Lyon
Directors reading file 4214 GSA
Br. reading file 4214 GSA

FILE COPY
SURNAME:

Lyons
McKnight
Moon

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

May 18, 1951

Re: Docket DMA-225

Mr. Compton I. White
608 N. Carolina Avenue, S.E.
Washington 3, D. C.

Dear Mr. White:

The Lead-Zinc Branch has reviewed your application, submitted on behalf of the Whitedelf Mining and Development Company for a loan to explore the Whitedelf mine in Bonner County, Idaho. The application, together with the supporting data, has been sent to Mr. A. E. Weissenborn, Executive Officer of the Field Team, S. 157 Howard Stree, Spokane 8, Washington, for further information and advice.

Very truly yours,

Tom Lyon, Director
Supply Division

EJLyons:emp
G 5/18/51
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
Tom Lyon
Directors reading file 4214 GSA
Br. reading file GSA 4214
Files

FILE COPY
SURNAME:

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

May 16, 1951

Mr. Compton I. White, Secretary
Whitedelf Mining and Development Company
608 North Carolina Avenue, S.E.
Washington 3, D.C.

Subject: DMA 255X
Re: Exploration Loan-
Whitedelf Mine
(Idaho)

My dear Mr. White:

Receipt is acknowledged of your application and attachments of May 4, 1951 for an exploration loan under the Defense Production Act of 1950.

The application was assigned Docket Number 255X and referred to Mr. Otto Herres, Chief, Lead-Zinc Branch on May 15, 1951.

In any future correspondence relating to your application, kindly refer to DMA 255X.

Sincerely yours,

LANDON F. STROBEL

Landon F. Strobel
Executive Secretary

LFSTROBEL:mab
cc: Strobel
Files
Herres
Lyon

FILE COPY
SURNAME:

McKnight
Note
Hypres
4/25

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

April 23, 1951

Mr. Compton I. White
Whitedelf Mining and Development Company
Clerks Fork, Idaho

Dear Mr. White:

In reply to your letter of April 3:

I am advised by our Lead-Zinc Branch that the project you have proposed, to develop the Whitedelf lead-silver mine, fits into a pattern common to many applications wherein the proven reserves of strategic minerals in short supply are insufficient to justify a procurement contract for metal, but the chances of opening up ore appear favorable enough to warrant consideration under the exploration program recently announced. I understand that information concerning this program and the necessary application forms have been sent to you. If you care to apply under this program, we will be glad to consider your project.

I regret that we are not, at this time, able to recommend an advance of public funds as a direct loan of the full amount needed to develop your mine in depth.

Very truly yours,

JAMES DOUGLAS
Acting
Administrator

ETMcKnight:emp
G 4/18/51
Copies to: Administrator
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

FILE COPY
SURNAME:

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

From: McKnight
Herres

APR 12

Mr. Compton I. White
608 N. Carolina Avenue
Washington 3, D. C.

In reply please
refer to DMA-255

Dear Mr. White:

One of the purposes of the Defense Production Act of 1950 is the encouragement of exploration, development and mining of strategic minerals and metals. Where an applicant has proven reserves of strategic materials, Federal aid in mining can be given through procurement contracts for such materials as are in short supply. On the strength of these contracts, the applicant can obtain private financing in most instances.

The program recently approved for encouragement of exploration of strategic materials calls for participation on the part of the applicant. For zinc, lead and copper deposits it will be necessary to match Government funds on an equal basis. Funds advanced by the Government will be considered a loan, to be repaid if the exploration is profitable, but to be canceled if unsuccessful. The details of the plan, explaining the projects that will be eligible for assistance, the terms and schedules of financing, repayment, and other pertinent information, are enclosed.

A review of your application (DMA-255) for financial aid in deepening the shaft at the Whitedelf Mine, Bonner Co., Idaho indicates that your proposal may be considered under this exploration program. Details concerning expenditures that will be considered chargeable to exploration aid will be subject to a final determination by negotiation, but as a preliminary appraisal, we believe that the program will apply to the entire application of $125,000.00.

Before we can proceed further with consideration of your application, which may or may not require a field examination, please indicate your willingness to provide your share of the funds needed to carry out the proposed exploration. Any modification of your original proposal that you may wish to make will be considered, but you should be specific concerning the work you wish to undertake.

Very truly yours,

Otto Herres

OTTO HERRES, Chief
Lead-Zinc Branch

ETMcKnight:bsp
G 3/22/51
Copies to: Chief, Lead-Zinc Branch
USGS McKnight
L. B. Moon
R. H. Mote
2 copies to A. E. Weissenborn
Exec. Officer, Region II

Enclosures

L. F. Strobel
C. O. Mittendorf
Files

DMA 255

LANDON F. STROBEL

COMPTON I. WHITE
SECRETARY-TREASURER
CLARKS FORK, IDAHO

COMPTON I. WHITE, JR.
PRESIDENT
CLARKS FORK, IDAHO

W. W. VON DANON
VICE-PRESIDENT
SANDPOINT, IDAHO

WHITEDELF MINING AND DEVELOPMENT CO.

MINE OFFICE
CLARKS FORK, IDAHO

FISCAL OFFICE
416 EMPIRE STATE BLDG.
SPOKANE 8, WASHINGTON

EASTERN OFFICE
608 NORTH CAROLINA AVE., S.E.
WASHINGTON 3, D. C.

BUREAU OF MINES
MAIL ROOM
WASHINGTON, D.C.
APR 10 10 44 AM '51

Clarks Fork, Idaho
April 7th 1951

Mr. Tom Lyons, Director
Supply Division.
Defense Minerals Administration
Washington D C.

4/10/51
(1) Lyons
(2) Bureau supply

Dear Mr. Lyons,-

Since writing you on March 31st concerning the examination of the Howe Mountain Copper properties I have had the crew doing surface trenching to uncover ore shoots and trace out vein intersection. with gratifying results

We are already for your engineers to make a preliminary examination of these copper properties It is my recollection that you told me that a application for mine development money was a requirement for making a mine examination It was my understanding before leaving Washington that the prescribed mine development application was about ready to be [illegible] Bureau of Budget and that these forms would be [illegible] as soon as they were available

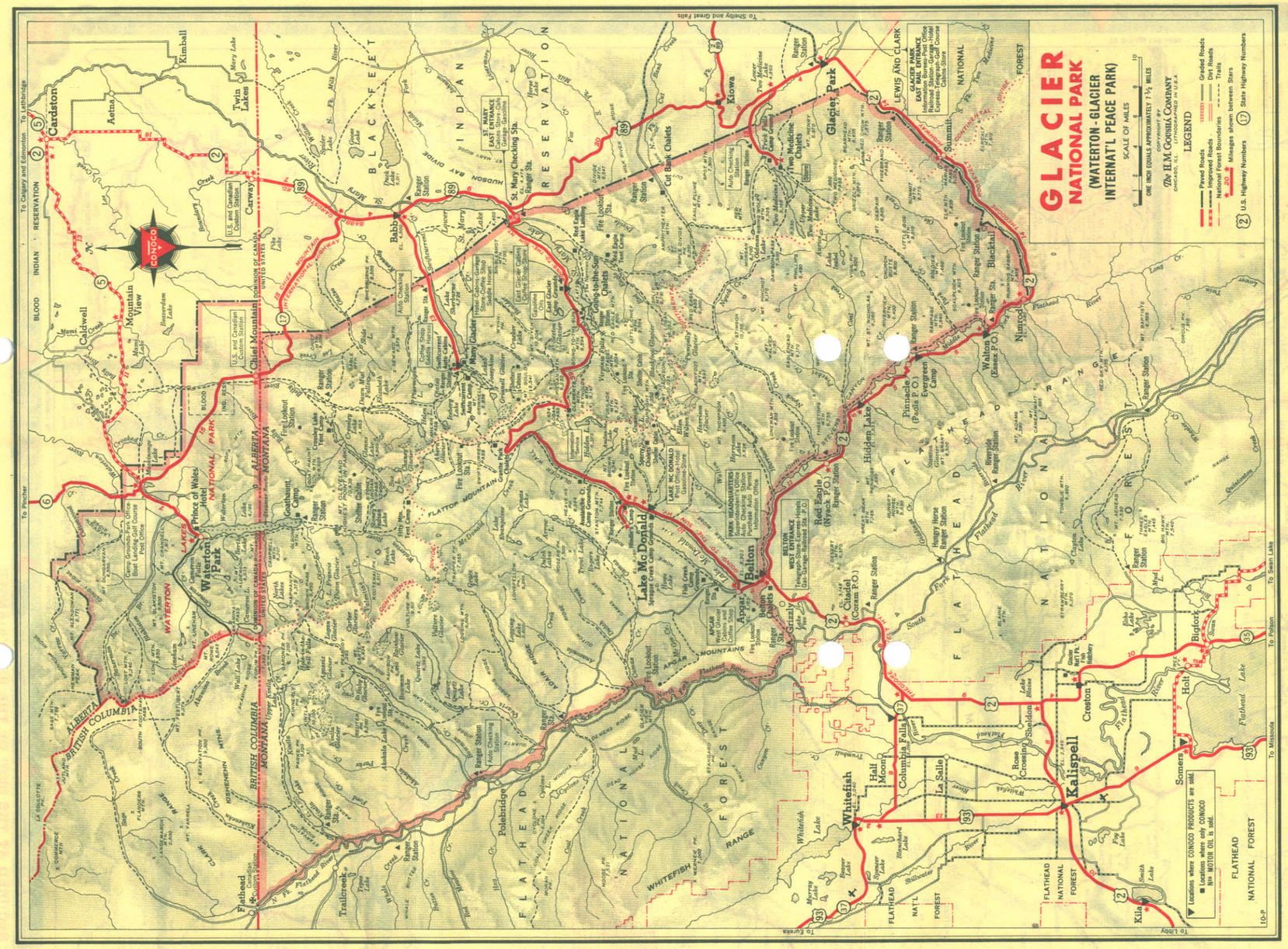
[illegible] these mining properties on the south slope of Howe Mountain [illegible] The Main line of the Northern Pacific Railway and the arterial road 10A This examination be made before your engineers have to go to remote [illegible] in higher elevations where snow and weather conditions make it difficult to late in the season necessary This is my reason for editing the [illegible] of having these examinations made [illegible] your office [illegible] authentic information as to [illegible] have in the way of copper deposits to develope.

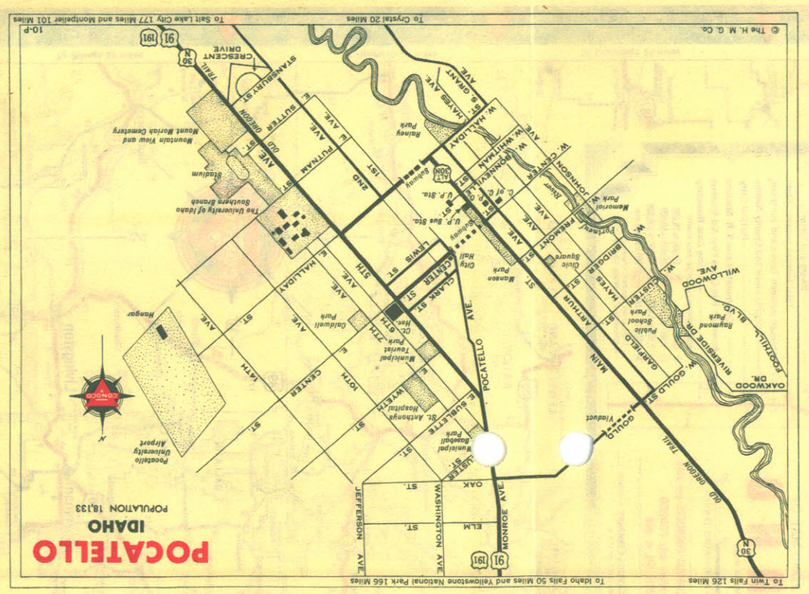
I would appreciate receiving the necessary application forms at the earliest convenience of your office.

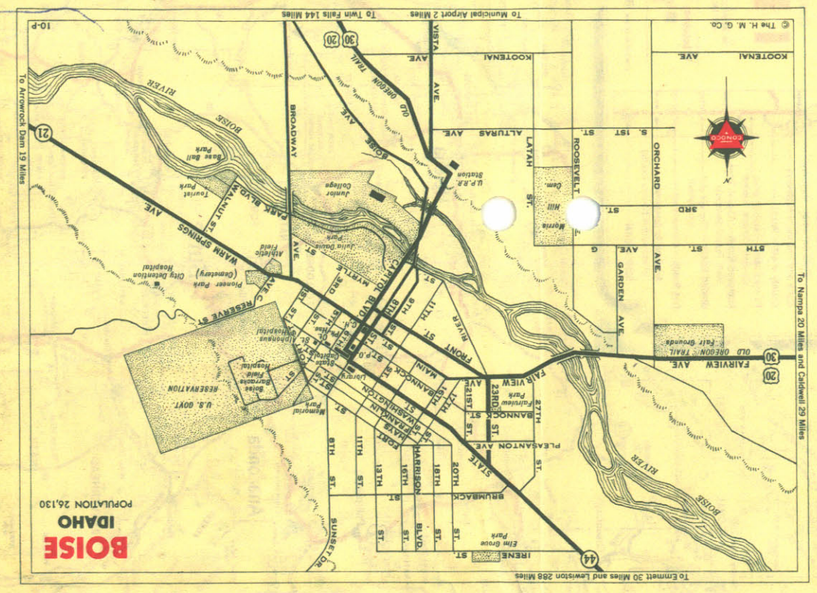
Sincerely

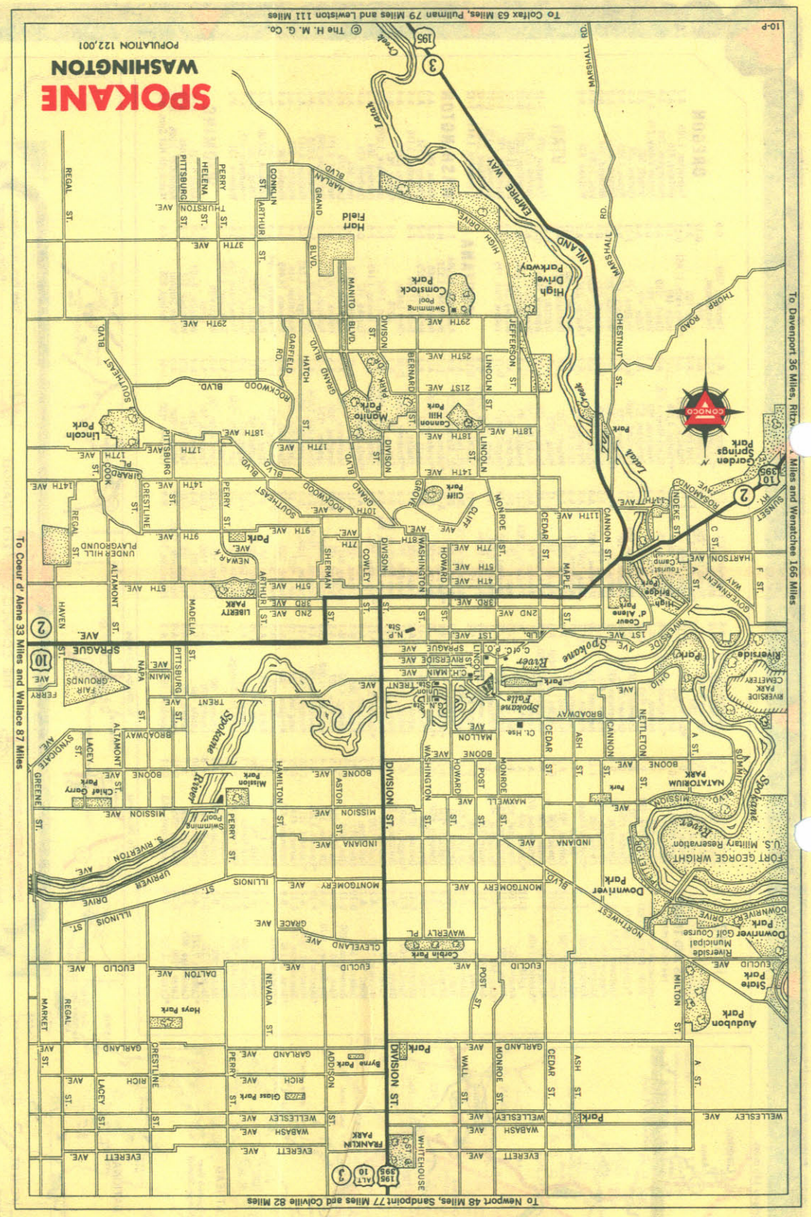
Compton I. White

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
APR 1 0 1951
LANDON F. STROBEL
Executive Secretary









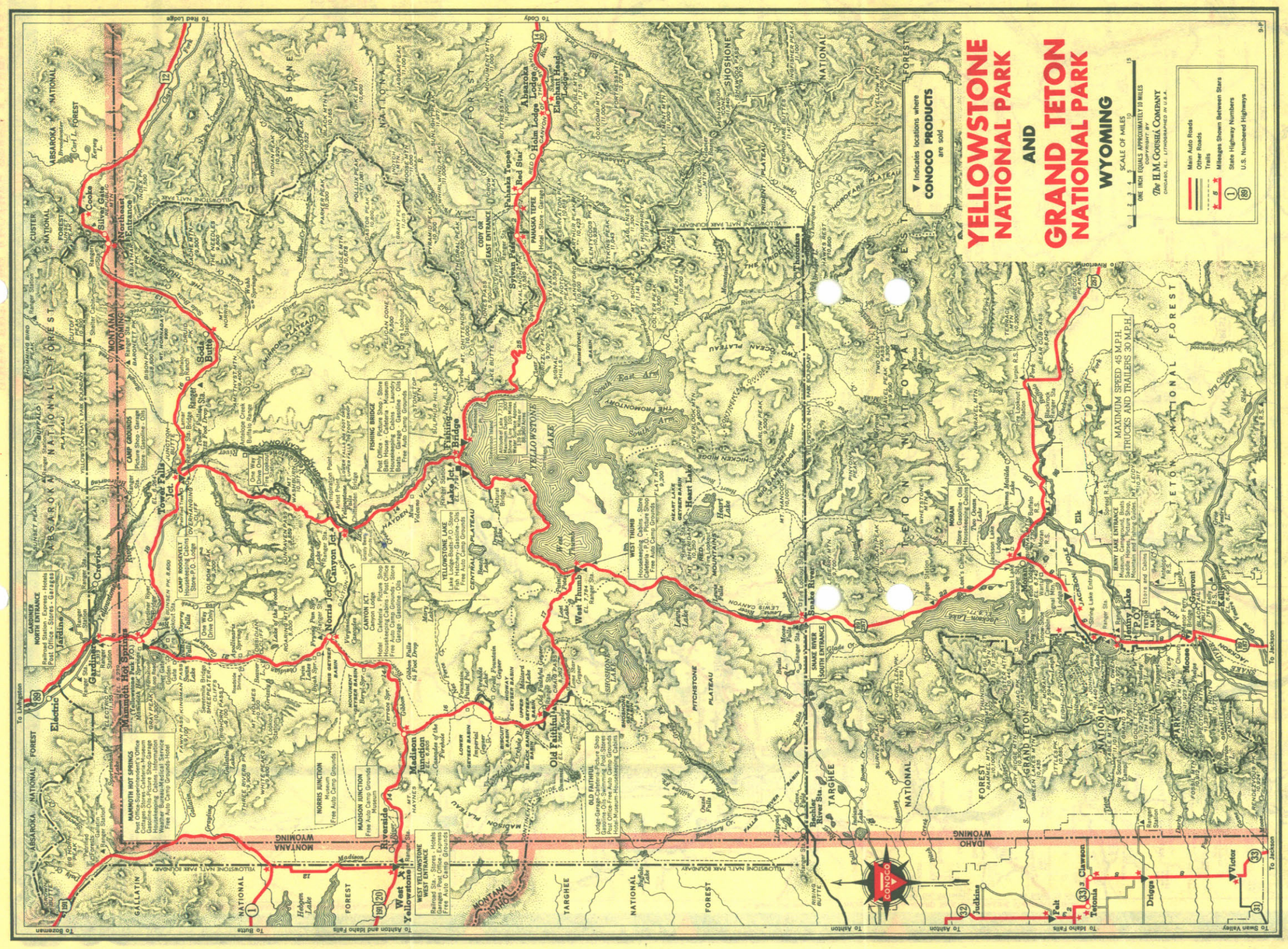


Exhibit No 17 Wholesale Affiliation 121 Sit

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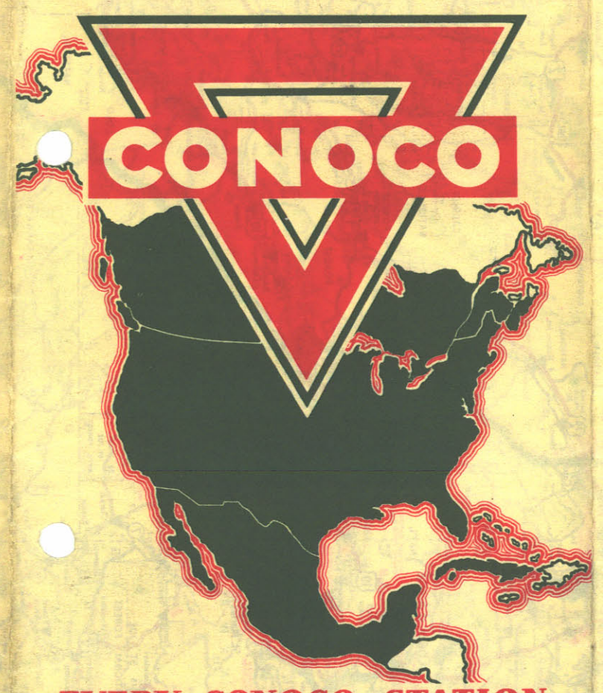

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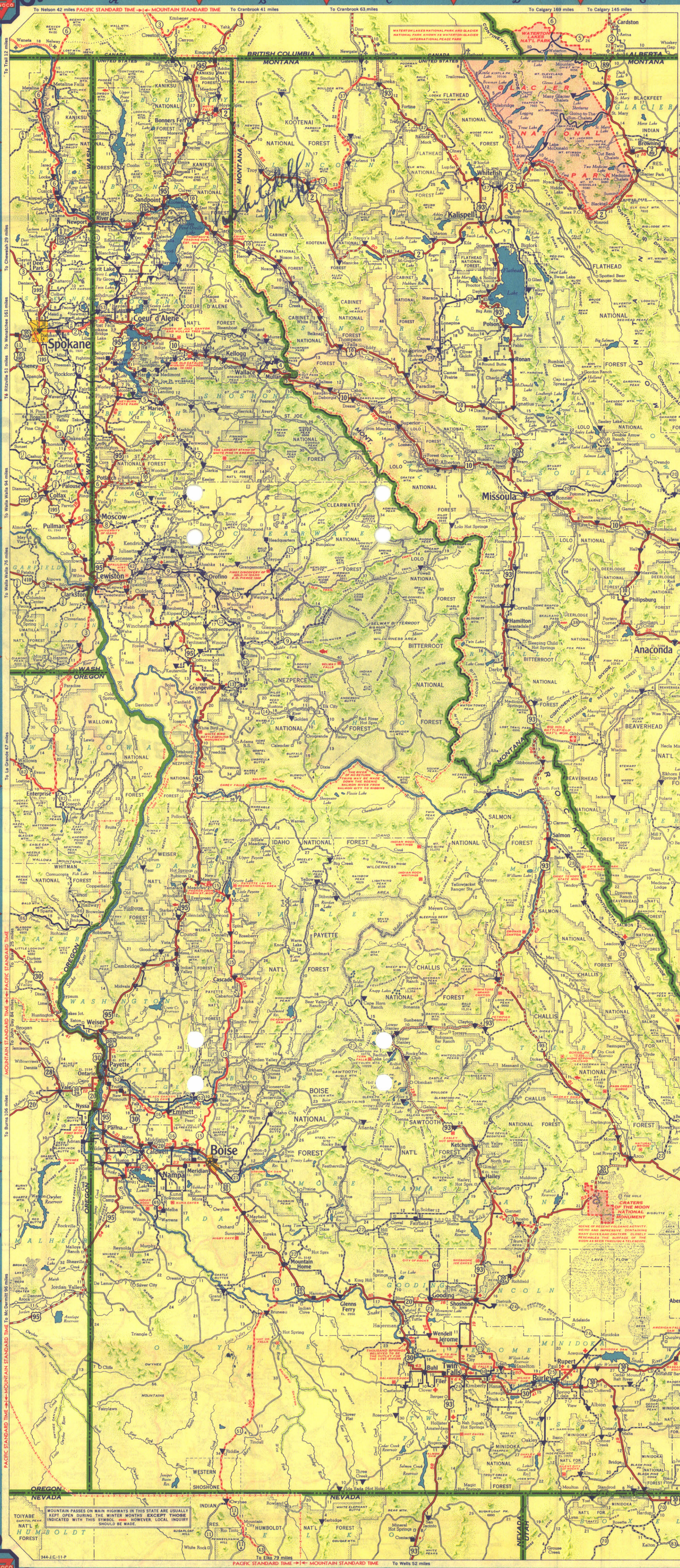

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*UNINCORPORATED—POP. ESTIMATED

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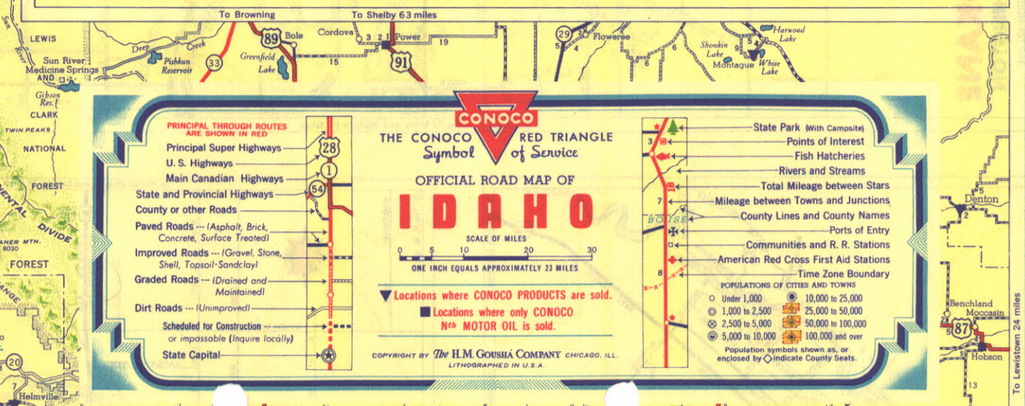
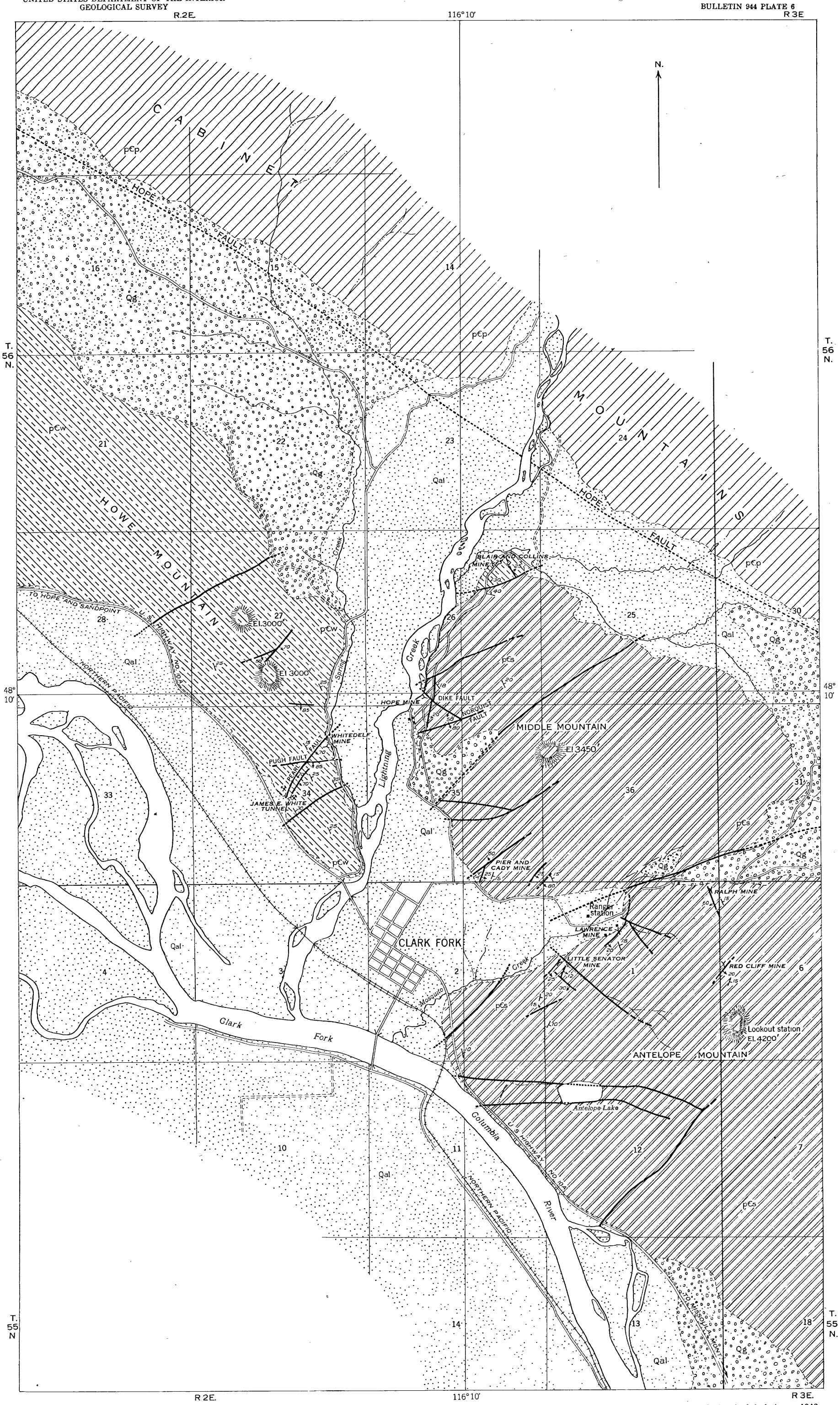


WHEN ENTERING ANOTHER STATE A NEW MAP MAY BE SECURED AT THE SIGN OF THE RED TRIANGLE.



Base from aerial photographs

Geology by A. L. Anderson, 1940

EXPLANATION

QUATERNARY

Recent

Qal — Alluvium (Recent stream deposits)

Pleistocene

Qg — Glacial deposits (Includes glacial till and fluvio-glacial outwash)

PRE-CAMBRIAN

Belt series

pЄs — Striped Peak formation (Chiefly greenish and reddish shales, sandstones, and quartzites, with some laminated black shale and some thin beds of impure limestone)

pЄw — Wallace formation (Greenish and grayish buff-weathering quartzites and siliceous shales, in part calcareous, interbedded with impure limestones)

pЄp — Prichard formation (Chiefly quartzitic beds with some grayish shale, which becomes more abundant in upper part of formation)

Fault showing dip (Dashed when inferred, dotted where concealed)

Strike and dip of beds

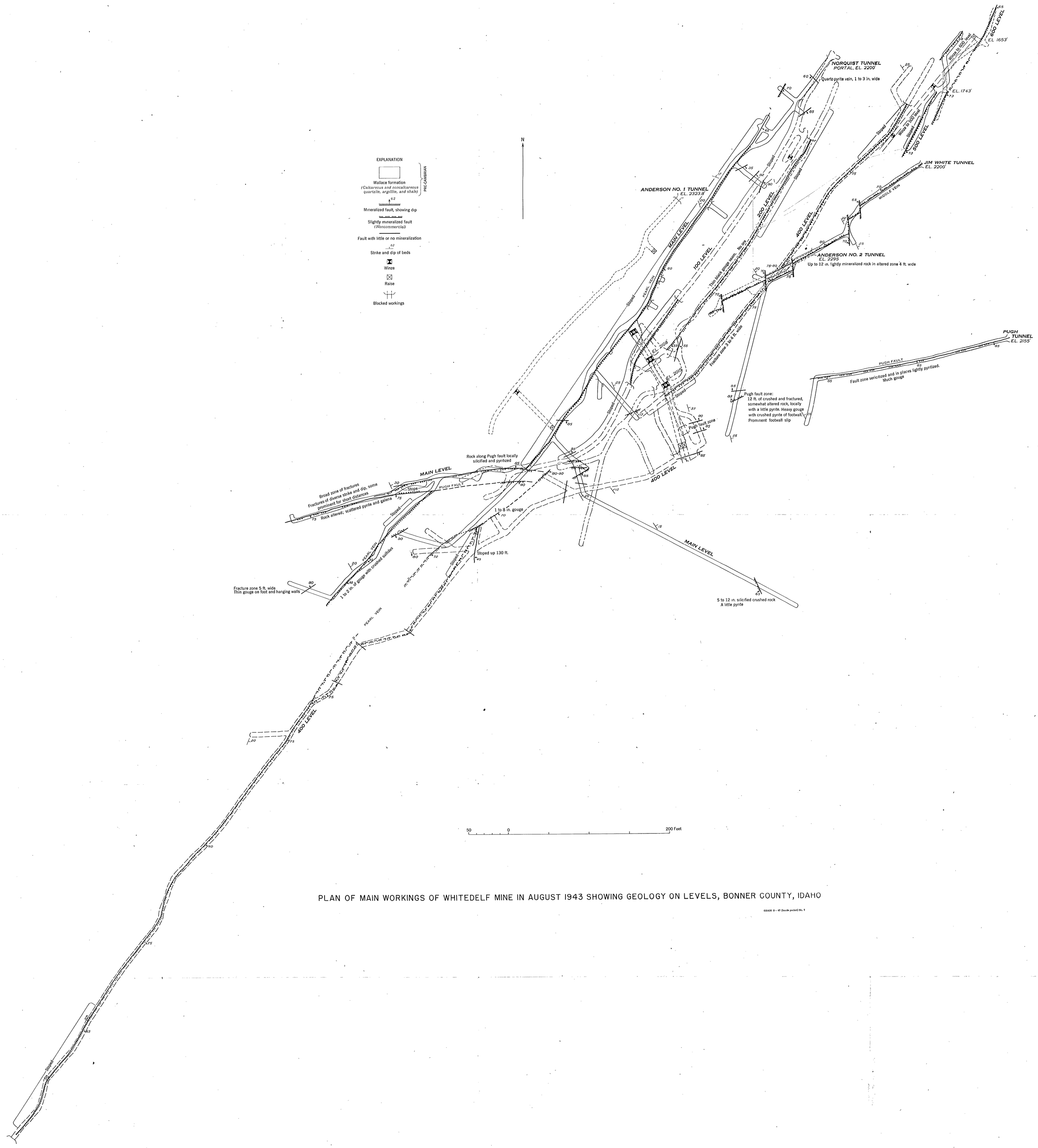
Tunnel

GEOLOGIC MAP OF THE AREA CONTAINING THE LEAD-SILVER DEPOSITS AROUND THE TOWN OF CLARK FORK

Scale $\frac{1}{31,680}$

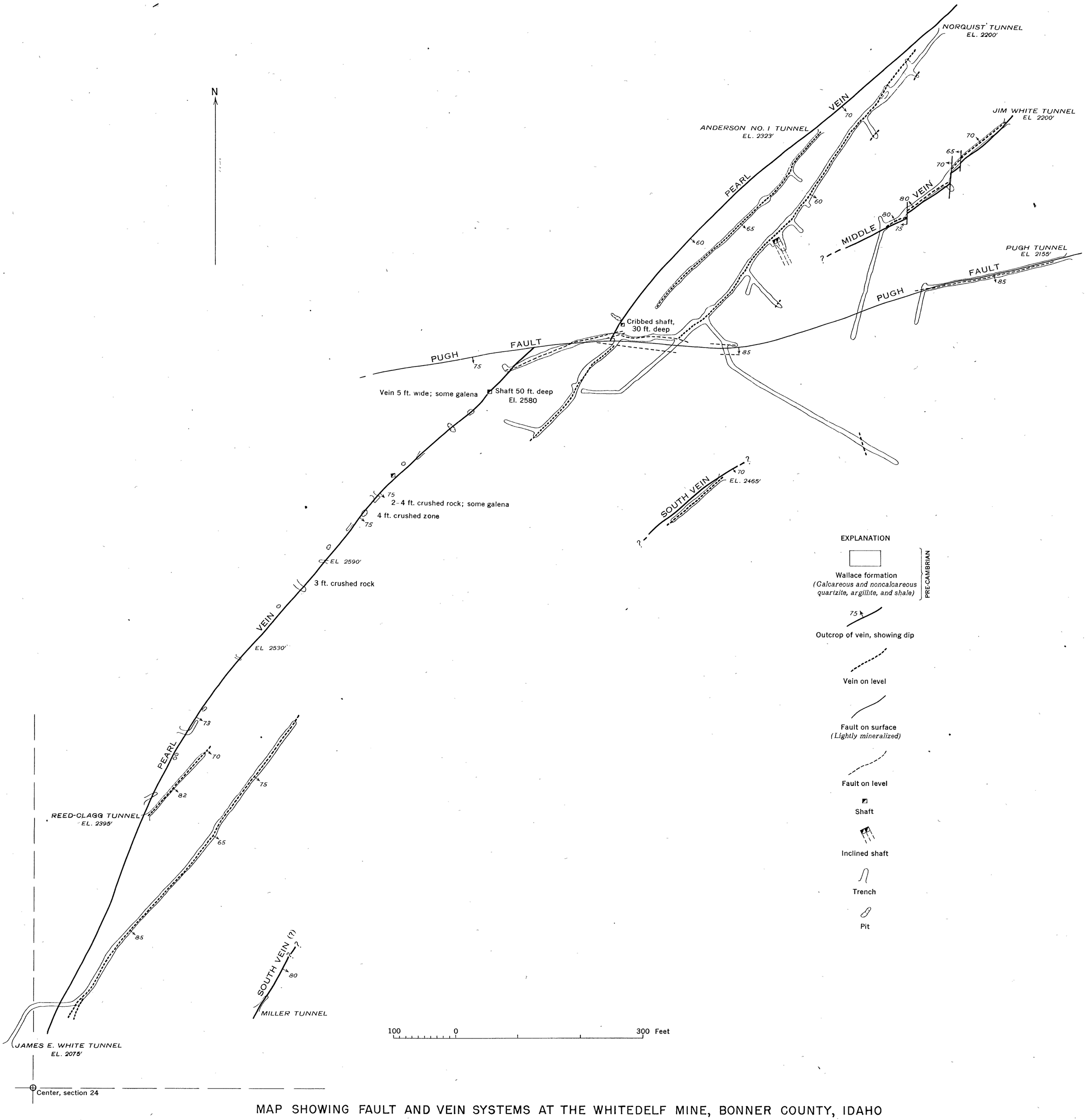
1 0 2 Miles

695456 O - 47 (Inside pocket) No. 6



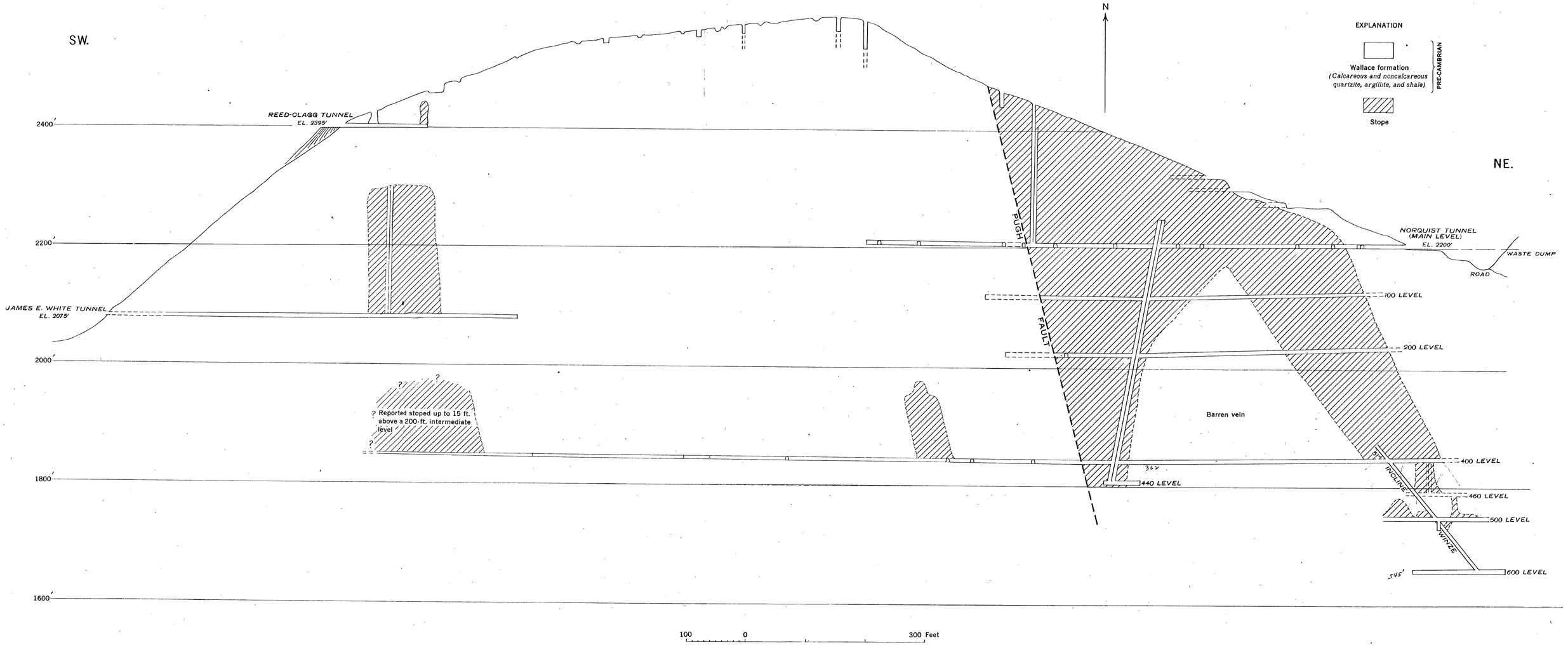
PLAN OF MAIN WORKINGS OF WHITEDELF MINE IN AUGUST 1943 SHOWING GEOLOGY ON LEVELS, BONNER COUNTY, IDAHO

695455 O - 47 (Inside pocket) No. 7



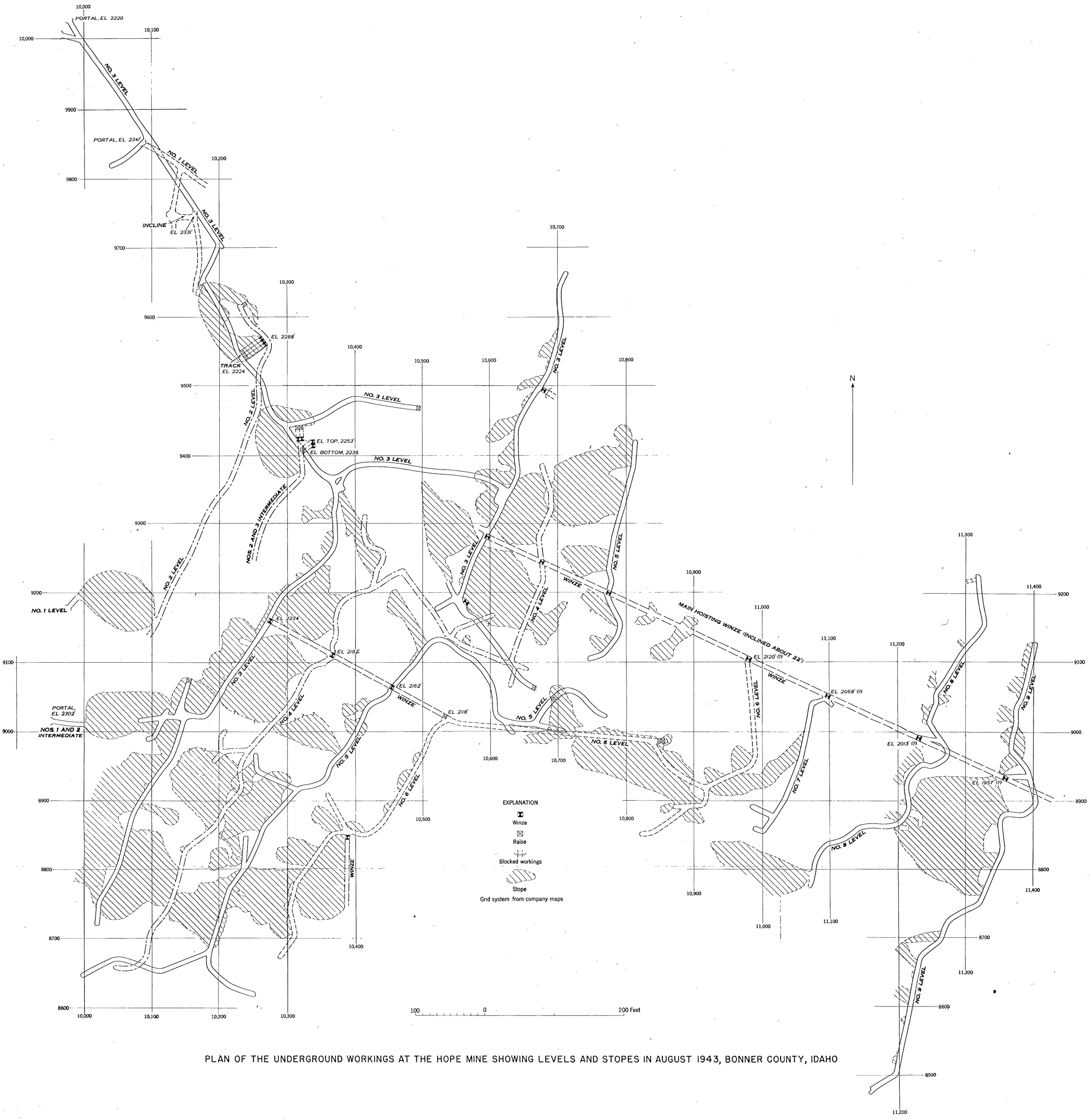
MAP SHOWING FAULT AND VEIN SYSTEMS AT THE WHITEDELF MINE, BONNER COUNTY, IDAHO

695456 O - 47 (Inside pocket) No. 9



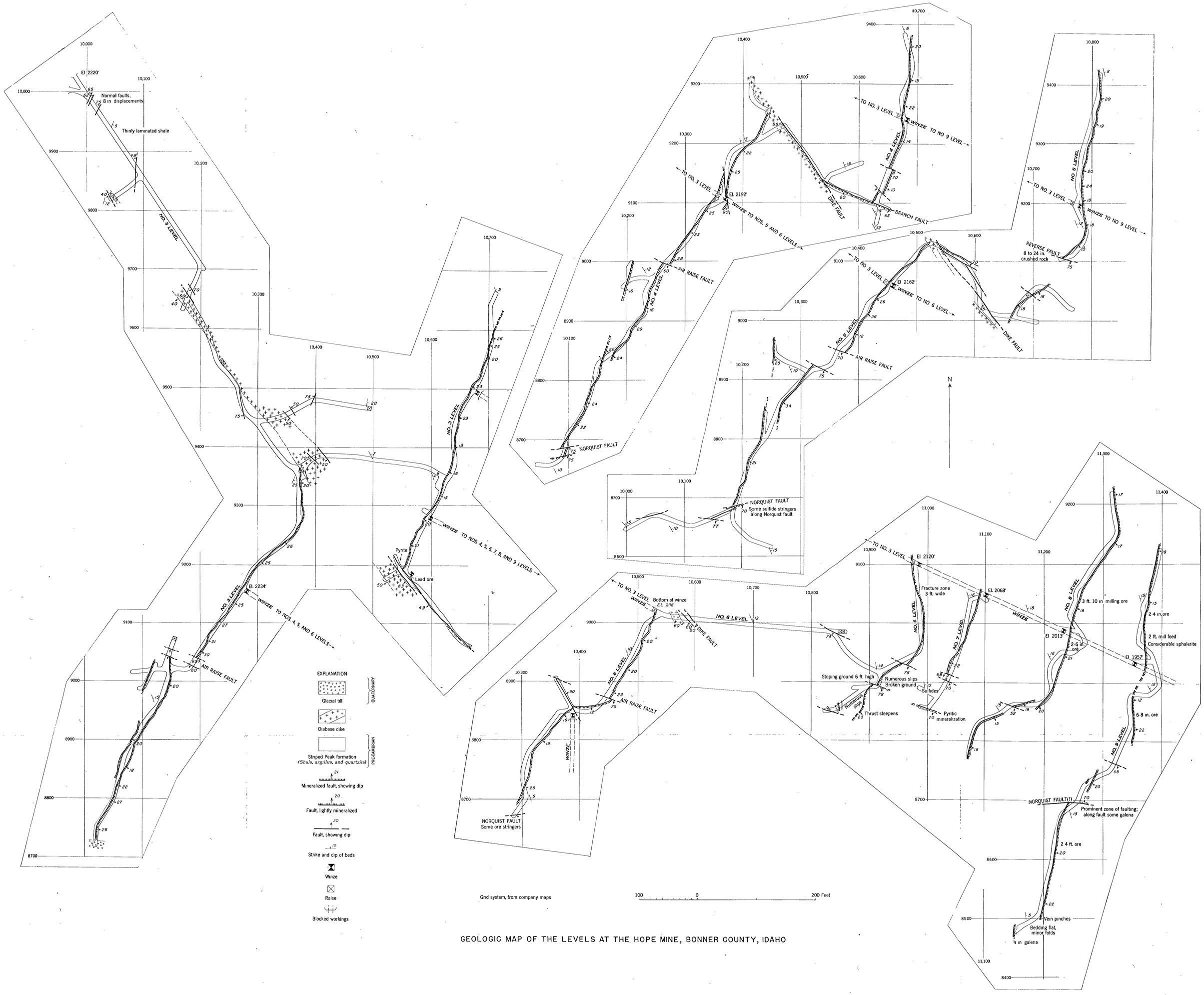
LONGITUDINAL SECTION ALONG THE PEARL VEIN AT THE WHITEDELF MINE SHOWING STOPES IN AUGUST 1943, BONNER COUNTY, IDAHO

695458 O - 47 (Inside pocket) No. 10



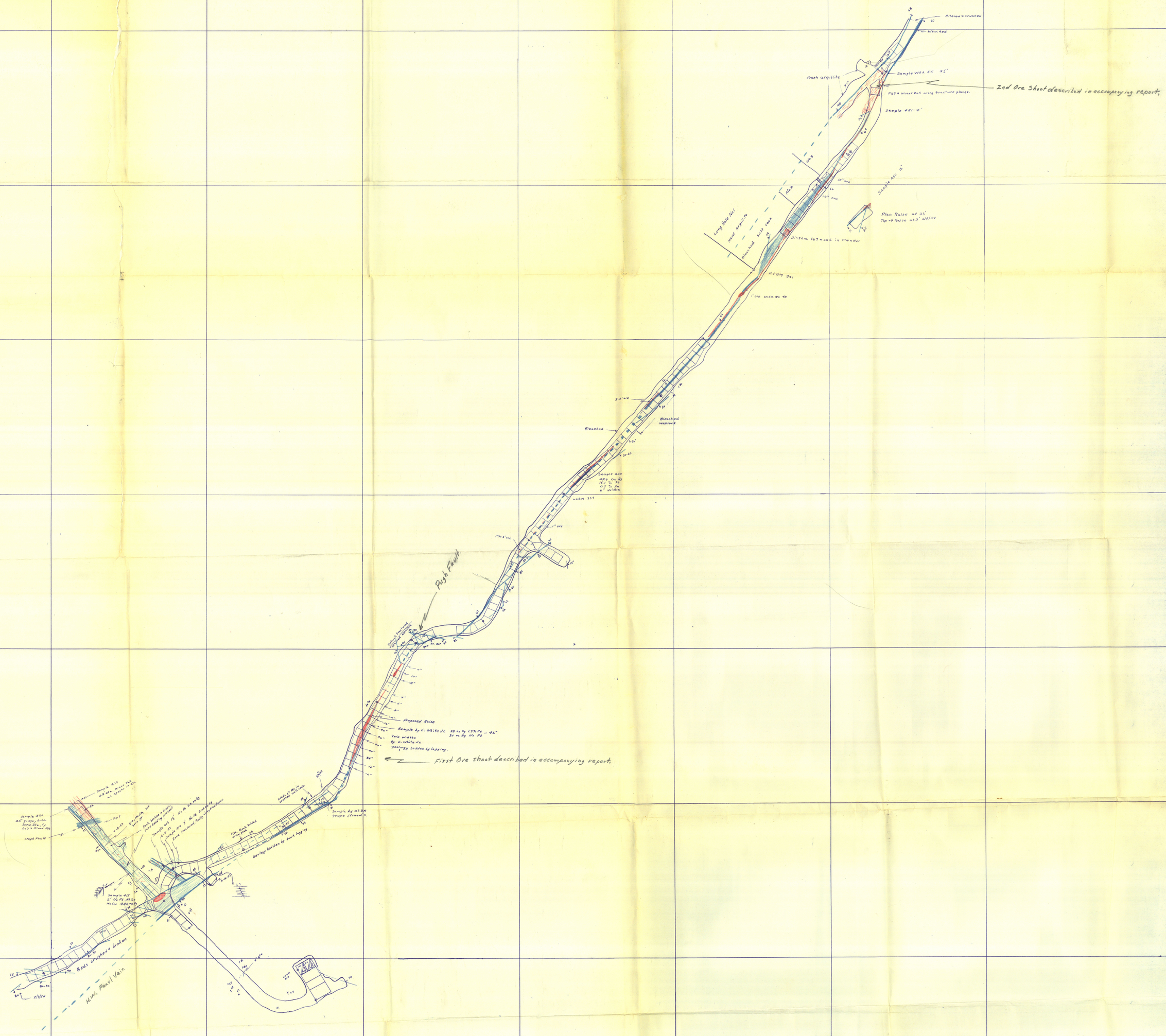
PLAN OF THE UNDERGROUND WORKINGS AT THE HOPE MINE SHOWING LEVELS AND STOPES IN AUGUST 1943, BONNER COUNTY, IDAHO

695456 O - 47 (Inside pocket) No. 11



GEOLOGIC MAP OF THE LEVELS AT THE HOPE MINE, BONNER COUNTY, IDAHO

695456 O - 47 (Inside pocket) No. 12



800' LEVEL

WHITEDELF MINE, BONNER COUNTY, IDAHO

DMEA Docket Number 255

0 20 40 60 80 100 FEET