FINAL FIELD REPORT - OME EXPLORATION PROJECT

By R. M. Smith, Geologist, Region II

March 20, 1973

1. OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Operator: Alexander von Hafften
3898 Washington Street
San Francisco, California 94118

Property: Great Basin group of 13 unpatented claims; Allied group of 20 unpatented claims; fee lands, 320 acres in secs. 3, 9, and 16; all in T. 41 N., R. 49 E., MDB&M.

Ownership: Operator owns the Great Basin group and leases the Allied group and fee lands from Allied Properties, Inc., Harry E. Olsson, Vice President, 340 Mason Street, San Francisco, California 94102.

2. Purpose of Project: To explore for ore bodies of silver minerals and gold disseminated in Tertiary volcanic rock by an induced polarization (IP) survey and by drilling promising anomalies.

3. Contract: Dated April 27, 1972, term 12 months.
Total allowable costs--$27,100.00
Government participation--$20,325.00 (75%)

Amendments: No. 1--August 4, 1972. Allowed dipole spacing of 600 feet, two additional IP traverse lines, and five additional days consulting services with expenses. Funds available by a saving in mobilization costs.

No. 2--November 2, 1972. Added a revised Figure 2, allowed four additional drill sites, 11 additional days consulting services, 12 additional assays. Funds available from unused drilling footage, bulldozing.

4. Project Work: Started May 30, 1972, completed October 12, 1972.

Cost Item	Costs Paid
Stage I	
Geophysical (IP) survey	$ 3,935
Outside consultant, 7 days	980
Travel, 1,958 miles	235
Per diem, 7 days	140
Total Stage I	$ 5,290
Stage II	
Bulldozer, transport	$ 250
Bulldozing, 19 hours	570
Drill rig, transport	250
Rotary drilling, 9 vertical holes, 3,123 feet	15,749
Reaming, casing, 6 hours	150
Casing lost in hole, 70 feet	88
Cement, 5 sacks	11
Additives, 10 sacks	51
Outside consultant, 19 days	2,660
Travel, 3,990 miles	479
Per diem, 19 days	380
Sample sacks, 620	235
Assays, gold/silver, 197	857
Total Stage II	$21,730
Total Cost of Project	$27,020
Government Participation	$20,265

The Government retains no equity in any of the equipment and materials used.

The work was done very efficiently, and the anomalous areas were adequately explored to test for large disseminated types of deposits.

5. Reports:

Good Hope mining district, R. D. Knox, August 1970.

Application Report, R. M. Smith, October 28, 1971.

I.P. Survey (Job 718), Heinrichs Geoexploration Co., Tucson, Arizona, June 1972.

5. Reports (Continued):

Operator's final report, E. F. Lawrence, November 20, 1972.

Final audit, U. S. Department of the Interior, Office of Survey and Review, February 1973.

Closing letter, OME, March 15, 1973.

Royalty review--none.

6. Project Results:

Discoveries:

No indication of a disseminated silver-gold deposit was found. Sufficient pyrite disseminated and in veinlets was seen in the drill cuttings to account for the IP anomalies. One sample, however, assayed 0.40 ounces gold per ton, but as it contained no silver the assay is suspect. The stored split of this sample should be reassayed. If a similar result is obtained, a 40-foot prospect shaft may be warranted to explore for a vein of commercial grade. On the basis of present information, Government participation in such a project would not be warranted, since the geologic probability of a significant discovery is small.

Assay Data:

Hole No.	Total Depth feet	Sample Depths feet	Highest Assay oz. gold	Highest Assay oz. silver
1	600	10-520	Tr.	0.2
2	560	10-560	Tr.	1.0
3	510	0-510	Tr.	0.2
4	600	5-600	0.01	0.1
5	360	55-95	Tr.	0.1
		95-100	0.01	2.4
		150-360	Tr.	0.2
6	140	0-35	0.02	0.2
		35-40	0.40	none
		40-135	Tr.	0.1
7	200	0-200	0.01	0.3
8	93	0-93	0.01	0.7
9	60	0-60	Tr.	0.2
	3,123			

6. Project Results (Continued):

Ore reserves--none

Future production--improbable

Future development--unwarranted

Future exploration--not warranted by results to date

Certification--not recommended. The drilling eliminated the possibility of a disseminated deposit of commercial size and grade.

Production--none

Royalties--none

7. Geologic Summary:

The oldest rock unit exposed in the Good Hope district is quartzite of the Valmy (or Vinini?) Formation of Ordovician age. It is overlain unconformably by rhyolitic welded tuffs and andesite flows, dikes, and sills of Miocene(?) age. These older volcanics are unconformably overlain by erosion remnants of fresh-water limestone and by younger rhyolitic welded tuffs and flows of Pliocene(?) age. The older volcanics are locally mineralized.

The ore bodies are narrow quartz veins along faults that strike northward or northeastward and dip steeply in the older volcanics. The largest ore shoots mined were in the Buckeye and Ohio mine where two intersecting quartz veins as much as 5 feet wide contained pyrite, arsenopyrite, freibergite, stibnite, and dark ruby silver. A sample (Nevada Bur. Mines Bull. 61, p. 61) across 36 inches of vein material assayed 7.6 ounces silver, 14.1 percent antimony, and a trace of gold. The depth mined is not known but probably did not exceed 100 feet. Total reported production from the district is 90,909 ounces silver prior to 1922, and about 2-1/2 tons of antimony during 1950.

On the Great Basin group of claims, the Good Hope and one other mine may have yielded some silver ore, but there is no record of production. Selected samples of quartz from the dumps assayed as high as $62 per ton in silver, and lower assays were obtained from seven other prospects. A zone of alteration trending northeast and covered by the Great Basin group of claims contains several geophysical and geochemical anomalies (Knox, 1970).

MME Form 9
Rev. Nov. 65

UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey

OFFICIAL DOCKET FILE

Contract No. 2303 Docket No. 6854

Application
- [ ] Denied
- [ ] Withdrawn

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

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

Folder No. 1:

Left Side

- [ ] Royalty Audits
- [ ] Certification of Discovery
- [ ] Closing Letter
- [x] Cost Audits
- [ ] Termination Notice or Agreement
- [ ] Recision Notice
- [ ] Assignment of Contract
- [x] Contract Amendments
- [x] Contract with all exhibits and annexes
- [ ] Owner's Consent to Lien and Subordination Agreement
- [x] Application and Attachments

Right Side

- [ ] Project Summary (final)
- [ ] Work Completed Analysis (final)
- All other material filed in chronological order including the following reports if checked:
- [ ] Field Team Semiannual Report for Certified Project
- [x] Final Field Team Report (Tab)
- [x] Operator's Final Report (Tab)
- [ ] Interim Field Team Reports
- [x] Operator's monthly reports and all attachments
- [x] On-site Exam. Report (Tab) 10/28/71 and Supplement
- [ ] Settlement Sheets
- [ ] Drill Logs

Additional Folders:

Left Side

Folders No._____: Reports
- [ ] Analysis of Semiannual Inspection Reports
- [ ] Project Summary (Interim) by MME Engineers

Right Side

- [ ] Field Team Semiannual Report for Certified Project
- [ ] Field Team Interim Reports
- [ ] Operator's Monthly Reports with Transmittal, Narrative and Maps

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

Folders No._____: Settlement Sheets

Folders No._____: Drill Logs

Folders No._____: Royalty Material

72195-65

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code

MAR 15 1973

AIRMAIL

Mr. Alexander von Hafften
d/b/a Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

Re: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Dear Mr. von Hafften:

Reference is made to your recently completed exploration contract with the Government.

We regret that the work performed did not result in a discovery warranting issuance of a certification of possible production under the provisions of the contract. In the absence of such certification, the Government retains no claim or lien against the property subject to the contract or any future production therefrom. We therefore, are closing our books and records on this contract. Your attention, however, is called to the provisions of the contract which require the Operator to keep and preserve certain records for the periods indicated.

We appreciate your interest and participation in the OME exploration program.

Sincerely yours,

Harold Kirkemo

Harold Kirkemo
Chief, Office of
Minerals Exploration

Copy to: Mr. Harry E. Olsson
Vice President
Allied Properties

cc: Director's reading file
Mineral Resources
OME reading file
Region II

Ann Gabor
Mr. Kirkemo

HKirkemo/cac 3/14/73

I-C-DC-OME-1(a)-73

UNITED STATES
DEPARTMENT OF THE INTERIOR

Office of Survey and Review

Audit Operations

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Report of Review-Contract No. 2303
Docket No. OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
San Francisco, California

Washington, D.C.
February 1973

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
OFFICE OF SURVEY AND REVIEW
Audit Operations, Region I
801 19th Street, N.W., Room 1115
Washington, D.C. 20240

February 22, 1973

Memorandum

To: Director, Geological Survey

From: Regional Director, Region I
Audit Operations, Office of Survey and Review

Subject: Review of Contract No. 2303
Docket No. OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
San Francisco, California

As requested by the Chief, Office of Minerals Exploration, we made a cost review of Contract No. 2303. The results of our review are shown in the attached report.

Frank V. Tassitt
Regional Director
Audit Operations

Attachment

We have reviewed (1) the current files of the Office of Minerals Exploration (OME) pertaining to Minerals Exploration Contract No. 2303 with Alexander von Hafften d/b/a, Great Basin Exploration Company (Operator) made under Public Law 85-701 (The Act) and (2) the related disbursement records in the Branch of Financial Management, Administrative Division, Geological Survey. The review was made during February 1973, at Washington, D.C.

The contract was awarded on April 27, 1972, with work to begin on or before July 1, 1972, and to be completed within 12 months from the date of the contract. The maximum allowable contract cost was $27,100 with OME participating on a 75 percent basis, or for a sum not in excess of $20,325.

Repayment of disbursed Federal funds, plus interest at 8 percent, was to be on the basis of established royalties on all minerals and metals produced from the land during the exploratory operation, and for a period of 10 years from the date of the contract, should a Certification of Possible Production be made by OME.

The purpose of the project was to explore for disseminated silver-gold-bearing ore bodies in Tertiary volcanic rocks by conducting a geophysical survey using the induced polarization (IP) method and by drilling promising anomalies using rotary drills.

The work was to be divided into two stages. All of Stage I was to be completed and as much of Stage II as was warranted by the results obtained in Stage I.

Stage I was to consist of an IP survey along seven approximately parallel traverses, six of them about 4,200 feet long and one 4,800 feet long, and one longitudinal traverse of about 9,000 feet at approximately a right angle to the other traverses. The Operator was to make a final report with interpretations of the results.

Upon selection by the Operator of drill sites and hole depths, based on the results of Stage I, and after approval by the Government, Stage II originally was to consist of bulldozing access roads to not more than five drill sites, leveling the sites and rotary drilling not more than five vertical holes aggregating not more than 3,000 feet. By amendment to the Contract, the number of drill holes was increased to nine, aggregating approximately 3,123 feet.

An interim field inspection was made by a representative of the OME Region II Field Office on September 13, 1972, and three vouchers were submitted by the Operator and approved by the OME Region II Office.

In a December 8, 1972, memorandum to the Chief, OME, the Region II Field Officer stated that silver sulfides and gold occurred in tiny quartz veinlets too sporadically and widely spaced to be of economic interest. The Field Officer declared that a Certification of Possible Production is not recommended.

Our review disclosed what appears to have been an oversight in amending the Contract to permit the payment of increased costs incurred for Outside Consultant services under Stage I, Category (2), Subcategory (a) Supervision and Technical Services, of the Contract.

As originally stated in Exhibit A of the Contract, an Outside Consultant was authorized for 2 work days, at $140 per day, or a total of $280. In addition to other revisions, Amendment I to the work Contract provided for payment to an Outside Consultant for 7 days at $140 per day, or $980. However, Amendment No. 1 also provided that it should not be construed as increasing the amount of any item designated as a maximum. Article 6, Category (2), Subcategory (a), of the Contract stipulates that periods of employment and the total cost thereof are maximums. Accordingly, in drafting Amendment No. 1 the increased cost and number of work days allowed for an Outside Consultant should have been specifically exempted from the language stipulating that Amendment No. 1 should not be construed as increasing the amount of any item designated as maximums. Amendment No. 2 correctly stated the situation with respect to the similar item in Stage II.

The units of work authorized and paid under Contract No. 2303 are summarized in Exhibit I.

As of December 20, 1972, OME had paid the Operator a total of $20,265.

The costs identified as approved by audit on Exhibit I are eligible for 75 percent OME participation in conformity with the provisions of the Act and the Contract.

OME Contract No. 2303 with Alexander von Hafften
d/b/a Great Basin Exploration Company
Summary of Contract Terms and Costs

Actual Costs	Authorized Amount	Costs Paid	Approved By Audit	Unexpended Balance
Stage I				
Category (1) Independent Contracts				
Geophysical survey, 25,200 feet or more, including mobilization, demobilization, labor, standby time, equipment, supplies and final report 1 job	$3,935	$3,935	$3,935	
Total Category (1)	3,935	3,935	3,935	
Category (2) Personal Services				
Subcategory (a) Supervision and Technical Services				
One Outside consultant 7 days at $140/day	980	980	980	
Total Category (2)	980	980	980	
Category (7) Miscellaneous				
Transportation, outside consultant 1,958 miles at $0.12/mile (rounded)	235	235	235	
Per diem, outside consultant 7 days at $20/day	140	140	140	
Total Category (7)	375	375	375	
Total Cost - Stage I	$5,290	$5,290	$5,290	
Stage II				
Category (1) Independent Contracts				
Mobilization and demobilization One bulldozer	$ 250	$ 250	$ 250	
Bulldozing access roads and drill sites, 19 hours at $30/hour	570	570	570	

OME Contract No. 2303 with Alexander von Hafften
d/b/a Great Basin Exploration Company
Summary of Contract Terms and Costs

Actual Costs	Authorized Amount	Costs Paid	Approved By Audit	Unexpended Balance
Stage II (Con't)				
Rotary drilling, 3,123 feet	$15,750	$15,749	$15,749	$ 1
Price per foot				
Depth in feet/ Price				
0-300 $4.50				
300-600 6.00				
Reaming, setting and pulling casings				
6 hours at $25/hour	150	150	150	
Casing lost in hole				
70 feet at $1.25/foot	88	88	88	
Cement, 5 sacks at $2.25/sack	11	11	11	
Additives, 10 sacks at $5.14/sack	51	51	51	
Mobilization and demobilization of drilling equipment	250	250	250	
Total Category (1)	17,120	17,119	17,119	1
Category (2) Personal Services				
Subcategory (a) Supervision and Technical Services				
One outside consultant				
19 days at $140/day	2,660	2,660	2,660	
Total Category (2)	2,660	2,660	2,660	
Category (7) Miscellaneous				
Travel, outside consultant				
3,990 miles at $0.12/miles	479	479	479	
Per diem, outside consultant				
19 days at $20/day	380	380	380	
Sample sacks, cloth				
620 sacks at $0.30/sack	186	235	235	(49)
Assays for gold and silver				
197 samples at $5/sample	985	857	857	128
Total Category (7)	2,030	1,951	1,951	79
Total Cost - Stage II	21,810	21,730	21,730	80

OME Contract No. 2303 with Alexander von Hafften
d/b/a Great Basin Exploration Company
Summary of Contract Terms and Costs

Actual Costs	Authorized Amount	Costs Paid	Approved By Audit	Unexpended Balance
Category (7) Miscellaneous (Con't)				
Total Estimated Cost of Project	$27,100	$27,020	$27,020	$80
Government Participation at 75 Percent (rounded)	$20,325	$20,265	$20,265	$60

Government's Copy

EXPLORATION CONTRACT
ALEXANDER VON HAFFTEN d/b/a
GREAT BASIN EXPLORATION COMPANY
OME-6854

AMENDMENT NO. 2

It is agreed this 2nd day of November, 1972, between the United States of America, acting through the Department of the Interior, U. S. Geological Survey, hereinafter called the "Government," and Alexander von Hafften, d/b/a Great Basin Exploration Company, hereinafter called the "Operator," that Exploration Contract 2303 (OME-6854), dated April 27, 1972, is amended effective October 3, 1972, as follows:

In Exhibit A:

(a) Under the heading Description of the Work, Stage I, the second paragraph is revised to read as follows:

"Locations of the existing traverses and tentative locations of the proposed traverses are shown on Figure 2 entitled 'Claim and composite anomaly map, Good Hope mining district, Elko County, Nevada, as revised,' attached hereto and made a part hereof."

(b) Under the heading Description of the Work, Stage II, on page 2 the second and third paragraphs are revised to read as follows:

"Upon approval of a drilling plan, the work shall consist of bulldozing access roads to about nine drill sites, leveling the sites, and rotary drilling about nine vertical holes aggregating approximately 3,123 feet."

"The tentative locations of the holes are shown on Figure 2, as revised."

(c) Under the heading Estimated Costs of the Work, Stage II, on pages 3 and 4, the entire schedule is revised to read as follows:

"Actual Costs

Category (1) Independent Contracts

Mobilization and demobilization one bulldozer	$ 250.00
Bulldozing access roads and drill sites, 19 hours at $30.00/hour	570.00

Mobilization, demobilization of drilling equipment	$ 250.00	
Rotary drilling, 3,123 feet	15,749.85	

Price per foot

Depth, feet	Price
0 - 300	$4.50
300 - 600	$6.00

Reaming, setting and pulling casing 6 hours at $25.00/hour	150.00	
Casing lost in hole 70 feet at $1.25/foot	87.50	
Cement 5 sacks at $2.25/sack	11.25	
Additives 10 sacks at $5.14/each	51.40	
Total Category (1)		$17,120.00

Category (2) Personal Services

Subcategory (a) Supervision and Technical Services

None except:

1 Outside consultant 19 days at $140.00/day	$ 2,660.00	
Total Category (2)		$ 2,660.00

Category (7) Miscellaneous

None except:

Travel, outside consultant 3,990 miles at $0.12/mile	$ 479.00	
Per diem, outside consultant 19 days at $20.00/day	380.00	
Sample sacks, cloth 620 sacks at $0.30/sack	186.00	

Assays for gold and silver 197 samples at $5.00/sample	$ 985.00	
Total Category (7)		$ 2,030.00
Total Estimated Cost Stage II		$ 21,810.00
Government Participation at 75% (rounded)		$ 16,355.00 "

This amendment shall not be construed to increase the estimated total cost of the Contract, the aggregate amount which the Government may be required to contribute, nor the fixed unit cost of any item of work.

Except as amended herein Exploration Contract 2303 (OME-6854), dated April 27, 1972, shall remain in full force and effect.

Executed in quadruplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By Harold Kiburno
Chief, Office of Minerals Exploration
U. S. Geological Survey

ALEXANDER VON HAFFTEN d/b/a
GREAT BASIN EXPLORATION COMPANY

By Alexander von Hafften

Appd. Sol. Office 11/1/72 Martin
Chairman 11/1/72
Peeler 11/2/72

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OME-6854 (Silver-Gold)
Great Basin Exploration Company

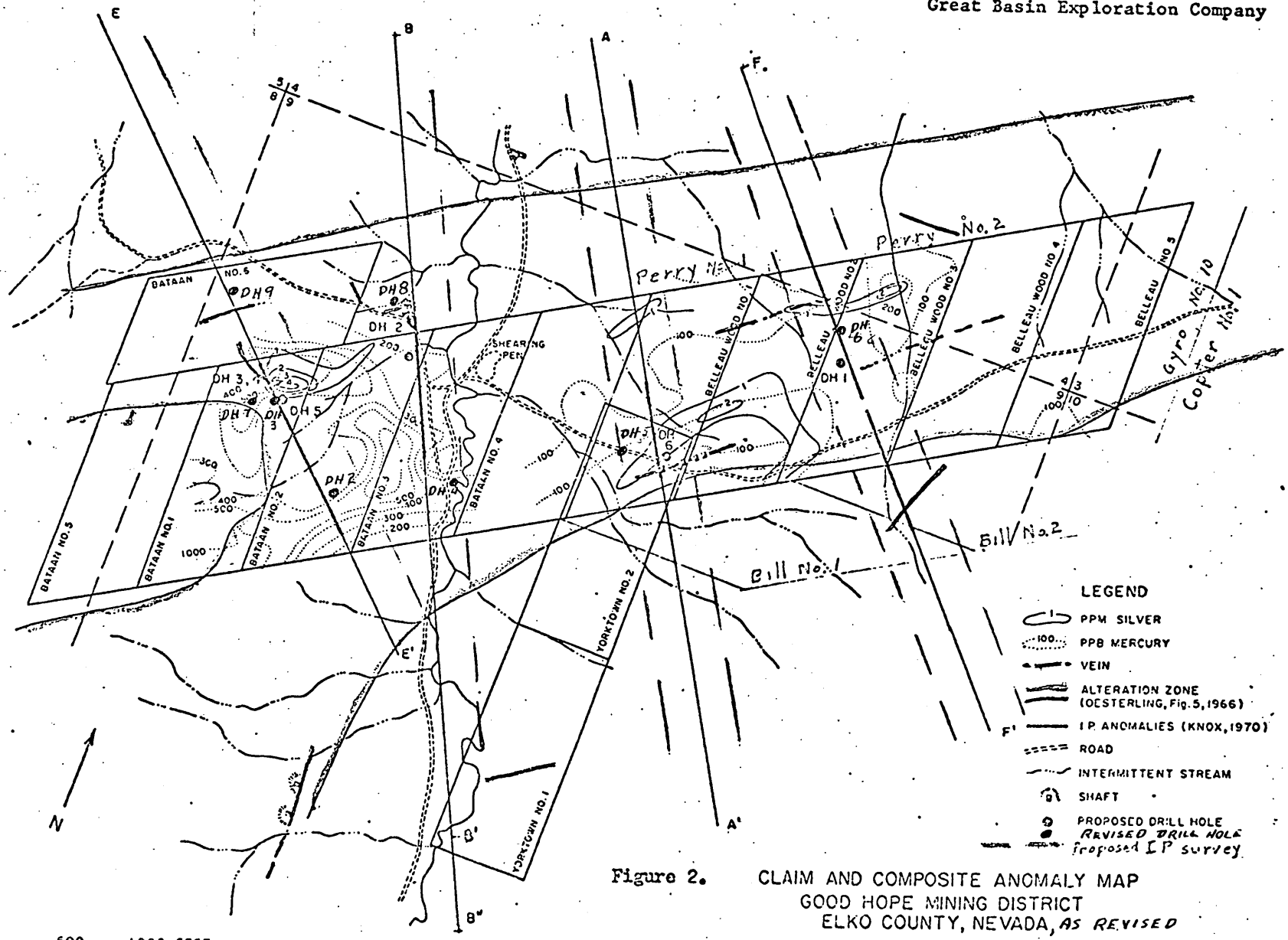

Figure 2. CLAIM AND COMPOSITE ANOMALY MAP
GOOD HOPE MINING DISTRICT
ELKO COUNTY, NEVADA, AS REVISED

2/8/63 R. HUGHES AND A. PAYNE

United States Department of the Interior

GEOLOGICAL SURVEY
Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

August 10, 1972

OFFICIAL COPY
O. M. E.
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INITIALS	CODE
Cal	120
HK	120
Ravi	Bluecha

Memorandum

To: Chief, Office of Minerals Exploration
Washington, D. C.

From: Field Officer
Region II

Subject: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Enclosed are the Government's copy and Budget and Finance's copy of Amendment No. 1 to the subject contract signed by the Operator. The other copies have been properly distributed.

R. M. Smith
for H. K. Stager

Government's copy

EXPLORATION CONTRACT
ALEXANDER VON HAFFTEN d/b/a
GREAT BASIN EXPLORATION COMPANY
OME-6854
AMENDMENT NO. 1

It is agreed this 4th day of August, 1972, between the United States of America, acting through the Department of the Interior, U.S. Geological Survey, hereinafter called the "Government," and Alexander von Hafften, d/b/a Great Basin Exploration Company, hereinafter called the "Operator," that Exploration Contract 2303 (OME-6854), dated April 27, 1972, is amended effective June 2, 1972, as follows:

In Exhibit A:

(a) Under the heading General Provisions, page 1, the first paragraph is revised to read as follows:

"The induced polarization survey shall be performed using a dipole spacing of 300 feet, or with prior Government approval, 600 feet. Interpretation shall include results down to the n-6 separation, if possible."

(b) A new paragraph is added at the top of page 2 to read as follows:

"Funds not expended in Stage I may be added to Stage II."

(c) Under the heading Description of the Work, Stage I, on page 2, the text is revised to read as follows:

"The work shall consist of an IP survey along six traverses each about 4,200 feet long located approximately parallel with and about 200 feet from existing traverses A, B, E, and F. In addition, one longitudinal traverse about 9,000 feet long may be run at approximately a right angle to the existing traverses, and another traverse about 4,800 feet long may be run approximately parallel with the existing traverses. The Operator shall make a report on the interpretation of the results of the geophysical work.

Locations of the existing traverses and tentative locations of the first six proposed traverses are shown on Figure 2 entitled 'Claim and composite anomaly map, Good Hope mining district, Elko County, Nevada,' attached hereto and made a part hereof."

(d) Under the heading Estimated Costs of the Work, Stage I on pages 2 and 3, the text is revised to read as follows:

"Stage I

Actual Costs

Category (1) Independent Contracts		
Geophysical survey, 25,200 feet or more, including mobilization, demobilization, labor, standby time, equipment, supplies, final report 1 job	$3,935.00	
Total Category (1)		$3,935.00
Category (2) Personal Services		
Subcategory (a) Supervision and Technical Services		
None except:		
1 Outside consultant 7 days at $140.00/day	$ 980.00	
Total Category (2)		$ 980.00
Category (7) Miscellaneous		
Transportation, outside consultant 1,958 miles at $0.12/mile (rounded)	$ 235.00	
Per diem, outside consultant 7 days at $20.00/day	140.00	
Total Category (7)		$ 375.00
Total Estimated Cost Stage I		$5,290.00
Government Participation at 75% (rounded)		$3,970.00"

This amendment shall not be construed to increase the estimated total cost of the Contract, the aggregate amount which the Government may be required to contribute, the amount of any item designated as maximum, nor the fixed unit cost of any item of work.

Except as amended herein Exploration Contract 2303 (OME-6854), dated April 27, 1972, shall remain in full force and effect.

Executed in quadruplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By Harold Kirkemo
Chief, Office of Minerals Exploration

ALEXANDER VON HAFFTEN d/b/a
GREAT BASIN EXPLORATION COMPANY

By Alexander von Hafften

8/3/72 Martin
8/4/72 Grambor
Asst. Sol. Off.
8/3/72 Weeks
8/3/72 Kirkemo
8/4/72 Gee

Government's copy

MME Form 50
July 1965

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

EXPLORATION CONTRACT
(Long Form)

Docket No.	Commodity	Contract No.	County	State
OME-6854	Silver-Gold	2000	Elko	Nevada

It is agreed APR 27 1972 (Date), between the United States of America, acting through the Department of the Interior, U. S. Geological Survey, hereinafter called the "Government," and

Alexander von Hafften d/b/a

Great Basin Exploration Company,

whose mailing address is 3898 Washington Street, San Francisco, California 94118 hereinafter called the "Operator," as follows:

ARTICLE 1. Authority and scope.--(a) This contract entered into under the authority of Public Law 701, 85th Cong., 2d sess. (72 Stat. 700; 30 U.S.C. § 641 - 646), consists of this form, the attached Annex I (land description), Exhibit A (work and costs), and the maps and documents listed. The work is a search for new or unexplored deposits of the commodity designated above. The Operator shall begin the work on or before July 1, 1972 (Date), and, subject to the provisions of Article 9 and Exhibit A, shall either have completed the work within 12 months from the date of the contract or shall have incurred allowable costs (see Article 6) in a sum not less than the total cost set forth in Exhibit A.

(b) The total allowable cost of the work set forth in Exhibit A is $27,100.00. The Government will contribute 75 percent of the allowable costs as they are incurred, in a total sum not in excess of $20,325.00 in accordance with the provisions of Articles 3, 4, 5, and 6. "Costs incurred" means costs that have been paid or have become due and payable, or that the Government determines have become obligations.

(c) Interest computation.--Simple interest at the rate of 8 percent shall accrue from the dates Federal funds are made available until the period specified for payment of royalty expires, or until the amount of Federal funds contributed is fully repaid with interest.

(d) The Operator shall not transfer or assign this contract or any right or obligation thereunder without the written consent of the Government.

ARTICLE 2. Operator's right in land.--(a) The Operator represents and undertakes that Annex I correctly describes the land which is the subject of this contract and the nature of the Operator's right of property and possession therein (whether as owner, lessee, or otherwise), and that such right, title, or interest is subject only to the following claims, liens, or encumbrances:

SEE ANNEX I

(b) The Subordination Agreement of the holder of any claim, lien, or encumbrance listed above and (if the Operator does not hold the legal title) the lien agreement of any holder of the legal title of the land (lessor, seller, optionor, etc.) are attached as follows:

SEE ANNEX I

(c) The Operator shall preserve and maintain his right, title, or interest in the land and his right to the possession thereof for the purposes of this contract, and shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of this contract. The Operator shall neither transfer, convey, nor surrender the land nor any right, title, or interest therein, nor permit nor suffer any claim, lien, or encumbrance thereon, without expressly referring to and providing in the instrument of conveyance, lien, or encumbrance for the preservation of the Government's right to a royalty on production and liens for the payment thereof. Two true copies of such instrument shall be furnished to the Government. If the Government's rights to royalty as provided in Article 7 have been terminated, the provisions of this paragraph (c) shall become inapplicable.

ARTICLE 3. Performance of the work.--(a) Operator's responsibility.--The work shall be performed diligently, efficiently, in a workmanlike manner in accordance with good mining standards, and in compliance with State laws governing health, safety, and liability insurance covering employment. The Operator shall provide suitable and adequate equipment, facilities, materials, supplies, and labor to complete the work as specified in Article 1(a).

(b) Independent contracts.--To the extent that the allowable costs are estimated in Exhibit A with express reference to performance by independent contractors on a unit-price basis (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations), the work may be so performed (see Article 6(a), Category (1)). Any such independent contract shall refer to some specific and identifiable part of the work, and shall be subject to all of the pertinent terms and conditions of this exploration contract; but the Government shall not be considered a party thereto, and its rights under this contract, including the right to terminate its contributions, shall not be affected thereby. Regardless of the provisions of any such independent contract, the Government will participate in payments to the independent contractor only as to work performed in accordance with the provisions of this exploration contract, and only to the extent that the Government deems the unit prices for the work under the independent contract to be reasonable.

(c) Government may inspect.--The Operator shall consult with and inform the Government on all phases of the work as it progresses. The Government may enter at all reasonable times to inspect the work under the contract and production operations during the period that royalty is payable to the Government. The Operator shall provide the Government with all reasonable means of access for such inspections.

ARTICLE 4. Contribution by the Government.-- The Government will make its contribution on the basis of the monthly vouchers referred to in Article 5(b), but all payments by the Government are provisional only, subject to audit. Until the account between the Operator and the Government is finally audited and settled and the Operator's final report has been received, the Government may withhold such sums as are necessary to protect its interests. The Government may make payments for the account of the Operator directly to independent contractors and suppliers rather than to the Operator.

ARTICLE 5. Reports, accounts, audits.--(a) Operator's records.--The Operator shall keep suitable records and accounts of the work performed and of any production in which the Government may have an interest; and shall preserve those with respect to work performed for at least three years after final payment by the Government, and those with respect to production for at least three years after any obligation to pay royalties to the Government has terminated. The Government may inspect and audit said records and accounts at any time, either by itself or by a certified public accountant. The Comptroller General of the United States or his representative, until the expiration of said three-year periods, shall have access to and the right to examine all pertinent books, documents, papers, and records of the Operator. If work under this contract 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 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.

(b) Monthly reports.--The Operator shall provide the Government with four copies of monthly reports in three sections as follows:

(1) Operator's Monthly Voucher claiming costs for work performed;

(2) Operator's Progress Report showing the number of units of the various types of work performed; and

(3) a narrative report of the work performed during the reporting period, including adequate engineering-geological maps or sketches, drill hole logs and locations, and assay reports on samples taken concurrently with advance in mineralized ground.

(Forms for reporting under (1) and (2) above will be provided by the Government; however, the original of the Operator's Monthly Voucher shall be supported by documentary evidence, such as certified copies or transcripts of payrolls and invoices, for all costs claimed under Article 6 (a) (1).)

(c) Final report.--Upon completion of the work or termination of the Government's obligation to contribute to costs, the Operator shall furnish the Government with three copies of a final report (in addition to the final monthly report). This final report shall include a geological and engineering evaluation of the results of the work performed under the contract with an estimate of the ore reserves resulting from such work, complete assay data, adequate geological and engineering maps or sketches, and a summary of the work performed and the related costs.

(d) Report of sales.--The Operator shall provide the Government with suitable accounting and documentary evidence covering all production to which the Government's royalty relates, such as two copies of smelter or concentrator settlement sheets and certified accounts of production and sale or other disposition of production.

(e) Compliance with requirements.--If the Government determines that any of the Operator's reports, records, or accounts are insufficient or incomplete, or if the Operator fails to make them, the Government may procure the preparation or completion of the same with suitable attachments as an expense of the work to which the Operator shall contribute. The Government may withhold approval and payment of any vouchers relating to insufficient or incomplete reports, records, or accounts.

ARTICLE 6. Costs.--(a) Allowable costs.--The allowable costs of the work to which the Government will contribute are limited to:

(1) the necessary, reasonable, and direct actual costs that are estimated in Exhibit A by categories as specified in this article; and

(2) fixed costs for units of work to be performed (per foot, per hour, etc.) agreed upon in lieu of actual costs and set forth in Exhibit A.

The Government will not contribute to costs under any category or subcategory omitted from the estimate of costs in Exhibit A. Any excess over any estimate which is indicated as the maximum of any category, subcategory, or item, either as to requirement or related cost; any excess over a fixed unit cost; and any excess over the total allowable cost of the work are not allowable. The Operator shall incur such excesses for his own account without contribution by the Government, but the Operator is not obligated to incur more than his agreed percentage of the total allowable cost of the work.

Any category or subcategory or element thereof not designated as a maximum in this article, or in Exhibit A may be exceeded, provided that the total allowable cost of the work, which is a maximum, is not exceeded.

CATEGORY (1)--INDEPENDENT CONTRACTS.--(See Article 3(b)). The total of this category and the average unit cost estimated for each type of work to be performed under an independent contract are maximums.

CATEGORY (2)--PERSONAL SERVICES.

Subcategory (a)--Supervision and Technical Services--All elements of this subcategory (number of supervisors, technicians, outside consultants, periods of employment, rates of pay, and total) are maximums.

Subcategory (b)--Labor.

CATEGORY (3)--OPERATING MATERIALS AND SUPPLIES.--Includes such items as drill bits and steel, explosives, fuel, pipe, power, timber, rail, and small tools costing less than $50 each.

CATEGORY (4)--OPERATING EQUIPMENT.

Subcategory (a)--Rental.--The number of each rented item [6 mine cars, 1 truck], the rate of rental [$100 per month, $5 per hour], and the total of this subcategory are maximums.

Subcategory (b)--Purchases.--The total of this subcategory is a maximum.

Subcategory (c)--Depreciation.--All elements of this subcategory (time periods, rate of depreciation, and subcategory total) are maximums.

CATEGORY (5)--INITIAL REHABILITATION AND REPAIRS.--Costs of items listed under this category include all requirements, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The total of this category is a maximum.

Subcategory (a)--Initial rehabilitation and repairs of existing buildings, fixtures, and installations (exclusive of mine workings).--The total of this subcategory is a maximum.

Subcategory (b)--Initial rehabilitation and repairs of operating equipment.--The total of this subcategory is a maximum.

CATEGORY (6)--NEW BUILDINGS, FIXTURES, AND INSTALLATIONS (EXCLUSIVE OF MINE WORKINGS).--Costs of items listed under this category include all requirements, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The total of this category is a maximum.

CATEGORY (7)--MISCELLANEOUS.--Includes requirements and costs that do not fall within any of the first six categories, such as repairs other than initial and maintenance of operating equipment, analytical work, prints and other reproductions, accounting, Operator's share of payroll taxes, liability insurance covering employment, travel, and communications.

(b) Nonallowable costs.--In addition to the limitations imposed by paragraph (a) of this Article 6 the Government will not contribute to the following costs:

(1) Costs of the land, such as rental, depreciation, depletion, or other costs of acquiring, owning, or holding possession;

(2) Indirect costs, such as general overhead, corporate management, interest, taxes (other than payroll and sales taxes), insurance (other than liability insurance covering employment), damages to persons, damages to property (other than necessary repairs or replacements of equipment or other property used in the work);

(3) Previous work performed or costs incurred before the date of this contract; and

(4) Deferred payments.--Any costs incurred by the Operator under any rental-purchase agreement, installment-purchase agreement, or any agreement for the purchase of goods under the provisions of which payment of the full purchase price is deferred more than 90 days from the delivery of the goods, unless the purchase agreement is approved by the Government in writing.

(c) Reductions in costs.--The Operator shall account for and give the Government credit for any incidental benefits, credits, or money received in the ordinary course of business in prosecuting the work (as by salvage or sale of materials or equipment, furnishing of room or board, furnishing of power or services to third persons, rebates or discounts on purchases, etc.), in the same ratio in which the Government contributes to costs; and such amounts shall be treated as a reduction in costs incurred so that they are available for use within the limit of the original total cost. The provision does not apply to receipts from production which are subject to the Government's royalty under the provisions of Article 7.

ARTICLE 7. Repayment by Operator.--(a) Certification.--If the Government considers that mineral or metal production from the land covered by the contract may be possible as a result of the exploration work, it shall so certify in writing to the Operator at any time not later than six months after a sufficient final report and final accounting (see Article 5) have been furnished.

(b) Royalty on production.--The Operator, whether or not the producer (for example, if the Operator either transfers or does not retains his interest in the land), shall pay to the Government a royalty on all minerals and metals mined or produced from the land as follows:

(1) irrespective of any certification of possible production--from the date of the contract until the lapse of the time within which the government may issue such certification or until the total net amount contributed by the Government is fully repaid with interest, whichever occurs first; or

(2) if the Government issues a certification of possible production--for a period of ten years from the date of the contract, or until the total net amount contributed by the Government is fully repaid with interest, whichever occurs first.

(c) Payment of royalty.--(1) The Government's royalty shall be five percent of the gross proceeds (including any bonuses, premiums, allowances, or other benefits) from the production sold, in the form sold (ore, concentrate, 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 (such as treatment processes performed by the buyer, sampling and assaying to determine the value of the production sold, and freight payable by the buyer to a carrier (not the Operator or producer)), shall be allowed as deductions in arriving at the "gross proceeds" as that term is used herein. No costs of the Operator or Producer are deductible in arriving at the "gross proceeds" as that term is here used.

The term "treatment processes" means those processes (such as milling, concentrating, smelting, refining, or equivalent, but excluding fabricating or manufacturing) applied to the crude ore or other production after it is extracted from the ground to put it into a commercially marketable form.

(2) The Government's royalty shall be computed and paid currently upon each lot sold, held, or used in integrated operations, as the case may be.

(d) Unsold production.--If any production (ore, concentrate, metal, or equivalent), after the lapse of six months from the date the ore was extracted from the ground, remains neither sold nor used 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, concentrate, metal, or equivalent) it is in when the Government elects to require computation and payment. If any production is used 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 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) Lien for payment.--To secure the payment of royalty (see Article 7(b)), the Operator hereby grants to the Government a lien upon his interest in the land and upon any production of minerals and metals therefrom until the royalty claim is extinguished by lapse of time or is fully paid.

(f) Notice to purchasers.--The Operator or producer 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 Government, and this estimate shall be final and binding upon the Operator or producer.

(g) No obligation to produce.--Nothing in this contract shall be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any production operations.

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

ARTICLE 8. Interests in purchased property.--(a) Title and ownership.--All costs under this contract shall be incurred by the Operator in the Operator's own name and for the Operator's own account; but any property acquired to the cost of which the Government contributes shall belong to the Operator and the Government jointly in proportion to their respective contributions although title thereto shall be taken in the name of the Operator.

(b) Preservation of property.--Until the final disposal of any property in which the Government has an interest, the Operator shall preserve and protect same for the best interest of the Government, and any reasonable and necessary cost thereof will be treated as an allowable cost of the exploration. After the completion of the work, termination of the Government's obligation to contribute, or when such property is not being used for the work, the Operator shall not use it elsewhere without the written consent of the Government and without paying a reasonable rental to be fixed by the Government for its proportionate interest.

(c) Disposal of property.--Upon the completion of the work, termination of the Government's obligation to contribute to costs, or when the property is no longer needed for the work, the Operator shall promptly dispose of salable or salvageable property in which the Government has an interest for the joint account of the Government and the Operator, either by return to the vendor, sale to others, purchase by the Operator, or sale or transfer to the Government at a price at least as high as could be obtained from others, unless the Government in writing waives its interest in any such property. Without advance approval of the sales price by the Government, the Operator shall not sell at any price any item of property that cost more than $500, and shall not sell at less than 25 percent of the purchase price any item of property that cost $500 or less. The Government, in lieu of approving the sales price for any such item, may itself purchase the item at the best price which the Operator is able to obtain or offers. Property remaining upon any termination of the work shall be considered in groups or categories (such as drill steel, explosives, pipe, or rail), and if the original cost of the remaining unexpended portion of any such group or category is less than $50, the Government waives its interest therein. If necessary to accomplish the disposal of any item, the Operator shall dismantle and sever it from the land, the cost thereof to be treated as a cost of the exploration.

(d) Default of the Operator re disposal.--If within 90 days after the completion of the work, termination of the Government's obligation to contribute to costs, or after the property is no longer needed for the work, the Operator has failed to sell or otherwise liquidate or dispose of any property in which the Government has an interest, the Government, at any time prior to final settlement under the contract, may:

(1) in writing extend the time within which the Operator must dispose of or liquidate the property;

(2) by written notice to the Operator, place upon such property what it determines to be a fair valuation thereof, not in excess of the cost less 1.66 percent per month from the date such property was purchased under this contract to the termination of said 90-day period; and such property shall thereupon be considered and accounted for as having been purchased by the Operator at the valuation so fixed by the Government; and

(3) enter and take possession of such property wherever it may be found, and remove and dispose of it for the joint account of the parties.

ARTICLE 9. Termination of the Government's obligations.--(a) If the Government determines that operations at any time have failed to achieve anticipated results and further work is not justified, the Government may give the Operator written notice thereof, and thereupon:

(1) the Government shall be free of all obligation to contribute to costs not then incurred other than such as may be allowable under the provisions of the contract as necessary and incidental to final accounting and reporting; and

(2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to final accounting and reporting.

(b) If the Government determines that the Operator is in default under the terms of the contract, the Government may give the Operator written notice of such default with a specification of reasonable time within which the default must be cured; and if the Operator fails to cure such default as required, thereupon:

(1) the Government shall be relieved of all obligation to contribute to costs not incurred when the notice was given, other than such as may be allowable by the provisions of the contract as necessary and incidental to final accounting and reporting; and

(2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to final accounting and reporting.

The Government may also avail itself of any other remedy the law may provide for breach of contract, including the right to rescind the contract and to demand repayment of all moneys contributed by the Government under the contract.

(c) The giving of any notice by the Government under the provisions of this Article 9 shall not affect the Government's rights as provided for in the contract with respect to royalty and liens to secure the payment thereof, and such rights shall be fully preserved.

(d) The determinations of the Government are subject to appeal under Article 13.

ARTICLE 10. Notices to be given by the Government may be delivered to the Operator, or may be sent by certified mail addressed to the Operator at his mailing address stated in this contract. If mailed, notices are deemed to have been delivered five days after the date of mailing.

ARTICLE 11. Officials not to benefit.--No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this contract or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE 12. Nondiscrimination in Employment. The provisions respecting nondiscrimination in employment which are required by section 301 of Executive Order 10925, dated March 6, 1961 as amended and supplemented are attached hereto as Exhibit B and are hereby incorporated in and made a part of this contract.

ARTICLE 13. Disputes.--Any dispute arising under this contract which is not disposed of by agreement shall be decided by the Director, U. S. Geological Survey, who shall reduce his decision to writing and mail or otherwise furnish a copy thereof to the Operator. The decision of the Director, U. S. Geological Survey, shall be final and conclusive unless, within 30 days from the date of receipt of such copy, the Operator mails or otherwise furnishes to the Director, U. S. Geological Survey, a written appeal addressed to the Secretary of the Interior. The decision of the Secretary or his duly authorized representative for the determination of such appeals shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent, or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence.

The term "Director, U. S. Geological Survey," as used herein includes his duly authorized representative.

ARTICLE 14. Work Hours Act of 1962 - Overtime Compensation.--This contract, to the extent that it is of a character specified in the Work Hours Act of 1962 (Public Law 87-581, 76 Stat. 357-360) and is not covered by the Walsh-Healey Public Contracts Act (41 U.S.C. 35-45), is subject to the following provisions and to all other provisions and exceptions of said Work Hours Act of 1962.

(a) Overtime requirements.--No Operator or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any laborer or mechanic to be employed on such work in excess of eight hours in any calendar day or in excess of forty hours in any workweek unless such laborer or mechanic receives compensation at a rate of not less than one and one-half times his basic rate of pay for all hours worked in excess of eight hours in any such calendar day or in excess of forty hours in any such workweek, as the case may be.

(b) Violations; liability for unpaid wages; liquidated damages.--In the event of any violation of the clause set forth in subparagraph (a) of this paragraph, the Operator and any subcontractor responsible therefor shall be liable to any affected employee for his unpaid wages. In addition, such Operator and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for

liquidated damages. Such liquidated damages shall be computed, with respect to each individual laborer or mechanic employed in violation of the clause set forth in subparagraph (a) of this paragraph, in the sum of $10 for each calendar day on which such employee was required or permitted to work in excess of eight hours or in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in subparagraph (a) of this paragraph.

(c) Withholding for unpaid wages and liquidated damages.--The U. S. Geological Survey may withhold or cause to be withheld, from any moneys payable on account of work performed by the Operator or subcontractor, such sums as may administratively be determined to be necessary to satisfy any liabilities of such Operator or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (b) of this paragraph.

ARTICLE 15. Copeland (Anti-Kickback) Act--Nonrebate of wages.--The regulations of the Secretary of Labor applicable to contractors and subcontractors (29 CFR, Part 3), made pursuant to the Copeland Act, as amended (40 U. S. C. 276c) and to aid in the enforcement of the Anti-Kickback Act (18 U. S. C. 874) are made a part of this contract by reference. The Operator will comply with these regulations and any amendments or modifications thereof and will be responsible for the submission of affidavits required of independent contractors thereunder. The foregoing shall apply except as the Secretary of Labor may specifically provide for reasonable limitations, variations, tolerances, and exemptions.

ARTICLE 16. Changes and added provision.--

Prior to the award by the Operator of any contract for work to be done pursuant to this Exploration Contract, the Operator shall require the prospective contractor to submit a Certificate of Nonsegregated Facilities in the form set forth as Exhibit C to this Contract and by reference made a part hereof.

Executed in ~~duplicate~~ quadruplicate the day and year first above written.

ALEXANDER VON HAFFTEN d/b/a
GREAT BASIN EXPLORATION COMPANY
(Operator)

By Alexander von Hafften

Title _____

THE UNITED STATES OF AMERICA

By _____

Deputy ~~Director~~ Assistant U. S. Geological Survey Director for Administration

I, _____ (Name), certify that I am the _____ secretary of the corporation named as Operator herein; that _____ (Name), who signed this contract on behalf of the Operator, was then _____ (Title) of said corporation; that said contract was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

3/30/72 Martin
Wm. Fox 4/3
Appd. Sol. Off.
Weeks 4/4
Stephens 4/4/72
Jaer 4/4/72
Albers 4/4

[CORPORATE SEAL]

EXPLORATION CONTRACT
ALEXANDER VON HAFFTEN d/b/a
GREAT BASIN EXPLORATION COMPANY
OME-6854

ANNEX I

The land, including all rights thereto, referred to in Article 2 of the contract consists of 13 unpatented lode mining claims hereinafter called the Great Basin group, 20 unpatented lode mining claims hereinafter called the Allied group, and 320 acres more or less of fee lands, in T. 41 N., R. 49 E., MDB&M, Good Hope mining district, Elko County, Nevada. These are recorded in the office of the County Recorder, Elko, Nevada, as follows:

Name	Book	Page
Great Basin group		
Bataan No. 1	56	60
Bataan No. 2	56	61
Bataan No. 3	56	62
Bataan No. 4	56	63
Bataan No. 5	83	552
Bataan No. 6	83	553
Belleau Wood No. 1	56	64
Belleau Wood No. 2	56	65
Belleau Wood No. 3	56	66
Belleau Wood No. 4	56	67
Belleau Wood No. 5	56	68
Yorktown No. 1	56	69
Yorktown No. 2	83	551
Allied group		
Gyro No. 1	75	365
Gyro No. 2	75	366
Gyro No. 3	75	367
Gyro No. 4	75	368
Gyro No. 5	75	369
Gyro No. 6	75	370
Gyro No. 7	75	371
Gyro No. 8	75	372
Gyro No. 9	75	373
Gyro No. 10	75	573
Copter No. 1	75	569
Copter No. 2	75	570
Copter No. 3	75	571
Copter No. 4	75	572

Name	Book	Page
Copter No. 5	75	374
Copter No. 6	73*	181*
Perry No. 1	75	574
Perry No. 2	75	575
Bill No. 1	77	33
Bill No. 2	77	34

* Number refers to the Notice of Location, not the Certificate of Location.

The fee lands, all in T. 41 N., R. 49 E., MDB&M, are as follows:

SW-1/4SW1/4 sec. 3

E1/2W1/2, NW1/4NW1/4, NW1/4SE1/4 sec. 9

W1/2NE1/4 sec. 16

The claim groups and fee lands are shown on Figure 1 entitled "Property map, Good Hope mining district, Elko County, Nevada," attached hereto and made a part hereof.

The Operator is the owner of the Great Basin group of unpatented lode mining claims by right of Deed and Assignment, dated March 6, 1968, from Great Basin Exploration Company, a co-partnership, and Anthony L. Payne.

The Operator is in possession of the Allied group of unpatented lode mining claims and of the fee lands under the terms of a 5-year Lease Agreement, dated August 1, 1969, from Allied Properties (a corporation), the owner.

A Lien and Subordination Agreements executed by Allied Properties on October 21, 1971, is attached and made a part hereof.

MME Form 52
Jan. 1959

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF MINERALS EXPLORATION

FOR GOVERNMENT USE ONLY
Operator
Docket No. OME –
Contract No. 14-23-090–
Contract Date APR 27 1972

LIEN AND SUBORDINATION AGREEMENTS[1]

To the United States of America:

That certain land in the County of Elko, State of Nevada,

described as follows:[2] See Annex attached

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

Great Basin Exploration Company[3],

hereinafter called the "Operator". In consideration for and as an inducement to the Government executing the Contract, the undersigned:

1. (a) Being the owner of an interest in the land, hereby grants to the Government a lien upon all of his right, title, and interest in the land and upon any production of minerals therefrom to secure the payment to the Government of the royalty on production provided for by the Contract, and agrees if the Operator's interest should be surrendered or terminated at any time prior to the expiration of the rights of the United States under said Contract to pay royalty to the Government according to the terms of said Contract; or

(b) Being the holder of a claim, lien, or encumbrance against the land, hereby subordinates his claim, lien, or encumbrance in or against the land and in any production therefrom to the rights of the Government under the Contract with respect to royalty on production and liens to secure same.[4]

2. 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.

3. Represents and undertakes that there is no claim, lien, or encumbrance upon the undersigned's right, title, claim, or interest in or against the land other than the following: (If "none" insert the word "none". Do not leave blank.)

NONE

1/ Production from the land is not required, and in the absence of production there is no obligation to pay royalty to the Government.

2/ 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 must be inserted above. If the space provided is insufficient, use an Annex and refer to the Annex in the space.

3/ Insert name exactly as it appears in the Application MME Form 40.

4/ Subparagraph 1(a) does not apply to the holder of a claim, lien, or encumbrance.

4. Undertakes and agrees (a) neither to commit any act nor assert any claim in conflict with the provisions of this Agreement; and (b) to give advance notice of the Government's rights under this agreement to any subsequent transferee, mortgagee, encumbrancer, or lessee of any of the undersigned's right, title, claim, or interest in or against the land or any production therefrom, furnishing the Government with two true copies of such notice; and

5. Consents to all amendments (including an agreement of termination) and assignments of the Contract without notice thereof, and undertakes and agrees that this agreement shall extend and apply thereto.

6. Added provisions ____ None ____ (State "None" or "See Annex No. ____".)

Dated this 21st day of October, 19 71.

ALLIED PROPERTIES

By: Harry E. Olsson — 340 Mason (Street)

Harry E. Olsson, Vice Pres. (Seal) — San Francisco, Calif 94102 (City & State)

____ (Street)

____ (Seal) ____ (City & State)

____ (Street)

____ (Seal) ____ (City & State)

____ (Street)

____ (Seal) ____ (City & State)

____ (Street)

____ (Seal) ____ (City & State)

____ (Street)

____ (Seal) ____ (City & State)

I, H. R. Alden (Name), certify that I am the Secretary-Treasurer (Title—Secretary, etc.) of the corporation named herein; that Harry E. Olsson (Name), who signed this agreement was then Vice President (Title—Pres., Vice-Pres., 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.

____ (Corporate Seal)

INT.-COP. SEC., WASH., D.C. 21103

ANNEX 1

The following unpatented lode mining claims are located in the Good Hope Mining District, Elko County, Nevada, and the names and books and pages of the record in the Office of the County Recorder of Elko County, Nevada, of the certificates of location whereof are as follows:

NAME	FILE NUMBER	BOOK	PAGE
Gyro No. 1	27686	75	365
Gyro No. 2	27687	75	366
Gyro No. 3	27688	75	367
Gyro No. 4	27689	75	368
Gyro No. 5	27690	75	369
Gyro No. 6	27691	75	370
Gyro No. 7	27692	75	371
Gyro No. 8	27693	75	372
Gyro No. 9	27694	75	373
Gyro No. 10	27851	75	573
Copter No. 1	27847	75	569
Copter No. 2	27848	75	570
Copter No. 3	27849	75	571
Copter No. 4	27850	75	572
Copter No. 5	27695	75	374
* Copter No. 6	26674	73	181
Perry No. 1	27852	75	574
Perry No. 2	27853	75	575
Bill No. 1	28311	77	33
Bill No. 2	28312	77	34
George No. 1	28059	76	225

*Copter No. 6: The file number, book and page for Copter No. 6 refers to the Notice of Location, not the Certificate of Location.

Together with the mineral rights on the following lands situate in Elko County, Nevada, T. 41 N., R. 49 E., MDB&M.

Section 2

E½ of E½; W½ of the NE¼; NE¼ of the NW¼ of Section 2

Section 3

SW¼ of the SW¼ of Section 3

Section 9

E½ of the W½; NW¼ of the NW¼; NW¼ of the SE¼ of Section 9

Section 16

W½ of the NE¼; S½ of the SW¼
NW¼ of the SW¼ of Section 16

Together with all water and water rights appurtenant to said mining claims or held, owned or used in connection therewith, and the right to use the same either on or off of said mining properties.

EXPLORATION CONTRACT
ALEXANDER VON HAFFTEN d/b/a
GREAT BASIN EXPLORATION COMPANY
OME-6854

EXHIBIT A

The purpose of the project is to explore for disseminated silver-gold-bearing ore bodies in Tertiary volcanic rocks by conducting a geophysical survey using the induced polarization (IP) method and by drilling promising anomalies using rotary drills.

General Provisions

The induced polarization survey shall be performed using a dipole spacing of 300 feet. Interpretation shall include results down to the n = 4 separation, and to the n = 6 separation if possible.

A bulldozer no smaller than the equivalent of a Caterpillar D-8 shall be used for preparation of access roads and drill sites.

All drill holes shall be cased as necessary and completed not less than 4-1/2-inch diameter.

All drill cuttings shall be stored in suitable containers identified by hole number and depth.

Stored samples shall be made available for Government inspection and possible use, and may be disposed of only with prior Government approval.

All drill cuttings shall be logged and significantly mineralized cuttings shall be split and one split assayed for gold and silver.

Copies of geophysical data, drill logs, true copies of assay certificates, and maps or sketches showing the work completed, the location, width, and assay value of all samples assayed, and the geological formations and structures traversed by the drill holes shall be furnished monthly to the Government.

The Operator shall provide such equipment, materials, supervision, labor, and technical services as may be required to perform the work in a satisfactory manner.

The work shall be divided into two stages. The Operator shall complete all of Stage I and as much of Stage II as is warranted by the results obtained in Stage I.

The location, direction, and extent of each work item shall be subject to Government approval.

The Government will not contribute to the cost of incomplete drill holes, casing left in a hole at the request of the Operator, or holes drilled closer than 100 feet to the outer boundary of the project area.

Description of the Work

Stage I

The work shall consist of an IP survey along six traverses each about 4,200 feet long located approximately parallel with and about 200 feet from existing traverses A, B, E, and F, and a final report with an interpretation of the results.

Locations of the existing traverses and tentative locations of the proposed traverses are shown on Figure 2 entitled "Claim and composite anomaly map, Good Hope mining district, Elko County, Nevada," attached hereto and made a part hereof.

Stage II

The drill sites and hole depths to explore the IP anomalies indicated to be most favorable by the results of Stage I and of all previous geological work shall be selected by the Operator and approved by the Government prior to undertaking any work on Stage II.

Upon approval of a drilling plan, the work shall consist of bulldozing access roads to not more than five drill sites, leveling the sites, and rotary drilling not more than five vertical holes aggregating not more than 3,000 feet.

The tentative locations of the holes are shown on Figure 2.

When drilling is completed, the Operator shall fill all trenches and pits excavated in the course of the work in order to restore the land surface to its approximate original configuration.

Estimated Costs of the Work

Stage I

Actual Costs

Category (1) Independent Contracts

Geophysical survey, approximately 25,200 feet, including mobilization, demobilization, labor, standby time, equipment, supplies, final report 1 job	$4,890.00
Total Category (1)	$ 4,890.00

Category (2) Personal Services

Subcategory (a) Supervision and Technical Services

None except:

1 outside consultant 2 days at $140.00/day	$ 280.00	
Total Category (2)		$ 280.00

Category (7) Miscellaneous

Transportation, outside consultant 665 miles at $0.12/mile	$ 80.00	
Per diem, outside consultant 2 days at $20.00/day	40.00	
Total Category (7)		120.00
Total Estimated Cost Stage I		$ 5,290.00
Government Participation at 75% (rounded)		$ 3,970.00

Stage II

Actual Costs

Category (1) Independent Contracts

Mobilization and demobilization one bulldozer	$ 250.00
Bulldozing access roads and drill sites, 24 hours at $30.00/hour	720.00
Mobilization, demobilization of drilling equipment	240.00
Rotary drilling, 3,000 feet	15,750.00

Price per foot

Depth, feet	Price
0 - 300	$4.50
300 - 600	$6.00

Reaming, setting and pulling casing 12 hours at $25.00/hour	$ 300.00	
Casing lost in hole 184 feet at $1.25/foot	230.00	
Reaming bits 2 bits at $115.00/bit	230.00	
Cementing, drilling cement 36 hours at $25.00/hour	900.00	
Cement 105 sacks at $2.00/sack	210.00	
Additives 30 sacks at $9.00/sack	270.00	
Total Category (1)		$19,100.00
Category (2) Personal Services		
Subcategory (a) Supervision and Technical Services		
None except:		
1 Outside consultant 8 days at $140.00/day	$ 1,120.00	
Total Category (2)		$ 1,120.00
Category (7) Miscellaneous		
None except:		
Travel, outside consultant 2,660 miles at $0.12/mile	$ 319.00	
Per diem, outside consultant 8 days at $20.00/day	160.00	
Sample sacks, cloth 620 sacks at $0.30/sack	186.00	
Assays for gold and silver 185 samples at $5.00.sample	925.00	
Total Category (7)		$ 1,590.00

Total Estimated Cost Stage II	$21,810.00
Government Participation at 75% (rounded)	$16,355.00

SUMMARY

Total Estimated Cost of Stage I	$ 5,290.00
Government Participation at 75%	$ 3,970.00
Total Estimated Cost of Stage II	$21,810.00
Government Participation at 75%	$16,355.00
Total Estimated Cost of the Project	$27,100.00
Government Participation at 75%	$20,325.00

EXHIBIT B

EQUAL OPPORTUNITY CLAUSE (FEDERALLY ASSISTED CONSTRUCTION)

EQUAL OPPORTUNITY (APPLICANT)

(a) The applicant hereby agrees to incorporate, or cause to be incorporated, into any contract for construction work, or modification thereof, as defined in the rules and regulations of the Secretary of Labor at 41 CFR, Chapter 60, which is paid for, in whole or in part, with funds obtained from the Federal Government or borrowed on the credit of the Federal Government pursuant to grant, contract, loan, insurance, or guarantee, or undertaken pursuant to any Federal program involving such grant, contract, loan, insurance, or guarantee, the following Equal Opportunity (Federally Assisted Construction) clause:

EQUAL OPPORTUNITY [1] (FEDERALLY ASSISTED CONSTRUCTION)

During the performance of this contract, the Contractor agrees as follows:

(a) The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, creed, color, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this Equal Opportunity (Federally Assisted Construction) clause.

(b) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, or national origin.

(c) The Contractor will send to each labor union or representative of workers, with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(d) The Contractor will comply with all provisions of Executive Order No. 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(e) The Contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(f) In the event of the Contractor's noncompliance with the Equal Opportunity (Federally Assisted Construction) clause of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended, in whole or in part, and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as provided by law.

(g) The Contractor will include this Equal Opportunity (Federally Assisted Construction) clause in every subcontract or purchase order unless exempted by the rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: *Provided, however,* That in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

(b) The applicant further agrees that it will be bound by the above Equal Opportunity (Federally Assisted Construction) clause with respect to its own employment practices when it participates in federally assisted construction work: *Provided, however,* That if the applicant so participating is a State or local government, the above Equal Opportunity (Federally Assisted Construction) clause is not applicable to any agency, instrumentality, or subdivision of such government which does not participate in work on or under the contract.

(c) The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of Contractors and subcontractors with the Equal Opportunity (Federally Assisted Construction) clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

(d) The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order No. 11246 of September 24, 1965, with a Contractor debarred from, or who has not demonstrated eligibility for, Government contracts and Federally assisted construction contracts pursuant to the Executive order and will carry out such sanctions and penalties for violation of the Equal Opportunity (Federally Assisted Construction) clause as may be imposed upon Contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D, of the Executive order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings the administering agency may take any or all of the following actions: Cancel, terminate, or suspend, in whole or in part, this grant [contract, loan, insurance, guarantee]; refrain from extending any further assistance to the applicant under the program with respect to which its failure or refusal occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

[1] On and after Oct. 14, 1968, the term "race, color, religion, sex, or national origin" is substituted for the term "race, creed, color, or national origin," as provided by Executive Order No. 11375, Oct. 13, 1967 (32 F.R. 14303).

EXHIBIT C

CERTIFICATION OF NONSEGREGATED FACILITIES

(Applicable to federally assisted construction contracts and related subcontracts exceeding $10,000 which are not exempt from the Equal Opportunity clause.)

The federally assisted construction contractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally assisted construction contractor certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally assisted construction contractor agrees that a breach of this certification is a violation of the Equal Opportunity clause in this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. The federally assisted construction contractor agrees that (except where he has obtained identical certifications from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity clause, and that he will retain such certifications in his files.

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

L. W. Eckland

Signature

Owner

Title

April 24, 1972

Date

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OME-6854 (Silver-Gold)
Great Basin Exploration Company

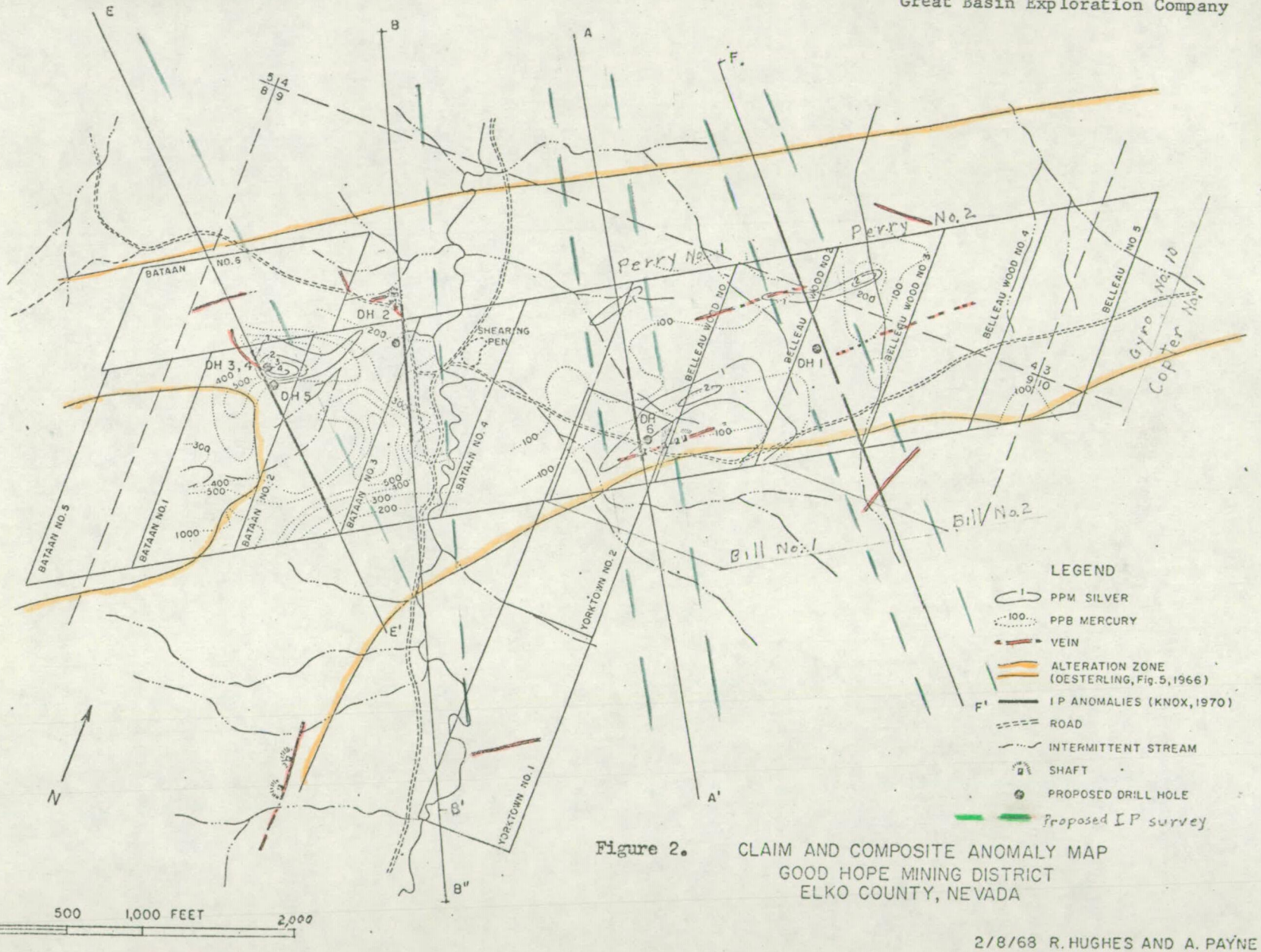

Figure 2. CLAIM AND COMPOSITE ANOMALY MAP
GOOD HOPE MINING DISTRICT
ELKO COUNTY, NEVADA

2/8/68 R. HUGHES AND A. PAYNE

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OME-6854 (Silver-Gold)
Great Basin Exploration Company

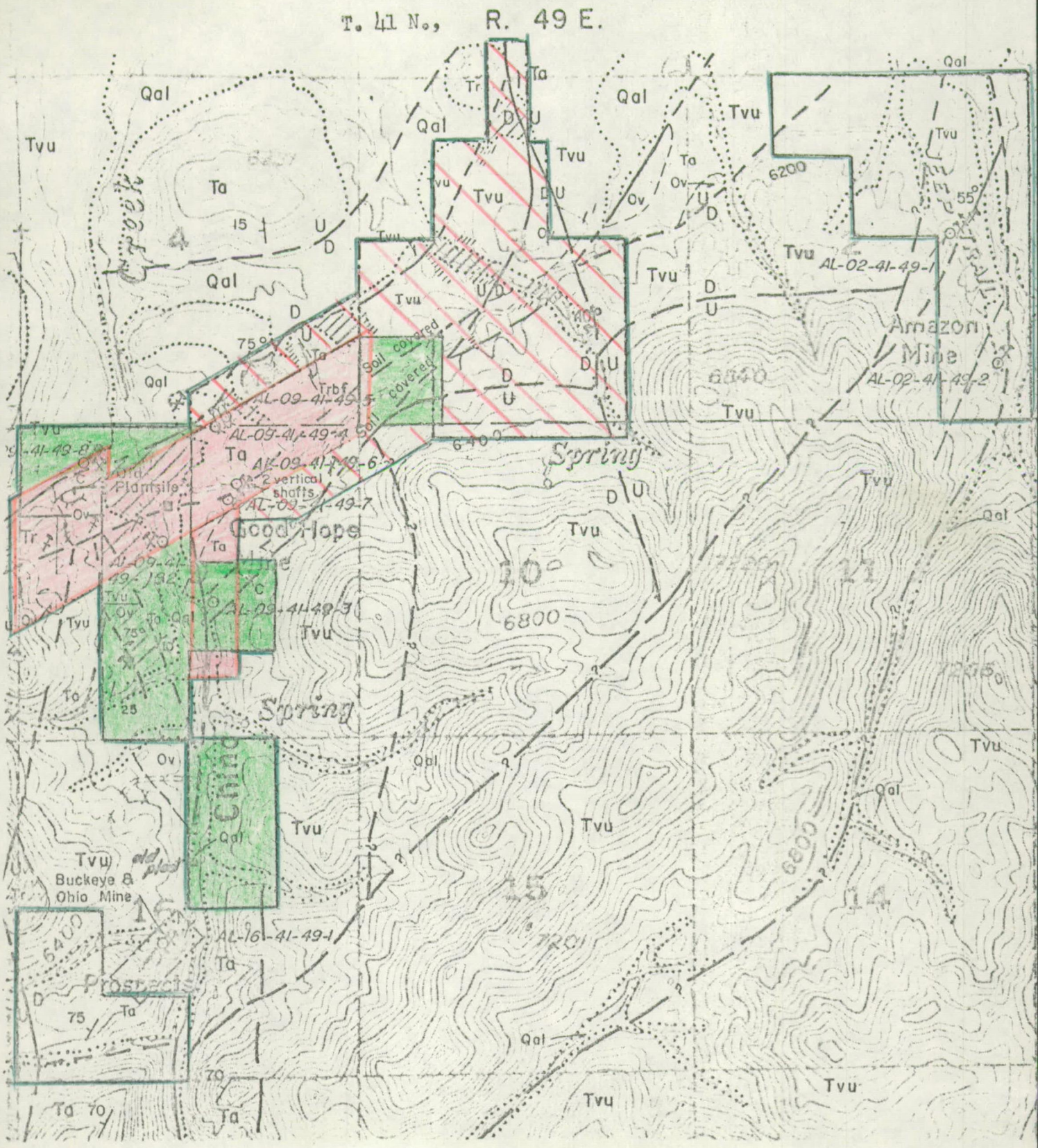

Figure 1. Property map, Good Hope mining district, Elko County, Nevada

Fee Lands

Great Basin Group

Allied Group

United States Department of the Interior

GEOLOGICAL SURVEY
Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

March 22, 1972

OFFICIAL COPY
O. M. E.
RECEIVED
MAR 23 1972

INITIALS	CODE
Cae	120
	~~130~~
	120

Memorandum

To: Chief, Office of Minerals Exploration
Washington, D. C.

From: Field Officer
Region II

Subject: OME-6854 (Silver-Gold)
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada

Enclosed is a revised original of the application form, a letter of credit from the Wells Fargo Bank, and copies of bids for the proposed geophysical survey. Duplicate copies are retained in our files.

R. M. Smith
for H. K. Stager

Enclosures

MME Form 40
(Revised Nov. 71)

Form approved
Budget Bureau No. 42-R1368

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

APPLICATION FOR FINANCIAL ASSISTANCE IN MINERALS EXPLORATION

Pursuant to Public Law 85—701 (72 Stat. 700; 30 U.S.C. 641)

NAME OF APPLICANT *(Full legal name and mailing address as they should appear on contract if one is executed.)*

Alexander von Hafften DBA
Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

APPLICANT DO NOT USE THIS BLOCK

DOCKET NUMBER 6854

DATE RECEIVED 3/23/72

REGION II

DIVISION CODE

BUSINESS ORGANIZATION *(Check one)*

- INDIVIDUAL [X]
- CORPORATION [ ]
- PARTNERSHIP [ ]
- OTHER *(Specify)* [ ]

STATE IN WHICH FIRM IS ORGANIZED: Nevada

LIST CORPORATE OFFICERS OR PARTNERS HERE, IF APPLICABLE

NAME	ADDRESS	TITLE

MINERAL(S) FOR WHICH YOU WISH TO EXPLORE: Silver and Gold

ESTIMATED COST OF PROJECT: $27,100.00

PROPERTY NAME	LOCATION COUNTY	STATE
Good Hope	Elko County,	Nevada

GENERAL INSTRUCTIONS

Before filling out this application, please read the *OME Regulations for Obtaining Federal Assistance in Financing Explorations for Mineral Reserves* (30 CFR Chap. II). To assure prompt action, your application must provide all applicable material and information specified on the back of this application form. Avoid unnecessary correspondence and delays by submitting complete and accurate information. *Please submit two copies of this application and all accompanying papers* except as otherwise noted. Place your name and address on each sheet. Each item of information, maps, and reports required as a part of this application is described on the back of this form. Identify each attached statement by the item number to which it applies. If an item does not apply to your application, show the item number on your statement and after it write "not applicable." Maps or sketches should be used to supplement narrative descriptions of the property location and boundaries in item 2, existing mine workings and geology in item 3, and the proposed exploration work in item 5. When this information is not too complex, all of it may be shown on one map or sketch. All documents and other attachments submitted as a part of this application, except those in item 3(g) which you mark to be returned, become the property of the Government and will not be returned to the applicant. Send true copies, *not originals*, of leases, contracts, and other documents which are an essential part of your business records. *File this application with the Department of the Interior, U.S. Geological Survey, Office of Minerals Exploration, Washington, D. C., 20242, or with the nearest OME Field Office.*

CERTIFICATION

The undersigned, whether as an individual, corporate officer, partner, or otherwise, both in his own behalf and acting for the applicant, certifies that the information set forth in this form and accompanying papers is correct and complete, to the best of his knowledge and belief, and that he would not ordinarily undertake the proposed exploration under current conditions and circumstances at his sole expense.

March 1, 1972
DATED

Alexander von Hafften
BY *(Signature)*

Alexander von Hafften, President
TITLE

A wilfully false statement or certification to any Department or Agency of the United States Government is a criminal offense. U. S. Code, Title 18, Sec. 1001.

INFORMATION REQUIRED WITH THIS APPLICATION

(submit on accompanying pages)

1. Financial Eligibility:

(a) Submit evidence of efforts made within 90 days preceding the filing of this application to obtain credit from your bank of account and at least one other banking institution or other private source of credit. Such evidence shall include (1) *true copies of your letters to credit sources* which show date of loan request, amount and terms requested, and proposed use of loan funds and (2) *true copies of replies from credit sources.* If the loan was offered under terms which you consider unreasonable, state why you consider them so.

(b) List names and addresses of affiliated, parent, or controlling companies or organizations and state extent and nature of their interest.

(c) State how you propose to furnish your share of the cost of the exploration work.

2. Applicant's Rights in Land:

(a) State your interest in the land and mineral rights, whether owner, lessee, purchaser under contract, or other. If you are not the owner, submit one true copy of the lease, contract, or other document (with address of owner) under which you control the property. Describe all liens, mortgages, or other encumbrances on the land and state book and page number and official place where recorded.

(b) State the legal description (section, township, and range; metes and bounds; patent number of claims) of the land upon which you wish to explore and all adjacent land which you own or control. Describe any part of the land or workings which should not be subject to Government royalty and liens. If the land consists of unpatented claims, state book and page number for each recorded location notice, including amended locations, and official place where recorded. State all the names by which you know the property.

(c) For all land or mineral rights encumbered or not owned, submit five copies of Lien and Subordination Agreements signed by owner on MME Form 52. If the agreements cannot be obtained, state reasons and whether you can furnish a performance bond.

3. Physical Description:

(a) Describe in detail and illustrate with maps or sketches all mining or exploration operations which you know have been or are being conducted upon the land. Include existing mine workings and all production facilities.

(b) State your interest, if any, in operations described in (a).

(c) State, if you know, the past and current production, supporting your statement with copies of settlement sheets, mine records, or published data if available.

(d) Describe known ore reserves, giving quantities and grades.

(e) Describe by narrative and maps or sketches the geologic features of the property, including ore minerals, geologic formations if known, and type of deposit (vein, bedded, etc.).

(f) If you have sampled the area you propose to explore, show where the samples were taken, describe sampling methods used, and provide copies of assay certificates. State your reasons for expecting to find ore.

(g) Send with your application at least *two* copies of all geologic or engineering reports, assay maps, or technologic information which you have, indicating whether you require their return.

4. Accessibility of Property:

(a) To aid the OME representative who may examine the property state name, address, and telephone number of person who will meet him; give directions for reaching the property; and describe accessibility of property and of any mine workings.

(b) Name the shipping and supply points and state the distances to the property.

5. Exploration Work:

(a) Describe fully the proposed exploration work giving individual footages and sizes of openings *for each item of work.* Use narrative, maps, plans, and sections as necessary. Show location of the proposed work as related to geologic features such as veins, ore-bearing beds, contacts of rock formations, etc. Show on maps also the relation of the proposed work to any existing mine workings and to *claim boundaries* or to the closest identifiable corner.

(b) If an access road must be built, show the proposed location on the property map and state the length, type and construction methods proposed.

(c) If an OME contract is executed, state how soon thereafter work would be started and finished. State your anticipated average daily or monthly rate of progress for each type of work.

6. Experience:

State your operating experience and background to conduct this exploration work and also that of the person who will supervise the work.

7. Estimate of Costs:

Furnish detailed estimates of the necessary costs for time and materials *for each item of the work proposed in 5(a)* under the headings listed below with a total for each heading and the estimated total cost of the work. Costs for any work to be performed by an independent contractor should be listed separately under category (a) below. Costs for any work that is not to be performed by an independent contractor should be listed under categories (b) through (g).

(a) Independent contracts. State the total cost of any proposed independent contract for all or any part of the work, and the number of units and the unit cost for each type of work, such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, or per cubic yard of material moved. Cost estimates should be supported by bids from three contractors if possible. (*Note*—If none of the work is to be contracted, write "none" after this item.)

(b) Personal services. The cost of supervision, engineering and geological services, outside consultants, and labor should be itemized by numbers and classes of employees; rates of wages, salaries or fees; and periods of employment. State whether these services are available.

(c) Operating materials and supplies. List items of material and supplies giving quantity and price of each. Include under this heading power, water, and fuel, and units of equipment and tools costing less than $50 each.

(d) Operating equipment. List items of equipment and tools costing $50 or more per unit. Give specifications and indicate how each item is to be acquired—i. e., rented, purchased or provided by the applicant. If rented or purchased, state the estimated rental or purchase price and mobilization charge. If furnished by the applicant, state condition and present fair market value.

(e) Initial rehabilitation and repairs. Describe the type and the cost of *initial* rehabilitation or repair of existing buildings, fixtures, installations (exclusive of mine workings), and movable operating equipment now owned by the applicant which will be used in the exploration work.

(f) New buildings, fixtures, installations. Describe each building, fixed improvement, and installation to be purchased, constructed, or installed for the exploration work, stating specifications and cost including labor, and materials.

(g) Miscellaneous. Describe the type and estimate the cost of repairs and maintenance of the operating equipment listed in 7(d). Do not repeat initial repairs listed in 7(e). Show also the costs of analytical work, accounting, workmen's compensation and employees' liability insurance, payroll taxes, and other required costs that do not fall within the previous categories. [*Note*—The Government will not contribute to costs incurred before the date of the contract, or to costs of or incident to: (1) acquiring, using, or possessing land and any existing improvements, facilities, buildings, installations, and appurtenances, or the depreciation and depletion thereof; (2) general overhead, corporate management, interest and taxes (other than payroll and sales taxes); (3) insurance (other than employees' liability insurance); and (4) damages to persons or property (other than authorized repair to or replacement of equipment or other property used in the work).]

ALEXANDER VON HAFFTEN
3898 WASHINGTON STREET
SAN FRANCISCO, CALIFORNIA 94118

March 20, 1972

Mr. Roscoe Smith
Office of Minerals Exploration
U. S. Geological Survey
345 Middlefield Road
Menlo Park, California

Re: OME Loan #6854

Dear Mr. Smith:

I am enclosing a letter addressed to me from Mrs. DeMarta, credit officer of Wells Fargo Bank, dated March 17, 1972.

Although I have sufficient funds to perform my part of the work at Good Hope, this letter will be evidence that funds will be made available if necessary.

Please let me know if you have any further questions.

Very truly yours,

Alexander von Hafften

Alexander von Hafften

AVH:PMK

Enclosure

Since 1852

WELLS FARGO BANK

NATIONAL ASSOCIATION

MARKET-MONTGOMERY OFFICE
4 MONTGOMERY STREET
SAN FRANCISCO, CALIFORNIA 94120

March 17, 1972

Mr. Alexander Von Hafften
dba Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

Dear Mr. Von Hafften:

This is to confirm our conversation of the Bank's willingness to extend a loan to you in the amount of $6,775.00.

The loan will be granted upon receipt of a Promissory Note signed jointly by you and Mrs. Von Hafften and will be supported by collateral we hold. The interest rate will be within our normal pattern at the time of disbursement.

This commitment will be available until March 16, 1973.

Sincerely yours,

(Mrs.) I. DeMarta
Credit Officer

ID/sa

OFFICE OF MINERAL EXPLORATION
U.S. GEOLOGICAL SURVEY
MENLO PARK, CALIF.

RECEIVED
SEP 16 1971

DME-6854

HEINRICHS GEOEXPLORATION COMPANY

806 WEST GRANT ROAD. TUCSON, ARIZONA 85703. P.O. BOX 5964. PHONE: (602) 623-0578

September 14, 1971

Mr. Edmond F. Lawrence
P. O. Box 804
University Station
Reno, Nevada 89507

Re: Proposed I. P. Survey
Good Hope Mine Area
near Jack Creek,
Elko County, Nevada

Dear Mr. Lawrence:

We submit the following bid for an I. P. survey of the Good Hope Mine Area, near Jack Creek, Elko County, Nevada, as outlined in our telephone conversation on 10 September 1971.

The total turn-key cost for six I. P. lines using a 300 foot dipole spacing with seven current electrodes would be $3,430.00, mobilized out of Tucson, Arizona. Right now we have a crew in the Reno, Nevada area and if still there at the time of your survey, mobilization would be from that city and the total price would be $2,950.00. This price includes the field work, mobilization - demobilization, transportation and living expenses, provided the crew can be accomodated at the Jack Creek Inn as you suggested, and a final report.

Additional I. P. surveying in the immediate adjacent or contiguous area if desired, will be done at the fixed rate of $370.00 for each seven electrode, 300 foot dipole spread. If 600 foot dipoles are desired for broader and deeper coverage, they will be run at the fixed rate of $390.00 for each five electrode spread. In the case of 300 foot dipoles we will, if possible, obtain data down to the n=6 separation, giving a surface coverage of 4,200 feet and "subsurface" plotted data for 2,700 feet. Six hundred foot dipole coverage will include, if possible, data to the n=6 separation giving a surface coverage of 8,400 feet and "subsurface" plotted data for 4,800 feet.

A three man crew and all necessary equipment will be supplied by GEOEX to perform the field work. Calculation of the I. P. data and final report will be done in the GEOEX Tucson office.

Our crew availability at this time is such that upon notice, we could probably start in one or two weeks.

All property permits, brushing and trespass-liability and related costs which are incurred on behalf of the client will be chargeable to the client. Charges for extra equipment and/or personnel employed, if mutually desired are extra.

GEOEX will save the client harmless from all Workmen's Compensation, public liability and property damage liability incurred by GEOEX employees.

Payment of statements are due on presentation and these may be submitted periodically with final payment due on presentation of final report.

The turn-key portion of this quotation will remain firm for a period of 90 days from this date, after which time it will be renegotiable.

Because of the possibility of seasonal snowstorms during the anticipated period of the survey, standby time due to inclement weather will be charged at $185.00 per day, in addition to the normal charges stated previously. Alternatively, in the case of apparent prolonged inclement weather, GEOEX will, with mutual consent, temporarily terminate the project, returning to complete it at a later date. In this case, additional mobilization - demobilization charges will be made.

Standby time due to client request will be charged at the rate of $175.00 per crew day.

In the event that the project is terminated by the client before the project is completed, charges will be made based upon the percentage of work completed on a per line basis plus mobilization and demobilization, but in no instance will it be less than one-half of the total amount quoted previously.

Your understanding and approval of the above may be indicated by signing as provided below on the attached copy of this letter and returning it to us together with $1,500.00 advance for a definite crew commitment.

Very truly yours,
Heinrichs GEOEXploration Company

John P. Matthews, Jr., Geophysicist

JPM,Jr./dm

Accepted: _____

Date: _____

Title: _____

cc: Extra Enclosure

Mr. Alexander Von Hafften
Great Basin Exploration Co.
Room 816, 369 Pine Street
San Francisco, California 94104

Mr. Roscoe Smith
Office of Mineral Exploration U.S.G.S.
345 Middlefield Road
Menlo Park, California 94025

McPHAR GEOPHYSICS INCORPORATED

818 WEST MIRACLE MILE • TUCSON, ARIZONA 85705
TELEPHONE (602) 624-2588

CANADIAN OFFICE
139 BOND AVENUE
DON MILLS, ONTARIO

RECEIVED
SEP 14 1971
OFFICE OF MINERALS EXPLORATION
U.S. GEOLOGICAL SURVEY
MENLO PARK, CALIF.

OME-6854

September 10, 1971

Mr. Roscoe Smith
Office of Mineral Exploration
U. S. G. S.
345 Middlefield Road
Menlo Park, California 94025

Dear Mr. Smith:

At the request of Dr. Edmond F. Lawrence I am forwarding a cost estimate on an induced polarization survey to be conducted on approximately five line miles in the Jack Creek Area, Nevada for Great Basin Exploration Company.

Survey Costs:

Estimate 6-8 days.

Standard Operating Rate per day	265.00
Two helpers @ 40.00/per each day	80.00
Room & Board 4 men per day	70.00
Vehicle daily	30.00
Misc.	5.00
	450.00/day

Estimated survey cost - $2700.00 to $3600.00.

Mobilization from Tucson to survey area and return is estimated at $1400.00.

Total estimated cost - $4100.00 to $5000.00.

It is possible that mobilization costs can be reduced if the survey can be started around the first week of October. McPhar has at present time a crew working in the Elko, Nevada area which will probably be able to conduct the survey for Great Basin Exploration Company before returning to Tucson if the timing is right.

If any further information is required of us, please do not hesitate to call.

Yours sincerely,

McPHAR GEOPHYSICS, INC.

Bruce S. Bell

Bruce S. Bell
Operations Manager

BSB:a

cc: Alexander Van Hofften
Dr. E. F. Lawrence

MME Form 40
(Revised Nov. 68)

Budget Bureau No. 42-R1368
Approval expires Dec. 1971

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

APPLICATION FOR FINANCIAL ASSISTANCE IN MINERALS EXPLORATION

Pursuant to Public Law 85—701 (72 Stat. 700; 30 U.S.C. 641)

NAME OF APPLICANT *(Full legal name and mailing address as they should appear on contract if one is executed.)*

Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

APPLICANT DO NOT USE THIS BLOCK

DOCKET NUMBER 6854

DATE RECEIVED 6-11-71

REGION II

DIVISION CODE

BUSINESS ORGANIZATION *(Check one)*

- INDIVIDUAL [X]
- CORPORATION [ ]
- PARTNERSHIP [ ]
- OTHER *(Specify)* [ ]

STATE IN WHICH FIRM IS ORGANIZED: Nevada

LIST CORPORATE OFFICERS OR PARTNERS HERE, IF APPLICABLE

NAME	ADDRESS	TITLE

MINERAL(S) FOR WHICH YOU WISH TO EXPLORE: Silver and Gold

ESTIMATED COST OF PROJECT: $19,957.00

PROPERTY NAME	LOCATION COUNTY	STATE
Good Hope	Elko County,	Nevada

GENERAL INSTRUCTIONS

Before filling out this application, please read the *OME Regulations for Obtaining Federal Assistance in Financing Explorations for Mineral Reserves* (30 CFR Chap. II). To assure prompt action, your application must provide all applicable material and information specified on the back of this application form. Avoid unnecessary correspondence and delays by submitting complete and accurate information. *Please submit two copies of this application and all accompanying papers* except as otherwise noted. Place your name and address on each sheet. Each item of information, maps, and reports required as a part of this application is described on the back of this form. Identify each attached statement by the item number to which it applies. If an item does not apply to your application, show the item number on your statement and after it write "not applicable." Maps or sketches should be used to supplement narrative descriptions of the property location and boundaries in item 2, existing mine workings and geology in item 3, and the proposed exploration work in item 5. When this information is not too complex, all of it may be shown on one map or sketch. All documents and other attachments submitted as a part of this application, except those in item 3(g) which you mark to be returned, become the property of the Government and will not be returned to the applicant. Send true copies, *not originals*, of leases, contracts, and other documents which are an essential part of your business records. *File this application with the Department of the Interior, U.S. Geological Survey, Office of Minerals Exploration, Washington, D. C., 20242, or with the nearest OME Field Office.*

CERTIFICATION

The undersigned, whether as an individual, corporate officer, partner, or otherwise, both in his own behalf and acting for the applicant, certifies that the information set forth in this form and accompanying papers is correct and complete, to the best of his knowledge and belief, and that he would not ordinarily undertake the proposed exploration under current conditions and circumstances at his sole expense.

June 7, 1971
DATED

Alexander von Hafften
BY *(Signature)*

Alexander von Hafften, President
TITLE

A wilfully false statement or certification to any Department or Agency of the United States Government is a criminal offense. U. S. Code, Title 18, Sec. 1001.

INFORMATION REQUIRED WITH THIS APPLICATION

1. Financial Eligibility:

(a) Submit evidence of efforts made within 90 days preceding the filing of this application to obtain credit from your bank of account and at least one other banking institution or other private source of credit. Such evidence shall include (1) true copies of your letters to credit sources which show date of loan request, amount and terms requested, and proposed use of loan funds and (2) true copies of replies from credit sources. If the loan was offered under terms which you consider unreasonable, state why you consider them so.

(b) List names and addresses of affiliated, parent, or controlling companies or organizations and state extent and nature of their interest.

(c) State how you propose to furnish your share of the cost of the exploration work.

2. Applicant's Rights in Land:

(a) State your interest in the land and mineral rights, whether owner, lessee, purchaser under contract, or other. If you are not the owner, submit one true copy of the lease, contract, or other document (with address of owner) under which you control the property. Describe all liens, mortgages, or other encumbrances on the land and state book and page number and official place where recorded.

(b) State the legal description (section, township, and range; metes and bounds; patent number of claims) of the land upon which you wish to explore and all adjacent land which you own or control. Describe any part of the land or workings which should not be subject to Government royalty and liens. If the land consists of unpatented claims, state book and page number for each recorded location notice, including amended locations, and official place where recorded. State all the names by which you know the property.

(c) For all land or mineral rights encumbered or not owned, submit five copies of Lien and Subordination Agreements signed by owner on MME Form 52. If the agreements cannot be obtained, state reasons and whether you can furnish a performance bond.

3. Physical Description:

(a) Describe in detail and illustrate with maps or sketches all mining or exploration operations which you know have been or are being conducted upon the land. Include existing mine workings and all production facilities.

(b) State your interest, if any, in operations described in (a)

(c) State, if you know, the past and current production, supporting your statement with copies of settlement sheets, mine records, or published data if available.

(d) Describe known ore reserves, giving quantities and grades.

(e) Describe by narrative and maps or sketches the geologic features of the property, including ore minerals, geologic formations if known, and type of deposit (vein, bedded, etc.).

(f) If you have sampled the area you propose to explore, show where the samples were taken, describe sampling methods used, and provide copies of assay certificates. State your reasons for expecting to find ore.

(g) Send with your application at least *two* copies of all geologic or engineering reports, assay maps, or technologic information which you have, indicating whether you require their return.

4. Accessibility of Property:

(a) To aid the OME representative who may examine the property state name, address, and telephone number of person who will meet him; give directions for reaching the property; and describe accessibility of property and of any mine workings.

(b) Name the shipping and supply points and state the distances to the property.

5. Exploration Work:

(a) Describe fully the proposed exploration work giving individual footages and sizes of openings *for each item of work*. Use narrative, maps, plans, and sections as necessary. Show location of the proposed work as related to geologic features such as veins, ore-bearing beds, contacts of rock formations, etc. Show also the relation of the proposed work to any existing mine workings and to *land boundaries* or to the closest identifiable corner.

(b) If an access road must be built, show the proposed location on the property map and state the length, type and construction methods proposed.

(c) If an OME contract is executed, state how soon thereafter work would be started and finished. State your anticipated average daily or monthly rate of progress for each type of work.

6. Experience:

State your operating experience and background to conduct this exploration work and also that of the person who will supervise the work.

7. Estimate of Costs:

Furnish detailed estimates of the necessary costs for time and materials *for each item of the work proposed in 5(a)* under the headings listed below with a total for each heading and the estimated total cost of the work. Costs for any work to be performed by an independent contractor should be listed separately under category (a) below. Costs for any work that is not to be performed by an independent contractor should be listed under categories (b) through (g).

(a) Independent contracts. State the total cost of any proposed independent contract for all or any part of the work, and the number of units and the unit cost for each type of work, such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, or per cubic yard of material moved. Cost estimates should be supported by bids from three contractors if possible. (*Note*—If none of the work is to be contracted, write "none" after this item.)

(b) Personal services. The cost of supervision, engineering and geological services, outside consultants, and labor should be itemized by numbers and classes of employees; rates of wages, salaries or fees; and periods of employment. State whether these services are available.

(c) Operating materials and supplies. List items of material and supplies giving quantity and price of each. Include under this heading power, water, and fuel, and units of equipment and tools costing less than $50 each.

(d) Operating equipment. List items of equipment and tools costing $50 or more per unit. Give specifications and indicate how each item is to be acquired—i. e., rented, purchased or provided by the applicant. If rented or purchased, state the estimated rental or purchase price. If furnished by the applicant, state condition and present fair market value.

(e) Initial rehabilitation and repairs. Describe the type and the cost of *initial* rehabilitation or repair of existing buildings, fixtures, installations (exclusive of mine workings), and movable operating equipment now owned by the applicant which will be used in the exploration work.

(f) New buildings, fixtures, installations. Describe each building, fixed improvement, and installation to be purchased, constructed, or installed for the exploration work, stating specifications and cost including labor, materials, and supervision.

(g) Miscellaneous. Describe the type and estimate the cost of repairs and maintenance of the operating equipment listed in 7(d). Do not repeat initial repairs listed in 7(e). Show also the costs of analytical work, accounting, workmen's compensation and employees' liability insurance, payroll taxes, and other required costs that do not fall within the previous categories. [*Note*—The Government will not contribute to costs incurred before the date of the contract, or to costs of or incident to: (1) acquiring, using, or possessing land and any existing improvements, facilities, buildings, installations, and appurtenances, or the depreciation and depletion thereof; (2) general overhead, corporate management, interest and taxes (other than payroll and sales taxes); (3) insurance (other than employees' liability insurance); and (4) damages to persons or property (other than authorized repair to or replacement of equipment or other property used in the work).]

Great Basin Exploration Company
3898 Washington Street
San Francisco, Calif. 94118

Item 1 Financial Eligibility

(a) See attached letters to

Mr. Donald A. Olivera
Assistant Vice President
Wells Fargo Bank
San Francisco, California

Mr. H. J. Brown
Vice President and Branch Manager
First National Bank of Nevada
Reno, Nevada 89504

(b) Not Applicable.

(c) The cost of the exploration work not financed by the Office of Mineral Exploration will be furnished by Great Basin Exploration Company.

GREAT BASIN EXPLORATION COMPANY
3898 WASHINGTON STREET
SAN FRANCISCO, CALIFORNIA 94118

June 1, 1971

Mr. H. J. Brown
Vice President and Branch Manager
First National Bank of Nevada
204 North Virginia Street
Reno, Nevada 89504

Dear Mr. Brown:

The Great Basin Exploration Company which was organized in 1964 has conducted a program of mineral exploration for precious metals in Nevada. Our Company holds thirteen (13) unpatented mining claims by rights of location in Elko County, Nevada. The name of the district where these claims are situated is known as the Good Hope District. Great Basin Exploration Company also holds a lease on some adjoining mining claims in the Good Hope area.

During the past several years the Great Basin Exploration Company has conducted extensive geochemical sampling of these properties as well as geophysical surveys. In addition, we have prepared geological studies of these properties. All of the technical work has been under the direction and supervision of qualified geologists.

As a result of the exploration activities by Great Basin Exploration Company, it is now necessary to conduct a drilling program in order to determine whether or not the properties have ore in commercial quantities. It is estimated that the cost of such a drilling program will approximate twenty thousand dollars ($20,000.00).

You will find enclosed a copy of the financial statement of Great Basin Exploration Company as of December 31, 1970.

In order for the Company to conduct this essential drilling program, it is necessary that we obtain funds for this purpose. For that reason, we are applying to your bank for a loan of twenty thousand dollars ($20,000.00).

We will appreciate your early reply.

Very truly yours,

Alexander von Hafften

Alexander von Hafften
President

AVH:CAI

Enclosure

GREAT BASIN EXPLORATION COMPANY
3898 WASHINGTON STREET
SAN FRANCISCO, CALIFORNIA 94118

June 1, 1971

Mr. Donald A. Olivera
Assistant Vice President
Wells Fargo Bank
464 California Street
San Francisco, California

Dear Mr. Olivera:

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We will appreciate your early reply.

Very truly yours,

Alexander von Hafften

Alexander von Hafften
President

AVH:CAI

Enclosure

Great Basin Exploration Company
3898 Washington Street
San Francisco, Calif. 94118

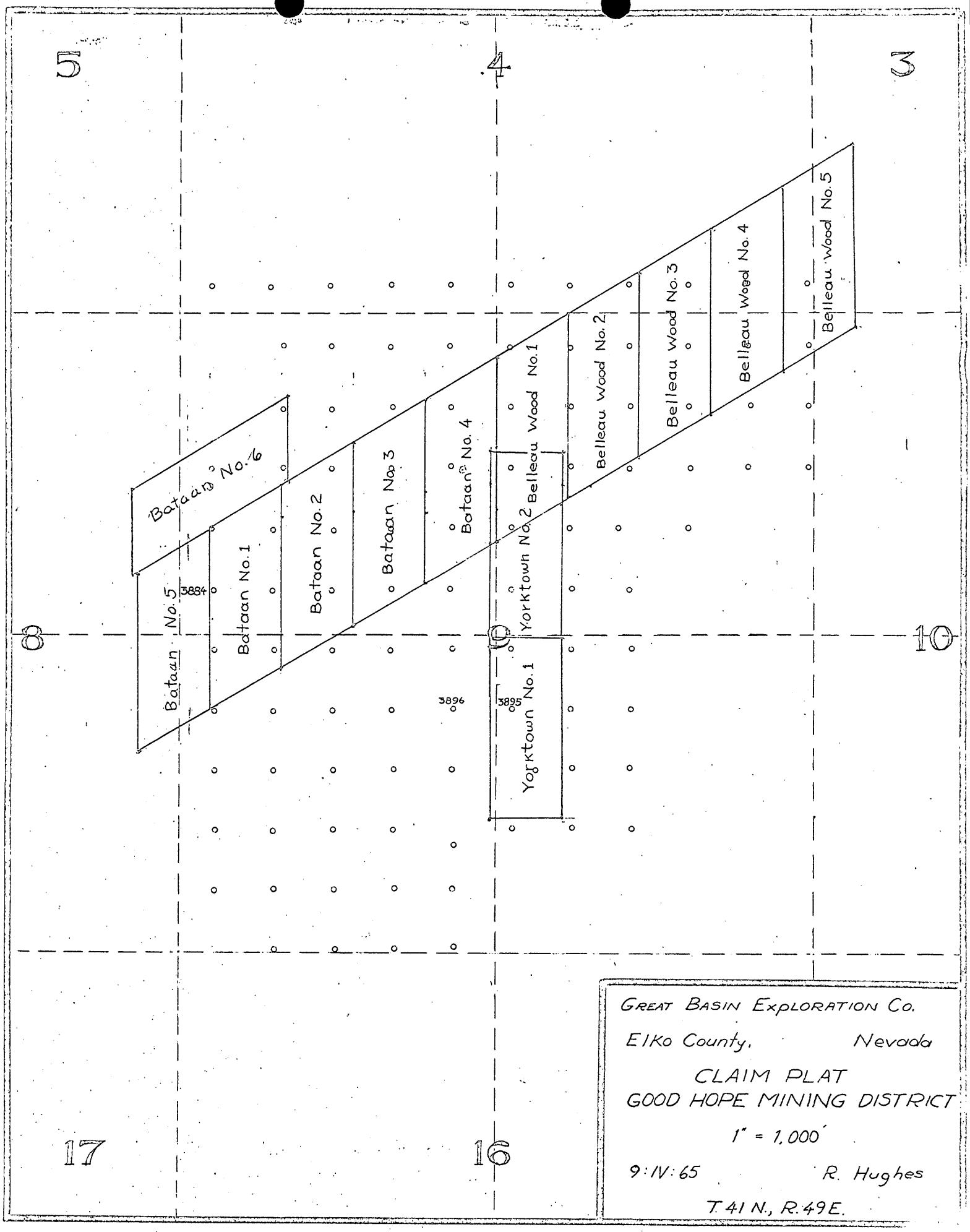
Item 2 Applicant's Rights in Land

Great Basin Exploration holds thirteen unpatented mining claims by rights of location. These claims are listed as following:

Bataan No. 1	recorded on page 60, Book 56 of Records
Bataan No. 2	recorded on page 61, Book 56 of Records
Bataan No. 3	recorded on page 62, Book 56 of Records
Bataan No. 4	recorded on page 63, Book 56 of Records
Bataan No. 5	recorded on page 552-Book 83 of Records
Bataan No. 6	recorded on page 553-Book 83 of Records
Belleau Wood No. 1	recorded on page 64, Book 56 of Records
Belleau Wood No. 2	recorded on page 65, Book 56 of Records
Belleau Wood No. 3	recorded on page 66, Book 56 of Records
Belleau Wood No. 4	recorded on page 67, Book 56 of Records
Belleau Wood No. 5	recorded on page 68, Book 56 of Records
Yorktown No. 1	recorded on page 69, Book 56 of Records
Yorktown No. 2	recorded on page 551-Book 83 of Records

The certificates of location for each and all of the above mining claims have been filed for record in the office of the County Recorder of Elko County, State of Nevada. All assessment work for each year has been accomplished and affidavits of annual assessment work have been filed. These claims are located in Section 9, T. 41 N., R. 49 E., MDB&M, with slight overlaps into Sections 3, 4, 8, and 10.

The Great Basin Exploration Company also holds a lease on the surrounding mining claims and minerals lands held by Allied Properties of San Francisco, California. A copy of this lease is attached.


5
4
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Bataan No. 6
Bataan No. 5
Bataan No. 1
Bataan No. 2
Bataan No. 3
Bataan No. 4
Yorktown No. 2
Yorktown No. 1
Belleau Wood No. 1
Belleau Wood No. 2
Belleau Wood No. 3
Belleau Wood No. 4
Belleau Wood No. 5
3884
3896
3895
GREAT BASIN EXPLORATION CO.
Elko County, Nevada
CLAIM PLAT
GOOD HOPE MINING DISTRICT
1" = 1,000'
9:IV:65
R. Hughes
T. 41 N., R. 49 E.

Figure

LEASE AGREEMENT

This Lease ~~and Option Agreement~~, entered into this 1st day of August, 1969, by and between ALLIED PROPERTIES, a Corporation, hereinafter referred to as "Owners", and GREAT BASIN EXPLORATION CO., a proprietorship, hereinafter referred to as "Lessee",

W I T N E S S E T H:

That for and in consideration of the mutual covenants hereinafter set forth, the parties hereto agree as follows:

ARTICLE I. LEASE

1. Lease of Mining Properties and Mineral Rights. Owners hereby lease to Lessee, on and subject to the terms, covenants, and conditions hereinafter set forth, the twenty-one (21) unpatented lode mining claims located in the Good Hope Mining District, Elko County, Nevada, together with seven Hundred Twenty (720) acres, more or less, of fee lands situated in T. 41 N., R. 49 E., MDB&M, Elko County, Nevada, on which Owners have reserved and retained all mineral rights, all as more particularly described in Exhibit "A" attached hereto and by this reference made a part hereof, hereinafter sometimes called the Mining Properties.

2. Term of Lease.

The term of this lease shall be for a period of five (5) years, commencing on the 1st day of August, 1969, and so long thereafter as minerals are being produced from said land in quantities deemed paying by Lessee, or so long thereafter as Lessee in good faith shall conduct drilling or exploratory operations on said land.

3. Title; Location of Claims.

(a) Owners do not and will not warrant title but Owners will cooperate in the defense or prosecution in any action arising from title to or possession of the subject mining properties; and

(b) Owners have full power and authority to enter into this Agreement and to deal with and convey such Mining Properties in accordance with the terms hereof.

Promptly following the execution of this Agreement, Owners at their expense will deliver to Lessee originals or photostatic copies of all Notices of Location, Certificates of Location, Proofs of Labor, and other documents in Owners' possession or reasonably requested by Lessee evidencing Owners' title to the Mining Properties as described in Exhibit A hereto. Lessee may order and pay for an abstract of title to such Mining Properties.

For the purpose of adjusting and changing the boundaries thereof, Lessee shall have the right, at any time and from time to time during the term of this Lease, and at Lessee's expense, to amend the location of or to relocate any or all of the unpatented mining claims included in the Mining Properties, in the names of and on behalf of the Owners, provided however, that said action by Lessee shall in no way adversely affect Owners' rights and interests in and to said Mining Properties.

4. Location of Fractional Claims by Lessee.

Lessee may locate in its own name and at its sole expense as a fractional claim any ground within the exterior boundaries of the Mining Properties as described in Exhibit A hereto which is not covered by any of the mining claims as described in such Exhibit A. Upon expiration or termination of this Lease any fractional claims located by Lessee pursuant to this section then held by it shall be conveyed by Lessee to Owners at no cost of Owners. Such fractional claims are not part of the Mining Properties as defined herein.

5. Maps, Reports, Data, etc.

Promptly following the execution of this Agreement, Owners at their expense will deliver to Lessee a map of the Mining Properties showing thereon the area included within each claim and the extent and boundaries of said patented land and originals or photostatic copies of all other maps, reports, drilling, geological and geophysical data and other data in Owners' possession or available to Owners relating to the Mining Properties. Lessee shall have no obligation to survey any of the Mining Properties or to check the accuracy of maps or other information supplies by Owners.

6. Rights of Lessee.

During the term of this Lease, Lessee shall have the exclusive right, at any time and from time to time, to enter in and upon the Mining Properties and each and every part thereof, and, to extent Lessee in its sole and absolute discretion may consider advisable, to explore, examine, prospect, investigate, map, survey, and develop the Mining Properties or any part or parts thereof, and use and control the same and the water and water rights appurtenant thereto, and to extract, remove, treat and sell ore, rock, earth and minerals therefrom, and to erect, construct, maintain, use, and operate thereon and therein buildings, structures, machinery, and equipment and to dump and store materials and waste materials therein or thereon. In doing such mining, exploration and development work, Lessee may treat all the Mining Properties as one group, and may explore and develop the Mining Properties by means of drilling, shaft sinking, cross-cutting, drifting and raising or by any other exploration or development method, whether aerial or surface or underground, by and through its engineers, geologists, consultants, other personnel, and contractors, without liability for waste or otherwise. Lessee shall have sole and exclusive

custody, possession, ownership and control of all drill cores and other materials extracted or removed from the Mining Properties for examination, assay, analysis, sampling or testing purposes, and may sell or otherwise dispose of materials extracted or removed for such purposes. In the exercise of the rights herein set forth Lessee shall be subject only to compliance with applicable statutes, rules and regulations and the provisions of paragraph 16 of this Agreement.

7. Rental Payments Under This Lease.

During the term of this Lease, Lessee shall pay to Owners a production royalty in an amount equal to five (5%) percent of the net smelter returns received or metal sales made from concentrates derived from ores mined from the Mining Properties and a royalty of seven and one-half (7½%) percent of the net smelter returns received from any ores that are mined from the property and ore shipped directly to the smelter without first being put through a concentrator.

All minerals extracted from ores mined from the Mineral Properties shall be sold under the name of Lessee and duplicate settlement sheets shall be furnished to Owners and royalty settlements shall be made by Lessee on or before the 25th day of each calendar month for all net smelter returns received or metal sales made by Lessee during the preceding calendar month from ores mined from the Mining Properties.

"Net smelter returns" shall mean all sums to be paid to Lessee for ores, concentrates or other products mined or extracted from the Mining Properties after deducting all charges for transportation to place of sale and all direct smelting charges, including, but not limited to penalties, made by a smelter. Each party hereto shall pay its proportionate share of excise production and/or bullion tax to be paid to any lawful taxing authority.

8. Assessment Work.

During the term of this Lease, Lessee shall as further and additional consideration herein perform or cause to be performed, at its expense, all assessment work required in order to maintain each unpatented mining claim as described in Exhibit A hereto, during each assessment year commencing on or after September 1, 1968, and will, at its expense, file or cause to be filed affidavits of the performance of such assessment work, allocating therein to or for the benefit of each claim at least the minimum amount of such work required to maintain such claim, provided however, that if this Lease has expired or is terminated within ninety (90) days of the end of any assessment year, Lessee shall perform the assessment work for said year at its expense and record affidavits of said performance for said assessment year.

Such assessment work need not be performed on each claim and may be of such nature, and may be performed in such manner, at such locations and in such areas, as, in the sole and exclusive judgment of Lessee, will tend to benefit the claims included hereunder, either on an individual or group basis.

If Lessee shall be prevented from peaceable entering upon or performing the assessment work on any of such claims by any person claiming, locating, holding or asserting conflicting rights to the surface thereof or to the minerals therein, Lessee (without limitation as to remedies which may be available to it) shall not be liable for failure to perform such assessment work.

The term "assessment work" as used in this Agreement shall mean labor performed and/or improvements made, in accordance with applicable statutes.

9. Liens or Encumbrances.

During the term of this Lease, Owners will not dispose of or release all or any part of their respective rights, titles and interests in and to any of the Mining Properties except as provided in this Agreement and neither Lessee nor Owners will by inaction cause, or take any action which will cause, any lien, charge or other encumbrance to be placed upon or against any of the Mining Properties, other than liens for taxes not yet due and delinquent or being contested as provided in Section 10 hereof, except that if Lessee, in good faith, shall dispute the validity or amount of any claim or liability asserted against it for work performed on the Mining Properties during the term of this Lease it shall not be required to pay the same until the amount and validity thereof have been finally determined.

10. Taxes and Royalties.

Lessee will pay when due and before delinquent any license, production and excise taxes and royalties incurred on account of ores or minerals extracted and removed by it from the Mining Properties during the term of this Lease, and any ad valorem and other taxes imposed during the term of this Lease upon improvements, machinery, equipment, tools and supplies constructed, installed or placed by Lessee on the Mining Properties.

Lessee shall also pay when due and before delinquent any and all taxes which may be levied against the mineral rights reserved and retained by Owners on the patented lands set forth in Exhibit A.

Owners or Lessee, as the case may be, may contest in good faith the amount and validity of any such taxes or royalties, and in such event shall not be obligated to pay the same until the amount and validity thereof have been finally determined, provided however, that in the event taxes are the subject of dispute, said taxes will be paid and any action on the part of Owners or Lessee shall be for refund and other appropriate relief.

11. Inspection.

Owners, or their duly authorized agent or representative, shall be permitted to enter upon and into the Mining Properties and the workings of Lessee at all reasonable times for the purpose of inspection, but shall enter upon said property at Owners' sole risk and so as not to hinder unreasonably the operations of Lessee, provided that Owners shall indemnify and hold harmless Lessee, its officers, agents, employees, and contractors, from any damage, claim or demand by reason of injury to or presence of Owners or their agents or representatives or any of them on said property or the approaches thereto not caused by the negligence or wilfulness of Lessee or its employees, agents or independent contractors performing work or services for Lessee.

12. Termination.

Anything herein to the contrary notwithstanding, Lessee shall have the right to terminate this Lease at any time by giving Owners thirty (30) days written notice of such termination, provided that neither party hereto shall thereby be relieved of any of its obligations or liabilities accrued prior to the date of such termination, it being understood, however, that Lessee shall be liable for the performance of assessment work as provided under Section 8 hereof.

13. Surrender Upon Termination.

Upon the expiration or prior termination of this Lease, Lessee shall execute and deliver to Owners such instruments as may be reasonably necessary to evidence the relinquishment by Lessee of any interest in the Mining Properties, and surrender to Owners the possession of said Mining Properties.

14. Data to be Supplied by Lessee.

Upon expiration or termination of this Lease, Lessee shall deliver to Owners all documents, maps and data delivered to it by Owners pursuant to Sections 3 and 5 hereof, ~~together with any abstracts of title which Lessee shall be obtained at Owners' expense~~, and, if Owners so request basic factual data developed by Lessee during the term hereof, including samples of drill core retained by Lessee.

15. Removal of Improvements and Equipment.

Notwithstanding the provisions of Section 12 and 13 above, Lessee shall have the right, during a reasonable time following the expiration or termination of this Lease, to remove, if it so elects, any and all improvements, machinery, equipment, tools and supplies constructed, installed, or placed by Lessee upon the Mining Properties.

16. Work to be Performed in Workmanlike Manner, etc.

So long as this Lease shall be in force and effect Lessee shall (a) perform all work relating to the Mining Properties, or cause the same to be performed, in a good and workmanlike manner, and in compliance with all applicable laws and regulations, and (b) safeguard and maintain the Mining Properties in compliance with all applicable laws and regulations with respect to fencing of open cuts, pits and shafts, and capping or plugging of drill holes.

17. Hold Harmless and Indemnification.

Subject to the provisions of paragraph 11 herein, Lessee will not hold Owners liable for any injury to or death of persons or loss of or damage to propery by fire, water, wreck, wind or other casualty occurring upon the said properties or any way of access on or leading to or from said property, arising from the existence, maintenance or operation of machinery, equipment,

excavation or mine workings, or otherwise, and Lessee shall release and discharge and promises and agrees to indemnify and save harmless Owners from and against any and all claims, liability, demands, causes of action, judgments, costs, expenses and attorney's fees arising or growing out of injury to or death of persons, or loss or destruction of or damage to property, from any cause resulting directly or indirectly from the operation of Lessee upon the said Mining Properties or approaches thereto, or from the use of said Mining Properties by Lessee.

18. Exploration, Development and Mining on Patented Lands.

It is fully understood by the parties hereto that Owners' only interests in patented lands described in said Exhibit A, are mineral rights reserved and retained and that surface rights are owned by persons or legal entities not parties to this Agreement, and that any operation conducted on said lands pursuant to this Agreement shall be done at the sole risk and liability of Lessee, provided however, that Owners will fully cooperate with Lessee in negotiating with the Owners of said surface rights, all matters relating to the rights of Lessee to go upon said lands for the purpose of exploration, development and mining and access to and from said patented lands.

19. Conflicting Mineral Interests.

The parties hereto are aware that certain unpatented mining claims located by Lessee may be in conflict with certain mineral interests included in this Agreement, and it is hereby agreed by and between the parties hereto that insofar as any of Lessee's said mining claims, or any part thereof, are determined to be in conflict with any of said Mining Properties, the area in conflict will be considered to be part of this Agreement and subject to all the terms, conditions and covenants hereto. The

parties hereto further agree that Lessee does not waive or relinquish any rights or interest in and to any of said mining claims owned by it which may come within the purview of this paragraph, except as hereinabove provided, and any provisions of the paragraph limiting the rights of Lessee in and to any of its mining claims or parts thereof made subject to this paragraph shall cease and determine upon termination of this Agreement.

20. Posting.

Lessee during its possession of said Mining Properties agrees to post, in the name of Owners, notices of non-liability for the protection of Owners against all claims of labor and materialmen and against all liens and liabilities arising out of its acts upon any of said Mining Properties. In the event Lessee shall fail to post said notices, Owners reserve the right to go upon said premises and post the aforesaid notices in such places as is deemed necessary by said Owners.

ARTICLE II. MISCELLANEOUS

1. Recording.

Owners, at any time upon request of Lessee, shall execute and acknowledge in form required by law for recording in the State of Nevada, and shall deliver to Lessee, such notices, contracts or other instruments incorporating or referring to the provisions of this Agreement as Lessee shall deem necessary to record in the State of Nevada in order to preserve and protect its interests under this Agreement.

2. Arbitration.

Any controversy or claim arising out of or relating to this Agreement or breach thereof except for default in payment of rental and/or advance payments shall be settled by arbitration in Nevada, in accordance with the laws of the State of Nevada,

by one (1) arbitrator to be appointed pursuant to the rules of the American Arbitration Association, and said arbitration shall be conducted in accordance with the rules of said Association. A judgment shall be entered upon the award made pursuant to the arbitration in the District Court of Nevada in and for the County of Washoe.

3. Notices.

All notices under this Agreement shall be deemed to have been given upon deposit thereof in a United States post office, registered or certified mail, postage prepaid, enclosed in a sealed envelope addressed:

(a) if to Owners, to

Allied Properties
340 Mason Street
San Francisco, California 94102

or to such other address as it shall have designated by written notice to Lessee. To Lessee,

(b) Alexander von Hafften

Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

or to such other address as Lessee shall have designated by written notice to Owners;

provided however, that the notices relating to changes of address shall not be deemed given until actually received.

4. Binding Effect of Agreement.

This Agreement shall be binding upon and shall inure to the benefit of the parties hereto, their heirs, legal representatives, successors and assigns.

5. Entire Agreement.

This Agreement embodies the entire agreement and understanding between the parties hereto, and supercedes all prior agreements and understandings relating to the subject matter hereof.

The relationship hereby created between the parties is that of buyer and seller and not of co-partnership or joint venture.

6. Assignment.

This Agreement is assignable by Lessee upon approval of Owners, provided however, that such approval shall not unreasonably be withheld.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first hereinabove written.

OWNERS ALLIED PROPERTIES

By _____
Vice President

Attest:

_____
Secretary

LESSEE GREAT BASIN EXPLORATION COMPANY

By _____
Proprietor

Attest:

_____
Secretary

EXHIBIT A

MINING PROPERTIES

The following unpatented lode mining claims are located in the Good Hope Mining District, Elko County, Nevada, and the names and books and pages of the record in the Office of the County Recorder of Elko County, Nevada, of the certificates of location whereof are as follows:

NAME	FILE NUMBER	BOOK	PAGE
Gyro No. 1	27686	75	365
Gyro No. 2	27687	75	366
Gyro No. 3	27688	75	367
Gyro No. 4	27689	75	368
Gyro No. 5	27690	75	369
Gyro No. 6	27691	75	370
Gyro No. 7	27692	75	371
Gyro No. 8	27693	75	372
Gyro No. 9	27694	75	373
Gyro No. 10	27851	75	573
Copter No. 1	27847	75	569
Copter No. 2	27848	75	570
Copter No. 3	27849	75	571
Copter No. 4	27850	75	572
Copter No. 5	27695	75	374
* Copter No. 6	26674	73	181
Perry No. 1	27852	75	574
Perry No. 2	27853	75	575
Bill No. 1	28311	77	33
Bill No. 2	28312	77	34
George No. 1	28059	76	225

*Copter No. 6: The file number, book and page for Copter No. 6 refers to the Notice of Location, not the Certificate of Location.

Together with the mineral rights on the following lands situate in Elko County, Nevada, T. 41 N., R. 49 E., MDB&M.

Section 2

E½ of E½; W½ of the NE¼; NE¼ of the NW¼ of Section 2

Section 3

SW¼ of the SW¼ of Section 3

Section 9

E½ of the W½; NW¼ of the NW¼; NW¼ of the SE¼ of Section 9

Section 16

W½ of the NE¼; S½ of the SW¼
NW¼ of the SW¼ of Section 16

Together with all water and water rights appurtenant to said mining claims or held, owned or used in connection therewith, and the right to use the same either on or off of said mining properties.

D E E D

THIS INDENTURE made this 1th day of August, 1965, by and between RICHARD A. HUGHES, of Reno, Washoe County, Nevada, Party of the First Part, and GREAT BASIN EXPLORATION COMPANY, a co-partnership of Reno, Washoe County, Nevada, Party of the Second Part,

W I T N E S S E T H:

That for and in consideration of the sum of Ten ($10.00) Dollars, lawful money of the United States of America, in hand paid to the Party of the First Part by the Party of the Second Part, the receipt whereof is hereby acknowledged, the Party of the First Part does by these premises grant, bargain, and sell unto the Party of the Second Part, its heirs and assigns, all of the following described un-patented mining claims, located in the Counties of Churchill, Elko, Mineral and Nye, State of Nevada:

8. Bataan No. 1, located in the Good Hope Mining District, Elko County, Nevada, and as recorded in Book 56, Page 60, in the Elko County Records.

9. Bataan No. 2, located in the Good Hope Mining District, Elko County, Nevada, and as recorded in Book 56, Page 61, in the Elko County Records.

10. Bataan No. 3, located in the Good Hope Mining District, Elko County, Nevada, and as recorded in Book 56, Page 62, in the Elko County Records.

11. Bataan No. 4, located in the Good Hope Mining District, Elko County, Nevada, and as recorded in Book 56, Page 63, in the Elko County Records.

12. Belleau Wood No. 1, located in the Good Hope Mining District, Elko County, Nevada, and as recorded in Book 56, Page 64, Elko County Records.

13. Belleau Wood No. 2, located in the Good Hope Mining District, Elko County, Nevada, and as recorded in Book 56, Page 65, Elko County Records.

14. Belleau Wood No. 3, located in the Good Hope Mining District, Elko County, Nevada, and as recorded in Book 56, Page 66, Elko County Records.

15. Belleau Wood No. 4, located in the Good Hope Mining District, Elko County, Nevada, and as recorded in Book 56, Page 67, Elko County Records.

16. Belleau Wood No. 5, located in the Good Hope Mining District, Elko County, Nevada, and as recorded in Book 56, Page 68, Elko County Records.

17. Yorktown No. 1, located in the Good Hope Mining District, Elko County, Nevada, and as recorded in Book 56, Page 69, Elko County Records.

TOGETHER WITH all the dips, spurs, and angles, and also all the metals, ores, gold and silver bearing quartz, rock and earth therein, and all the rights, privileges and franchises thereto incident, appendant and appurtenant, or therewith usually had and enjoyed and also all and singular the tenements, hereditaments and appurtenances thereto belonging or in anywise appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof.

TO HAVE AND TO HOLD all and singular the said premises, together with the appurtenances, unto the said Party of the Second Part, their heirs and assigns forever.

IN WITNESS WHEREOF, the said Party of the First Part has hereunto set his hand the day and year first above written.

Richard A. Hughes

RICHARD A. HUGHES

STATE OF NEVADA)
: SS.
COUNTY OF WASHOE)

On this 8th day of August, 1983, personally appeared before me, a Notary Public in and for said County and State, RICHARD A. HUGHES, known to me to be the person described in and who executed the annexed instrument, who acknowledged to me that he executed the same freely and voluntarily, and for the uses and purposes therein mentioned.

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

JOHN C. GONZALES
Notary Public — State of Nevada
Washoe County
My Commission Expires: Jan 23, 1989

John C. Gonzales

Notary Public in and for the County of Washoe, State of Nevada.
My Commission expires: _____

DEED

THIS INDENTURE made this 24 day of July, 1967, by and between ANTHONY L. PAYNE, of Reno, Washoe County, Nevada, Party of the First Part, and GREAT BASIN EXPLORATION COMPANY, a co-partnership of Reno, Washoe County, Nevada, Party of the Second Part,

WITNESSETH:

That for and in consideration of the sum of Ten ($10.00) Dollars, lawful money of the United States of America, in hand paid to the Party of the First Part by the Party of the Second Part, the receipt whereof is hereby acknowledged, the Party of the First Part does by these premises grant, bargain, and sell unto the Party of the Second Part, its heirs and assigns, all of the following described un-patented mining claims, located in the State of Nevada:

1. Cabot No. 2, located in the Golden Arrow Mining District, Nye County, Nevada, and as recorded in Book 97, Page 493 in the Nye County Recorder's Office.

2. Yorktown No. 2, located in the Good Hope Mining District, Elko County, Nevada, and as recorded in Book 83, Page 551 in the Elko County Recorder's Office.

3. Bataan No. 5, located in the Good Hope Mining District, Elko County, Nevada, and as recorded in Book 83, Page 552 in the Elko County Recorder's Office.

4. Bataan No. 6, located in the Good Hope Mining District, Elko County, Nevada, and as recorded in Book 83, Page 553 in the Elko County Recorder's Office.

TOGETHER WITH all the dips, spurs and angles, and also all the metals, ores, gold and silver bearing quartz, rock and earth therein, and all the rights, privileges and franchises thereto incident, appendant, appurtenant, or therewith usually had and enjoyed and also all and singular the tenements, hereditaments and appurtenances thereto belonging or in anywise appertaining, and the reversion and reversions, remainder and remainders,

rents, issues and profits thereof.

TO HAVE AND TO HOLD all and singular the said premises together with the appurtenances, unto the said Party of the Second Part, their heirs and assigns forever.

IN WITNESS WHEREOF, the said Party of the First Part has hereunto set his hand the day and year first above written.

Anthony L. Payne

Anthony L. Payne

STATE OF NEVADA)
) SS.
COUNTY OF WASHOE)

On this 24 day of July, 1967, personally appeared before me, a Notary Public in and for said County and State, ANTHONY L. PAYNE, known to me to be the person described in and who executed the annexed instrument, who acknowledged to me that he executed the same freely and voluntarily, and for the uses and purposes mentioned.

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

JOHN C. GONZALES
Notary Public — State of Nevada
Washoe County
My Commission Expires June 23, 1969

John C. Gonzales

Notary Public in and for the County of Washoe, State of Nevada
My Commission expires: 6-23-69

DEED AND ASSIGNMENT

THIS INDENTURE made this 6th day of March, 1968, by and between GREAT BASIN EXPLORATION COMPANY, a co-partnership, and ANTHONY L. PAYNE, a single man, of Reno, Washoe County, Nevada, Party of the First Part, and ALEXANDER VON HAFFTEN, of San Francisco, California, Party of the Second Part,

WITNESSETH:

That for and in consideration of the sum of Ten Dollars ($10.00), lawful money of the United States of America, in hand paid to the Party of the First Part by the Party of the Second Part, the receipt whereof is hereby acknowledged, the Party of the First Part does by these presents grant, bargain, sell and assign unto the Party of the Second Part, his heirs and assigns, all real and personal property of GREAT BASIN EXPLORATION COMPANY, a co-partnership, including engineering data, soil samples, assay reports, maps and mining reports, including the right to engage in the same or similar business, within the Great Basin area or elsewhere, as heretofore conducted by said GREAT BASIN EXPLORATION COMPANY (First Party hereby releasing Second Party from that certain covenant and agreement set forth in Paragraph 18, Page 5 of General Partnership Agreement) and the right to use said name in connection therewith, and including all of the following-described unpatented mining claims located in the Counties of Lyon, Mineral, Pershing, Churchill, Nye and Elko, State of Nevada:

1. Monterey No. 1, located in the Rosebud Mining District, Pershing County, Nevada, and as recorded June 22,

1965 in Book 33, Page 326, in the Pershing County Official Records, and as amended and re-recorded July 26, 1965, in Book 34, Page 21, in the Pershing County Official Records.

2. Monterey No. 2, located in the Rosebud Mining District, Pershing County, Nevada and as recorded July 21, 1965 in Book 33, Page 595 in the Pershing County Official Records.

3. Princeton No. 1, located in the Jessup Mining District, Churchill County, Nevada and as recorded July 2, 1965 in Book 32, Page 556 in the Churchill County Book of Mines.

4. Princeton No. 2, located in the Jessup Mining District, Churchill County, Nevada and as recorded July 2, 1965 in Book 32, Page 557 in the Churchill County Book of Mines.

5. Princeton No. 3, located in the Jessup Mining District, Churchill County, Nevada and as recorded July 2, 1965 in Book 32, Page 558 in the Churchill County Book of Mines.

6. Princeton No. 4, located in the Jessup Mining District, Churchill County, Nevada and as recorded July 2, 1965 in Book 32, Page 559 in the Churchill County Book of Mines.

7. San Jacinto No. 1, located in the Jessup Mining District, Churchill County, Nevada and as recorded July 2, 1965 in Book 32, Page 560 in the Churchill County Book of Mines.

8. Langley No. 1, located in the Bell Mining District, Mineral County, Nevada and as recorded July 6, 1965 in Book 23, Pages 299-300, in Mineral County Mining Locations.

9. Langley No. 2, located in the Bell Mining District, Mineral County, Nevada and as recorded July 6, 1965 in Book 23, Page 300, in Mineral County Mining Locations.

10. Langley No. 3, located in the Bell Mining District, Mineral County, Nevada and as recorded July 6, 1965 in Book 23, Page 301, in Mineral County Mining Locations.

11. Langley No. 4, located in the Bell Mining District, Mineral County, Nevada and as recorded July 6, 1965 in Book 23, Page 302, in Mineral County Mining Locations.

12. Langley No. 5, located in the Bell Mining District, Mineral County, Nevada, and as recorded July 6, 1965 in Book 23, Page 303, in Mineral County Mining Locations.

13. Langley No. 6, located in the Bell Mining District, Mineral County, Nevada and as recorded July 6, 1965 in Book 23, Page 304, in Mineral County Mining Locations.

14. Langley No. 7, located in the Bell Mining District, Mineral County, Nevada, and as recorded July 6, 1965 in Book 23, Page 305, in Mineral County Mining Locations.

15. Langley No. 8, located in the Bell Mining District, Mineral County, Nevada, and as recorded July 6, 1965 in Book 23, Page 306, in Mineral County Mining Locations.

16. Langley No. 9, located in the Bell Mining District, Mineral County, Nevada, and as recorded July 6, 1965 in Book 23, Page 307, in Mineral County Mining Locations.

17. Langley No. 10, located in the Bell Mining District, Mineral County, Nevada, and as recorded July 6, 1965 in Book 23, Page 308, in Mineral County Mining Locations.

18. Langley No. 11, located in the Bell Mining District, Mineral County, Nevada, and as recorded July 6, 1965 in Book 23, Page 309, in Mineral County Mining Locations.

19. Langley No. 12, located in the Bell Mining District, Mineral County, Nevada, and as recorded July 6, 1965 in Book 23, Page 310, in Mineral County Mining Locations.

20. Cabot, located in the Golden Arrow Mining District, Nye County, Nevada, and as recorded May 27, 1965 in Book 78, Page 372, in the Nye County Official Records.

21. Cabot No. 2, located in the Golden Arrow Mining District, Nye County, Nevada, and as recorded July 12, 1967, in Book 97, Page 493, in the Nye County Official Records.

22. Bataan No. 1, located in the Good Hope Mining District, Elko County, Nevada, and as recorded June 7, 1965 in Book 56, Page 60, in the Elko County Records.

23. Bataan No. 2, located in the Good Hope Mining District, Elko County, Nevada, and as recorded June 7, 1965 in Book 56, Page 61, in the Elko County Records.

24. Bataan No. 3, located in the Good Hope Mining District, Elko County, Nevada, and as recorded June 7, 1965 in Book 56, Page 62, in the Elko County Records.

25. Bataan No. 4, located in the Good Hope Mining District, Elko County, Nevada, and as recorded June 7, 1965 in Book 56, Page 63, in the Elko County Records.

26. Bataan No. 5, located in the Good Hope Mining District, Elko County, Nevada, and as recorded July 12, 1967 in Book 83, Page 552, in the Elko County Records.

27. Bataan No. 6, located in the Good Hope Mining District, Elko County, Nevada, and as recorded July 12, 1967 in Book 83, Page 553, in the Elko County Records.

28. Belleau Wood No. 1, located in the Good Hope Mining District, Elko County, Nevada, and as recorded June 7, 1965 in Book 56, Page 64, in the Elko County Records.

29. Belleau Wood No. 2, located in the Good Hope Mining District, Elko County, Nevada, and as recorded June 7, 1965 in Book 56, Page 65, in the Elko County Records.

30. Belleau Wood No. 3, located in the Good Hope Mining District, Elko County, Nevada, and as recorded June 7, 1965 in Book 56, Page 66, in the Elko County Records.

31. Belleau Wood No. 4, located in the Good Hope Mining District, Elko County, Nevada, and as recorded June 7, 1965 in Book 56, Page 67, in the Elko County Records.

32. Belleau Wood No. 5, located in the Good Hope Mining District, Elko County, Nevada, and as recorded June 7, 1965 in Book 56, Page 68, in the Elko County Records.

33. Yorktown No. 1, located in the Good Hope Mining District, Elko County, Nevada, and as recorded June 7, 1965 in Book 56, Page 69, in the Elko County Records.

34. Yorktown No. 2, located in the Good Hope Mining District, Elko County, Nevada, and as recorded July 12, 1967 in Book 83, Page 551, in the Elko County Records.

35. Lexington No. 1, located in the Talapoosa Mining District, Lyon County, Nevada, and as recorded October 2, 1964 in Book 8, Page 265, in Lyon County Mining Locations.

36. Lexington No. 2, located in the Talapoosa Mining District, Lyon County, Nevada, and as recorded October 2, 1964 in Book 8, Page 266, in Lyon County Mining Locations.

37. Lexington No. 3, located in the Talapoosa Mining District, Lyon County, Nevada, and as recorded October 2, 1964 in Book 8, Page 267, in Lyon County Mining Locations.

38. Lexington No. 4, located in the Talapoosa Mining District, Lyon County, Nevada, and as recorded October 2, 1964 in Book 8, Page 268, in Lyon County Mining Locations.

39. Essex No. 1, located in the Talapoosa Mining District, Lyon County, Nevada, and as recorded August 28, 1964 in Book 8, Page 152, in Lyon County Mining Locations.

40. Essex No. 2, located in the Talapoosa Mining District, Lyon County, Nevada, and as recorded August 28, 1964 in Book 8, Page 153, in Lyon County Mining Locations.

41. Essex No. 3, located in the Talapoosa Mining District, Lyon County, Nevada, and as recorded August 28, 1964 in Book 8, Page 154, in Lyon County Mining Locations.

42. Essex No. 4, located in the Talapoosa Mining District, Lyon County, Nevada, and as recorded August 28, 1964 in Book 8, Page 155, in Lyon County Mining Locations.

43. Essex No. 5, located in the Talapoosa Mining District, Lyon County, Nevada, and as recorded August 28, 1964 in Book 8, Page 157, in Lyon County Mining Locations.

44. Wasp No. 1, located in the Aurora Mining District, Mineral County, Nevada, and as recorded September 22, 1964 in Book 22, Pages 531-532, in Mineral County Mining Locations.

45. Wasp No. 2, located in the Aurora Mining District, Mineral County, Nevada, and as recorded July 15, 1965 in Book 23, Page 317, Mineral County Mining Locations.

46. Hornet No. 1, located in the Aurora Mining District, Mineral County, Nevada, and as recorded October 6, 1964 in Book 22, Pages 550-551, in Mineral County Mining Locations.

47. Hornet No. 2, located in the Aurora Mining District, Mineral County, Nevada, and as recorded October 6, 1964 in Book 22, Pages 551-552, in Mineral County Mining Locations.

48. Hornet No. 3, located in the Aurora Mining District, Mineral County, Nevada, and as recorded July 15, 1965 in Book 23, Pages 312-313, in Mineral County Mining Locations.

TOGETHER WITH all the dips, spurs and angles, and also all the metals, ores, gold and silver bearing quartz, rock and earth therein, and all the rights, privileges and franchises thereto incident, appendant and appurtenant, or therewith usually had and enjoyed and also all and singular the tenements, hereditaments

and appurtenances thereto belonging or in anywise appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof.

TO HAVE AND TO HOLD all and singular the said premises, together with the appurtenances, unto the said Party of the Second Part, his heirs and assigns forever.

This Deed and Assignment is made after a full accounting and in liquidation of that certain partnership known as GREAT BASIN EXPLORATION COMPANY, composed solely of ALEXANDER VON HAFFTEN and ANTHONY L. PAYNE, heretofore dissolved as of December 22, 1967 and as return of Second Party's capital investment therein.

IN WITNESS WHEREOF, the said Party of the First Part have hereunto set their hands the day and year first above written.

GREAT BASIN EXPLORATION COMPANY,
a co-partnership

By Alexander von Hafften
ALEXANDER VON HAFFTEN, Partner

By Anthony L. Payne
ANTHONY L. PAYNE, Partner

Anthony L. Payne
ANTHONY L. PAYNE

STATE OF CALIFORNIA)
) ss.
City & COUNTY OF San Francisco)

On this 6th day of March, 1968, before me, a Notary Public in and for the City & County of San Francisco State of California, duly commissioned and sworn, personally appeared ALEXANDER VON HAFFTEN, known to me to be one of the partners

of the partnership that executed the within instrument and acknowledged to me that such partnership 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.

Barbara Call
Notary Public in and for said
County and State.

BARBARA CALL
My Commission Expires Feb. 3, 1969

STATE OF Nevada)
) ss.
COUNTY OF Washoe)

ON THIS 8 day of March, 1968, before me, a Notary Public in and for the County of Washoe, State of Nevada duly commissioned and sworn, personally appeared ANTHONY L. PAYNE, known to me to be one of the partners of the partnership that executed the within instrument and acknowledged to me that such partnership 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.

GERALDINE SPENCER
Notary Public — State of Nevada
Washoe County
My Commission Expires Sept. 2, 1971

Geraldine Spencer
Notary Public in and for the
County of Washoe
State of Nevada
My Commission Expires _____

STATE OF Nevada)
) ss.
COUNTY OF Washoe)

ON THIS 8 day of March, 1968, personally appeared before me, a Notary Public in and for said County and State, ANTHONY L. PAYNE, known to me to be the person described in and who executed the annexed instrument, who acknowledged to me that he executed the same freely and voluntarily, and for the uses and purposes therein mentioned.

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

GERALDINE SPENCER
Notary Public — State of Nevada
Washoe County
My Commission Expires Sept. 2, 1971

Geraldine Spencer
Notary Public in and for the
County of Washoe
State of Nevada
My Commission Expires _____

Undersigned Party of the Second Part hereby accepts foregoing Deed and Assignment and in consideration thereof hereby releases

ANTHONY L. PAYNE from that certain covenant and agreement set forth in Paragraph 18, Page 5 of General Partnership Agreement, this acceptance and release to become effective only upon execution and acknowledgment of foregoing Deed and Assignment by ANTHONY L. PAYNE and delivery to Second Party on or before March 20, 1968.

ALEXANDER VON HAFFTEN

Affidavit or Statement of Annual Assessment Work

(PROOF OF LABOR)

ON UNPATENTED MINING CLAIM

STATE OF NEVADA, }
COUNTY OF Wa shoe } ss.

PROOF OF LABOR ON THE

Bataan No. 1, Bataan No. 2, Bataan No. 3, Bataan No. 4, Bataan No. 5, Bataan No. 6, Belleau Wood No. 1, Belleau No. 2, Belleau No. 3, Belleau No. 4, Belleau Wood No. 5, Yorktown No. 1, and Yorktown No. 2 lode mining claims, all being contiguous

(NAME OR NAMES OF CLAIM)

all being lode mining claims

(LODE OR PLACER)

TO WHOM IT MAY CONCERN: *Please take notice that* Alexander von Hafften

(NAME OF OWNER OR CLAIMANT)

says that he ~~they~~ expended more than $1,300.00 *dollars for labor and improvements, as the annual assessment work for the year ending September 1, 19*71, *on the* all of the above listed *mining claim*s, *in the* Good Hope *Mining District,* Elko *County, Nevada, owned by* Great Basin Exploration Company, *for the purpose of holding said claim*s.

Said labor was performed by Edmond F. Lawrence, Mining Geologist

(NAME OF PERSON OR CONTRACTOR WHO PERFORMED THE WORK)

~~On Month Day Year Shts (Continue on back if necessary)~~

DURING THE MONTH OF SEPTEMBER, OCTOBER, AND NOVEMBER OF 1970, AND APRIL, JUNE, AND AUGUST, 1971

Such work consisted of further structural mapping, rock sampling, and correlation of geological, geochemical, and geophysical data upon all of the above listed mining claims.

The basic findings from from such surveys are (1) new exposures of surface mineralization appear to correlate with geochemical anomalies and geophysical data, (2) and the limestone at the surface appear to be Tertiary in age.

Such work or improvements, and character, consisted of

Edmond F. Lawrence is a consulting mining gelogist holding a B.S. degree in geology from the University of Alabama; a M.S. degree in geeology from the University of California at Los Angeles, and a Ph. D. degree in geology from the University of California at Riverside; his experience includes six years as a mining geologist with the Anaconda Company and the Idaho Maryland Mines Company, six years as a mining geologist with the Nevada Bureau of Mines, and ten years as a consulting mining geologist, including one year teaching economic geology and applied geophysics.

~~(INCLUDE DESCRIPTION OF CLAIM OR PART OF CLAIM AFFECTED)~~

Dated this 16 *day of* October, 19 71.

File # 65983
FILED FOR RECORD
AT REQUEST OF
Great Basin Exploration
OCT 26 4 55 PM '71
RECORDED BOOK 155 PAGE 627
ESTHER N. SKELTON
ELKO COUNTY RECORDER
Fee $3.50

(Name of Subscriber)
Edmond F. Lawrence
Mining Geologist

(Witness)

SEAL AFFIXED

Subscribed and sworn to before me this

16 day of October, 19 71.

INDEXED

(Witness)

JOHN MERTENS
NOTARY PUBLIC
In and for the City and County of San Francisco, State of California.
My Commission Expires Jan. 3, 1975

CARLISLE'S FORM NO. 60 N

65983

BK 155 PG 627

Affidavit or Statement of Annual Assessment Work

(PROOF OF LABOR)

ON UNPATENTED MINING CLAIM

STATE OF NEVADA, }
COUNTY OF Washoe } ss.

PROOF OF LABOR ON THE
Gyro #1, Gyro #2, Gyro #3, Gyro #4, Gyro #5, Gyro #6, Gyro #7, Gyro #8, Gyro #9, Gyro #10, Copter #1, Copter #2, Copter #3, Copetr #4, Copter #5, Copter #6, Perry No. 1, Perry No. 2, Bill No. 1 and Bill No. 2 lode mining claims, all being contigueous
(NAME OR NAMES OF CLAIM)

all lode mining claims
(LODE OR PLACER)

TO WHOM IT MAY CONCERN: *Please take notice that* Alexander von Hafften
(NAME OF OWNER OR CLAIMANT)

says that he-~~they~~ expended more than $2,000.00 *dollars for labor and improvements, as the annual assessment work for the year ending September 1, 19*71, *on the* Bill No. 1, Perry No. 1, Gyro #3, Gyro #4, Gyro #10, George No.1, and roads on surrounding area *mining claim*s, *in the* Good Hope *Mining District,* Elko *County, Nevada, owned by* Allied Properties, *for the purpose of holding said claim*s.

Said labor was performed by Manuel Vega, of the Vega Construction Company, Johnnie Yarn, Contractor, Alexander von Hafften, and Edmond F. Lawrence
(NAME OF PERSON OR CONTRACTOR WHO PERFORMED THE WORK)

~~Month Day Year Shift (Continue on back if necessary)~~
who performed said work during the months of September, October, and November of 1970 and during August, September, and October of 1971, said work consisting of bulldozing along contacts, drill sites, and road work, and opening of adit and shafts, such work being for the benefit of all the mining claims described above.

~~Such work or improvements and character consisted of~~

File # 65981
FILED FOR RECORD
AT REQUEST OF
Great Basin Exploration
OCT 26 4 55 PM '71
INDEXED
RECORDED BOOK 155 PAGE 625
ESTHER N. SKELTON
ELKO COUNTY RECORDER
Fee $5.25

~~INCLUDE DESCRIPTION OF CLAIM OR PART OF CLAIM AFFECTED~~

Dated this 16 *day of* October, 19 71.

Edmond F. Lawrence
(Name of Subscriber)
Edmond F. Lawrence

Subscribed and sworn to before me this
(Witness)

16 day of October, 19 71.
(Witness)

SEAL AFFIXED

John Mertens

JOHN MERTENS
NOTARY PUBLIC
In and for the City and County of San Francisco, State of California,
My Commission Expires Jan. 8, 1975

CARLISLE'S FORM NO. 60 N

65981

BOOK 155 PAGE 625

Affidavit or Statement of Annual Assessment Work

(PROOF OF LABOR)

ON UNPATENTED MINING CLAIM

STATE OF NEVADA, }
COUNTY OF Washoe } SS.

PROOF OF LABOR ON THE

George No. 1 lode mining claim

(NAME OR NAMES OF CLAIM___)

(LODE OR PLACER)

TO WHOM IT MAY CONCERN: *Please take notice that* Alexander von Hafften
(NAME OF OWNER OR CLAIMANT)

says that he-~~they~~ expended more than $100.00 *dollars for labor and improvements, as the annual assessment work for the year ending September 1, 19*71*, on the* George No.1 *mining claim, in the* Good Hope *Mining District,* Elko *County, Nevada, owned by* Allied Properteies *, for the purpose of holding said claim.*

Said labor was performed by Johnnie Yarn, Contractor

(NAME OF PERSON___ OR CONTRACTOR___ WHO PERFORMED THE WORK)

~~on Month Day Year Shift (Continue on back if necessary)~~
WHOM PERFORMED THE WORK during the period from August 28, 1971 to September 17, 1971, ~~said work consisting of re-opening of the~~ adit to the Buckeye and Ohio mine in the approximate center of the mining claim.

~~Such work, improvements and character consisted of:~~

File # 65982
FILED FOR RECORD
AT REQUEST OF
Great Basin Exploration
OCT 26 4 55 PM '71
RECORDED BOOK 155 PAGE 626
ESTHER N. SKELTON
ELKO COUNTY RECORDER
Fee $8.00

INDEXED

~~(Description of work and improvements)~~

Dated this 16 *day of* October 19 71

Edmond F. Lawrence
(Name of Subscriber)

Subscribed and sworn to before me this

(Witness)

16 day of October, 19 71

(Witness)

SEAL AFFIXED

John Mertens
JOHN MERTENS
NOTARY PUBLIC
In and for the City and County of
San Francisco, State of California.
My Commission Expires Jan. 3, 1976

CARLISLE'S FORM NO. 60 N

65982

BK 155 PG 626

UNITED STATES
DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY
Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

June 9, 1971

CO
O. M.
REC
JUN 11 71
INITIALS | CO.

Memorandum

To: Chief, Office of Minerals Exploration
Washington, D. C.

From: Field Officer
Region II

Subject: New Application (Silver and Gold)
Great Basin Exploration Company
Good Hope Area
Elko County, Nevada

Enclosed is one copy of a new application received in this office on June 8, 1971. The application appears complete, except for replies from the two banks that will be supplied within a few days, and in good order, but will be reviewed in detail within the next week by Roscoe Smith.

Inasmuch as this property is in Elko County, Nevada, and Roscoe plans to be in the area during the week of June 21 to 25, in connection with his county report work, he plans to make a field examination at that time.

H. K. Stager

Enclosure

Great Basin Exploration Company
3898 Washington Street
San Francisco, Calif. 94118

Item 3 Physical Description

(a) The Buckeye and Ohio mine consists of one adit approximately 300 feet long, with one crosscut to the west to a second drift. There are two winzes and several stopes. This adit lies 1-1/2 miles south of the Good Hope mine.

The Good Hope mine consists of three shallow shafts, each with water at 10 feet from the top.

Several long trenches have been dug and numerous pit made during assessment work and for the location work as required by law.

There are no mine workings or production facilities.

(b) Not applicable.

(c) Emmons (1910, p. 65-66) credits a production of about $100,000 in silver to the mines of the Good Hope Mining District.

(d) There are no known ore reserves.

(e) See the attached geological report by Edmond F. Lawrence summarizing earlier reports by Oesterling (1966), Payne (1967), Knox (1970), and Emmons (1910). Copies of these reports are also attached.

(f) Lawrence (1963) took one vein sample with a width of 36 inches in the Buckeye and Ohio mine. It ran 14.61 percent antimony, 7.56 ounces of silver per ton, and a trace of gold.

Oesterling (1966) cut 16 samples from over the area. They are shown in an attached sheet and also in the copy of his report accompaning this application.

See summary report by Lawrence (1971) for reasons for expecting to find ore.

(g) Two copies of all reports are attached.

Great Basin Exploration Company
3898 Washington Street
San Francisco, Calif. 94118

Item 4 Accessibility of Property

The Good Hope Mining District is located along the northern base of the Tuscarora Mountains, approximately 96 miles northwest from Elko, Nevada. It is situated in an area of low hills, and is drained by Chino Creek, which would be a source of water for drilling or mining operations.

The area may be reached by driving 66 miles north from Elko, Nevada, on State Highway 51 and 11, past Jack Creek Inn to the end of the pavement at Deep Creek; thence west on 19 miles of graded gravel road to the IL Ranch headquarters, and then five miles westerly on the Midas road to Chino Creek; then 6 miles south along Chino Creek to the Good Hope mine area. These roads are accessible most of the year.

Elko, Nevada is the nearest source of supplies and the shipping point. It is located on the Southern Pacific and Western Pacific Railroads.

NEVADA BUREAU OF MINES

Vernon E. Scheid, Director

BULLETIN 61

ANTIMONY DEPOSITS OF NEVADA

By

EDMOND F. LAWRENCE

$2.25

MACKAY SCHOOL OF MINES
UNIVERSITY OF NEVADA
Reno, Nevada

1963

The stibnite occurs as blebs, pods, and single crystals with quartz, calcite, and barite in a silicified zone on the east side of the dike at the upper shaft. Yellow antimony oxide is present as pseudomorphs after stibnite crystals in vugs, as powdery coatings along fractures, and as earthy masses. Stibnite is present also in a veinlike body in the adit directly below the upper shaft. This occurrence was inaccessible, but reportedly consisted of a vein 4 inches wide containing 1 to 3 inches of stibnite which is partially altered to yellow and white antimony oxides. The wall rock apparently was silicified limestone.

Analyses of a grab sample from the Bootstrap mine showed 9.40 percent antimony, a trace of gold, and 6.08 ounces of silver per ton.

Cornucopia mining district

The Cornucopia mining district is situated in sec. 18, T. 42 N., R. 51 E., 12 miles west of Deep Creek (see U. S. 1:250,000 scale topographic map, McDermitt sheet). Antimony was reported in gold ore of the district (Aune, unpublished data, U. S. Bureau of Mines). The country rock consists of rhyolite intruded by andesite. Veins, striking N. 78° E. and dipping 83° N., consist principally of quartz with some argentite, tetrahedrite, pyrargyrite, and pyrite. Cerargyrite, pyromorphite, and yellow antimony oxide occur near the surface.

Delano mine

Antimony reportedly occurred at the Delano mine, sec. 28, T. 44 N., R. 68 E., in the northeastern corner of Elko County (see U. S. 1: 250,000 scale topographic map, Wells sheet). The geology of this area has been described by Granger and others (1957, p. 48). Antimony occurs in tetrahedrite and pyrargyrite but these minerals are present only in minor amounts and are not potential sources of antimony.

Good Hope mine

Other names	Heffner.
Location	Sec. 16, T. 41 N., R. 49 E.
Ownership	Good Hope Investors, Inc.
Production	None.
Base map	USGS Mt. Blitzen 15′ topographic quadrangle.

The Good Hope mine (fig. 13) is in the Good Hope mining district on Chino (Four Mile) Creek, 6 miles north of Rock Creek.

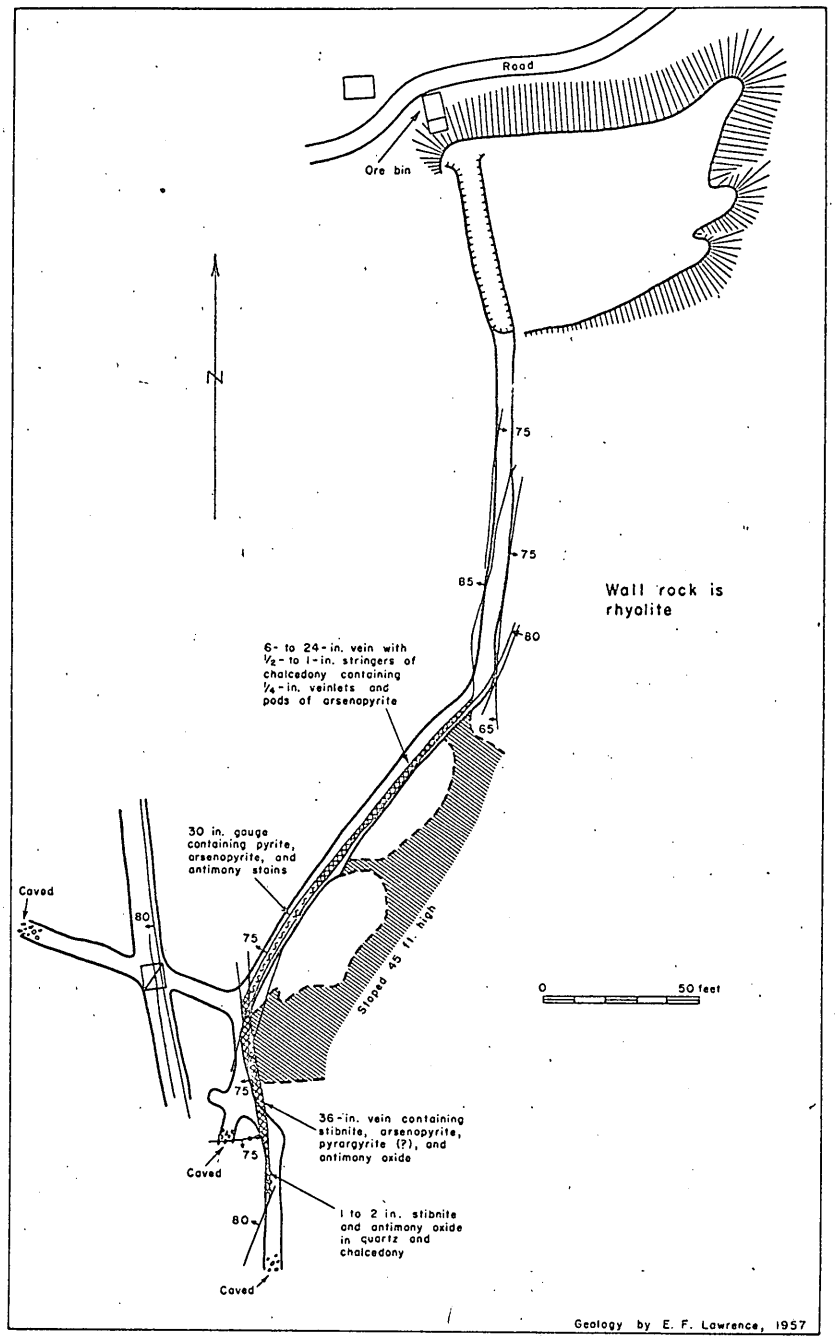

FIGURE 13. Geologic map of the Good Hope mine, Elko County, Nevada.

Mine openings include two shafts, now caved, and an adit with several winzes, drifts, and crosscuts.

Light-colored, argillized, and sericitized rhyolite flow breccia crops out at the mine (Emmons, 1910, p. 65). The main vein strikes N. 10° W. and dips 70° W., and is cut and offset by a cross fault which strikes N. 40° E. and dips 75° NW. Gouge, arsenopyrite, pyrite, and traces of yellow antimony oxide occur in the cross fault. Up to 36 inches of vein material occur along the main vein beyond the cross fault. The vein consists principally of quartz and chalcedony with some stibnite, arsenopyrite, pyrite, and rounded blebs of pyrargyrite. A sample of this material assayed 14.61 percent antimony, 7.56 ounces of silver per ton, and a trace of gold. Stibnite and antimony oxides occur in 16 inches of the 35-inch vein of the hanging wall at a distance of 240 feet from the portal. This vein splits into a 12-inch footwall zone and a 4-inch hanging wall zone, each containing quartz, stibnite, and antimony oxides.

Stibnite occurs as blebs, pods up to 6 inches across, veinlets, rosettes, and single crystals. Single bladed crystals of stibnite commonly line vugs in quartz. The stibnite commonly is partially altered to yellow and white antimony oxides. The yellow oxide is powdery to earthy, and occurs as coatings along fractures and as pseudomorphs after stibnite. A white oxide less commonly replaces stibnite.

Hunter prospect

Other names	Merrimac, Silver Tip, Lone Mt., Reincarnation, Malachite, Lone Wolf.
Location	Sec. 2, T. 37 N., R. 53 E.
Ownership	E. F. Hunter (1957).
Production	None.
Base map	U. S. 1:250,000 scale topographic map, Wells sheet.

The Hunter prospect is at the head of McClelland Creek on the south flank of Lone Mountain.

Twelve tons of lead-silver-antimony ore were shipped unprofitably in 1921(?) (Mrs. T. E. Hunter, oral communication, 1957). The claims are developed by two adits and several prospect pits and trenches. The adits are partially caved.

Limestone of the Devonian(?) eastern facies McClellan Creek sequence crops out at the mine. It is part of the lower plate of the thrust fault mapped by Lovejoy (1959, p. 539), and is overlain by Ordovician chert and shale in the upper plate of the

GEOLOGICAL, GEOCHEMICAL, AND GEOPHYSICAL SURVEYS OF THE GOOD HOPE MINING DISTRICT, ELKO COUNTY, NEVADA

(Summary with Recommendations for Exploration)

Introduction

The Good Hope Mining District is located along the northern base of the Tuscarora Mountains, approximately 96 miles northwest from Elko, Nevada. It is situated in T. 41 N., R. 49 E. MDB&M, in northwestern Elko County, Nevada. It is easily accessible by driving 66 miles north from Elko on State Highway 51 and 11 past Jack Creek to Deep Creek, where the pavement ends; thence 19 miles of graded gravel road to the IL Ranch headquarters, and then continue on the Midas road for 5 miles to Chino Creek; then six mile south along Chino Creek to the area.

History

The Good Hope Mining District was discovered in 1878 (Lincoln, 1923, p. 46), and has a reported production of $100,000 in silver (Emmons, 1910, p. 65-66). The principle mines were the Buckeye and Ohio, Snyder, and Page and Kelley. The Buckeye and Ohio mine at the junction of Chino Creek and Atlantic Gable Gulch was operated from 1882 to 1884. This mine was developed by an adit along the vein for 300 feet, and several winzes and stopes. The ore was processed at a 5-stamp mill 1½ miles below the mine. Later a small concentrator was built in 1903, but only a small amount of ore was run through it. There are two small mines approximately one mile west of the Buckeye and Ohio. Three shallow shafts were sunk in the areas of the Bataan-Belleau Wood mining claims.

Previous Work

Emmons (1910, p. 65-66) visited the area in 1908 and mapped the underground geology of the Buckeye and Ohio mine. Granger (1957) reported on the geology and mineral resources of Elko County but did not do any mapping in the area. Lawrence (1963, p. 62) reported on the occurence of antimony in the Buckeye and Ohio mine. Oesterling (1966) and Payne (1967) conducted geological and geochemical surveys over the area. Lawrence did additional geological mapping and geochemical surveys over the mines in 1968. Knox (1970) conducted geological, magnetic, resistivity, induced polarization, gravity, and VLF-EM surveys in the district, and reported certain geophysical anomalies that coincide with geochemical anomalies previously reported by Payne.

Present Work

There has been considerable interest in the Good Hope Mining District in recent years. Payne (1967) conducted geochemical surveys over the area in 1964 and located thirteen lode mining claims for the Great Basin Exploration Company of Reno, Nevada. Oesterling (1966) also conducted geological and geochemical surveys over the district and located twenty-one lode mining claims for Allied Properties of San Francisco, California. Charles B. Welsh located two mining claims in the area in 1965. Considerable trenching and bull-dozer work has been done over these claims, however, no drilling has been done.

Geology

The Good Hope Mining District is in an area of Tertiary volcanics consisting of Miocene and Pliocene welded tuffs , Miocene andesite, and

Pliocene dacite. There are three outcrops of limestone, that has been tentatively correlated with the Miocene Humboldt Formation (Knox, 1970, p. 14). Payne (1967) and Oesterling (1966) have assigned this unit to the Roberts Mountain Formation of the lower plate of the Roberts thrust fault. There is one outcrop of Ordovician Vinini (or Valmy) quartzite on the northeast edge of the district (Knox, 1970). Payne (1967) and Oesterling (1966), however, have shown numerous areas of Vinini quartzite on their maps. They believe that the area is underlain by rocks of the eastern assemblage, and that the Good Hope Mining District represents a window in the Roberts thrust fault. However, if Knox is correct in the Miocene age of the limestone, this interpretation is erroneous.

The Miocene welded tuffs has been intensely silicified and argillized. Most of this alteration is spatially associated with Miocene andesitic intrusives. There are numerous random veinlets and several larger veins containing pyrite, arsenopyrite, stibnite, pyrargyrite, and freibergite in a gangue of quartz and sparse calcite. Approximately $100,000 in silver has been mined from such veins.

Structurally the area does not appear to be complex. Normal faults trend northwest, north-northeast, and northeast, all with only small off-sets.

Ore Deposits

Pyrargyrite, freibergite, stibnite, pyrite, and arsenopyrite occur in quartz veins with minor amounts of calcite. The vein in the Buckeye and Ohio mine is up to 36 inches in width, and contains quartz and calcite with numerous veinlets and pods of pyrarpyrite, freibergite, pyrite, and arsenopyrite along with minor amounts of antimony oxides (Lawrence, 1963). In the Good Hope mine area, the veins are narrow, with only sparse mineralization of pyrargyrite, pyrite, and arseopyrite. Small amounts of pyrargyrite

can be found with quartz veinlets on the dump on the west side of Chino Creek in the NW ¼ of Section 9. Barite has been found in veinlets in a prospect pit on the hill west of Chino Creek in the E ½ of Section 8. Cinnabar occurs as occasional grains in the area of the geochemical (mercury) anomaly in the NW ¼ of Section 9.

Geochemical Surveys

Payne (1967) selected the Good Hope District for exploration because of its similarity to the Tuscarora district. He collected 112 samples in 1964 for arsenic determination on the premise that arsenic was a good indicator for precious metal deposits. Three anomalies were delineated (Payne, 1967, Fig. 7). Later 225 samples were collected and the anomalies are shown in Figure 8 of that report. These samples were then sent to the Cordero Mining Company in Winnemucca, Nevada for precise determination of mercury, and the resulting anomalies are shown in Figure 9 of the same report. These anomalies are generally correlative with the arsenic anomalies, however, the mercury halo is stronger on the Bataan No. 1 and 2 mining claims.

The same samples were then sent to the Rocky Mountain Geochemical Laboratory in Salt Lake to be analyzed for trace amounts of gold and silver by atomic absorption spectrophotometry. Payne indicated that the silver anomalies coincided with the arsenic and mercury anomalies. Cinnabar has been found by the writer in the areas of the mercury anomaly on Bataan No. 1 and 2 mining claims.

Oesterling (1966) also ran geochemical surveys over the area, collecting 901 shallow samples, 63 samples at depth of 1½ feet, and 60 samples in trenches. These samples were analyzed for silver by atomic absorption spectrophotometry by Metallurgical Laboratories, Inc. of San Francisco,

California. He outlined two anomalous zones. One zone extends about one-quarter mile in a northeastern direction on Gyno #1, #2, and #3 claims. Another anomalous zone was shown in the east center of Copter #4 claim. These zones are east of the Bataan-Belleau Wood claims.

Geophysical Surveys

Knox (1970) ran geophysical surveys consisting of magnetic, resistivity, induced polarization, gravity, and VLF-EM methods. Only the induced polarization and resistivity appear to be significant in regards to alteration and mineralization. Knox outlines the anomalous areas as following:

Line B (Figure 4)

The pronounced anomalies are located between B1800 and B2700 (Anomaly Bi) and between B3300 and B4500 (Anomaly Bii). A possible, but incompletely explored, anomaly occurs between B600 and B900. Anomaly Bi is well developed in both the PFE and MF plots. The resistivity profile indicates a highly resistive body possibly overlying the potential mineralized zone. The PFE contour distribution suggests either a deep source of the anomaly or else an increase in metal content with depth.

The Bii anomaly suggest a relatively near surface upper limit for the implied ore body. The shape of the anomaly implies a possible break between upper and lower segments of the body. This area is marked by a resistivity low which may indicate a fault separating the two portions. The resistivity data is otherwise quite nondescript.

It is of interest to note that both anomalies Bi and Bii have anomalous magnetics and geochemical arsenic values (Payne, 1967, Figure 7) associated with them. The arsenic anomalies seem to correspond well with the IP anomalies at depth. The magnetics highs associated with Anomaly Bi are offset a few hundred feet to the north of the highest IP values. The close areal correlation of these three types of anomalies suggests that this area is of prime interest for drilling. The most interesting targets are in the vicinity of B2300 and B3500.

The reference to the geochemical arsenic values is based entirely upon the work done by Payne (1967, Figure 7). His work is not reviewed here, but the results of his arsenic survey are compared with the IP and magnetics data.

Line F (Figure 8)

The three IP anomalies along line F occur between F300 and F1200 (Anomaly Fi), between F1500 and F2700 (Anomaly Fii), and between F2700 and F3600 (Anomaly Fiii). Line F is characterized by

several thin anomalous zones, some of which appear to widen at depth. Small arsenic and magnetic anomalies are associated with the upper and lower portions of Fii. Implications of the resistivity data are unclear, although possibly significant resistivity lows are associated with sections of Fi and Fii. Anomaly Fi was not fully explored and the line should be extended to the northwest to check the significance of the IP high.

Two potential drill targets lie in the vicinity of F1800 and F2950. If these two are shown to be significantly mineralized, a supplemental target at F600 is also suggested. The latter target is listed as supplemental because the survey does not delineate its full extent.

Line E (Figure 7)

The anomaly between E2400 and E3600, Ei, has many features in common with Anomaly Bi. The shape and magnitude of the resistivity and PFE of Bi and Ei are very similar. The MF profiles are also comparable but somewhat less convincingly. Although Ei lies in a magnetically flat area, it is associated with the same arsenic high that occurs at Bi. A suggested drilling target lies near E2700.

Minor Anomalies

The anomalies to be discussed below are considered to be of secondary importance. They should be drilled only if justified by data from drilling of the primary targets.

Line A (Figure 3)

Two IP anomalies are delineated on line A. The first, Ai, lies between A3600 and A4000. The second, Aii, lies between A2200 and A2800. Each is smaller and less well developed than those discussed above, but they could be significant if the primary targets prove good. Anomaly Aii has corresponding magnetics and arsenic anomalies. Secondary drill targets are suggested in the vicinity of A2700 and A3900.

Summary

1. The Bataan-Belleau Wood group of mining claims in the Good Hope Mining District lies in an areas of Miocene tuffs that have been intruded by dikes, sills, and plugs of andesite. This relationship is common to many of the Silver-mining districts of Nevada and California.

2. These claims are located in an intensely silicified and argillized area along a northeast trending zone. This altered zone is quite similar to the rock and alteration pattern at the Calico Silver District near Barstow, California.

3. Veinlets of barite, with single crystals up to two inches across are found cutting these tuffs, somewhat similar to those at Calico, California.

4. Anomalous zones of arsenic, mercury, and silver coincide in two areas. Traces of cinnabar have been found in the outcrops in these areas.

5. Veins of quartz, calcite, pyrite, arsenopyrite, pyrargyrite, and freibergite are found at various places around the district. Over $100,000 in silver has been produced from the area.

6. Resistivity and induced polarization anomalies have been delineated. They partially coincide with the geochemical anomalies.

Recommendations

It is recommended that a drilling program be initiated to properly test this area for economic deposits of silver. It is recommended that this drilling consist of the following drill holes:

Location	Depth	
Line E - 2550 feet	500 feet	To test the silver, mercury, arsenic and IP anomalies in this area. Cinnabar occurs as scattered grains in outcrops.
" " - 2700 feet	400 feet	Same as above.
Line B - 2050 feet	600 feet	To test IP and resistivity anomalies; pyrargyrite, pyrite, and arsenopyrite on mine dump, highly altered.
Line F - 2500 feet	500 feet	To test the IP, resistivity, silver mercury, and arsenic anomalies in this highly altered area: numerous random veinlets of quartz.
Line A - 2600 feet	600 feet	To test the IP, resistivity, silver, mercury, and arsenic anomalies in this highly altered area around the

		old Good Hope mine shafts: small amounts pyrargyrite on mine dumps.
Line G - 1000 feet	400 feet	To test the veins at the Buckeye and Ohio mine for the possibility of an ore shoot or disseminated silver ore beneath the old adit level.

It is recommended that the drilling program be set up in two stages as follows:

Stage 1	Location	Depth
1.	Line F - 2500 feet	500 feet
2.	Line B - 2050 feet	600 feet
3.	Line E - 2550 feet	300 feet
Stage 2		
4.	Line E - 2550 feet	300 feet*
5.	Line E - 2700 feet	400 feet
6.	Line A - 2600 feet	600 feet
7.	Line G - 1000 feet	400 feet

(*deepen to 600 feet if indicated by data from 0 - 300 feet)

Objective

The objective of this drilling program is to explore for a large disseminated silver deposit beneath the extensive northeasterly trending altered zone. This area is somewhat similar to the surface expression of the Calico Mining District near Barstow, California, where American Smelting and Refining Company recently drilled out a large-tonnage, low-grade disseminated silver deposit. There are several reasons for suspecting the possible presence of such a deposit at Good Hope. These are (1) the strong silicified and argillized zone, (2) silver mineralization in veinlets in the altered zone, (3) strong geochemical anomalies, (4) barite and cinnabar

mineralization in the altered zone, and (5) resistivity and induced polarization anomalies which coincide with the geochemical anomalies.

May 29, 1971

Edmond F. Lawrence
Mining Geologist
P.O. Box 8044
University Station
Reno, Nevada 89507

REFERENCES

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Lawrence, Edmond F., 1963, Antimony deposits of Nevada: Nevada Bur. Mines Bull. 61, 248 p.

Lincoln, Francis C., 1923, Mining districts and mineral resources of Nevada: Nevada Newsletter Pub., 295 p.

Oesterling, William A., 1966, Silver potential of Allied properties in the Good Hope Mining District, Elko County, Nevada: private report, 13 p.

Payne, Anthony L., 1967, Geological report: Good Hope Mining District, Elko County, Nevada: private report, 26 p.

DESCRIPTION OF GOOD HOPE SAMPLES
(All from T.41N., R.49E., MDM)

Sample Number & Total Value*	Location (See Geol. Map)	Description
AL-02-41-49-1 $23.10/ton	Just E. of center of E½ of Sec. 2; at pit 35' E. of vert. shaft.	Selected sample of quartz vein two feet wide with visible sulfide crystals.
AL-02-41-49-2 $16.68/ton	SE¼ofSE¼ of Sec. 2; at caved shaft.	Pieces of vein quartz from dark dump
AL-09-41-49-1 $1.03/ton	Near center of SE¼of NW¼ of Sec. 9.	Sample of old waste dump from caved shaft; rusty, silicified rhyolite & chert.
AL-09-41-49-2 $0.53/ton	(same as above)	Pieces of vein quartz from old dump.
AL-09-41-49-3 $0.17	Just E. of Chino Crk. in W½ofNW¼ofSE¼ of Sec. 9.	Vein quartz float from wide fault zone in altered andesite.
AL-09-41-49-4 $0.90	West trench in N½ofNW¼ ofNE¼ of Sec. 9.	Vein quartz pieces from trench dump.
AL-09-41-49-5 $0.73	East trench & nearby pit in N½ofNW¼ofNE¼ of Sec. 9.	Pieces of vein quartz from pit and trench dump.
AL-09-41-49-6 $61.79	"Central" area main dump just west of shaft with water @ 40'; near center of W½ofNE¼ of Sec. 9.	Pieces of vein quartz from old dump.
AL-09-41-49-7 $8.10	(same as above)	Composite sample of old waste dump taken at several places with shovel.
AL-09-41-49-8 $14.71	Dumps from two caved shafts in NE¼of[illegible]¼of NW¼ of Sec. 9; at "West" area, north workings.	Pieces of vein quartz from old dumps.
AL-09-41-49-9 $0.00	(same as above; at pit)	Limestone from Eastern Assemblage rocks of lower plate of Roberts Thrust.
AL-09-41-49-10 $0.00	N½ofNE¼ of Sec. 9	Bright green altered andesite float.
AL-16-41-49-1 $33.18	Buckeye & Ohio mine in E½ofNE¼ofSW¼ of Sec.16.	Selected vein quartz from old ore bin.

* @ $1.29/oz

Description of Good Hope Samples (continued)

Sample Number & Total Value*	Location (See Geol. Map)	Description
AL-09-41-49-11 $2.09	SE¼ of NW¼ of Sec. 9	Composite sample of old waste dump taken at several places.
AL-09-41-49-12 $2.92	NE¼ of NW¼ of NW¼ of Sec. 9	Composite sample of old waste dump taken at several places.
AL-16-41-49-2 $5.23	E½ of NE¼ of SW¼ of Sec. 16	Composite sample of old waste dump taken at several places.

* @ $1.29/oz.

CHEMISTS • ASSAYERS • SPECTROGRAPH

1142 HOWARD STREET • SAN FRANCISCO, CALIFORNIA
UNDERHILL 3-8575

REPORT OF ASSAY

Submitted by Mr. William A. Oesterling
1131 Westwood Street
Redwood City, California

Date July 18, 1966

Sample of Ore

LABORATORY NO. 6151

MARK	GOLD, PER TON OF 2,000 LBS.		SILVER, PER TON OF 2,000 LBS.		Copper %	Antimony %
	TROY OUNCES	VALUE AT $35.00 OZ.	TROY OUNCES	VALUE@ $1.29/oz		
AL-02-41-49-1	0.02	0.70	17.37	22.40		
AL-02-41-49-2	0.015	0.52	12.53	16.16		
AL-09-41-49-1	0.005	0.17	0.67	0.86		
AL-09-41-49-2	0.005	0.17	0.28	0.36		
AL-09-41-49-3	0.005	0.17	Trace			
AL-09-41-49-4	0.02	0.70	0.16	0.20		
AL-09-41-49-5	0.015	0.52	0.17	0.21		
AL-09-41-49-6	0.025	0.87	47.23	60.92		
AL-09-41-49-7	0.005	0.17	6.15	7.93	0.012	
AL-09-41-49-8	0.015	0.52	11.00	14.19	0.002	
AL-09-41-49-9	Trace		Trace			
AL-09-41-49-10					0.001	
AL-16-41-49-1	0.035	1.22	24.78	31.96		0.96*
AL-35-44-52-1	Trace		0.13	0.16		Not applicable to this report
AL-35-44-52-2	Trace		Trace		0.032	
AL-36-44-52-1	Trace		Trace			
AL-36-44-52-2	Trace		Trace			

Ⓟs

* Arsenic present

METALLURGICAL LABORATORIES I

By

METALLURGICAL LABORATORIES INC. CHEMISTS • ASSAYERS • SPECTROGRAPHER

1142 HOWARD STREET • SAN FRANCISCO, CALIFORNIA
UNDERHILL 3-8575

REPORT OF ASSAY

Submitted by Mr. William A. Oesterling
1131 Westwood Street
Redwood City, California

Date September 20, 1966

Sample of Ore

LABORATORY NO. 6640

MARK	GOLD, PER TON OF 2,000 LBS.		SILVER, PER TON OF 2,000 LBS.		%	%	
	TROY OUNCES	VALUE AT $35.00 OZ.	TROY OUNCES	VALUE @ $1.29/oz			
AL-09-41 49-11			1.62	2.09			
AL-09-41 49-12			2.27	2.92			
AL-16-41 49-2			4.06	5.23			

METALLURGICAL LABORATORIES INC

By

EXCERPT FROM W. H. EMMONS (1910)

ON THE GOOD HOPE DISTRICT

normal, the vein to the west of it should be found south of the present workings, where possibly it is represented by some poorly defined masses of quartz which outcrop at that place.

A few rods northeast of the surface stope is a prominent ledge which strikes a few degrees north of east. This ledge, which is several hundred feet long, is the altered andesite somewhat silicified, fractured, and seamed with quartz veinlets. To the east of the ledge a vein in altered andesite has been developed for a few feet and some ore has been stoped. This vein is probably the faulted continuation of the silicified outcrop of quartz which lies between the two groups of workings.

GOOD HOPE DISTRICT.

In the Good Hope district, which is about 12 miles southwest of Cornucopia, mining was carried on in the early eighties, when the camp is said to have produced over $100,000 in silver. The principal mines are the Buckeye and Ohio, the Snyder, and the Page & Kelley. All these mines were inaccessible in 1908 except the Buckeye and Ohio, which was under water above the adit level. The deposits are in the main sheeted zones in rhyolite flow breccia, but altered andesite is exposed at several places and it is probably the country rock for some of the ore deposits. The leaching of the country rock is extensive near some of the deposits, but is not so general as at Cornucopia. Pyritization is, however, more pronounced in the wall rock and the ore at Good Hope contains a much greater amount of the sulphides. The Buckeye and Ohio mine is on Fourmile Creek near its junction with Atlantic Cable Gulch. The mine was operated from 1882 to 1884, and the ore was run through a 5-stamp mill 1½ miles below the mine. This mill was equipped with roaster, pans, and settlers and employed the Reese River process. A small concentrator was built in 1903, but the treatment employed was presumably unsuccessful, as only a small amount of ore was put through it.

On the surface above the adit level obsidian and other varieties of glassy lavas outcrop at several places. In the mine the rhyolite is a light-colored flow breccia, which is locally altered to a white claylike mass. Along a zone of movement it has been converted to gouge.

The lode is composed of veinlets of quartz and sulphides, which include masses of the country rock highly altered and partly silicified. A tunnel driven on the vein for 300 feet southwestward gives a depth below the surface of about 65 feet. At some places stopes are carried to the grass roots and several winzes are sunk upon the vein. The ore is composed of quartz, pyrite, arsenopyrite, freibergite, stibnite, and dark ruby silver.

The vein, as shown in figure 6, is followed by the adit for a distance of 300 feet. At the breast, where it dips steeply westward, it is cut off by a fault which strikes 37° E. This fault follows a vein also and carries much crushed ore and some banded ribbons of unbroken ore. A stope from this vein is carried to the surface. Near the junction of the two veins a second fault, which deviates from the principal fault about 5°, cuts off the west vein. The ore therefore forms a letter V, which points to the south. If the faults are normal the continuation of the principal vein will be found south of the present workings, on the west side of the fault.

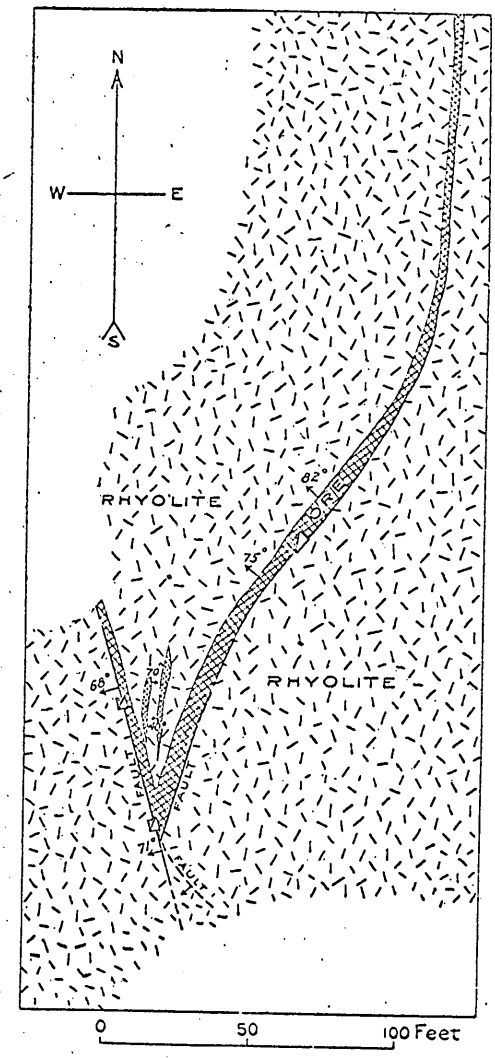

FIGURE 6.—Plan of adit level of Buckeye and Ohio mine, Good Hope district.

Near the head of Atlantic Cable Gulch, about 1 mile above the Buckeye and Ohio mine, several prospects show brecciated rhyolite silicified and cemented by quartz and dark sulphides. One of the lodes outcropping boldly on either side of the gulch strikes N. 10° E. and dips 35° W., and its outcrop forms a V pointing up the gulch. In places it carries a considerable quantity of dark pyritic ore which has been crushed and recemented by white and barren-looking quartz. At one place an abandoned incline is driven on the lode to a depth of about 30 feet, exposing a considerable mass of quartz and sulphides.

BURNER HILLS.

GENERAL FEATURES.

The Burner Hills, which are some 10 miles west of Good Hope, rise about 800 feet above the broad undulating plain of the Owyhee Desert, which lies to the east and north. From Good Hope to the

EXCERPT FROM W. H. EMMONS (1910)

ON THE GOOD HOPE DISTRICT

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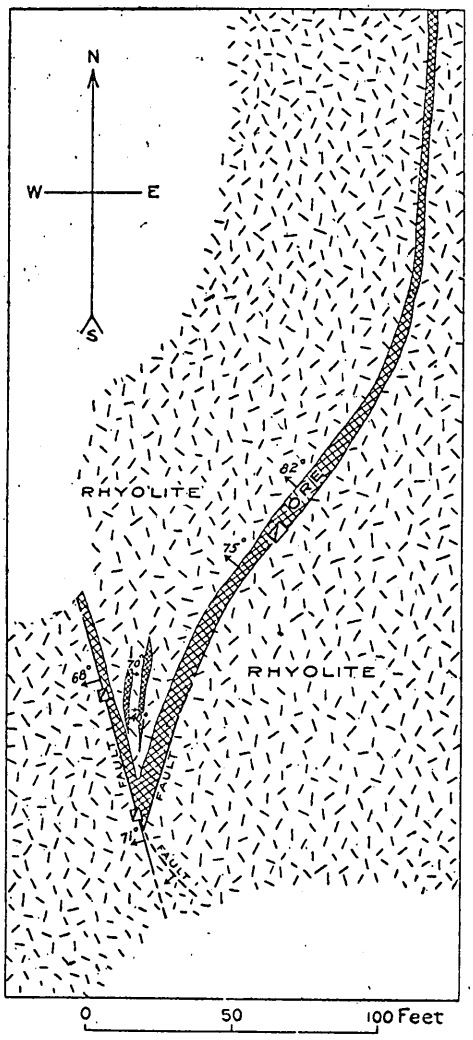

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Great Basin Exploration Company
3898 Washington Street
San Francisco, Calif. 94118

Item 5 Exploration Work

It is proposed that 3,100 feet of drilling be accomplished in two stages as following:

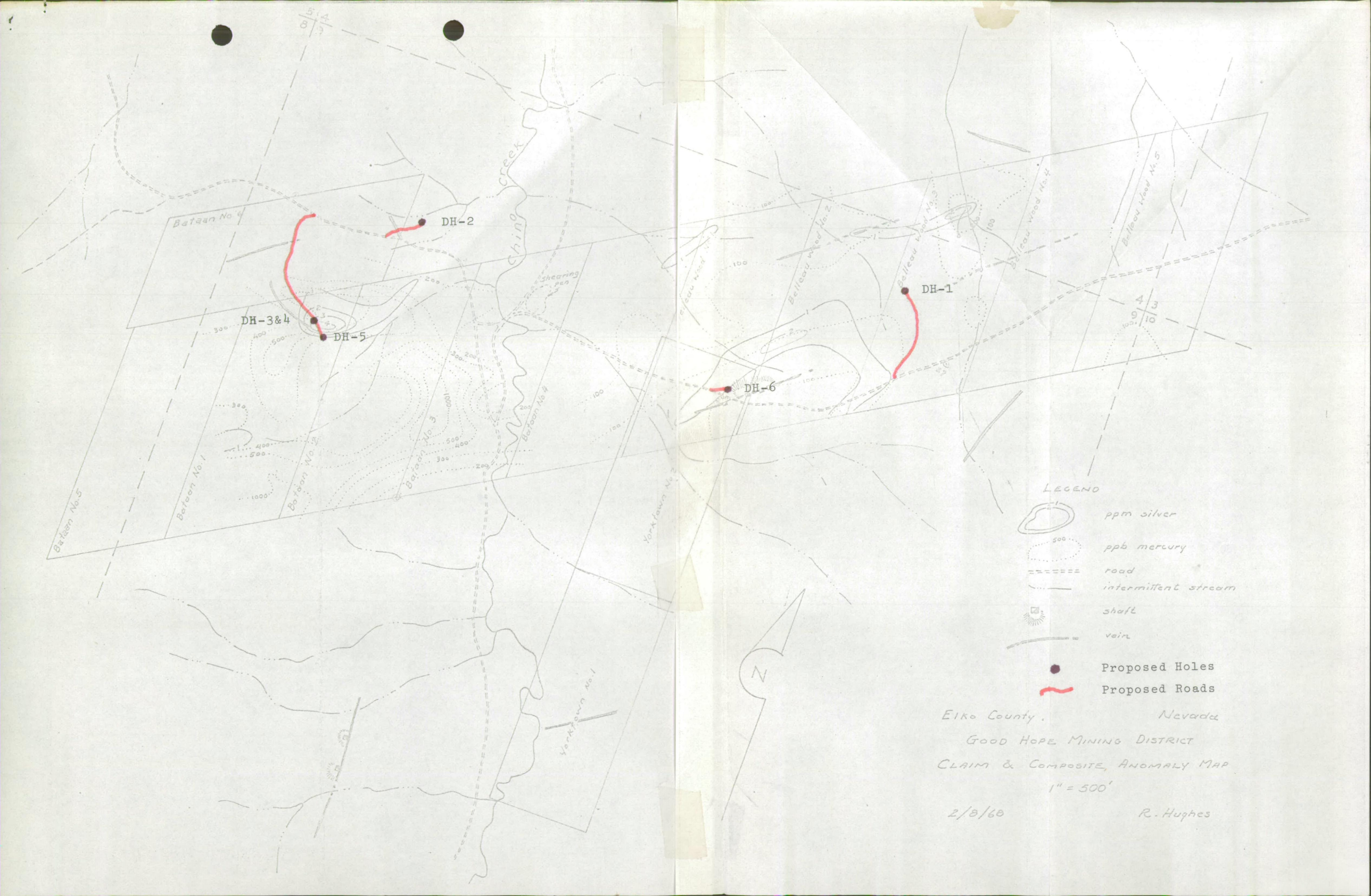
	Location	Depth of Hole
Stage 1		
	1. Line F - 2500 feet	500 feet
	2. Line B - 2050 feet	600 feet
	3. Line E - 2550 feet	300 feet
Stage 2		
	4. Line E - 2550 feet	300 feet*
	5. Line E - 2700 feet	400 feet
	6. Line A - 2600 feet	600 feet
	7. Line G - 1000 feet	400 feet

(*deepen to 600 feet if indicated by data from 0 to 300 feet)

(a) See attached map for location of proposed drill holes. The relationship of these drill holes to the silver and mercury anomalies are shown on this map. The relationship of these proposed holes to the geophysical anomalies are shown on the cross-sections by Knox (1970).

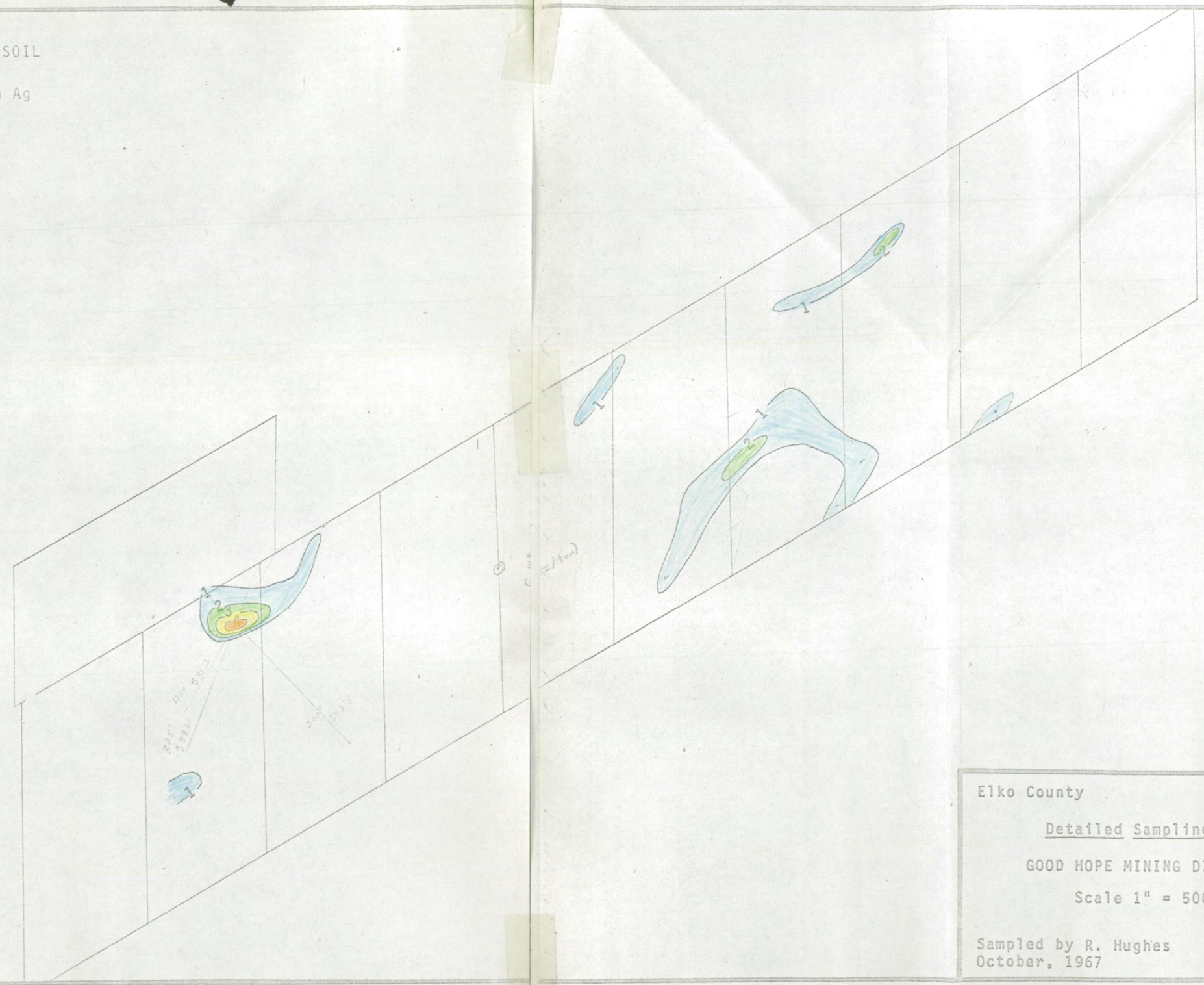
(b) Access roads are shown on the attached maps. These roads would be built by bull-dozer by local contractors. Would require approximately 1,200 feet of road-building.

(c) If an OME contract is granted, the road building and drilling would be started as soon as equipment is available from contractors. The road building should not require more than three days of bull-dozer time. It would be anticipated that all drilling could be finished within 90 days.


DH-2
DH-3&4
DH-5
DH-1
DH-6
Bataan No. 6
Bataan No. 5
Bataan No. 1
Bataan No. 2
Bataan No. 3
Bataan No. 4
Yorktown No. 1
Yorktown No. 2
Belleau Wood No. 2
Belleau Wood No. 3
Belleau Wood No. 4
Belleau Wood No. 5
China Creek
Shearing Pen
N
LEGEND
ppm silver
ppb mercury
road
intermittent stream
shaft
vein
Proposed Holes
Proposed Roads
Elko County. Nevada
GOOD HOPE MINING DISTRICT
CLAIM & COMPOSITE ANOMALY MAP
1" = 500'
2/8/68
R. Hughes

SILVER CONTENT OF SOIL

- +5 ppm Ag
- 4-5
- 3-4
- 2-3
- 1-2
- 0-1



Elko County Nevada

Detailed Sampling Grid

GOOD HOPE MINING DISTRICT

Scale 1" = 500'

Sampled by R. Hughes
October, 1967 A. L. Payne

Figure 10

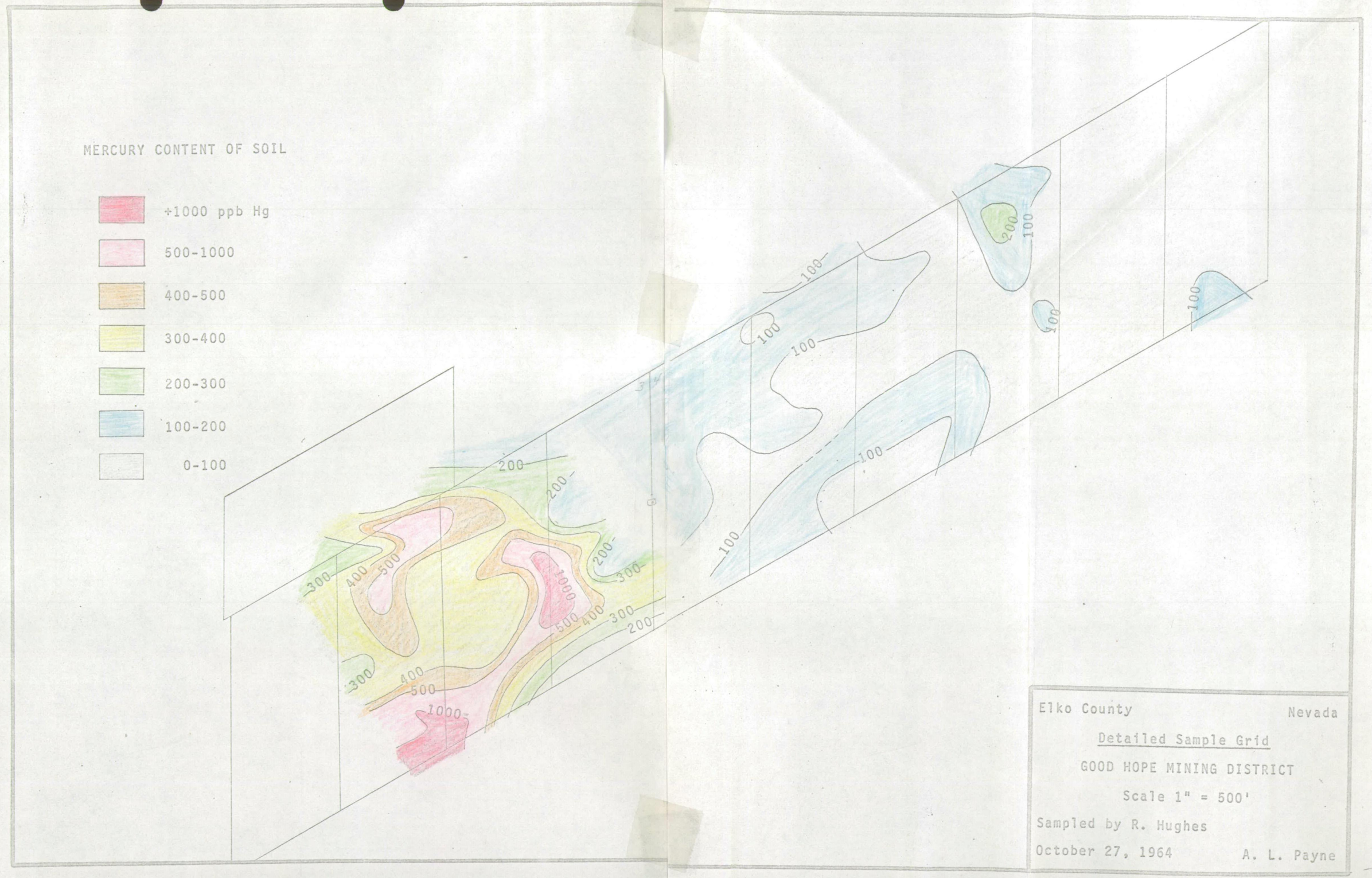
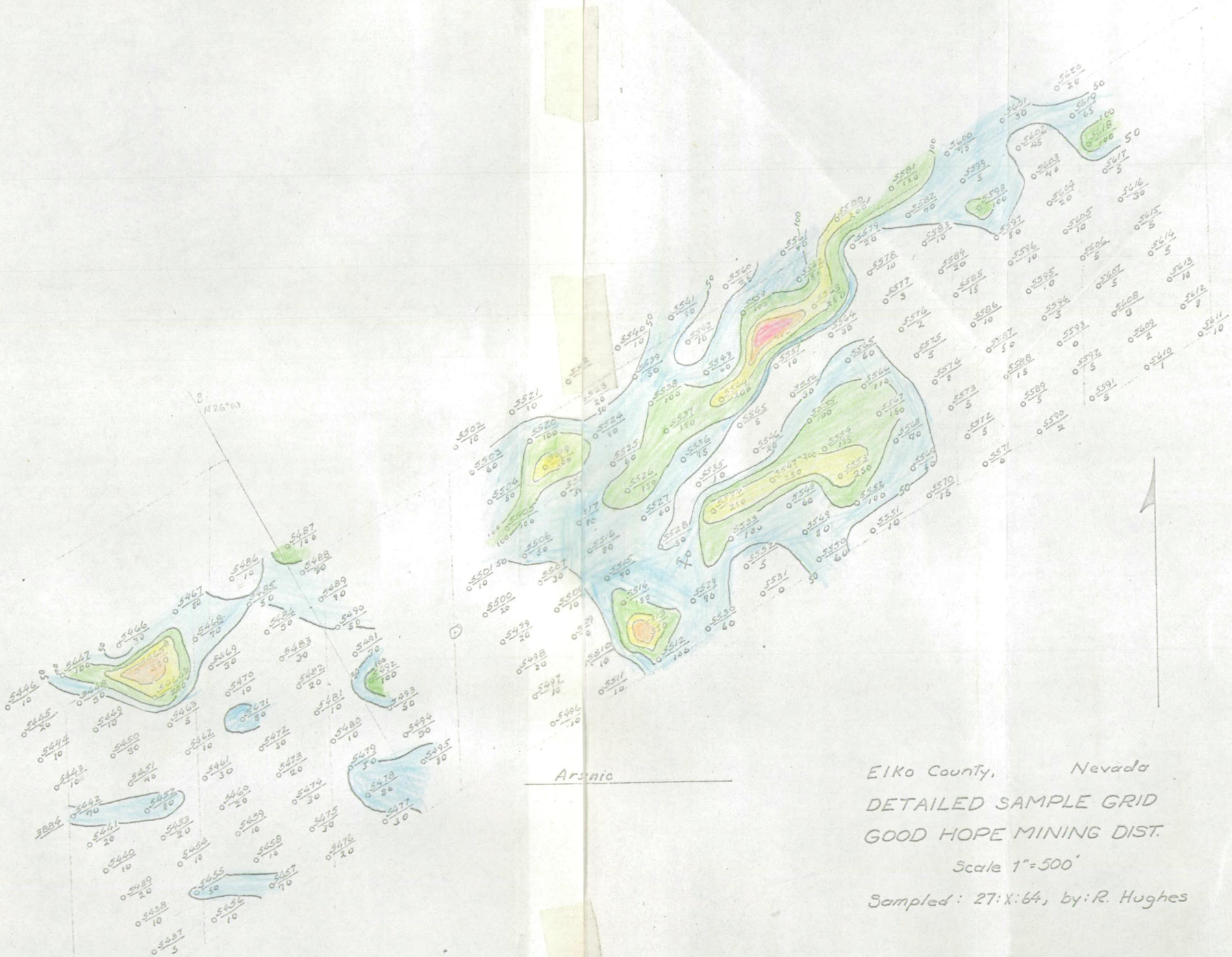

MERCURY CONTENT OF SOIL
+1000 ppb Hg
500-1000
400-500
300-400
200-300
100-200
0-100
Elko County
Nevada
Detailed Sample Grid
GOOD HOPE MINING DISTRICT
Scale 1" = 500'
Sampled by R. Hughes
October 27, 1964
A. L. Payne

Figure 9



Elko County, Nevada

DETAILED SAMPLE GRID

GOOD HOPE MINING DIST.

Scale 1"=500'

Sampled: 27:X:64, by: R. Hughes

Figure 8

Great Basin Exploration Company
3898 Washington Street
San Francisco, Calif. 94118

Item 6 Experience

Great Basin Exploration Company was organized in 1964 for the purpose of exploring for precious metals in Nevada.

Mr. Alexander von Hafften is the owner of the mining claims held by Great Basin Exploration Company and is the President of the organization. Mr. von Hafften's function is that of Business Manager of the corporation. He is a graduate of Stanford University and holds an MBA degree from Stanford Business School. Mr. von Hafften has been the Executive Director of the Northern California Suppliers Association in San Francisco since 1952.

The technical activities of Great Basin Exploration Company are under the direction and supervision of Dr. E. F. Lawrence whose experience is shown in the attached resume.

EDMOND F. LAWRENCE PERSONAL DATA

COLLEGE DEGREES:

University of Alabama, 1946, B.S., Geology
University of California, Los Angeles, 1951-54, M.S., Geology
University of California, Riverside, 1967-69, Ph.D., Geology

PROFESSIONAL EXPERIENCE:

Consulting Mining Geologist, 1961 - present time.
Specializing in detailed underground mapping, and geological and geochemical exploration.

Mining Geologist, 6 years.
Nevada Bureau of Mines, full time research and public service.

Mining Geologist, 2½ years.
Idaho Maryland Mines, Inc., Grass Valley, California. Fully responsible for all geological work. Directed exploration program for tungsten, which was highly successful.

Research Geologist, 2 years.
Anaconda Copper Mining Company, Butte, Montana. Laboratory and underground research on ore deposition.

Graduate Student, 2 years.
University of California, Riverside. Major in economic geology, with emphasis on intergrated geological, geophysical, and geochemical exploration programs.

Graduate Student, 3 years.
University of California at Los Angeles. Major in economic geology, with considerable emphasis on stratigraphy and paleontology.

Metallurgist, 4 years.
Tennessee Coal, Iron & R.R. Division, U.S. Steel Corporation, Birmingham, Alabama.

PUBLICATIONS:

Deposition of mercuric sulfide at Amedee Hot Springs, F. W. Dickson; George Tunell; E. F. Lawrence; R. Horton, Abs., Geol. Soc. Am., Bull., Vol. 68, No. 12, Dec., 1957, p. 1822

Geology of the Idaho Maryland - Brunswick gold mine at Grass Valley, California, 1955, private company report, unpublished.

The occurrence of scheelite at Grass Valley, California, with notes on mining and milling, Abs., AIME, S.W. Min. Conf., 1957, private company report.

PUBLICATIONS: (Continued)

Antimony deposits of Nevada, Nevada Bureau of Mines, Bull. 61., Nevada Bureau of Mines, 248 pp., 16 plates, 80 figures (maps), 1963.

Antimony occurrences in Nevada, Nevada Bureau of Mines, Map 2, 1962.

Mercury occurrences in Nevada, E. F. Lawrence and R. V. Wilson, Nevada Bureau of Mines, Map 7, 1962.

Exploration of the Hottentot prospect, Walker River Indian Reservation, Nevada, E. F. Lawrence and W. L. Wilson, Nevada Bureau of Mines, Report 13, Part 2, pp. 143-158, 1966.

Exploration of the Calico Area, Walker River Indian Reservation, Mineral County, Nevada, by E. F. Lawrence and Robert L. Redmond, Amer. Inst. Min. & Met. Engs., Preprint No. 67-I-311.

Geological and geophysical investigation of the mineral deposits of the Calico Hills, Mineral County, Nevada, Doctoral dissertation, University of California, Riverside, 1969.

ACTIVITIES:

Chairman and Vice-Chairman, Reno Subsection, AIME, 1957, 1958.

Sec. Treas. and Vice-Chairman, Nevada Section, AIME, 1959, 1960.

Chairman, Nevada Section, AIME, 1961.

Member, American Institute Mining & Metallurgical Engineers, Geological Society of America, Society of Economic Geologist, Mineralogical Society of America, Geochemical Society, Sigma Xi, National Society of Professional Engineers.

Member and Secretary of Governor's Mining Advisory Board (Nevada), 1960-1961.

Registered Professional Engineer, Nevada No. 1133.

Great Basin Exploration Company
3898 Washington Street
San Francisco, Calif. 94118

Item 7 Estimate of Costs

(a) Independent contractors

1800 feet of rotary drilling @ $4.50 per foot (0-300 ft.)	$8,100.00	
1300 feet of rotary drilling @ $6.00 per foot (300 ft.-600ft.)	7,800.00	
Mobilization (Carlin to Good Hope)	240.00	
Mud, cement, etc.	200.00	
	$16,340.00	$16,340.00

(note: The above cost of drilling and mobilization are based on bids received from Eklund Drilling Company of Carlin, Nevada per attached letter)

Bull-dozing - road building and construction of drill platforms		
24 hours @ $30.00 per hour	720.00	
Mobilization-Elko to Good Hope	200.00	
	$920.00	920.00

(b) Personal Services

Consulting Mining Geologist - for supervision of drilling and logging of hole		
7 Days @ $150.00 per day	1,050.00	
Travel expenses:		
7 Days @ $20.00	140.00	
Mileage - 4 trips from Reno to Good Hope 3300 Miles @ .12	396.00	
	$1,586.00	1,586.00

(c) Supplies

620 Sample bags @ 30¢/each	186.00	186.00

(d) Not Applicable
(e) Not Applicable
(f) Not Applicable

(g) Miscellaneous

185 Analyses for gold & silver @ $5.00 per analysis	925.00	925.00
		$19,957.00

Eklund Drilling Company

L. W. EKLUND, Owner

P.O. Box 666 Phone 702-754-6548 Carlin, Nevada 89822

June 1, 1971

Mr. Ed Lawrence
P.O. Box 5351
Riverside, Calif. 92507

Dear Mr. Lawrence:

Pursuant to our telephone conversation, I am pleased to quote the following prices for your proposed drilling project in the Tuscarora area.

Footage basis:
Rotary drilling:
0 - 300 @ $4.50 per ft.
300 - 600 @ $6.00 per ft.
Coring:
0 - 300 @ $12.50 per ft.
300 - 600 @ $15.50 per ft.

Mud, cement and lost circulation materials will be billed to you at our cost. Reaming to set casing, cementing, drilling out cement, pulling casing @ $25.00 per hr. plus reaming bits at our cost.
Mobilization - $1.00 per mile from Carlin, Nevada to job site de-mobilization - $1.00 per mile from job site to Carlin, Nevada.

Trusting you will favor us with this contract, I remain.

Sincerely,

L. W. Eklund

L.W. Eklund
Eklund Drilling Co.

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OME-6854 (Silver-Gold)
Great Basin Exploration Company

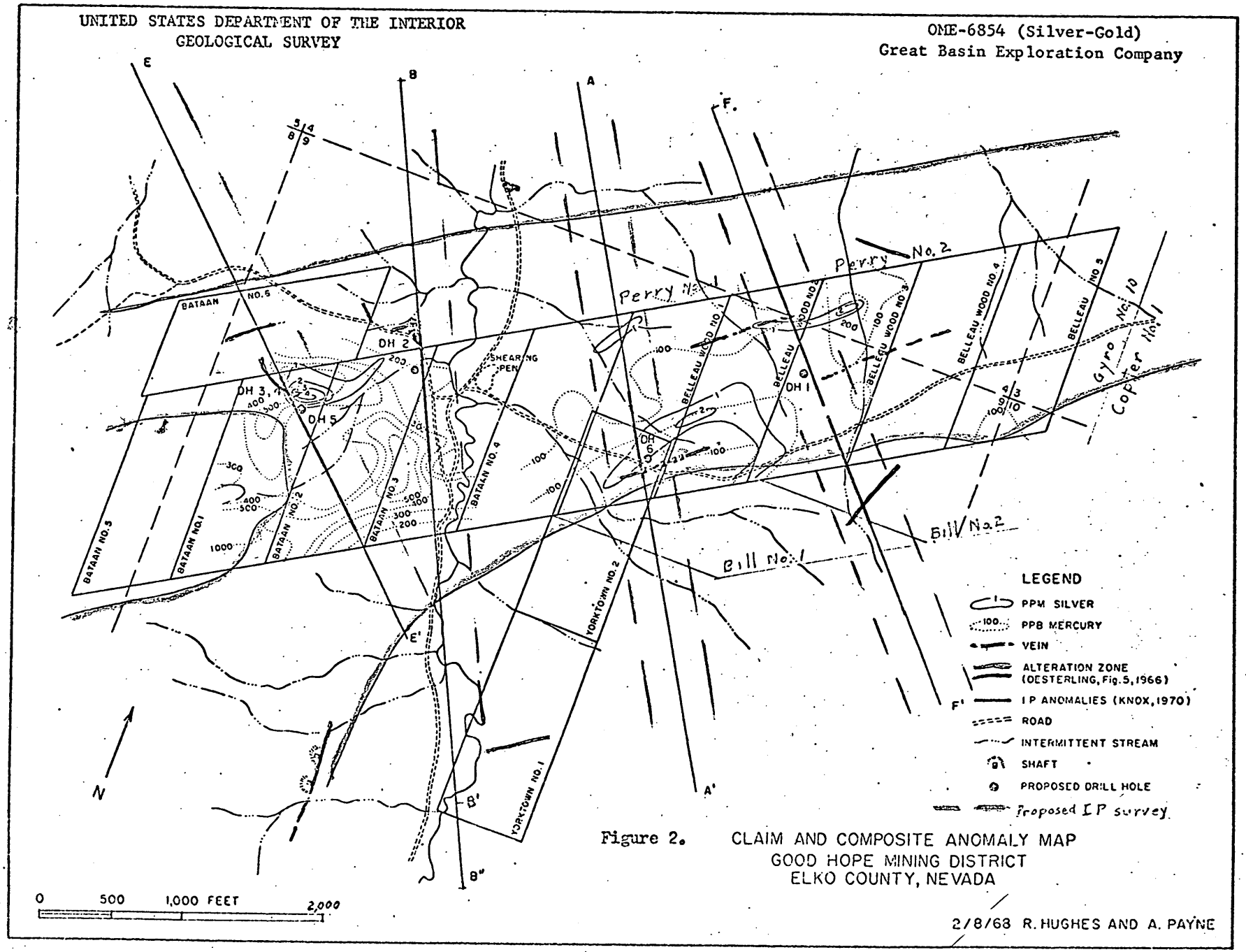
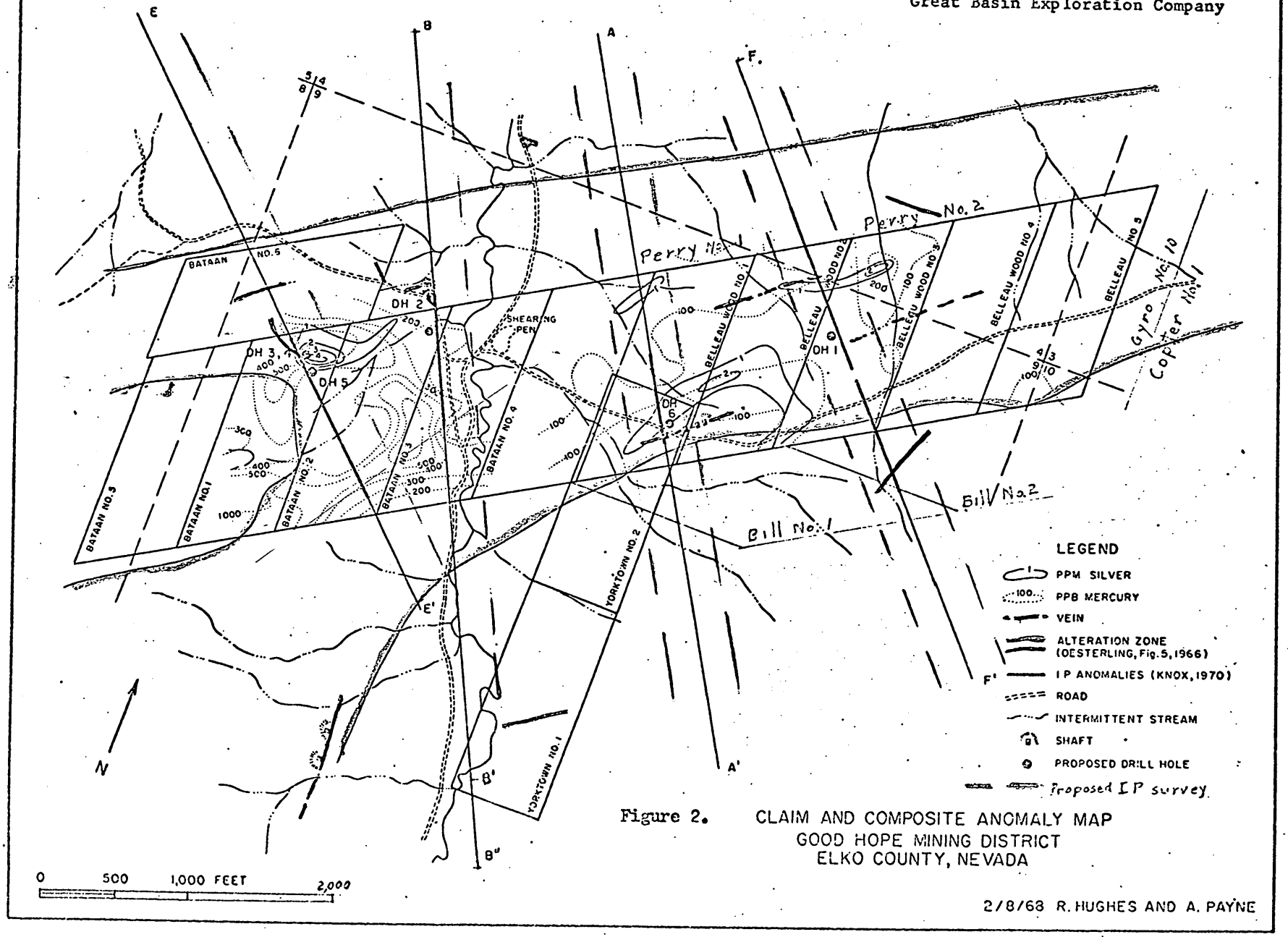


Figure 2. CLAIM AND COMPOSITE ANOMALY MAP
GOOD HOPE MINING DISTRICT
ELKO COUNTY, NEVADA

2/8/68 R. HUGHES AND A. PAYNE

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OME-6854 (Silver-Gold)
Great Basin Exploration Company



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ELKO COUNTY, NEVADA

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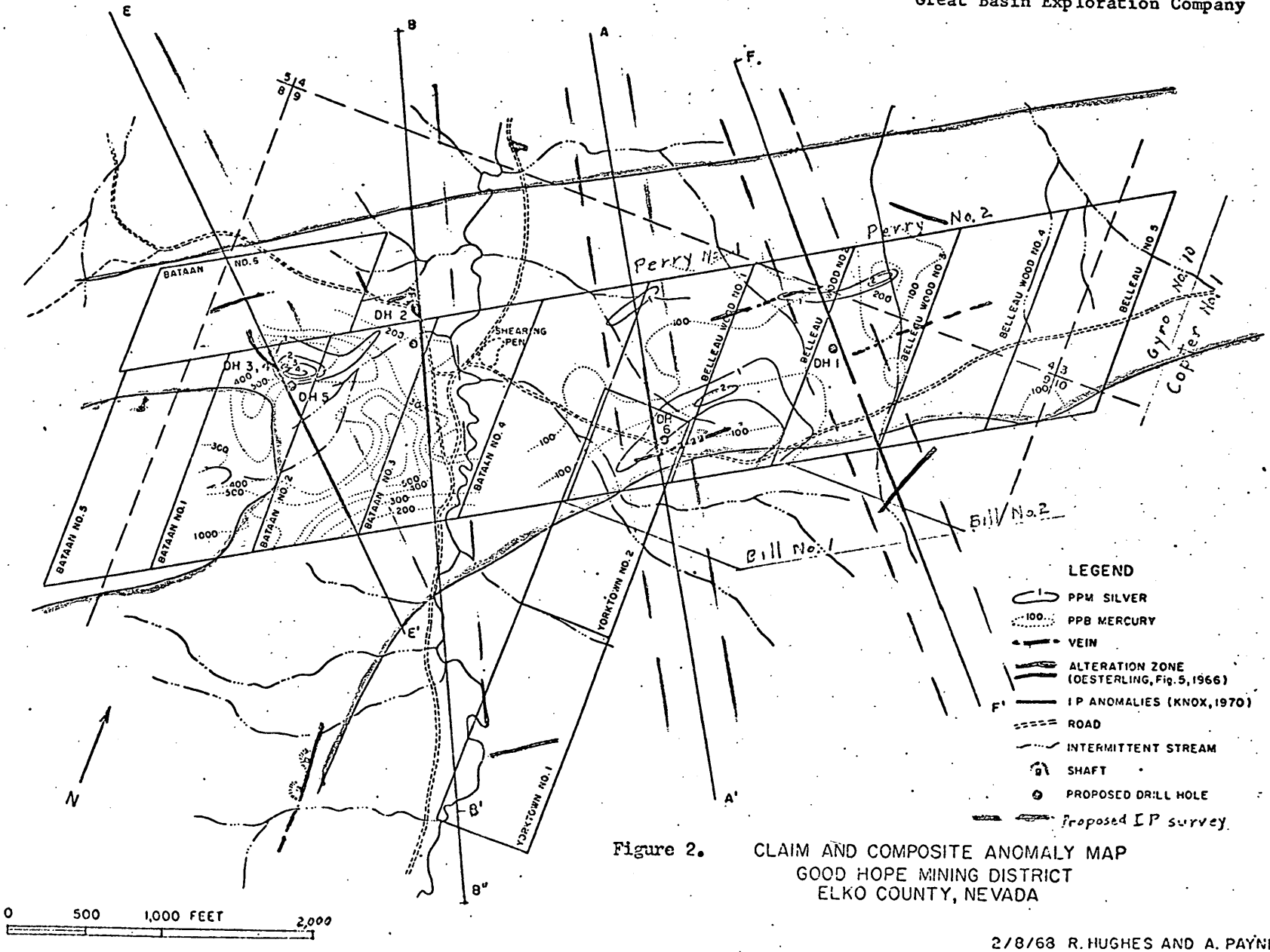
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OME-6854 (Silver-Gold)
Great Basin Exploration Company



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ELKO COUNTY, NEVADA

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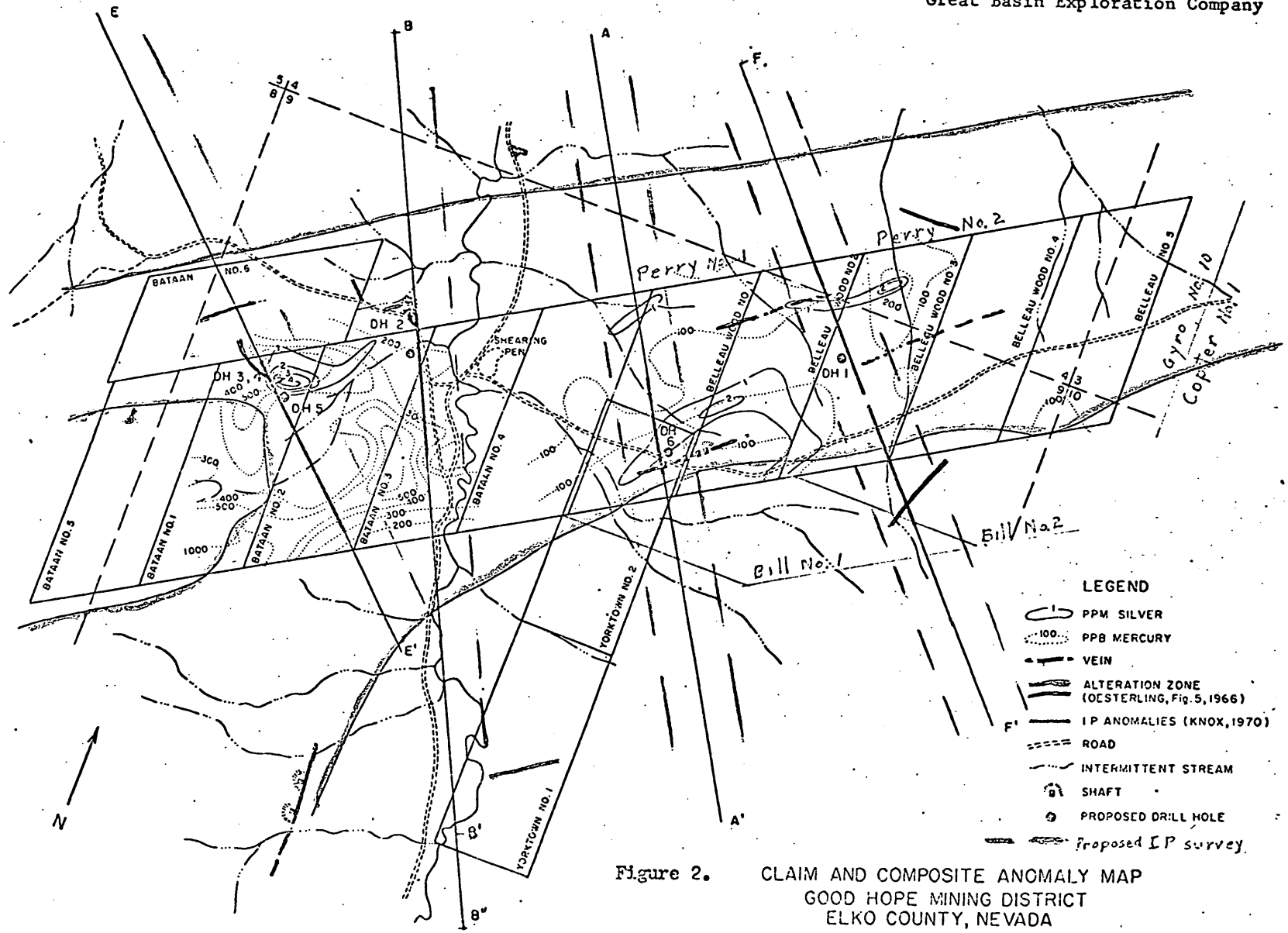
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OME-6854 (Silver-Gold)
Great Basin Exploration Company



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ELKO COUNTY, NEVADA

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UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OME-6854 (Silver-Gold)
Great Basin Exploration Company

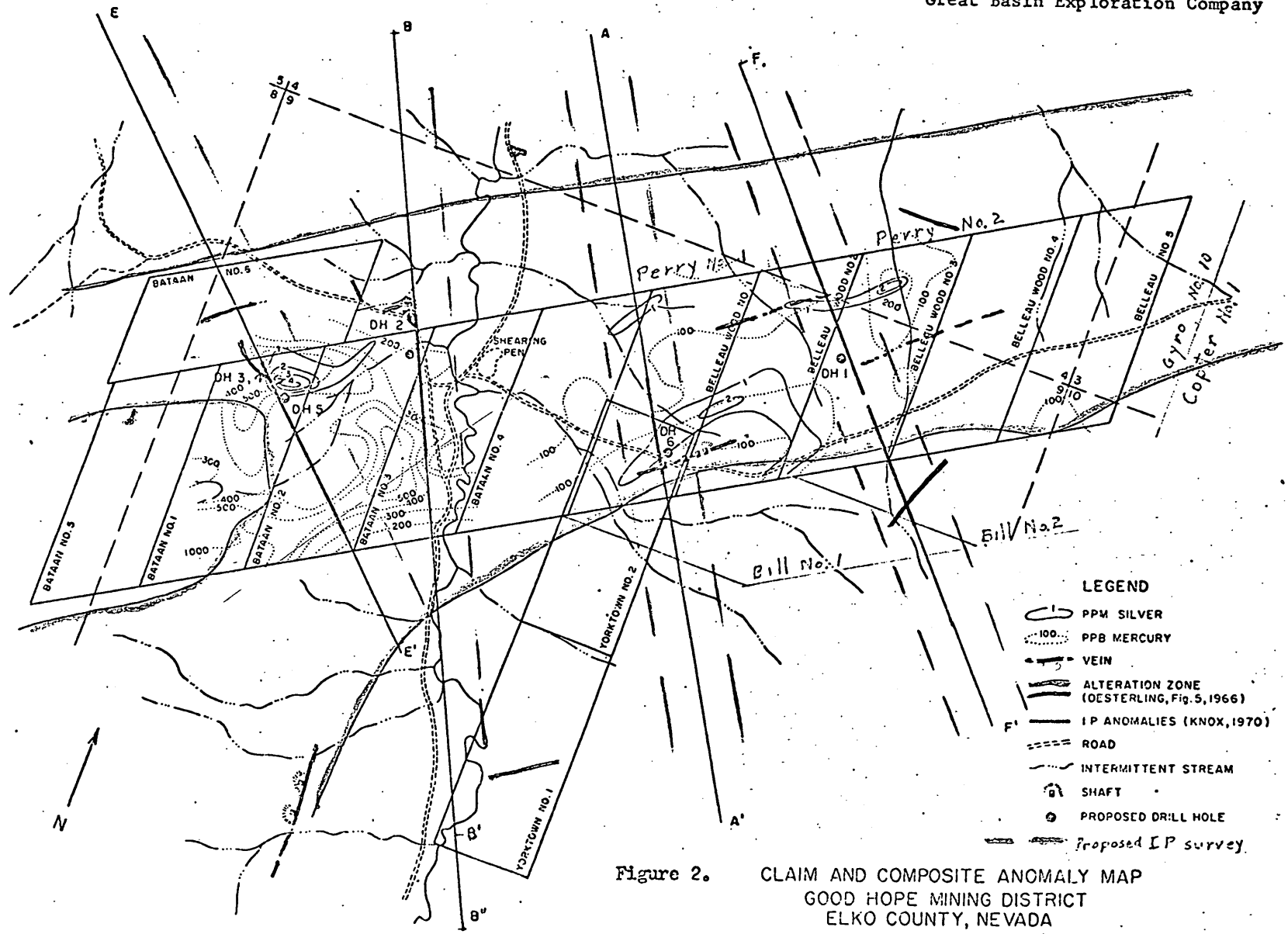

Figure 2. CLAIM AND COMPOSITE ANOMALY MAP
GOOD HOPE MINING DISTRICT
ELKO COUNTY, NEVADA

2/8/68 R. HUGHES AND A. PAYNE

United States Department of the Interior

GEOLOGICAL SURVEY
Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

March 20, 1973

O. M.
RECEIVED
MAR 22
INITIALS | CO. I.
Cal 120 ~~120~~
HK ~~120~~

Memorandum

To: Chief, Office of Minerals Exploration
Washington, D. C.

From: Field Officer
Region II

Subject: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Enclosed is a summary-type Final Field Report on the subject project.

H. K. Stager

Enclosure

F. Team
FinalRpt.

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code

AIRMAIL

MAR 15 1973

Mr. Harry E. Olsson
Vice President
Allied Properties
340 Mason Street
San Francisco, California 94102

Re: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Dear Mr. Olsson:

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

This correspondence relates to the Lien and Subordination Agreements signed by you on October 21, 1971, under the Office of Minerals Exploration program.

Sincerely yours,

Harold Kirkemo

Harold Kirkemo
Chief, Office of
Minerals Exploration

Enclosure

cc: Director's reading file
Mineral Resources
OME reading file
Region II
Mr. Kirkemo

HKirkemo/cac 3/14/73

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code

March 6, 1973

Memorandum

To: Chief, Branch of Financial Management

From: Chief, Office of Minerals Exploration

Subject: OME-6854 (Silver-Gold)
Alexander van Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Enclosed is a copy of the Field Officer's letter of March 1, 1973 to the subject Operator forwarding a copy of the Report of Review issued in February 1973. Also enclosed is a copy of the report for your files.

Harold Kirkemo

Harold Kirkemo

Enclosures

cc: Director's reading file
Mineral Resources
OME reading file
Mr. Kirkemo

HKirkemo/cac 3/6/73

Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

March 1, 1973

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Mr. Alexander von Hafften
3898 Washington Street
San Francisco, California 94118

Re: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Dear Mr. von Hafften:

Enclosed for your files is a copy of a Report of Review dated February 1973 by the Office of Survey and Review in Washington, D. C., where your OME contract was audited.

The figures in the report agree with those in the records of the Field Office, and I concur in the report.

Sincerely yours,

H. K. Stager
Field Officer
OME, Region II

Enclosure

cc: Chief, OME, WDC (2)
DRF
ACG RF
MP RF
Docket

RMSmith:mkh

MME Form 7
(2/63)

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Date	Surname	Code

February 28, 1973

Memorandum

To: Field Officer, Region II

From: Chief, Office of Minerals Exploration

Subject: OME-6854 (Gold-Silver)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Elko County, Nevada
Contract 2303

Enclosed are the Field Officer's and Operator's copies of the Report of Review issued in February 1973 on the subject contract.

Please review the report and if you concur in the facts, forward a copy to the Operator and send us two copies of the transmittal letter. If for any reason you do not concur, both copies of the report should be returned to this office with appropriate comments.

Harold Kirkemo

Harold Kirkemo

Enclosures

cc: Director's reading file
Mineral Resources
OME reading file
Mr. Kirkemo
130

HKirkemo/cac 2/28/73

FINAL REPORT

GEOPHYSICAL AND DRILLING EXPLORATION
GOOD HOPE PROPERTY
ELKO COUNTY, NEVADA

Exploration Contract 2303
Docket No. OME-6854
(Silver-Gold)

ALEXANDER VON HAFFTEN
GREAT BASIN EXPLORATION COMPANY
3898 Washington Street
San Francisco, California 94118

OPR'S FINAL REPORT

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INTRODUCTION

Geophysical and rotary drilling exploration on the Good Hope property, Elko County, Nevada, was completed in October, 1972 under an exploration contract between the United States Government, Department of Interior (U. S. Geological Survey, Office of Mineral Exploration) and Alexander von Hafften, d/b/a, Great Basin Exploration Company of San Francisco, California. Work done under Exploration Contract 2303, Docket No. OME-6854 (Silver-Gold) was to explore for disseminated silver-gold-bearing ore bodies in Tertiary volcanic rocks by conducting a geophysical survey using the induced polarization (IP) method and by drilling promising anomalies using rotary drilling. Under terms of the contract, the Government loaned Great Basin Exploration Company seventy-five percent of the funds estimated for completing the program scheduled in the contract.

The induced polarization survey was conducted by Heinrichs Geoexploration Company of Tucson, Arizona. Preparation of access roads and drill sites was done by Vega Construction and Trucking Company of Elko, Nevada. Eaklund Drilling Company of Carlin, Nevada, did the rotary drilling, and all assaying of samples from the drill holes was done by Union Assay Office, Inc. of Salt Lake City, Utah. Field supervision, sample preparation, and all geologic work was accomplished by an outside consultant, Dr. Edmond F. Lawrence, Mining Geologist, of Reno, Nevada. Financial control and administration was by Mr. Alexander von Hafften of San Francisco, California.

OPERATIONAL SUMMARY

Induced polarization (IP) surveys were conducted over the Good Hope property, Elko County, Nevada, by Heinrichs Geoexploration Company of Tucson, Arizona during the interim May 30 to June 10, 1972. Eight lines were run, Lines H, I, J, K, L, M and O on a 300-foot dipole spacing and Line N on a 600-foot spacing. All lines were oriented northwesterly to cross the main geologic trends except Line N which was oriented northeasterly along the zone of interest. The dual frequency IP technique was used with sending frequency pairs of 3.0 with 0.3 hz on some lines and 1.0 with 0.1 hz on others as indicated on the sectional data sheets. A GEOEX MK-7 IP system was used to obtain the data. The array used was the collinear dipole-dipole electrode configuration with "n" intervals ranging from 1 through 6. Copies of the resulting report by Heinrichs Geoexploration Company have been submitted previously to the Office of Mineral Exploration by Great Basin Exploration Company.

In accordance with the letter from Mr. Roscoe M. Smith of the Office of Mineral Exploration, dated July 31, 1972, authorizing Great Basin Exploration Company to proceed with the work in Stage II of the contract, bulldozing and drilling contractors were contacted. Access roads and drill sites were prepared with a Catapillar 46-A (D-8) bulldozer by Vega Construction and Trucking Company of Elko, Nevada. Care was taken to minimize any damage to the surface. Drilling was commenced on August 28, 1972 by Eaklund Drilling Company of Carlin, Nevada. In accordance with the contract and subsequent amendments, nine holes were drilled as follows:

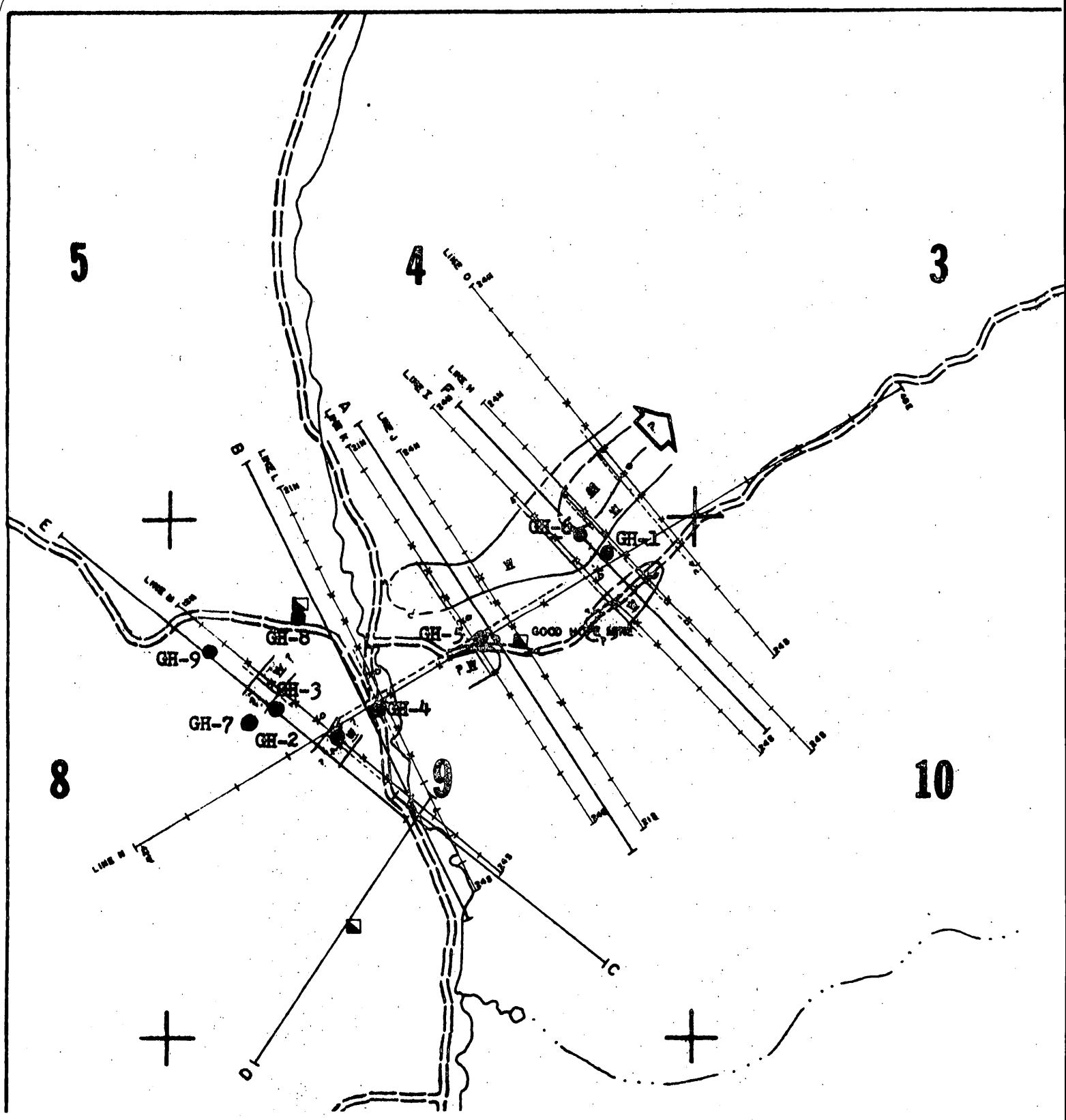

Figure 1 Location of rotary drill holes, Good Hope Mining District, Elko County, Nevada, showing relationship to induced polarization anomalies (Heinrichs, 1972).

Drill Hole No.	Total Depth
1	600 Feet
2	560 "
3	510 "
4	600 "
5	360 "
6	140 "
7	200 "
8	93 "
9	60 "
Total Footage	3,123 Feet

A Mayhew drill rig and a Mission hammerdril was used by Eaklund Drilling Company to drill all of the holes. Each hole was completed not less than 5 inches in diameter. Holes Nos. 1 through 5 were cased as necessary. Casing was removed from Hole No. 1, but was left in Holes Nos. 2 through 4. All drill cuttings were logged by an outside consultant, Dr. Edmond F. Lawrence, Mining Geologist. Splits were taken of significantly mineralized cuttings for assaying by Union Assay Office, Inc. of Salt Lake City, Utah for silver and gold. The balance of the drill cuttings have been split, with one portion being stored in suitable containers and identified by hole number and depth in Reno, Nevada. The rest of the samples have been stored in canvas sample bags and identified by hole number and depth at Good Hope, Nevada. These samples are available for Government inspection and possible use. Drill logs and true copies of assay certificates showing sample intervals have been made a part of this final report. Stage II of the exploration contract was completed in October, 1972.

F I N A N C I A L S U M M A R Y

The cost for each item of work in Stages I and II, and the total cost for the completed project under Exploration Contract No. 2303, Docket No. OME-6854 (Silver-Gold) has been summarized on page 5 of this report. All drilling costs have been tabulated on page 6, and all assaying charges by Union Assay Office, Inc. of Salt Lake City on page 7. Other items in the summary are self-explanatory. The Government participation under the contract is seventy-five percent of the cost of each item.

The total estimated cost of the project under the contract was $27,100.00. The total actual cost of the work performed under this contract was $27,019.91. The Government participation at seventy-five percent is $20,264.93, while the cost to Great Basin Exploration Company is $6,754.98.

SUMMARY OF WORK PERFORMED AND RELATED COSTS

STAGE I		
Catagory 1:		
Geophysical survey		$ 3,935.00
Catagory 2:		
Outside consultant, 7 days @$140.00		980.00
Catagory 7:		
Transportation, outside consultant, 1,958 miles @0.12		234.96
Per diem, outside consultant, 7 days @$20.00		140.00
Total actual cost, Catagories 1, 2, & 7 (Stage I)		$ 5,289.96
STAGE II		
Catagory 1:		
Mobilization & demobilization, one bulldozer		$ 250.00
Bulldozing access roads - 19 hrs. @$30.00		570.00
Mobilization & demobilization of drilling equipment		250.00
Rotary drilling, 3,123 feet: - 0 - 300 feet	$8,968.50	
300 - 600 "	6,780.00	15,748.50
Reaming, setting and pulling casing, 6 hrs.		150.00
Casing lost in hole, 70 feet @$1.25		87.50
Cement, 5 sacks @$2.25		11.25
Additives		51.40
Catagory 2:		
Outside consultant, 19 days @$140.00		2,660.00
Catagory 7:		
Travel, outside consultant, 3,990 miles @0.12		478.80
Per diem, outside consultant, 19 days @$20.00		380.00
Sample sacks for storage, 300 sacks @0.30		186.00
Assays for gold and silver, 245 assays @$3.50		857.50
Sample sacks - 245 additional sacks for assays @0.20		49.00
Total actual cost, Catagories 1, 2, & 7 (Stage II)		$21,729.95
Total actual cost, Stages I & II		$27,019.91

SUMMARY OF DRILLING COSTS

Drilling:

Drill Hole Number	Total Depth	0 - 300 feet @ $4.50/ft. Feet	Cost	300 - 600 feet @ $6.00/ft. Feet	Cost
1	600	300	$1,350.00	300	$1,800.00
2	560	300	1,350.00	260	1,560.00
3	510	300	1,350.00	210	1,260.00
4	600	300	1,350.00	300	1,800.00
5	360	300	1,350.00	60	360.00
6	140	140	630.00		
7	200	200	900.00		
8	93	93	418.50		
9	60	60	270.00		
	3,123	1,793	$8,968.50	1,130	$6,780.00

Reaming, setting, pulling casing: / **Casing lost in hole:**

Drill Hole Number	Hours	Cost @ $25.00/hr.	Feet	Cost @ $1.25/ft.
1	2	$ 50.00		
2	1	25.00	20	$ 25.00
3	1	25.00	20	25.00
4	1	25.00	20	25.00
5	1	25.00	10	12.50
		$150.00		$ 87.50

Cement: / **Additives:**

Drill Hole Number	Sacks	Cost @ $2.25/sack			
1	2	$ 4.50	4 sacks mud	@ $4.15	$16.60
2	1	2.25	1 sack mud	@ 4.15	4.15
4	1	2.25	5 gals additive	@ 6.13	30.65
5	1	2.25			
		$11.25			$51.40

Mobilization and demobilization of drilling equipment:

From Carlin, Nevada to Good Hope	$250.00
	$250.00

Total Drilling Cost - Stage II $16,298.65

SUMMARY OF COSTS FOR ASSAYING

Drill Hole Number	Number of Assays	Cost @ $3.50/Assay
1	33	$115.50
2	36	126.00
3	21	73.50
4	40	140.00
5	16	56.00
6	28	98.00
7	40	140.00
8	19	66.50
9	12	42.00
	245	$857.50

GEOLOGIC REPORT

BY

EDMOND F. LAWRENCE

MINING GEOLOGIST

The Good Hope property of Great Basin Exploration Company is located in northern Elko County, approximately ninty-five miles by road northwesterly from Elko, Nevada. The geography and geology has been described in a report by Knox (1970), a copy of which has been submitted to the Office of Mineral Exploration.

Geology

The Good Hope Mining District lies in an area of Tertiary volcanics consisting of Miocene and Pliocene welded tuffs, Miocene andesite, and Pliocene dacite. There are three outcrops of limestone that have been tentatively correlated with the Miocene Humboldt Formation (Knox, 1070, p. 14). There is one outcrop of Ordovician Vinini (or Valmy) quartzite on the northeast edge of the district. This formation probably underlies the Tertiary volcanic rocks in most of the area.

The Miocene welded tuffs have been intensely silicified and argillized. Most of this alteration is spatially associated with Miocene andesitic intrusives. Knox (1970, p. 14) concluded that the addesite is directly related to the mineralization, and that hydrothermal solutions were either introduced simultaneously with the intrusion of the andesite, or the intrusive may have provided paths for later transfer of the ore solutions from depth. There are numerous random veinlets and several larger veins containing pyrite, arsenopyrite, pyrargyrite, and freibergite in a gangue of quartz and sparse calcite. Approximately $100,000 in silver has been mined from the area.

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Geochemical Surveys

Payne (1967) selected the Good Hope District for geochemical exploration because of its similarity to the Tuscarora district. He used arsenic, mercury and silver as indicators, and delineated several anomalies which coincide with the anomalous zones in the IP surveys by Knox and Heinrichs. Oesterling (1966) also ran geochemical surveys over the area, and outlined two geochemical anomalies.

Geophysical Surveys

Knox (1970, p. 55) conducted magnetic, electromagnetic (VLF), and induced polarization (IP) surveys over the mineralized areas, and made suggestions for exploration. Lawrence (letter report, 1971) made certain recommendations for exploring the area. Based on these recommendations, Great Basin Exploration Company applied for assistance from the Office of Mineral Exploration in June, 1971. During these negotiations, it was agreed that further geophysical work would be desirable to help delineate the anomalies discovered by Knox. Geophysical surveys consisting of induced polarization (IP) and resistivity methods were conducted by Heinrichs Geoexploration Company during the interim May 30 to June 10, 1972 under Stage I of the contract. Anomalies were noted by Heinrichs on all eight lines, and generally confirmed the earlier work by Knox. A description of these anomalies and recommendations for future work were made in a report, copies of which have been submitted to the Office of Mineral Exploration by Great Basin Exploration Company.

Drilling Program

At the conclusion of the geophysical surveys under Stage I of the contract, the geophysical data was reviewed by Lawrence (letter, July 13, 1972) and recommendations were made for drilling five holes under Stage II of the contract. The location of these proposed drill holes was based on integrated

geophysical, geochemical, and geological data, including the recommendations made by Heinrichs Geoexploration Company, Richard Knox, and Dr. Tsvi Meidav, Professor of Geophysics. These recommendations were reviewed by the Office of Mineral Exploration, and Great Basin Exploration Company was authorized to proceed with Stage II of the contract. Based upon geologic data obtained from the earlier holes, it was recommended that four additional holes be drilled under an amendment to the original contract. Nine holes were drilled for a total footage of 3,123 feet. The objective, description and results of the nine holes are as follows:

Good Hope No. 1 Rotary Drill Hole

Drilled at F-2200 plus 100 feet northeast, which is equivalent to H-500N plus 100 feet southwest. This hole was drilled to intercept the zone of highest PFE (percent frequency effects) at the n-4 or n-5 level. It was recommended by the field geophysicist for a depth of 450 to 600 feet. The veins and faults on the surface at F-1820 appear to be dipping to the south. Payne (1967) showed both mercury and silver anomalies in this area.

This drill hole intercepted 225 feet of quartz latite tuff from the surface, 85 feet of andesite, and 290 feet of quartz latite tuff to the bottom of the hole (see P. A-1). The tuff was oxidized to 20 feet, and gray in color from 20 to 135 feet. It became darker in color from 135 feet to the contact at 225 feet. The tuff beneath the andesite is also darker in color, becoming lighter in color away from the contact.

No silver-gold mineralization was observed in the drill cuttings from the hole. Only traces of silver were indicated in the assays, while gold in trace amounts was fairly consistent throughout the hole. Cinnabar was observed in trace amounts near the surface. Arsenopyrite occurred sporadically as grains in the groundmass and along fractures. Some pyrite was observed in the upper

part of the hole, but was more plentiful nearer the bottom. It occurred as one percent to two percent at 500 to 550 feet and three to six percent at 550 to 600 feet. The amount of pyrite observed would probably account for the IP anomaly. Good Hope No. 6 Drill Hole was drilled approximately 390 feet north of this hole to further test the IP anomaly near the surface in the area of the mercury, arsenic, and silver geochemical anomalies.

Good Hope No. 2 Rotary Drill Hole

Good Gope No. 2 Rotary Drill Hole was drilled along Line M at 300S, which would be 200 feet northeast from E-3300. This hole was drilled to intercept the zone of highest PFE (percent frequency effects) at the n-4 level. This is in an area of quartz veinlets in highly silicified tuff. It was recommended by the field geophysicist for a depth of 450 feet, with a maximum of 600 feet.

This hole intercepted quartz latite tuff at 0 to 215 feet, welded andesitic tuff at 215 to 260 feet, welded quartz latite tuff at 260 to 400 feet, andesite at 400 to 420 feet, and quartz latite tuff at 420 to the bottom of the hole at 560 feet. This rock contains one to seven percent pyrite at 85 to 215 feet; ½ to 3 percent at 215 to 400 feet, 10 to 20 percent at 400 to 420 feet, and 1 to 4 percent pyrite at 400 to 560 feet. No other sulfides or silver minerals were observed in the cuttings. A few traces of gold and silver were found in the assays in the upper part of the hole. The amount of pyrite observed in this hole should be enough to account for the IP anomaly in this area. Judging from the cutting, no significant mineralization was found.

Good Hope No. 3 Rotary Drill Hole

Good Hope No. 3 Drill Hole was drilled at E-2600, which would be 200 feet southwest of M-400 N. This hole was drilled to intercept the zone of

highest PFE (percent freguency effects) near the area of high arsenic, mercury, and silver anomalies. The tuff in this area is highly silicified and contains quartz veinlets.

The drill hole intercepted quartz latite tuff at 0 to 180 feet, andesitic tuff at 180 to 267 feet, andesite at 267 to 420 feet, and andesitic tuff at 420 to 510 feet. The rock contains a trace of pyrite to 110 feet; two to four percent at 110 to 180 feet, four to five percent at 180 to 267 feet, one to four percent at 267 to 420 feet, one to two percent at 420 to 475 feet, and traces to one-half percent at 475 to 510 feet. Arsenopyrite was seen as occasional grains. A few traces of cinnabar and pyrargyrite were observed at 345 to 355 feet.

The amount of pyrite observed in this hole is probably enough to account for the IP anomaly along this line. Judging from the cuttings, no significant mineralization was found.

Good Hope No. 4 Rotary Drill Hole

Good Hope No. 4 Drill Hole was drilled at L-300S plus 100 feet southwest, which is opposite B-2400. It was drilled to explore the zone of highest PFE (percent frequency effects).

This hole cut silicified quartz latite tuff at 0 to 25 feet, greenish gray andesitic tuff at 25 to 80 feet, andesite at 80 to 305 feet, andesitic tuff at 305 to 530 feet, and quartz latitic tuff at 530 to 600 feet. These cuttings contained a trace to two percent pyrite at 0 to 80 feet, traces to five percent at 80 to 305 feet, traces to one percent to 425 feet, one to two percent at 425 to 530 feet, and two to four percent at 530 to 600 feet. No other sulfides or silver minerals were observed in the hole. The assays showed 0.01 ounces gold per ton at 505 to 510 feet, and traces in two other

samples; and traces of silver in only two samples. Judging from the cuttings, no significant mineralization was found in this hole.

Good Hope No. 5 Rotary Drill Hole

Good Hope No. 5 Drill Hole was drilled at A-2750 plus 80 feet west. It was drilled to explore the zone of higher PFE (percent frequency effects) in the area of the old Good Hope mine. It was recommended by the field geophysicist that this hole should cut the zone at 250 feet, or a maximum depth of 400 feet. It was moved to the west because of slightly higher PFE along Line K. Also, this was in an arsenic and silver anomaly (Payne, 1967).

Andesite was found from the surface to 25 feet, quartz latite tuff at 25 to 180 feet, and andesitic(?) tuff at 180 to the bottom at 360 feet. Minor amounts of magnetite were disseminated in the andesite. Traces to one percent pyrite were found in the cuttings at 25 to 180 feet, and traces to two percent at 180 to 360 feet. No other sulfides or silver minerals were observed. The assays revealed 0.01 ounces of gold and 2.4 ounces of silver at 95 to 100 feet and traces in four other samples. Judging from the cuttings, no significant mineralization was found.

Good Hope No. 6 Rotary Drill Hole

Good Hope No. 6 Drill Hole was placed at F-1820 feet, directly on a spot of silicified quartz latite tuff with numerous quartz veinlets that contained trace amounts of pyrargyrite, pyrite, and arsenopyrite at the surface. This was also the zone of highest PFE (percent frequency effects) at the surface, and was apparently at the nearest-surface expression of the same zone that dipped southward toward Good Hope No. 1 Drill Hole. This appeared to be the same zone cut near the bottom of that hole. Also, this spot was near the center of the silver, mercury, and arsenic anomalies described by Payne (1967).

Oxidized tuff was cut at 0 to 35 feet, and greenish gray quartz latite

tuff at 35 to 140 feet. Traces to three percent pyrite and trace amounts of arsenopyrite were found in this hole. Traces of pyrargyrite were observed at 35 to 40 feet and at 80 to 85 feet. The assays showed some gold at 0 to 50 feet, with 0.400 ounces of gold per ton and no silver at 35 to 40 feet. The section from 0 to 25 feet contained 0.01 to 0.02 ounces of gold per ton and traces to 0.2 ounces of silver. Although the one sample may be of economic interest, the low tenor of the rock, both above and below, would make this of doubtful value. There is a possibility that further drilling might outline an ore body of economic value, but the lack of values in Drill Hole No. 1 only 380 feet to the south would discourage further drilling.

Good Hope No. 7 Rotary Drill Hole

Good Hope No. 7 Drill Hole was drilled at a distance of 168 feet in a S30°E direction from the northwest corner of Bataan No. 1 mining claim. It is approximately 280 feet in a S56°W direction from Good Hope No. 3 Drill Hole. This hole is in a highly silicified quartz latite with considerable iron oxide, and numerous quartz veinlets along the northwesterly striking shear zone.

The hole cut silicified quartz latite tuff at 0 to 95 feet and gray quartz latite tuff at 95 to 200 feet. There were trace amounts of pyrite at 35 to 95 feet, and traces to two percent at 95 to 200 feet. Traces of arsenopyrite were found at 95 to 100 feet. No other sulfides or silver minerals were observed. Assays revealed trace amounts of gold and silver scattered throughout the hole, but none of economic value.

Judging from the cuttings, no significant mineralization was found in the hole.

Good Hope No. 8 Rotary Drill Hole

Good Hope No. 8 Drill Hole was located S35°W - 142 feet from B-1500,

to explore for a possible mineralized zone between the two old mining shafts where ruby silver and other sulfides had been found on the dumps. Grab samples from these dumps assayed 0.015 ounces of gold and 11.00 ounces of silver per ton. It is also in the near-surface expression of the IP anomaly that dips southward to Good Hope No. 4 Drill Hole.

This hole cut 93 feet of quartz latitite tuff, of which the upper 35 feet was oxidized. It contained traces to two percent pyrite, and trace amounts of arsenopyrite. Pyrargyrite occurred as traces. Assays revealed trace amounts of gold and silver in the upper 70 feet of the hole.

Judging from the cuttings, no significant mineralization was observed in this hole.

Good Hope No. 9 Rotary Drill Hole

Good Hope No. 9 Drill Hole was located on Line E at 1950 feet plus 50 feet to the east for the purpose of testing the intersection of two veins for the possibility of an ore shoot raking to the northeast. It is also in the area of the strong arsenic, mercury, and silver anomalies (Payne, 1967).

Sixty feet of quartz latite tuff was cut in this hole. Pyrite was present only in trace amounts. Traces of pyrargyrite were seen in the cutting at 20 to 40 feet, and a few grains of cinnabar was found at 45 to 50 feet. Assays revealed trace amounts of gold and silver throughout the hole

Judging from the drill cuttings, no significant mineralization was observed in this hole.

Summary

The drilling program at Good Hope under Exploration Contract 2303, Docket No. OME-6854 (Silver-Gold) did not reveal any significant mineralization, with the possible exception of the one sample interval at 35 to 40 feet in Good Hope No. 6 Drill Hole that assayed ~~0.04~~ 0.40 ounces of gold per ton

and no silver. This appeared to be a sporadic occurrence. Pyrargyrite (ruby silver) was observed in cuttings from sample intervals in several of the holes, but was also too sporadic to be of economic interest. Only one sample at 95 to 100 feet in Good Hope No. 5 Drill Hole assayed over one ounce per ton in silver.

Enough pyrite was observed in all of the holes to account for the induced polarization (IP) anomalies found by Knox and by Heinrichs. The depth estimations made by Knox and Heinrichs were amazingly accurate.

The widespread mineralization observed at the surface in the Good Hope Mining District appear to consist principally of pyrite, with a small amount of arsenopyrite, and minor amounts of gold and silver. A few traces of cinnabar and pyrargyrite were observed on the surface and in the drill cuttings. Quartz veinlets with minor calcite occur throughout the area and in the drill holes. The andesite appear to be intrusive, and the pyrite mineralization is spatially associated with it. The welded tuffs are chloritized near the contacts with the andesite. The widespread alteration halo over the area appear to be due to argillization and silicification. Some of the clay alteration is the result of surface weathering.

EDMOND F. LAWRENCE
P. O. Box 8044
University Station
Reno, Nevada 89507

November 20, 1972

R E F E R E N C E S

Heinrichs, 1972, Induced polarization survey in the Good Hope area, Elko County, Nevada, Heinrichs Geoexploration Company, 6 p.

Knox, Richard D., 1970, Geological and geophysical investigations of the Good Hope Mining District, Elko County, Nevada, Master Thesis, University of California, Riverside, California, 76 p.

Oesterling, William A., 1966, Silver potential of Allied properties in the Good Hope District, Elko County, Nevada, private report, 13 p.

Payne, Anthony L., 1967, Geological report, Good Hope Mining District, Elko County, Nevada, private report, 26 p.

A P P E N D I X

Good Hope No. 1
Rotary Drill Hole
August, 1972

Descriptive Drill Log:

Feet	Description
0 - 20	Quartz-latite(?) tuff, buff in color, with 5%-10% shards; highly argillized with limonitic stains; traces cinnabar, traces pyrite.
20 - 40	Quartz-latitic tuff, gray to buff-gray in color, occasional grains of pyrite.
40 - 135	Quartz-latite tuff, gray in color, with anhedral to subhedral crystals of plagioclase, 3%-10% lithic fragments, and occasional glass shards; slightly to moderately argillized and completely argillized at 65 feet; occasional grains of arsenopyrite at 85-90 feet and at 130-135 feet; a few scattered grains of pyrite at 40-85 feet, traces to ½% at 85-105 feet and 1% to 2% at 105-135 feet.
135 - 225	Quartz-latitic tuff, darker gray in color, gray black at 200-225 feet; traces pyrite with minute veinlets of quartz and pyrite at 165-170 feet; traces arsenopyrite at 150-155 and 185-190 feet.
225 - 310	Andesite(?), gray-black in color, with 30% to 40% euhedral laths of plagioclase; chloritized, with 3% to 10% calcite, moderately argillized; almost completely argillized at 275-285 feet; traces of pyrite, except 1% to 2% at 275-305 feet; pyrite occurs as disseminated grains, blebs and small pods; traces of arsenopyrite at 270-275, 285-295 and 300-305 feet; 3% to 10% calcite.
310 - 430	Quartz-latitic(?) tuff, gray in color; 10% to 40% subhedral to euhedral crystals of plagioclase, 1% to 5% hornblende crystals, and glass shards; chloritized and argillized, with minor amounts calcite; traces pyrite, with minute veinlets of quartz and pyrite at 320-325 feet and 1% pyrite at 410-415 feet; less than ½% arsenopyrite at 380-385 feet.
430 - 500	Quartz-latitic tuff, greenish gray in color, with 10% to 40% crystals of plagioclase; feldspars soft and chalky; traces to ½% pyrite and several minute veinlets of pyrite at 440-445 feet.
500 - 600	Quartz-latitic tuff, welded, gray in color; propylitized with 5% to 10% calcite; 1% to 2% pyrite at 500-550 feet, and 3% to 6% at 550-600 feet; traces arsenopyrite at 575-580 feet and 590-595 feet.
Bottom	

Telephone 355-3572

Sample Serial 25042-25056

ASSAY REPORT

UNION ASSAY OFFICE, Inc.

W. C. WANLASS, President
L. G. HALL, Vice President
G. P. WILLIAMS, Treasurer
GERALDINE A. WANLASS, Secretary
P. O. Box 1528
Salt Lake City, Utah 84110

Great Basin Exploration Company
Mine 3898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS September 12, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Per Cent	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH 1-1	None	None	10 -	20 feet							
1-2	Trace	0.1	85 -	90 "							
1-3	None	None	115 -	120 "							
1-4	Trace	None	120 -	130 "							
1-5	Trace	None	230 -	240 "							
1-6	Trace	None	250 -	260 "							
1-7	None	None	260 -	270 "							
1-8	Trace	None	280 -	290 "							
1-9	Trace	None	450 -	455 "							
1-10	Trace	None	455 -	460 "							
1-11	None	0.2	460 -	465 "							
1-12	None	None	490 -	495 "							
1-13	None	None	495 -	500 "							
1-14	None	None	500 -	505 "							
1-15	Trace	None	505 -	510 "							
1-16	None	None	510 -	515 "							
1-17	Trace	0.2	515 -	520 "							

Remarks

Charges $ 59.50

Glen P. Williams

Good Hope No. 2
Rotary Drill Hole
September, 1972

Descriptive Drill Log:

Feet	Description
0 - 25	Quartz latite tuff, welded, oxidized, reddish brown in color; 10% to 20% plagioclase laths and 5% to 10% glass shards; completely argillized, a few scattered pseudomorphs of limonite after pyrite.
25 - 85	Quartz latite tuff, white in color, with some yellowish brown staining by limonite; some pyrophyllite at 30-60 feet; 3% to 10% calcite as an alteration product; no sulfides noted.
85 - 215	Quartz latite tuff, gray in color, 10% to 20% plagioclase, 3% quartz, and 5% to 10% glass shards, with occasional biotite and hornblende; ½% pyrite at 85-95 feet, 1% to 2% at 95-125 feet, ½% at 125-140 feet, 5% to 7% at 140-160, 2% to 3% at 160-195 feet, and 1% at 195-215 feet; pyrite occurring as minute pods, narrow veinlets, and disseminated grains in the groundmass; occasional trace of arsenopyrite.
215 - 260	Welded andesitic(?) tuff, gray in color; with ½% to 2% pyrite as small pods, narrow veinlets, and disseminated grains; chloritized and argillized, with 3% to 5% calcite.
260 - 400	Welded quartz latite tuff, lighter gray in color; with 20% to 30% subhedral to euhedral plagioclase laths and 2% to 3% glass shards; 1% to 3% pyrite, usually subhedral to euhedral, occurring as minute pods, veinlets and disseminated grains.
400 - 420	Andesite(?), black in color, aphanitic, with 10% to 20% pyrite as minute randomly oriented veinlets, and as minute pods and individual grains; partly chloritized.
420 - 560	Quartz latite tuff, gray in color; with 10% to 20% plagioclase laths, 2% to 5% quartz and 3% to 5% glass shards; chloritized and argillized, with 3% to 15% calcite; 2% to 4% pyrite at 420-430 feet; 1% to 2% at 430-530 feet, and 1% at 530-560 feet.

Bottom

Telephone 363-3302

Hand Sample Serial 29296-29313

ASSAY REPORT

UNION ASSAY OFFICE, Inc.

W. C. WANLASS, President
L. G. HALL, Vice President
G. P. WILLIAMS, Treasurer
GERALDINE A. WANLASS, Secretary
P. O. Box 1528
Salt Lake City, Utah 84110

Mine Great Basin Exploration Co.
3898 Washington St.
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS

October 5, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Per Cent	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH 2-3	Trace	None	10	- 15 feet							
2-9	None	None	40	- 45 "							
2-23	None	None	110	- 115 "							
2-24	None	None	115	- 120 "							
2-28	Trace	0.1	135	- 140 "							
2-31	None	None	150	- 155 "							
2-32	None	None	155	- 160 "							
2-33	None	0.1	160	- 165 "							
2-34	None	0.2	165	- 170 "							
2-40	None	0.1	195	- 200 "							
2-44	None	None	215	- 220 "							
2-45	None	0.4	220	- 225 "							
2-46	None	None	225	- 230 "							
2-47	None	1.0	230	- 235 "							
2-59	None	0.2	290	- 295 "							
2-60	None	0.2	295	- 300 "							
2-68	None	None	335	- 340 "							
2-69	None	None	340	- 345 "							

Remarks

Charges $ 63.00

Glen P. Williams

Telephone 363-3302

Hand Sample Serial 29314-29331

ASSAY REPORT

UNION ASSAY OFFICE, Inc.

W. C. WANLASS, President
L. G. HALL, Vice President
G. P. WILLIAMS, Treasurer
GERALDINE A. WANLASS, Secretary
P. O. Box 1528
Salt Lake City, Utah 84110

Mine Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS

October 5, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Per Cent	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH 2-73	None	None	360 -	365 "							
2-74	None	None	365 -	370 "							
2-79	None	None	390 -	395 "							
2-80	None	None	395 -	400 "							
2-81	None	None	400 -	405 "							
2-82	None	None	400 -	410 "							
2-83	None	None	410 -	415 "							
2-84	None	None	415 -	420 "							
2-85	Trace	0.3	420 -	425 "							
2-91	None	None	450 -	455 "							
2-92	None	None	455 -	460 "							
2-93	None	None	460 -	465 "							
2-98	None	None	485 -	490 "							
2-99	None	0.1	490 -	495 "							
2-106	None	None	525 -	530 "							
2-108	None	0.2	535 -	540 "							
2-109	None	None	540 -	545 "							
2-112	None	None	555 -	560 "							

Remarks

Charges $ 63.00

Glen P. Williams

Good Hope No. 3
Rotary Drill Hole
September, 1972

Descriptive Drill Log:

Feet	Description
0 - 10	Alluvium
10 - 110	Silicified quartz latite tuff, buff in color; 10% to 20% plagioclase and minor amounts glass shards; 5% to 20% limonite and traces of carbonate; partly argillized at 10-35 feet; ½% pyrite at 10-30 feet, with only traces at 35-110 feet.
110 - 180	Quartz latitic(?) tuff, gray in color, partly argillized with 2% to 3% calcite, almost completely argillized at 175-180 feet. 2% to 4% pyrite as disseminated grains and minute veinlets, occasional grains of arsenopyrite.
180 - 267	Tuff(?), andesitic, gray in color; moderately argillized, with small amounts of calcite; 4% to 5% pyrite as disseminated grains, small pods and veinlets.
267 - 420	Andesite, gray in color, with numerous subhedral to euhedral phenocrysts of plagioclase; slightly argillized; 265-290 feet: 3% pyrite 290-345 feet: traces to 1% pyrite 345-360 feet: 2% to 4% pyrite 360-420 feet: traces to 1% pyrite traces pyrargyrite at 345-355 feet; trace cinnabar at 350-355 feet; tuffaceous texture at 320 to 420 feet.
420 - 475	Andesitic tuff, gray in color; slightly argillized with 3% calcite; 1% to 2% pyrite as disseminated grains, small pods and minute veinlets.
475 - 510	Andesitic(?) tuff with considerable magnetite as disseminated grains; 15% calcite at 475-480 feet and 5% at 480-510 feet; traces to ½% pyrite as disseminated grains.

Bottom

Telephone 363-3302

Hand Sample Serial 27425-27452

ASSAY REPORT

UNION ASSAY OFFICE, Inc.

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L. G. HALL, Vice President
G. P. WILLIAMS, Treasurer
GERALDINE A. WANLASS, Secretary
P. O. Box 1528
Salt Lake City, Utah 84110

Mine Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS

September 22, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Wet on Ore	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH-3-1	Trace	None	0 -	5 "							
2	Trace	0.2	5 -	10 "							
3	Trace	None	10 -	15 "							
4	Trace	None	15 -	20 "							
5	Trace	None	20 -	25 "							
GH-3-23	Trace	None	110 -	115 "							
24	Trace	None	115 -	120 "							
25	Trace	None	120 -	125 "							
26	None	None	125 -	130 "							
27	None	None	130 -	135 "							
28	None	None	135 -	140 "							
29	None	None	140 -	145 "							
30	None	None	145 -	150 "							
GH-3-41	None	None	200 -	205 "							
42	Trace	None	205 -	210 "							
43	None	None	210 -	215 "							
44	None	None	215 -	220 "							
45	None	None	220 -	225 "							
46	None	None	225 -	230 "							

Remarks

Charges $ 98.00

Glen P. Williams

Telephone 363-3302

Ha
Sample Serial....27453-27473...

ASSAY REPORT
UNION ASSAY OFFICE, Inc.

W. C. WANLASS, President
L. G. HALL, Vice President
G. P. WILLIAMS, Treasurer
GERALDINE A. WANLASS, Secretary
P. O. Box 1528
Salt Lake City, Utah 84110

Mine Great Basin Exploration Company
3898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS

September 22, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Wet on Ore	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH-3-47	None	None	230 -	235 feet							
" 48	None	None	235 -	240 "							
" 49	None	None	240 -	245 "							
" 50	None	None	245 -	250 "							
" 51	None	None	250 -	255 "							
" 52	None	None	255 -	260 "							
" 53	None	None	260 -	265 "							
GH-3-65	None	None	320 -	325 "							
" 66	None	None	325 -	330 "							
" 67	None	None	330 -	335 "							
" 68	None	None	335 -	340 "							
" 69	None	None	340 -	345 "							
" 70	None	0.1	345 -	350 "							
" 71	None	None	350 -	355 "							
" 72	None	None	355 -	360 "							
GH-3-81	None	None	400 -	405 "							
GH-3-95	None	None	470 -	475 "							
GH-3-98	None	None	485 -	490 "							
GH-3-100	None	None	495 -	500 "							
" 101	None	None	500 -	505 "							
" 102	None	None	505 -	510 "							

Good Hope No. 4
Rotary Drill Hole
September, 1972

Descriptive Drill Log:

Feet	Description
0 - 10	Silicified tuff, oxidized; reddish brown in color, a few pseudomorphs of limonite after pyrite.
10 - 25	Silicified tuff, quartz-latitic, gray in color, with shards of glass, biotite fresh; slightly argillized at 10-15 feet, but highly argillized at 15-25 feet; 1% to 2% pyrite as disseminated grains.
25 - 80	Andesitic(?) tuff, greenish gray in color; very fine-grained, with numerous minute plagioclase crystals, plagioclase usually soft and argillized; trace to ½% pyrite as disseminated grains.
80 - 305	Andesite with numerous minute phenocrysts of plagioclase, and a few subhedral to euhedral phenocrysts of hornblende; greenish gray in color; groundmass usually highly chloritized and argillized, with 5% to 10% calcite; occasional areas of celadonite; three to five feet of andesitic tuff interlayered at 265-270 feet; 80-125 feet: less than ½% pyrite as disseminated grains 125-130 feet: 5% pyrite as small pods and veinlets, with calcite 130-150 feet: ½% to 1% pyrite as disseminated grains 150-200 feet: traces of pyrite 200-305 feet: ½% pyrite as disseminated grains
305 - 365	Andesitic tuff(?), greenish-gray in color; occasional lithic fragments and a few glass shards; similar to 25-80 feet above; ½% to 1% pyrite, usually as disseminated grains, but in calcite veinlets at 330-360 feet; 5% to 15% calcite.
365 - 425	Same as above, except with only a trace to ½% pyrite; at 410-415 feet, a quartz veinlet with small amounts pyrite and calcite.
425 - 530	Andesitic tuff, argillized, with numerous veinlets of calcite; 30% to 40% calcite at 490-520 feet. 425-480 feet: 1% pyrite as disseminated grains and in minute veinlets, usually associated with calcite 480-485 feet: 2% pyrite 485-530 feet: less than ½% pyrite
530 - 600	Quartz-latitic(?) tuff, moderately silicified, with some argillization; slightly chloritized in places; with 2% to 4% pyrite as disseminated grains and as numerous veinlets containing calcite and occasional quartz; pyrite up to ½ inch across.

Bottom

Telephone 363-3302

Hand Sample Serial....26359-26370.....

ASSAY REPORT

UNION ASSAY OFFICE, Inc.

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L. G. HALL, Vice President
G. P. WILLIAMS, Treasurer
GERALDINE A. WANLASS, Secretary
P. O. Box 1528
Salt Lake City, Utah 84110

Mine ..Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS September 15, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Wet on Ore	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH 4-2	None	None	5 -	10 feet							
4-24	None	None	115 -	120 "							
4-25	None	None	120 -	125 "							
4-26	None	None	125 -	130 "							
4-80	None	None	395 -	400 "							
4-92	None	None	455 -	460 "							
4-93	None	None	460 -	465 "							
4-96	None	None	475 -	480 "							
4-102	None	None	505 -	510 "							
4-103	None	None	510 -	515 "							
4-107	None	None	530 -	535 "							
4-109	None	None	540 -	545 "							
GH-4-112	0.010	0.1	555 -	560 feet							
113	None	None	560 -	565 "							
114	None	None	565 -	570 "							
115	Trace	None	570 -	575 "							
116	None	0.1	575 -	580 "							
117	None	None	580 -	585 "							
118	Trace	None	585 -	590 "							
119	None	None	590 -	595 "							
120	None	None	595 -	600 "							

Good Hope No. 5
Rotary Drill Hole
September, 1972

Descriptive Drill Log:

Feet	Description
0 - 25	Andesite(?), black in color; with 10% to 35% subhedral to euhedral phenocysts of plagioclase; partly chloritized and argillized, with 5% calcite; minor amounts of magnetite as minute grains.
25 - 180	Quartz latite tuff, gray in color, with 5% to 10% plagioclase crystals, 3% to 5% glass shards and scattered lithic fragments; partly argillized and chloritized, with 10% calcite at 130 feet, 5% calcite at 130-160 feet and 1% at 160-185 feet; traces to ½% pyrite at 55-70 feet, 1% at 70-80 feet, trace to ½% at 80-160 feet, 1% at 160-170 feet, and traces at 170-180 feet; pyrite occuring as minute veinlets and disseminated grains.
180 - 360	Andesitic(?) tuff, dark gray to greenish gray in color, with 20% to 40% subhedral to euhedral plagioclase laths, 1% to 5% hornblende crystals and occasional glass shards; chloritized and partly argillized; 1% pyrite at 180-190 feet, traces at 190-210 feet, 3% at 210-250 feet, 1% to 2% at 250-270 feet, ½% to 1% at 270-305 feet, traces at 305-315 feet, 1% to 2% at 305-360 feet; pyrite occurring as minute pods, narrow veinlets, and disseminated grains.

Bottom

Telephone 363-3302

Hand Sample Serial 32853-32868

ASSAY REPORT

UNION ASSAY OFFICE, Inc.

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L. G. HALL, Vice President
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GERALDINE A. WANLASS, Secretary
P. O. Box 1528
Salt Lake City, Utah 84110

Mine Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS

November 7, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Per Cent	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GII-5											
12	None	0.1	55 -	60 feet							
19	Trace	None	90 -	95 "							
20	0.010	2.4	95 -	100 "							
31	None	0.4	150 -	155 "							
32	Trace	0.1	155 -	160 "							
39	None	None	190 -	195 "							
40	None	None	195 -	200 "							
46	None	None	225 -	230 "							
47	None	None	230 -	235 "							
48	None	None	235 -	240 "							
52	None	None	255 -	260 "							
53	None	None	260 -	265 "							
58	None	None	285 -	290 "							
70	None	0.2	345 -	350 "							
71	None	None	350 -	355 "							
72	None	None	355 -	360 "							

Remarks

Charges $ 56.00

Glenn P. Williams

Good Hope No. 6
Rotary Drill Hole
October, 1972

Descriptive Drill Log:

Feet	Description
0 - 35	Quartz latite tuff, silicified, buff in color; with 10% to 20% plagioclase subhedral to euhedral crystals and 3% to 5% glass shards; a few scattered pseudomorphs of limonite after pyrite; slightly chloritized in places; partly argillized; 1% pyrite at 30-35 feet.
35 - 140	Quartz latite tuff, greenish gray in color; highly argillized, and partly chloritized with up to 3% calcite; 2% to 3% pyrite at 35-55 feet, 1% at 75-80 feet and trace amounts in balance; trace of arsenopyrite at 35-40 feet; traces of pyrargyrite at 35-40 feet and 80-85 feet.

Bottom

Mine Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

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L. G. HALL, Vice President
G. P. WILLIAMS, Treasurer
GERALDINE A. WANLASS, Secretary
P. O. Box 1528
Salt Lake City, Utah 84110

RESULTS PER TON OF 2000 POUNDS

November 7, 1972

ASSAY REPORT
UNION ASSAY OFFICE, Inc.

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Wet on Ore	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH-6											
1	0.010	0.2	0 -	5 Feet							
2	0.010	0.2	5 -	10 "							
3	0.010	0.2	10 -	15 "							
4	0.020	None	15 -	20 "							
5	0.010	None	20 -	25 "							
6	Trace	None	25 -	30 "							
7	0.020	0.1	30 -	35 "							
8	0.400	None	35 -	40 "							
9	0.030	None	40 -	45 "							
10	Trace	None	45 -	50 "							
11	None	0.1	50 -	55 "							
12	None	None	55 -	60 "							
13	None	0.1	60 -	65 "							
14	None	None	65 -	70 "							
15	None	None	70 -	75 "							
16	None	None	75 -	80 "							
17	None	None	80 -	85 "							
18	None	None	85 -	90 "							
19	Trace	None	90 -	95 "							
20	None	None	95 -	100 "							
21	None	0.1	100 -	105 "							
22	None	None	105 -	110 "							
23	Trace	0.1	110 -	115 "							
24	None	None	115 -	120 "							
25	None	0.1	120 -	125 "							
26	None	None	125 -	130 "							
27	None	None	130 -	135 "							

Good Hope No. 7
Rotary Drill Hole
October, 1972

Descriptive Drill Log:

Feet	Description
0 - 95	Silicified quartz latite tuff, buff in color, with 10% to 20% plagioclase, 3% to 5% quartz crystals and 5% to 10% glass shards; welded; groundmass appears to have been highly silicified before weathering, presently highly argillized, plagioclase soft and chalky; stained yellowish brown by limonite, with a few pseudomorphs of limonite after pyrite; several quartz veinlets up to ¼ inch wide; one quartz vein one-half inch wide containing minor pyrite at 60-65 feet; traces pyrite at 35-95 feet.
95 - 200	Quartz latite tuff, gray in color, with 10% to 25% plagioclase laths, 3% to 5% quartz crystals and 5% glass shards; welded; shows some oxidation; highly argillized to bottom of hole, with small amounts chlorite at 105-200 feet; 1% to 2% pyrite at 95-110 feet, ½% to 1% at 110-145 feet, trace at 145-170 feet, trace to ½% at 120-195 feet, 1% at 190-195 feet, and trace at 195-200 feet; traces of arsenopyrite at 95-100 feet; pyrite usually disseminated, but occasionally in minute veinlets.
Bottom	

Telephone 363-3302

Hand Sample Serial 33011-33026

ASSAY REPORT

UNION ASSAY OFFICE, Inc.

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GERALDINE A. WANLASS, Secretary
P. O. Box 1528
Salt Lake City, Utah 84110

Mine Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS November 8, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Per Cent	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
CH-7											
1	None	0.3	0 -	5 Feet							
2	None	0.1	5 -	10 "							
3	Trace	0.1	10 -	15 "							
4	Trace	0.1	15 -	20 "							
5	Trace	None	20 -	25 "							
6	Trace	0.1	25 -	30 "							
7	Trace	0.1	30 -	35 "							
8	Trace	0.1	35 -	40 "							
9	Trace	0.1	40 -	45 "							
10	Trace	None	45 -	50 "							
11	Trace	0.2	50 -	55 "							
12	Trace	None	55 -	60 "							
13	Trace	0.1	60 -	65 "							
14	Trace	None	65 -	70 "							
15	Trace	0.1	70 -	75 "							
16	Trace	0.1	75 -	80 "							

Remarks

Charges $ 56.00

Glen P. Williams

Telephone 363-3302

Ha[illegible] Sa[illegible] Serial 33305-33328

ASSAY REPORT

UNION ASSAY OFFICE, Inc.

W. C. WANLASS, President
L. G. HALL, Vice President
G. P. WILLIAMS, Treasurer
GERALDINE A. WANLASS, Secretary
P. O. Box 1528
Salt Lake City, Utah 84110

Name Great Basin Exploration Co.
~~3898 Washington Street~~
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS

November 10, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Wet on Ore	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH-7											
17	Trace	None	80 -	85 Feet							
18	None	None	85 -	90 "							
19	None	0.1	90 -	95 "							
20	Trace	0.1	95 -	100 "							
21	None	None	100 -	105 "							
22	None	0.2	105 -	110 "							
23	Trace	None	110 -	115 "							
24	0.010	None	115 -	120 "							
25	Trace	None	120 -	125 "							
26	Trace	0.2	125 -	130 "							
27	None	None	130 -	135 "							
28	None	0.1	135 -	140 "							
29	None	None	140 -	145 "							
30	None	None	145 -	150 "							
31	None	None	150 -	155 "							
32	None	None	155 -	160 "							
33	None	None	160 -	165 "							
34	Trace	None	165 -	170 "							
35	Trace	0.2	170 -	175 "							
36	Trace	None	175 -	180 "							
37	None	0.1	180 -	185 "							
38	Trace	None	185 -	190 "							
39	None	0.1	190 -	195 "							
40	Trace	None	195 -	200							

Good Hope No. 8
Rotary Drill Hole
October, 1972

Descriptive Drill Log:

Feet	Description
0 - 30	Quartz latite tuff, buff in color; groundmass completely argillized with relict plagioclase crystals; apparently 20% plagioclase laths and 5% glass shards; groundmass appears to have been silicified before argillization; 10% chlorite and 3% calcite; a few pseudomorphs of limonite after pyrite.
30 - 93	Quartz latite tuff, gray in color; with 10%-25% plagioclase laths, occasional quartz grains, and 5% glass shards; 1% to 2% pyrite at 30-50 feet, and trace to 1% at 50-93 feet; pyrite occurs as disseminated grains, small pods and minute veinlets; traces of arsenopyrite, usually as spangles along fractures; trace of pyrargyrite; some oxidation to bottom of hole.

Bottom

Telephone 363-3302

Ha
Sample Serial 33329-33347

ASSAY REPORT
UNION ASSAY OFFICE, Inc.

W. C. WANLASS, President
L. G. HALL, Vice President
G. P. WILLIAMS, Treasurer
GERALDINE A. WANLASS, Secretary
P. O. Box 1528
Salt Lake City, Utah 84110

Mine Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS

November 10, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Wet on Ore	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH-8											
1	Trace	0.2	0 -	5 Feet							
2	Trace	0.5	5 -	10 "							
3	None	None	10 -	15 "							
4	Trace	None	15 -	20 "							
5	Trace	0.3	20 -	25 "							
6	Trace	0.5	25 -	30 "							
7	Trace	0.4	30 -	35 "							
8	Trace	0.7	35 -	40 "							
9	Trace	0.2	40 -	45 "							
10	Trace	0.1	45 -	50 "							
11	Trace	None	50 -	55 "							
12	0.010	0.4	55 -	60 "							
13	Trace	None	60 -	65 "							
14	Trace	0.5	65 -	70 "							
15	None	None	70 -	75 "							
16	None	None	75 -	80 "							
17	None	None	80 -	85 "							
18	None	None	85 -	90 "							
19	None	None	90 -	93							

Good Hope No. 9
Rotary Drill Hole
October, 1972

Descriptive Drill Log:

Feet	Description
0 - 25	Quartz latite tuff, with 5% to 10% glass shards; buff in color; almost completely argillized to a montmorillionitic clay, some yellowish brown stains of limonite.
25 - 60	Quartz latite tuff, yellowish brown to reddish in color; 10% to 30% laths of plagioclase, usually soft and chalky, 5% to 10% glass shards; occasional grains of pyrite; traces of pyrargyrite at 20-40 feet; small amounts manganese oxide at 25-30 feet; traces cinnabar at 45-50 feet.

Bottom

Telephone 363-3302

Hand Sample Serial 33348-33359

ASSAY REPORT

UNION ASSAY OFFICE, Inc.

W. C. WANLASS, President
L. G. HALL, Vice President
G. P. WILLIAMS, Treasurer
GERALDINE A. WANLASS, Secretary
P. O. Box 1528
Salt Lake City, Utah 84110

Mine Great Basin Exploration Co.
5898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS

November 10, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Wet on Ore	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH-9											
1	Trace	0.1	0 -	5 Feet							
2	Trace	None	5 -	10 "							
3	Trace	None	10 -	15 "							
4	Trace	None	15 -	20 "							
5	Trace	None	20 -	25 "							
6	Trace	0.1	25 -	30 "							
7	None	0.1	30 -	35 "							
8	None	0.2	35 -	40 "							
9	None	0.1	40 -	45 "							
10	None	0.1	45 -	50 "							
11	None	0.2	50 -	55 "							
12	None	None	55 -	60							

Remarks

Charges $ 42.00

Glen P. Williams

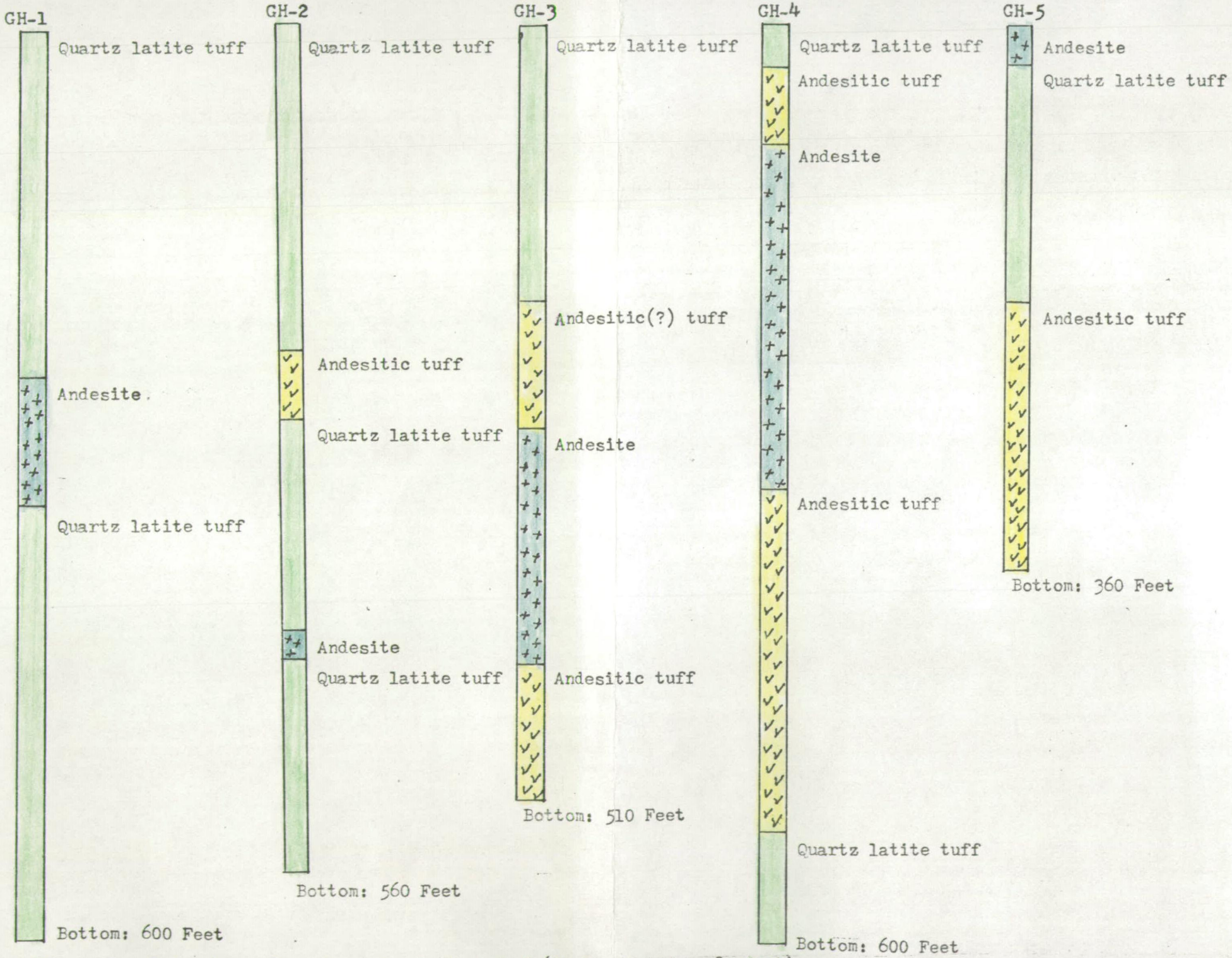

Figure 2. Drill logs, Good Hope No. 1 through 5 (Scale: 1 inch = 80 feet)

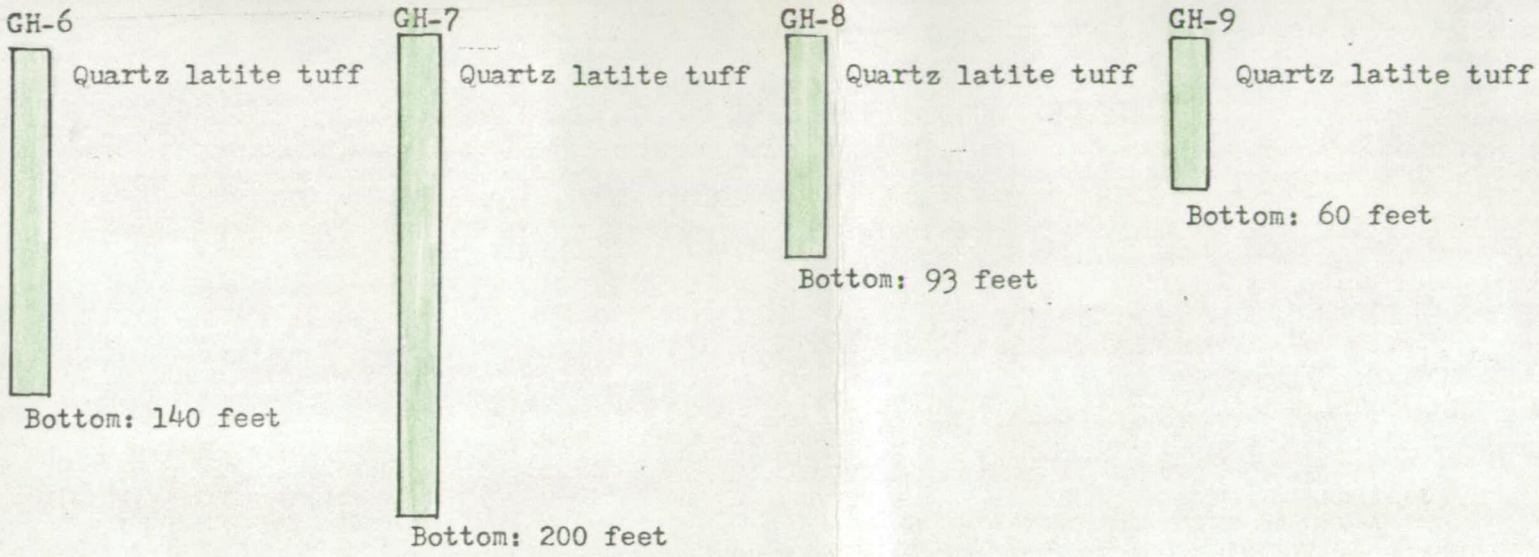

Figure 3. Drill logs, Good Hope No. 6 through 9 (Scale: 1 inch = 80 feet)

OFFICIAL FILE COPY

Date	Surname	Code
1/16/73		120
		220

MME Form 7
(2/63)

January 16, 1973

Memorandum

To: Assistant Director, Audit Operations
Contract and Grant Audit
Office of Survey and Review, Room 5226, Interior Building

From: Chief, Office of Minerals Exploration
Room 865, Matomic Building
1717 H Street, N. W.

Subject: Report of Cost Review

Please prepare a Report of Review on the following OME contract:

Docket No.	Operator	Contract No.
OME-6854	Alexander von Hafften d/b/a Great Basin Exploration Company	2303

Harold Kirkemo

Harold Kirkemo

Copy to: Frank V. Passuth, Room 1115 - 801 19th Street, N. W.

cc: Director's Reading File
Mineral Resources
OME docket
OME Reading File
Mr. Weeks
Mr. Kirkemo
130

GLAult/a 1/16/73

U.

UNITED STATES
DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY
Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

December 8, 1972

FICIAL
COPY
M. E.
EIVED
11 1972
INITIALS | CODE
Cac | 120 M
Ifa | 130
| 120
RMW | 130

Memorandum

To: Chief, Office of Minerals Exploration
Washington, D. C.

From: Field Officer
Region II

Subject: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Enclosed are the Operator's final voucher and final report. After they are approved by your office, a final audit may be requested.

The favorable areas were adequately explored and the results indicate that the IP anomalies are caused by disseminated pyrite. Silver sulfides and gold occur in tiny quartz veinlets too sporadically and wide spaced to be of economic interest. A certification of possible production is not recommended.

R. M. Smith
for H. K. Stager

Enclosures

FORM 9-1648
MARCH 1968

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
OFFICE OF MINERALS EXPLORATION

OFFICIAL COPY O. M. E. RECEIVED DEC 21 1972 INITIALS

OPERATOR'S MONTHLY VOUCHER

For Month of September-October 1972

Docket No. OME- 6854

Contract 14-08-0001 (2303)

Contract Amount $27,100.00

Gov't. Participation % 75 $20,325.00

Operator's Name: Alexander von Hafften
Great Basin Exploration Company

Address: 3898 Washington Street
San Francisco, California 94118

COST ITEMS (FROM EXHIBIT A)	FOR OPERATOR'S USE: THIS MONTH UNITS	THIS MONTH COSTS	TO DATE UNITS	TO DATE COSTS	FOR GOVERNMENT USE ONLY: THIS MONTH UNITS	THIS MONTH COSTS	TO DATE UNITS	TO DATE COSTS
Stage I		$		$		$		$
Category 1.								
Geophysical Survey			1	3,935.00			1	3935.00
Category 2.								
Outside Consultant	1	140.00	6	840.00	1	140.00	7	980.00
Category 7.								
Travel Consultant	618	74.00	1340	161.00	618	74.16	1958	235.16
Per Diem, Consultant	1	20.00	6	120.00	1	20.00	7	140.00
Stage II								
Category 1.								
Mobilization&Demob.								
Bulldozer			1	250.00			1	250.00
Bulldozing			19	570.00			19	570.00
Mobilization&Demob.								
Drilling Equipmt.	1/2	125.00	1/2	125.00	1/2	125.00	1	250.00
Rotary Drillg.@4.50	1793	8,068.50	200	900.00	1793	8068.50	1993	8968.50
Rotary Drillg.@6.00	1130	6,780.00			1130	6780.00	1130	6780.00
Reaming, Setting	6	150.00			6	150.00	6	150.00
Casing Lost in Hole	70	87.50			70	87.50	70	87.50
Cement	5	11.25			5	11.25	5	11.25
Additives	10	51.40			10	51.40	10	51.40
Category 2.								
Outside Consultant	16	2,240.00	3	420.00	16	2240.00	19	2660.00
Category 7.								
Travel, Consultant	2970	356.40	1020	122.40	2970	356.40	3990	478.80
Per Diem, Consultant	16	320.00	3	60.00	16	320.00	19	380.00
Sample Sacks	300	90.00	320	96.00	300	90.00	620	186.00
Assays	212	742.00	33	115.00	212	742.00	245	857.50
Assay Sacks	245	49.00			245	49.00	245	49.00
TOTALS		$19,305.05		$ 7,714.40		$19305.21		$27020.11

I certify that the above bill is correct and just and that payment therefor has not been received.

Date 12/4/72 *Payee Great Basin Exploration Co.

Per [signature] President

*When a voucher is signed or receipted in the name of a company or corporation, the name of the person writing the company or corporate name, as well as the capacity in which he signs, must appear. For example: "John Doe Company, per John Smith, Secretary," or "Treasurer," as the case may be.

A willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction is a criminal offense. (U. S. Code, Title 18, Sec. 1001.)

(INSTRUCTIONS ON REVERSE)

Approved as noted, subject to field examination and audit.

Signature R. M. Smith for OME Field Officer Date 12/7/72

(63) 14X0804

Approved for: $14,478.90 (SUBJECT TO AUDIT)

Signature BMT

Date 20 DEC 1972 Vou. No. 03712A

(SEE OTHER SIDE)

FINAL BILLING & RESUME

	This Statement	Previously Billed	Total
STAGE I			
Catagory 1:			
Geophysical survey	None	3,935.00	3,935.00
Catagory 2:			
Outside consultant, 1 day @140.00	140.00	840.00	980.00
Catagory 7:			
Transportation, outside consultant	74.16	160.80	234.96
Per diem, outside consultant	20.00	120.00	140.00
Total actual cost, Catagory 1, 2, & 7 (Stage I)			$5,289.96
STAGE II			
Catagory 1:			
Mobilization & demobilization, one bulldozer		250.00	250.00
Bulldozing access roads - 19 hrs. @ $30.00		570.00	570.00
Mobilization & demobilization of drilling equipment	125.00	125.00	250.00
Rotary drilling, 3,123 feet; - 0 - 300 feet	8,068.50	900.00)	
300 - 600 "	6,780.00	-)	15,748.50
Reaming, setting and pulling casing, 6 hrs.	150.00	-	150.00
Casing lost in hole, 70 feet @ 1.25	87.50	-	87.50
Cement, 5 sacks @ 2.25	11.25	-	11.25
Additives	51.40	-	51.40
Catagory 2:			
Outside consultant, 16 days @ $140.00	2,240.00	420.00	2,660.00
Catagory 7:			
Travel, outside consultant 2,970 miles @ 0.12	356.40	122.40	478.80
Per diem, outside consultant; 16 days @ $20.00	320.00	60.00	380.00
Sample sacks for storage; 300 sacks @ 0.30	90.00	96.00	186.00
Assays for gold and silver; 212 assays @ 3.50	742.00	(33) 115.50	857.50
Sample sacks - 245 additional sacks for assays @ 0.20	49.00	-	49.00
Total actual cost, Catagories 1, 2, & 7 (Stage II)			$21,729.95
Total this statement (Stages I & II)	$19,305.21		
Total previously billed (Stages I & II)		$7,714.70	
Total actual cost, Stages I & II			27,019.91
Balance due, this statement	$19,305.21		

(EFL - 11/18/72)

EDMOND F. LAWRENCE
MINING GEOLOGIST
TELEPHONE 747-3333
P. O. BOX 8044
UNIVERSITY STATION
RENO, NEVADA 89507

November 10, 1972

To: Alexander von Hafften
Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

Subject: Statement for consulting work in connection with Stage 1 of the exploration program under OME-6854.

Consulting fees for work in connection with the interpretation of the Geophysical Report by Heinrichs GEOExploration Company and the location of drill holes and access roads, and preparations for drilling under Stage II of the contract. ((This was not billed in previous statements. This work was performed on August 25-26, 1972, with a trip to the drill sites from Elko. The statement dated September 18, 1972, was for work from August 28 through August 31, 1972, a total of three days. Actual drilling commenced on August 29, 1972, under Stage II of the contract.)

1 day @ $140.00	140.00
Per deim, 1 day @ $20.00	20.00
Transportation, 618 miles @ 0.12	74.16
Total due	$234.16

Edmond F. Lawrence

FINAL STATEMENT FOR DRILLING COSTS

Drilling:

Drill Hole Number	Total Depth	0 - 300 feet @ $4.50/ft. Feet	Cost	300 - 600 feet @ $6.00/ft. Feet	Cost
1	600	100	$ 450.00	300	$1,800.00
2	560	300	1,350.00	260	1,560.00
3	510	300	1,350.00	210	1,260.00
4	600	300	1,350.00	300	1,800.00
5	360	300	1,350.00	60	360.00
6	140	140	630.00		
7	200	200	900.00		
8	93	93	418.50		
9	60	60	270.00		
	3,123	1,793	$8,068.50	1,130	$6,780.00

Reaming, setting and pulling casing:

Drill Hole Number	Hours	Cost @ $25.00/hr.
1	2	$ 50.00
2	1	25.00
3	1	25.00
4	1	25.00
5	1	25.00
		$150.00

Casing lost in hole:

Drill Hole Number	Feet	Cost @ $1.25/ft.
2	20	$ 25.00
3	20	25.00
4	20	25.00
5	10	12.50
		$ 87.50

Cement:

Drill Hole Number	Sacks	Cost @ $2.25/sack
1	2	$ 4.50
2	1	2.25
4	1	2.25
5	1	2.25
		$11.25

Additives:

Drill Hole Number			
1	4 sacks mud	@ $4.15	$16.60
2	1 sack mud	@ 4.15	4.15
4	5 gals additive	@ 6.13	30.65
			$51.40

Demobilization:

From Good Hope Drill Site to Carlin	$125.00
	$125.00

Total Drilling Costs - This Statement	$15,273.65
Previously Billed	1,025.00
Total Costs - Stage II	$16,298.65

Eklund Drilling Company

L. W. EKLUND, Owner

P.O. Box 666 Phone 702-754-6548 Carlin, Nevada 89822

October 12, 1972

ALEXANDER VON HAFFTEN
Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

The attached invoice in the amount of $16,298.65 includes $1,025.00 which was invoiced September 7. If this previous invoice has been already processed, please credit $1,025.00 against the attached invoice and pay $15,273.65.

Thank you,

EKLUND DRILLING COMPANY

jv

Eklund Drilling Company

L. W. EKLUND, Owner

P.O. Box 666 Phone 702-754-6548 Carlin, Nevada 89822

October 12, 1972

ALEXANDER VON HAFFTEN
Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

INVOICE

For drilling services performed near Tuscarora, Nevada during September and October, 1972:

Mobilization & Demobilization from Carlin, Nev., 250 miles round trip @ $1.00		$250.00
Hole GH-1	300 ft. @ $4.50	1,350.00
	300 ft. @ $6.00	1,800.00
	2 hrs. casing @ $25.00	50.00
	2 sks. cement @ $2.25	4.50
	4 sks. mud @ $4.15	16.60
Hole GH-2	300 ft. @ $4.50	1,350.00
	260 ft. @ $6.00	1,560.00
	1 hr. casing	25.00
	20 ft. casing @ $1.25	25.00
	1 sk. cement	2.25
	1 sk. mud	4.15
Hole GH-3	300 ft. @ $4.50	1,350.00
	210 ft. @ $6.00	1,260.00
	1 hr. casing	25.00
	20 ft. casing @ $1.25	25.00
Hole GH-4	300 ft. @ $4.50	1,350.00
	300 ft. @ $6.00	1,800.00
	1 hr. casing	25.00
	20 ft. casing @ $1.25	25.00
	1 sk. cement	2.25
	5 gal. additive @ $6.13	30.65
Hole GH-5	300 ft. @ $4.50	1,350.00
	60 ft. @ $6.00	360.00
	1 hr. casing	25.00
	10 ft. casing @ $1.25	12.50
	1 sk. cement	2.25
Hole GH-6	140 ft. @ $4.50	630.00
Hole GH-7	200 ft. @ $4.50	900.00
Hole GH-8	93 ft. @ $4.50	418.50
Hole GH-9	60 ft. @ $4.50	270.00
	Total This Invoice	$16,298.65

EDMOND F. LAWRENCE
MINING GEOLOGIST

TELEPHONE 747-3333

P. O. BOX 8044
UNIVERSITY STATION
RENO, NEVADA 89507

November 18, 1972

To: Alexander von Hafften
Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

Subject: Statement for consulting work in connection with Stage II of the exploration contract, OME-6854.

Consulting fees for work in connection with the drilling program at Good Hope, Nevada, as part of Stage II of the exploration contract, OME 6854. This work included the preparation of a final report. 16 days @ $140.00	2,240.00
Per diem, 16 days @ $20.00	320.00
Transportation, 2,970 miles @ 0.12	356.40
Sample sacks, 300 sacks @ 0.30 (for storage)	90.00
Sample sacks, 245 additional sacks for assays @ 0.20	49.00
Freight, Greyhound and Continental Trailsways, samples for assay to Union Assay Office, and sample bags to Eaklund Drilling Company: 7 shipments	43.40
Supplies	
Mountain City Lumber & Shovelin Hardware - plastic sheeting for protection of samples stored at Good Hope	11.56
Carter's Mark-A-Lot pencils for marking samples, 4 @ 0.79	3.16
Telephone: 21 calls to Carlin, Elko, Tuscarora, & Battle Mountain 2 calls to Menlo Park, OME (Smith) 2 calls to Midvale, Utah for sample bags 1 call to San Francisco (A. von Hafften)	38.70
Total due	$3,152.52

Edmond F. Lawrence

Note: Actually drove 4,090 miles during Stage II. Actually worked 3 days in August, 11½ days in September, 10 days in October, and 5 days in November on Stage II of the project.

FINAL STATEMENT FOR ASSAYS

Drill Hole Number	Number of Assays	Cost @ $3.50/Assay
2	18	$ 63.00
2	18	63.00
3	21	73.50
4	12	42.00
4	28	98.00
5	16	56.00
6	28	98.00
7	16	56.00
7	24	84.00
8	19	66.50
9	12	42.00
	212	$742.00
Previously Billed		
1	33	$115.50
Total Costs - Stage II	245	$857.50

UNION ASSAY OFFICE, INC.

P. O. BOX 1528
SALT LAKE CITY, UTAH 84110
(801) 363-3302

CHARGE TO Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

DATE October 5, 1972

DATE		NAME	LOT NUMBER				
Oct.	5	GH 2-73, 2-74, 2-79 to 2-85, 2-91 to 2-93, 2-98, 2-99, 2-105, 2-108, 2-109, 2-112		63.00			
						63.00	

To insure proper credit please return one copy with payment
DUE UPON RECEIPT

UNION ASSAY OFFICE, INC.

P. O. BOX 1528
SALT LAKE CITY, UTAH 84110
(801) 363-3302

CHARGE TO Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

DATE October 5, 1972

DATE		NAME	LOT NUMBER				
Oct.	5	GH 2-3, 2-9, 2-23, 2-24, 2-28, 2-31 to 2-34, 2-40, 2-44, to 2-47, 2-59, 2-60, 2-68, 2-69		63.00			
						63.00	

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UNION ASSAY OFFICE, INC.

P. O. BOX 1528
SALT LAKE CITY, UTAH 84110
(801) 363-3302

CHARGE TO Great Basin Exploration Company
3898 Washington Street
San Francisco, CA 94118

DATE Sept. 22, 1972

DATE		NAME	LOT NUMBER				
Sept.	22	GH-3-47 to GH-3-53, GH-3-65 to GH-3-72, GH-3-81, GH-3-95, GH-3-98, GH-3-100 to GH-3-102		73.50			
						73.50	

To insure proper credit please return one copy with payment
DUE UPON RECEIPT

UNION ASSAY OFFICE, INC.

P. O. BOX 1528
SALT LAKE CITY, UTAH 84110
(801) 363-3302

CHARGE TO Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

DATE Sept. 15, 1972

DATE		NAME	LOT NUMBER				
Sept.	15	GH-4-2, 4-24, 4-25, 4-26, 4-80, 4-92, 4-93, 4-96, 4-102, 4-103, 4-107, 4-109		42.00			
						42.00	

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UNION ASSAY OFFICE, INC.

P. O. BOX 1528
SALT LAKE CITY, UTAH 84110
(801) 363-3302

CHARGE TO Great Basin Exploration Co.
398 Washington Street
San Francisco, CA 94118

DATE Sept. 22, 1972

DATE		NAME	LOT NUMBER		
Sept	22	GH-4-112 to GH-4-120, Gh-3-1 to GH-3-5, GH-3-23 to GH-3-3-, GH-3-41 to GH-3-46		98.00	
					98.00

To insure proper credit please return one copy with payment
DUE UPON RECEIPT

UNION ASSAY OFFICE, INC.

P. O. BOX 1528
SALT LAKE CITY, UTAH 84110
(801) 363-3302

CHARGE TO Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

DATE Nov. 7, 1972

DATE		NAME	LOT NUMBER		
Nov.	7	GH-5 12,19,20,31, 32,39, 40 46 to 48, 52,53, 58,70,71,72		56.00	
					56.00

To insure proper credit please return one copy with payment
DUE UPON RECEIPT

UNION ASSAY OFFICE, INC.

P. O. BOX 1528
SALT LAKE CITY, UTAH 84110
(801) 363-3302

CHARGE TO Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

DATE Nov. 7, 1972

DATE		NAME	LOT NUMBER		
Nov.	7	GH-6, 1 to 28		98.00	
					98.00

To insure proper credit please return one copy with payment
DUE UPON RECEIPT

UNION ASSAY OFFICE, INC.

P. O. BOX 1528
SALT LAKE CITY, UTAH 84110
(801) 363-3302

CHARGE TO Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

DATE Nov. 8, 1972

DATE		NAME	LOT NUMBER		
Nov.	8	GH-7, 1 to 16		56.00	
					56.00

To insure proper credit please return one copy with payment
DUE UPON RECEIPT

UNION ASSAY OFFICE, INC.

P. O. BOX 1528
SALT LAKE CITY, UTAH 84110
(801) 363-3302

CHARGE TO Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

DATE Nov. 10, 1972

DATE		NAME	LOT NUMBER		
Nov.	10	GH-7, 17 to 40		84.00	
					84.00

To insure proper credit please return one copy with payment
DUE UPON RECEIPT

UNION ASSAY OFFICE, INC.

P. O. BOX 1528
SALT LAKE CITY, UTAH 84110
(801) 363-3302

CHARGE TO Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

DATE Nov. 10, 1972

DATE		NAME	LOT NUMBER		
Nov.	10	GH-8, 1 to 19		66.50	
					66.50

To insure proper credit please return one copy with payment
DUE UPON RECEIPT

UNION ASSAY OFFICE, INC.

P. O. BOX 1528
SALT LAKE CITY, UTAH 84110
(801) 363-3302

CHARGE TO Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

DATE Nov. 10, 1972

DATE		NAME	LOT NUMBER		
No.v	10	GH-9, 1 to 12		42.00	
					42.00

To insure proper credit please return one copy with payment
DUE UPON RECEIPT

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

November 20, 1972

OFFICIAL COPY
O. M. E.
RECEIVED
NOV 22 1972
INITIALS CODE
Cal 120 NW
gla 130
HK 120
Ken BW

Memorandum

To: Chief, Office of Minerals Exploration
Washington, D. C.

From: Field Officer
Region II

Subject: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Enclosed are the Government's copy and Branch of Financial Management's copy of Amendment No. 2 to the subject contract signed by the Operator. The other copies have been properly distributed.

H. K. Stager

Enclosures

Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

November 6, 1972

OFFICIAL COPY
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INITIALS	CODE
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HK	~~120~~
Law	~~BW~~

Mr. Alexander von Hafften
3898 Washington Street
San Francisco, California 94118

Re: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Dear Mr. von Hafften:

Enclosed are the original and three copies of proposed Amendment No. 2 (three pages and one illustration) to the subject contract, signed for the Government. If the proposed amendment is satisfactory to you, please sign all copies and return all except the Operator's copy--which is for your use--to this office.

If any part of the proposed amendment does not have your approval, the original and all copies should be returned to this office together with the proposed changes for consideration.

Sincerely yours,

H. K. Stager
Field Officer
OME, Region II

Enclosures

cc: OME, Wash., D.C.
DRF
ACG RF
MP RF
Docket

RMSmith:mkh

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code
11/2	Weeks	

NOV 2 1972

Memorandum

To: Field Officer, Region II

From: Chief, Office of Minerals Exploration

Subject: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Enclosed are the original and three copies of proposed Amendment No. 2 (three pages and one illustration) to the subject contract, signed for the Government. An extra copy of the amendment is also enclosed for field use.

If the proposed amendment is satisfactory to you and the Operator, all four copies should be signed by Mr. von Hafften and distributed as usual.

If any part of the proposed amendment does not have your approval or that of the Operator, the original and all copies are to be returned to this office together with the proposed changes for consideration.

Harold Kirkemo

Harold Kirkemo

Enclosure

cc: Director's reading file
Mineral Resources
OME reading file
RWeeks
130

RWeeks:cac 11/2/72

Form 7
2/63)

OFFICIAL FILE COPY

Date	Surname	Code
10/30/72	Kirkham	120

October 30, 1972

Memorandum

To: The File

From: Robert A. Weeks

Subject: OME-6854 (Silver, Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Justification for Amendment No. 2

Results of initial exploration drilling indicate that the IP geophysical anomalies were caused by disseminated pyrite ranging between 1 and 3 percent sulfides without significant silver and gold content. Further deep drilling of the geophysical anomalies is not warranted, but additional shallower drill holes are needed to evaluate the grade and extent of mineralization associated with outcropping veins and silicified zones.

Full-time supervision of the drilling has been necessary to provide timely geologic interpretation of the drill cuttings. As the results of the deep drilling disproved the existence of a large low grade target, the savings from prompt abandonment of this drilling permitted fuller investigation of surface showings.

I concur with the Operator's request of October 3, 1972, and the Field Officers recommendation of October 6 and October 18, 1972 that the contract be amended to authorize that funds not expended in deep drilling and bull dozing be utilized in additional shallow drilling and in geologic supervision.

Robert A. Weeks

Robert A. Weeks

cc: Director's reading file
Mineral Resources
OME reading file
Region II
Mr. Weeks

RWeeks:cac 10/30/72

~~Extra copy~~ Draft Cy from Field Office

EXPLORATION CONTRACT
ALEXANDER VON HAFFTEN d/b/a
GREAT BASIN EXPLORATION COMPANY
OME-6854

AMENDMENT NO. 2

It is agreed this _____ day of _____, 1972, between the United States of America, acting through the Department of the Interior, U.S. Geological Survey, hereinafter called the "Government," and Alexander von Hafften, d/b/a Great Basin Exploration Company, hereinafter called the "Operator," that Exploration Contract 2303 (OME-6854), dated April 27, 1972, is amended effective October 3, 1972, as follows:

In Exhibit A:

Insert 1

(a) Under the heading Description of the Work, Stage II, on page 2, the second paragraph is revised to read as follows:

"Upon approval of a drilling plan, the work shall consist of bulldozing access roads to about nine drill sites, leveling the sites, and rotary drilling about nine vertical holes aggregating approximately 3,123 feet."

"The tentative location of the holes are shown on Figure 2 as revised."

(b) Under the heading Estimated Costs of the Work, Stage II, on pages 3 and 4, the entire schedule is revised to read as follows:

Actual Costs

Category (1) Independent Contracts

Mobilization and demobilization one bulldozer	$ 250.00
Bulldozing access roads and drill sites, 19 hours at $30.00/hour	570.00
Mobilization, demobilization of drilling equipment	250.00
Rotary drilling, 3,123 feet	15,749.85

Price per foot

Depth, feet	Price
0 - 300	$4.50
300 - 600	$6.00

Reaming, setting and pulling casing 6 hours at $25.00/hour	150.00
Casing lost in hole 70 feet at $1.25/foot	87.50

Cement 5 sacks at $2.25/sack	$ 11.25	
Additives 10 sacks at $5.14/each	51.40	
Total Category (1)		$17,120.00
Category (2) Personal Services		
Subcategory (a) Supervision and Technical Services		
None except:		
1 Outside consultant 19 days at $140.00/day	$ 2,660.00	
Total Category (2)		$ 2,660.00
Category (7) Miscellaneous		
None except:		
Travel, outside consultant 3,990 miles at $0.12/mile	$ 479.00	
Per diem, outside consultant 19 days at $20.00/day	380.00	
Sample sacks, cloth 620 sacks at $0.30/sack	186.00	
Assays for gold and silver 197 samples at $5.00/sample	985.00	
Total Category (7)		$ 2,030.00
Total Estimated Cost Stage II		$21,810.00
Government Participation at 75% (rounded)		$16,355.00

This amendment shall not be construed to increase the estimated total cost of the Contract, the aggregate amount which the Government may be required to contribute, nor the fixed unit cost of any item of work.

United States Department of the Interior

GEOLOGICAL SURVEY
Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

October 18, 1972

OFFICIAL
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Memorandum

To: Chief, Office of Minerals Exploration
Washington, D. C.

From: Field Officer
Region II

Subject: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Enclosed is a suggested format for Amendment No. 2 to the subject contract.

Please refer to my memorandum of October 6, 1972, recommending Amendment No. 2 to increase the allowable number of drill holes, and indicating that an increase in the allowable costs for personal services will be needed.

Personal services in excess of the amount originally estimated became necessary when the first five drill holes indicated that the geophysical anomalies are caused mainly by disseminated pyrite without significant amounts of silver or gold, and that in order to adequately explore the favorable area four additional short holes would be needed. Full-time supervision was required for immediate geologic interpretation of drill cuttings.

Funds for the additional holes and extra services are available from savings in bulldozing and drilling costs. An amendment is required to authorize more than five holes and to increase personal services, which are specified as maximums in the contract.

R. M. Smith
for H. K. Stager

Enclosure

10/11/72

Note:

Hold this request until known costs are reported in about a week and then prepare one amendment to allow additional drill holes and personal services. Also, effective date should be Oct. 3, instead of Oct. 6 as suggested by Roscoe in this memo.

Kirk

United States Department of the Interior

GEOLOGICAL SURVEY

Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

October 6, 1972

OFFICIAL COPY
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Memorandum

To: Chief, Office of Minerals Exploration
Washington, D. C.

From: Field Officer
Region II

Subject: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Enclosed is a request dated October 3, 1972 from the Operator to amend the subject contract to authorize as many as nine drill holes totalling approximately 3,123 feet at no increase in the total cost. The locations of the four additional holes (6, 7, 8, and 9) are shown on the map attached to the request.

As mentioned in my interim report of September 20, 1972, the completed holes indicate that the explored parts of the IP anomalies are caused by 1 to 3% disseminated pyrite without significant amounts of silver or gold. Further exploration of those parts appears to be unwarranted. The proposed additional holes are located with respect to surface showings. Their targets are ore bodies inferred to be localized in, along, or between quartz veins and zones of silicification known to be mineralized, rather than very large disseminated deposits which were the original targets. The probability of a discovery is increased by the proposed additional holes, which, if drilled, will adequately explore the remaining part of the favorable area.

I recommend, therefore, that the request be approved, effective October 6, 1972. The only change needed is under the heading Description of the Work, Stage II, on page 2. The second paragraph should be revised to read as follows:

"Upon approval of a drilling plan, the work shall consist of bulldozing access roads to about nine drill sites, leveling the sites, and rotary drilling about nine vertical holes aggregating approximately 3,000 feet."

After the drilling is completed, another amendment will be needed to increase the costs for Personal Services, but this cannot be done until the amount saved on other items, such as cementing, is known.

R. M. Smith
for H. K. Stager

EDMOND F. LAWRENCE
MINING GEOLOGIST

TELEPHONE 747-3333

P. O. BOX 8044
UNIVERSITY STATION
RENO, NEVADA 89507

October 3, 1972

Mr. Roscoe M. Smith
Office of Mineral Exploration
345 Middlefield Road
Menlo Park, Calif. 94025

Re: OME-6854 (Silver-Gold)
Alexander von Hafften
Great Basin Exploration Co.
Good Hope Property
Elko County, Nevada

Dear Mr. Smith:

The drilling program under Stage II of the above contract will be finished this week, and to this date, the assay data and careful logging of the cuttings from the drill holes have not indicated any significant mineralization. Therefore it is requested that the contract be amended to allow up to nine (9) vertical drill holes for a total footage of 3,123 feet. Drill hole No. 5 is presently being drilled at a point 27 feet west of Line A - 2600' as indicated in the original application and in my letter of July 13, 1972. Drill holes Nos. 6 though 9 would be drilled in the following locations and order:

DH-6 Line - F at 1820 feet
This hole would be on the spot where silver mineralization (ruby silver) has been found in a highly silicified and argillized zone, with numerous quartz veinlets. Also in the area of good silver and mercury geochemical anomalies. Depth of hole approximately 150 feet

DDH-7 West of Line-E at a point S30°E from the Northwest corner of Bataan No. 1 mining claim at a distance of 168 feet. This would be S56°W from DH-3. This hole would be in a highly silicified zone, with considerable iron oxide, and numerous veinlets of quartz. This is in the northwest striking shear zone. Depth of hole approximately 200 feet

DH-8 At S35°W - 142 feet from B-1500'
This would be on fee land under lease under this contract. It would explore for a possible mineralized zone between the two shallow shafts, where ruby silver and other sulfides have been found on the dump. Grab samples from these dumps assayed 0.015 ounces gold and 11.00 ounces of silver. Depth of hole approxiamtely 100 feet.

DH-9 Line E at 1950', and at approximately 56 feet east.
This would test the intersection of two veins for the possibility of an ore shoot raking to the northeast. Depth of hole approximately 40 feet.

The total cost for the nine (9) vertical holes for a total of 3,123 feet would be the same as in the present contract, a total of $15,750.00. The increased footage of 123 feet would be paid from the savings from the differnce in price between $6.00 per foot for deeper holes as opposed to the cost of $4.50 per foot forthese shallow holes. It is anticipated that between 330 and 370 feet

of allowable drilling would be left after the completion DH-5.

330 feet @ 6.00 would allow 440 feet @ 4.50
370 " @ 6.00 " " 493 " @ "

The hole depths to date are as following:

DH-1 600 feet
DH-2 560 "
DH-3 510 "
DH-4 600 "
DH-5 360 to 400 feet, anticipated depth

The completion of these proposed shallow drill holes would give a more complete test for silver-gold mineralization in the Good Hope area under this contract. I would be on the drill site during the drilling of these holes and will log the cuttings immediately. The total depth of each hole will depend on the mineralization observed in the hole while drilling. The total cost of drilling will be kept under the total allowable in the contract of $15,750.00.

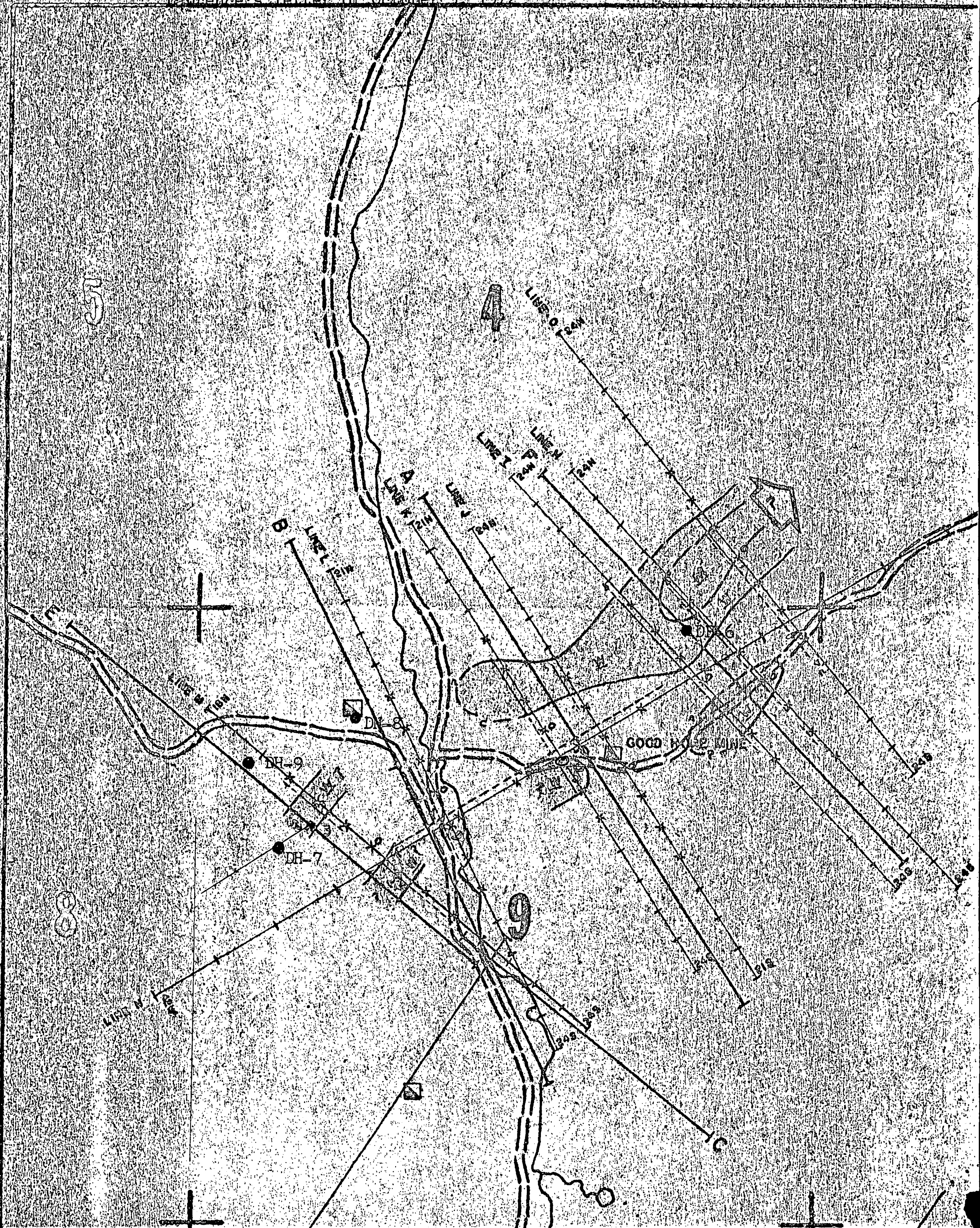
Respectfully yours

Edmond F. Lawrence

RECEIVED
OCT - 5 1972
OFFICE OF MINERALS EXPLORATION
U.S. GEOLOGICAL SURVEY
MENLO PARK, CALIF.

DME-6854 (Great Basin Exploration Company)
Proposed drill holes under admendment
Lawrence's letter of October 3, 1972

R 49E



FORM 9-1648
MARCH 1968

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
OFFICE OF MINERALS EXPLORATION

INITIALS: Carl Rowe, HR, Rec'd B.W.

OPERATOR'S MONTHLY VOUCHER For Month of August 1972

Docket No. OME- 6854
Contract 14-08-0001 2303
Contract Amount $ 27,100.00
Gov't. Participation % 75 $ 20,325.00

Operator's Name Alexander von Hafften
Great Basin Exploration Company
Address 3898 Washington Street
San Francisco, California 94118

FOR OPERATOR'S USE					FOR GOVERNMENT USE ONLY			
COST ITEMS (FROM EXHIBIT A)	THIS MONTH UNITS	THIS MONTH COSTS	TO DATE UNITS	TO DATE COSTS	THIS MONTH UNITS	THIS MONTH COSTS	TO DATE UNITS	TO DATE COSTS
Geophysical Survey		$	1	$3,935.00	—	$	1	$3935.00
Outside Consultant			2	280.00	4		6	840.00
Travel Consultant			665	80.00	675	Reclaim	1340	161.00
Per Diem			2	40.00	4		6	120.00
Total Reclaim						721.00		
Stage II								
Category (1)								
Mobilization & Demobilization								
Bulldozer	1	250.00			1	250.00	1	250.00
Bulldozing	19	570.00			19	570.00	19	570.00
Mobilization of Drilling Equipt.	1/2	125.00			1/2	125.00	1/2	125.00
Rotary Drilling	200	900.00			200	900.00	200	900.00
Assays	33	115.50			33	115.50	33	115.50
Outside Consultant	3	420.00			3	420.00	3	420.00
Travel Consultant	1020	122.40			1020	122.40	1020	122.40
Per Diem	3	60.00			3	60.00	3	60.00
Sample Sacks	320	96.00			320	96.00	320	96.00
						3,379.90		
TOTALS		$ 2,658.90		$ 4,335.00		~~$2658.90~~		$7714.90

I certify that the above bill is correct and just and that payment therefor has not been received.

Date Sept. 29, 1972 *Payee Great Basin Exploration Co.

Per Alexander von Hafften Title President

*When a voucher is signed or receipted in the name of a company or corporation, the name of the person writing the company or corporate name, as well as the capacity in which he signs, must appear. For example: "John Doe Company, per John Smith, Secretary," or "Treasurer," as the case may be.

A willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction is a criminal offense. (U. S. Code, Title 18, Sec. 1001.)

(INSTRUCTIONS ON REVERSE)

Approved as noted, subject to field examination and audit.

Signature R. M. Smith for OME Field Officer Date 10/10/72

(63) 14X0804

Approved for: $2,534.93
(SUBJECT TO AUDIT)

Signature BM7

Date OCT 17 1972 Vou. No. 084004

(SEE OTHER SIDE)

FORM 9-1648
MARCH 1968

HK 10/10/72

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
OFFICE OF MINERALS EXPLORATION

OPERATOR'S MONTHLY VOUCHER For Month of July 1972

Operator's Name Alexander von Hafften
Great Basin Exploration Company
Address 3898 Washington Street
San Francisco, California 94118

Docket No. OME- 6854
Contract 14-08-0001 2303
Contract Amount $27,100.00
Gov't. Participation %75 $20,325.00

COST ITEMS (FROM EXHIBIT A)	FOR OPERATOR'S USE: THIS MONTH UNITS	THIS MONTH COSTS	TO DATE UNITS	TO DATE COSTS	FOR GOVERNMENT USE ONLY: THIS MONTH UNITS	THIS MONTH COSTS	TO DATE UNITS	TO DATE COSTS
Reclaimed (Suspension Statement attached)		$		$		$		$
Category (2)								
Outside Consultant	4	560.00			4	560,00		
Category (7)								
Transportation								
Outside Consultant	675	81.00			675	81,00		
Per Diem								
Outside Consultant	4	80.00			4	80,00		
TOTALS		$ 721.00		$		$721,00		$

I certify that the above bill is correct and just and that payment therefor has not been received

Date Sept. 29, 1972 *Payee Great Basin Exploration Co.

Per Alexander von Hafften Title President

*When a voucher is signed or receipted in the name of a company or corporation, the name of the person writing the company or corporate name, as well as the capacity in which he signs, must appear. For example: "John Doe Company, per John Smith, Secretary," or "Treasurer," as the case may be.

A willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction is a criminal offense. (U. S. Code, Title 18, Sec. 1001.)

(INSTRUCTIONS ON REVERSE)

Approved as noted, subject to field examination and audit.

Signature R. M. Smith for OME Field Officer 10/10/72 Date

(63) 14X0804

Approved for: $
(SUBJECT TO AUDIT)

Signature

Date Vou. No.
(SEE OTHER SIDE)

UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey
Branch of Budget and Finance
Washington, D. C. 20242

ADMINISTRATIVE SUSPENSION STATEMENT

Name and Address of Payee:

Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

Amount Claimed:	Differences (Explained Below)	Amount Approved
$ 5,063.80	$ 728.80	$ 4,335.00 $3,251.25 (Govt part)
Bu. Voucher No.	Payee's Invoice No.	Period
	Docket #6854 Contract #2303	July 1972

EXPLANATION

		Difference
Category (2):		
Outside consultant		
Claimed 6 days at $140 per day	840.00	
Allowed 2 days at 140 per day	280.00	560.00
Category (7):		
Transportation, outside consultant *		
Claimed 1340 miles at $.12 per mile	168.80	
Allowed 665 miles at $.12 per mile	80.00	88.80
Per diem, outside consultant		
Claimed 6 days at $20 per day	120.00	
Allowed 2 days at $20 per day	40.00	80.00
TOTAL DIFFERENCE		728.80

*Computational error also involved

Any reclaim for items deducted must be included as a separate item on subsequent monthly voucher and supported by the original of this statement.

bmf

Branch of Budget and Finance

STATEMENT

VEGA CONSTRUCTION AND TRUCKING

DEMOLITION & EXCAVATING & LOT SWEEPING

514 So. 4th St.
Phone 738-5381 ELKO, NEVADA 89801 P. O. Box 1142

Sept. 16, 1972

M Great Basin Exploration
3898 Washington St.
San Francisco Calif. 94118
Att. Alexander Von Hafften

	Transportation of 46-A		
	to & From Good Hope Mine		$ 250.00
19	Hrs. rental of 46-A D8		
	Catipiller @$30.00		$ 570.00
	Total Due		$ 820.00

IF NOT PAID 4% INTEREST WILL BE ADDED NEXT BILLING

Eklund Drilling Company

L. W. EKLUND, Owner

P.O. Box 666 Phone 702-754-6548 Carlin, Nevada 89822

September 7, 1972

ALEXANDER VON HAFFTEN
Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

INVOICE

For drilling services performed by Rig No. 76 near Tuscarora, Nevada, during August 1972:

200 ft. @ $4.50	$900.00
Mobilization from Carlin, Nev., to jobsite 125 miles @ $1.00	125.00
Total this Invoice	$1,025.00

Thank you,

EKLUND DRILLING COMPANY

jv

UNION ASSAY OFFICE, INC.

P. O. BOX 1528
SALT LAKE CITY, UTAH 84110
(801) 363-3302

CHARGE TO Great Basin Exploration Co.
3898 Washington St.
San Francisco, CA 94118

DATE Sept. 12, 1972

DATE		NAME	LOT NUMBER			
Sept. 12		GH 1-1 to GH 1-17		59.50		
						59.50

RECEIVED PAYMENT
Union Assay Office, Inc.
By

To insure proper credit please return one copy with payment
DUE UPON RECEIPT

UNION ASSAY OFFICE, INC.

P. O. BOX 1528
SALT LAKE CITY, UTAH 84110
(801) 363-3302

CHARGE TO Great Basin Exploration Co.
3898 Washington St.
San Francisco, CA 94118

DATE Sept. 12, 1972

DATE		NAME	LOT NUMBER				
Sept.	12	GH 1-18 to GH 1-33		56.00			
						56.00	

RECEIVED PAYMENT.
Union Assay Office, Inc.
By .....

To insure proper credit please return one copy with payment
DUE UPON RECEIPT

EDMOND F. LAWRENCE
MINING GEOLOGIST

TELEPHONE 747-3333

P.O. BOX 8044
UNIVERSITY STATION
RENO, NEVADA 89507

September 18, 1972

To: Alexander von Hafften
Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

Subject: Statement for consulting work in connection with Stage 2 of the exploration contract, OME-6854.

Consulting fees for work in connection with the drilling program at Good Hope, Nevada as part of Stage 2 of the exploration contract, OME-6854 - 3 days @ $140.00		$420.00
Per deim - 3 days @ $20.00		60.00
Travel - 1020 miles @ $0.12		122.40
Sample sacks - 320 @ $0.30		96.00
Telephone - May 19 - Tuscarora from Lafayette	$ 4.75	
" 19 - Tuscarora from Lafayette	3.40	
June 30 - Tucson from New York	3.50	
" 30 - Redwood City, Calif.	1.55	
July 3 - Redwood City, Calif.	7.35	
June 9 - Carlin from Elko	.20	
" 10 - Tucson from Winnemucca	1.20	
	21.95	21.95
	Total Due	$720.35

Edmond F. Lawrence

EFL:pl

EDMOND F. LAWRENCE
MINING GEOLOGIST

TELEPHONE 747-3333

P.O. BOX 8044
UNIVERSITY STATION
RENO, NEVADA 89507

September 15, 1972

To: Alexander von Hafften
Great Basin Exploration Company
3898 Washington Street
San Francisco, Calif. 94118

Subject: Monthly report, OME-6854 (Silver-Gold), Good Hope Property, Elko County, Nevada.

Stage 2 of the exploration program at Good Hope, Elko County, Nevada, was started on August 29, 1972. Eaklund Drilling Company of Carlin, Nevada moved his drill No. 76 to the first site, and commenced drilling on the 29th. This hole, DH-1 was drilled on F-line at 2200 feet and 100 feet to the northeast as recommended in my letter of July 13, and as approved by Mr. Roscoe M. Smith in his letter of July 31, 1972. A condensed drill log is shown below, and a copy of the assays for this hole is attached. A complete log for the hole will be submitted in the monthly report for September, after further mineralogic work has been done on the cuttings. This hole was completed on September 2nd. As of the date of this letter all drill sites have been prepared by Vega Construction Company of Elko, Nevada, using a D-8 bulldozer. Access roads have also been prepared.

Depth (feet)	Description	Pyrite %	Clay %
0 - 20	Quartz-latite (?) tuff, buff in color, highly argillized;	Trace	30%
20 - 200	Quartz-latite tuff, gray in color; small phenocrysts of plagioclase at 110 - 120 feet; minute veinlets of pyrite and quartz at 130-135 feet and at 165-170 feet; traces arsenopyrite at 80-85 feet; small amount celadonite and glass at 110-115 feet; No sulfides at 20 to 40 feet and 55-80 feet, traces of pyrite at 35-50 feet, a trace to ½% at 85-105 feet, 1-2% at 110-130 feet and a trace to ½% at 130-200 feet. Traces of arsenopyrite at 125-130 feet, 150-155 feet, and 185-190 feet. Clay occurs as 25 to 35 per cent at 20-125 feet, and as 10 to 15 per cent at 125-200 feet.	None to 2 %	

Drilling will continue on the other holes during the month of September.

Edmond F. Lawrence

Telephone 363-3302

Hand Sample Serial 25642-25658

ASSAY REPORT

UNION ASSAY OFFICE, Inc.

W. C. WANLASS, President
L. G. HALL, Vice President
G. P. WILLIAMS, Treasurer
GERALDINE A. WANLASS, Secretary
P. O. Box 1528
Salt Lake City, Utah 84110

Great Basin Exploration Company
Mine 3898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS September 12, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Per Cent	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH 1-1	None	None	10 -	20 feet							
1-2	Trace	0.1	85 -	90 "							
1-3	None	None	115 -	120 "							
1-4	Trace	None	120 -	130 "							
1-5	Trace	None	230 -	240 "							
1-6	Trace	None	250 -	260 "							
1-7	None	None	260 -	270 "							
1-8	Trace	None	280 -	290 "							
1-9	Trace	None	450 -	455 "							
1-10	Trace	None	455 -	460 "							
1-11	None	0.2	460 -	465 "							
1-12	None	None	490 -	495 "							
1-13	None	None	495 -	500 "							
1-14	None	None	500 -	505 "							
1-15	Trace	None	505 -	510 "							
1-16	None	None	510 -	515 "							
1-17	Trace	0.2	515 -	520 "							

Remarks

Charges $ 59.50

Glen P. Williams

Telephone 363-3302

Hand Sample Serial 25659-25674

ASSAY REPORT

UNION ASSAY OFFICE, Inc.

W. C. WANLASS, President
L. G. HALL, Vice President
G. P. WILLIAMS, Treasurer
GERALDINE A. WANLASS, Secretary
P. O. Box 1528
Salt Lake City, Utah 84110

Mine: Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS September 12, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Per Cent	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH 1-18	Trace	None	520 - 525 feet								
1-19	Trace	None	525 - 530 "								
1-20	None	0.1	530 - 535 "								
1-21	Trace	None	535 - 540 "								
1-22	None	None	540 - 545 "								
1-23	Trace	None	545 - 550 "								
1-24	Trace	None	550 - 555 "								
1-25	Trace	None	555 - 560 "								
1-26	Trace	None	560 - 565 "								
1-27	Trace	None	565 - 570 "								
1-28	Trace	None	570 - 575 "								
1-29	Trace	None	575 - 580 "								
1-30	Trace	None	580 - 585 "								
1-31	Trace	None	585 - 590 "								
1-32	Trace	0.1	590 - 595 "								
1-33	Trace	None	595 - 600 "								

Remarks

Charges $ 56.00

Glen P. Williams

United States Department of the Interior

GEOLOGICAL SURVEY
Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

September 20, 1972

Memorandum

To: Chief, Office of Minerals Exploration
Washington, D. C.

From: Field Officer
Region II

Subject: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

OFFICIAL COPY
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RECEIVED
SEP 22 1972

INITIALS	CODE
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[illegible]	130
HK	~~120~~
Law	Bwe

An interim inspection of the drilling project was made September 13, 1972, by R. M. Smith accompanied by E. F. Lawrence, the Operator's consultant.

Work completed consisted of the following three holes at sites authorized by the contract and specified in Mr. Lawrence's letter of July 13, 1972:

Hole 1 - between Line F at 2,200 feet and Line H at 500 feet. Total depth 600 feet. As much as 3% pyrite which may be the cause of the IP anomaly. No silver sulfides evident.

Hole 4 - between Line L at 300 feet and Line B at 2,400 feet. Total depth 600 feet. Local concentrations of pyrite in quartz veinlets and in bleached volcanics.

Hole 3 - Line E at 2,600 feet. Stopped at 510 feet--last 25 feet in fresh volcanics. Local pyrite in bleached volcanics.

Rotary drilling with 8-inch and 6-inch bits and sampling are being done in accordance with good practice by a crew whose experience includes drilling at the Carlin and Cortez Mines.

Results to date indicate that much of the IP anomaly is caused by pyrite. However, Lines A and B in the area of known silver production have not yet been drilled.

Depending upon the results of the last two holes and upon unused footage, if any, one or two shallow holes may be needed to adequately explore the project area. An amendment would be required to authorize additional holes.

A copy of a certification of nonsegregated facilities was posted on the drill rig.

R. M. Smith
for H. K. Stager

FORM 9-1648
MARCH 1968

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
OFFICE OF MINERALS EXPLORATION

OPERATOR'S MONTHLY VOUCHER For Month of July 1972

Alexander von Hafften

Operator's Name Great Basin Exploration Company

Address 3898 Washington Street
San Francisco, California 94118

Docket No. OME- 6854

Contract 14-08-0001 2303

Contract Amount $27,100.00

Gov't. Participation % 75 $ 20,325.00

FOR OPERATOR'S USE					FOR GOVERNMENT USE ONLY			
COST ITEMS (FROM EXHIBIT A)	THIS MONTH		TO DATE		THIS MONTH		TO DATE	
	UNITS	COSTS	UNITS	COSTS	UNITS	COSTS	UNITS	COSTS
Geophysical Survey	1	$ 3,935.00		$	1	$3935.00	1	$3935.00
Outside Consultant	6	840.00			6	840.00	6	840.00
Travel Consultant	1340	168.80			1340	160.80	1340	160.80
Per Diem	6	120.00			6	120.00	1	120.00
TOTALS		$5,063.80		$		$5055.80		$5055.80

I certify that the above bill is correct and just and that payment therefor has not been received.

Date 7/19/72 *Payee Great Basin Exploration Co.

Per Alexander von Hafften Title President

*When a voucher is signed or receipted in the name of a company or corporation, the name of the person writing the company or corporate name, as well as the capacity in which he signs, must appear. For example: "John Doe Company, per John Smith, Secretary," or "Treasurer," as the case may be.

A willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction is a criminal offense. (U. S. Code, Title 18, Sec. 1001.)

(INSTRUCTIONS ON REVERSE)

Approved as noted, subject to field examination and audit.

Signature R. M. Smith for OME Field Officer 7/20/72 Date

(63) 14X0804~~V080XV1~~

Approved for: $3,251.25
(SUBJECT TO AUDIT)

Signature BMT

AUG 9 - 1972 0 3075 B 1

Date Vou. No.

(SEE OTHER SIDE)

UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey
Branch of Budget and Finance
Washington, D. C. 20242

ADMINISTRATIVE SUSPENSION STATEMENT

Name and Address of Payee:

Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

Amount Claimed:	Differences (Explained Below)	Amount Approved
$ 5,063.80	$ 728.80	$ 4,335.00 $3,251.25 (Govt part)
Bu. Voucher No.	**Payee's Invoice No.**	**Period**
	Docket #6854 Contract #2303	July 1972

EXPLANATION

		Difference
Category (2):		
Outside consultant		
Claimed 6 days at $140 per day	840.00	
Allowed 2 days at 140 per day	280.00	560.00
Category (7):		
Transportation, outside consultant *		
Claimed 1340 miles at $.12 per mile	168.80	
Allowed 665 miles at $.12 per mile	80.00	88.80
Per diem, outside consultant		
Claimed 6 days at $20 per day	120.00	
Allowed 2 days at $20 per day	40.00	80.00
TOTAL DIFFERENCE		728.80

*Computational error also involved

Any reclaim for items deducted must be included as a separate item on subsequent monthly voucher and supported by the original of this statement.

bmf

Branch of Budget and Finance

HEINRICHS GEOEXPLORATION COMPANY

806 WEST GRANT ROAD. TUCSON, ARIZONA 85703. P.O. BOX 5964. PHONE: (602) 623-0578

STATEMENT

Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

Attn: Mr. Alexander von Hafften

May 30, 1972

Re: GEOEX Job # 718
I. P. Survey
Elko County, Nevada

Professional Fees & Services

Six I. P. Lines - 300 foot dipole spacing with seven current electrodes including mobilization, demobilization (Reno - Job Site - Reno), transportation and living expenses and a final report	$ 2,950.00
TOTAL	$ 2,950.00
Received on account May 24, 1972	1,000.00
TOTAL AMOUNT DUE UPON COMPLETION OF ASSIGNMENT	$ 1,950.00

(301)

HEINRICHS GEOEXPLORATION COMPANY

806 WEST GRANT ROAD. TUCSON, ARIZONA 85703. P.O. BOX 5964. PHONE: (602) 623-0578

STATEMENT

Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

Attn: Mr. Alexander von Hafften

July 12, 1972

Re: GEOEX Job # 718
I. P. Survey
Elko Co., Nevada

Professional Fees & Services

Statement May 30, 1972 (see attachment)	
Balance Due	$ 1,950.00
Received on account June 9, 1972	350.00
	$ 1,600.00
Additional	
1 - 300' dipole line	370.00
1 - 600' dipole line	390.00
1 - standby (rain) day	185.00
Subtotal	$ 2,545.00
Five extra copies of reports and diagrams	40.00
TOTAL AMOUNT DUE THIS STATEMENT	$ 2,585.00

(301)

EDMOND F. LAWRENCE
MINING GEOLOGIST
TELEPHONE 747-3333
P. O. BOX 8044
UNIVERSITY STATION
RENO, NEVADA 89507

July 13, 1972

To: Alexander von Hafften
Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

Subject: Statement for consulting work in connection with Stage 1, geophysical survey, of the exploration contract, OME-6854.

Consulting fees for work in connection with the geophysical survey at Good Hope, Nevada as part of Stage 1 of the exploration contract, OME-6854 - 6 days @ $140.00		$ 840.00
Per deim - 6 days @ $20.00		120.00
Mileage - 1340 miles @ $0.12		168.80
Telephone - May 19 - Tucson from Lafayette	$ 4.25	
" 19 - Riverside from Lafayette	6.50	
June 2 - Palo Alto from Lafayette	7.15	
" 6 - Elko from Florisant, Mo.	9.65	
" 7 - Elko from Hazelton, Colo.	2.35	
" 7 - Elko from Limon, Colo.	1.65	
" 8 - Elko from Magma, Utah	1.35	
	32.90	
Tax	3.30	36.20
Total Due		$1,157.00

Edmond F. Lawrence

EFL:pl

EDMOND F. LAWRENCE
MINING GEOLOGIST
TELEPHONE 747-3333
P. O. BOX 8044
UNIVERSITY STATION
RENO, NEVADA 89507

July 13, 1972

To: Mr. Alexander von Hafften
Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

Subject: Drilling sites for Good Hope, Nevada, under the exploration contract, OME-6854.

Stage 1 of the work at Good Hope, Nevada, conducted under the exploration contract, OME-6854 has been completed. Copies of the report by Heinrichs Geophysical (Geox) were received this week, and have been studied. This work has substantiated the previous work by Richard Knox.

After a review of the new geophysical work (induced polarization) by Heinrichs, the previous work by Knox, the geochemical reports by Anthony Payne, and the geological maps and other data by Knox, the following drilling sites are recommended:

1. F-line at approximately 2200', possibly 100 feet to the northeast. This is equivalent to H-line at 500N and 100 feet southwest.

2. M-line at 300S, which would be 200 feet northeast of E-3300'.

3. E-line at approximately 2600 feet, which would be 200 feet southwest of M-400N.

4. L-line at approximately 300 feet south and 100 feet southwest, which is opposite B-2400'.

5. A-line at approximately 2750 feet, or 100 feet north of road, and 50 feet southwest.

6. If drilling data from previous holes indicates, change No. 5 above to O-line at 800S.

The approximate position of these holes are shown on the attached map. The first hole to be drilled would be No. 1 listed above on F-line. The order of drilling the other holes would depend on data from each previous hole. Six holes are shown on the map, with hole No. 6 possibly replacing hole No. 5.

Attached is a statement for the work done on Stage 1.

Edmond F. Lawrence

EFL:pl

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OME-6854 (Silver-Gold)
Great Basin Exploration Company

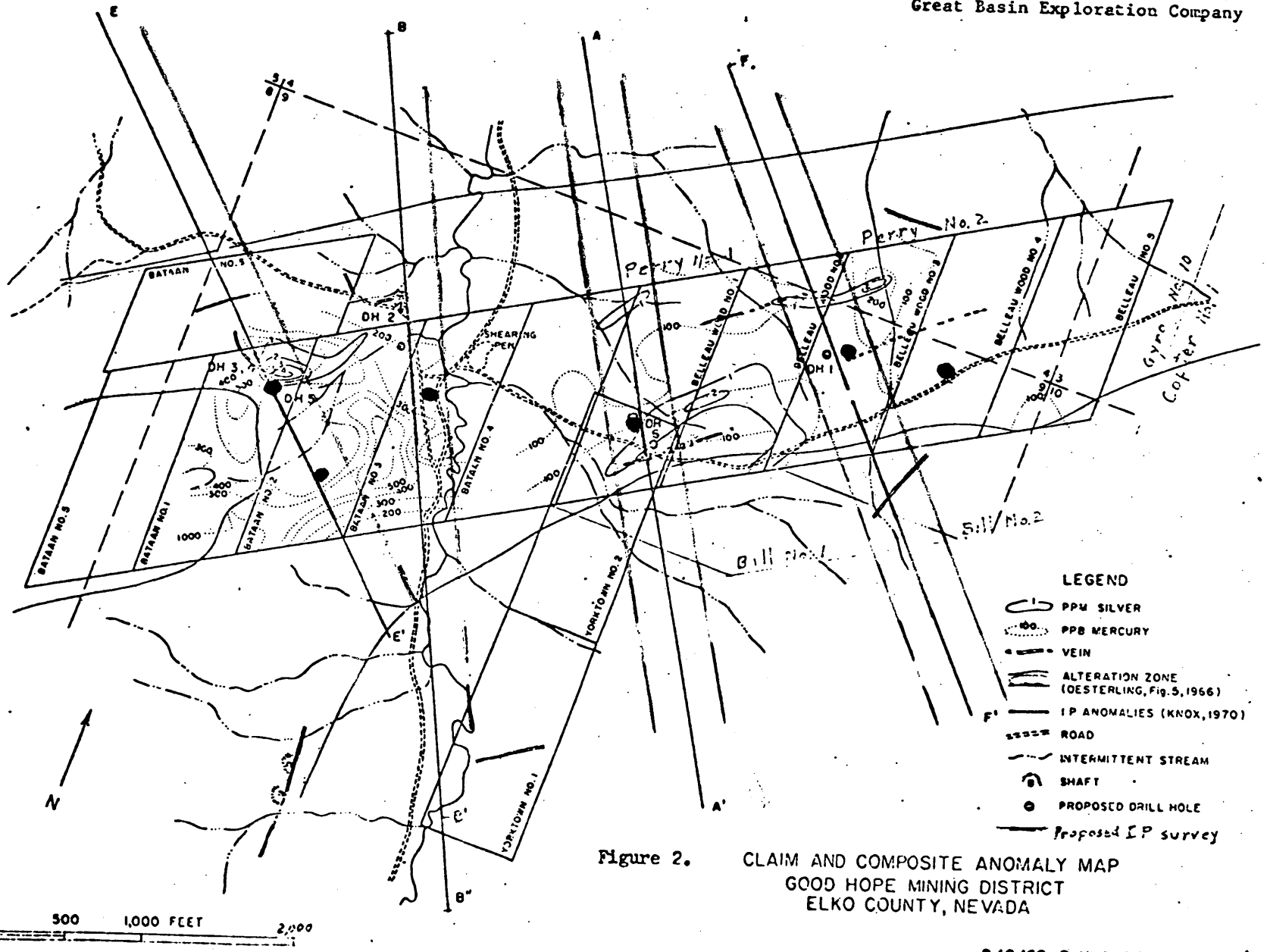

Figure 2. CLAIM AND COMPOSITE ANOMALY MAP
GOOD HOPE MINING DISTRICT
ELKO COUNTY, NEVADA

2/8/68 R. HUGHES AND A. PAYNE

Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

August 7, 1972

Mr. Alexander von Hafften
3898 Washington Street
San Francisco, California 94118

Re: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Cal 120 M
HK 120
Ray ~~Bweeks~~

Dear Mr. von Hafften:

Enclosed are the original and three copies of proposed Amendment No. 1 (three pages) to the original contract, signed for the Government. If the proposed amendment is satisfactory to you, please sign all copies and return all except the Operator's copy--which is for your use--to this office.

If any part of the proposed amendment does not have your approval, the original and all copies should be returned to this office together with the proposed changes for consideration.

Sincerely yours,

H. K. Stager
Field Officer
OME, Region II

Enclosures

cc: OME, Wash., D.C.
DRF
ACG RF
MP RF
Docket

RMSmith:mkh

file

OFFICIAL COPY
O. M. E.
RECEIVED
AUG 3 1972

INITIALS	CODE
Kirkemo	8/3/72
Weeks	8/3/72
Gaur	8/4/72

August 3, 1972

Memorandum

To: Field Officer, Region II

From: Chief, Office of Minerals Exploration

Subject: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Enclosed are the original and three copies of proposed Amendment No. 1 (three pages) to the subject contract, signed for the Government. An extra copy of the amendment is also enclosed for field use.

If the proposed amendment is satisfactory to you and the Operator, all four copies should be signed by Mr. von Hafften and distributed as usual.

If any part of the proposed amendment does not have your approval or that of the Operator, the original and all copies are to be returned to this office together with the proposed changes for consideration.

Harold Kirkemo

Harold Kirkemo

Enclosures

cc: Director's Reading File
Mineral Resources
OME Reading File
Mr. Kirkemo
130

HKirkemo:ohm 8/3/72

DRAFT 7/31/72 R. WEEKS/H. KIRKEMO/seb

EXPLORATION CONTRACT
ALEXANDER VON HAFFTEN d/b/a
GREAT BASIN EXPLORATION COMPANY
OME-6854
AMENDMENT NO. 1

It is agreed this_____ day of_____, 1972, between the United States of America, acting through the Department of the Interior, U. S. Geological Survey, hereinafter called the "Government", and Alexander von Hafften, d/b/a Great Basin Exploration Company, hereinafter called the "Operator", that Exploration Contract 2303 (OME-6854), dated April 27, 1972, is amended effective_____, 1972, as follows:

In Exhibit A:

a. Under the heading "General Provisions," the first paragraph, page 1, is revised to read:

"The induced polarization survey shall be performed using a dipole spacing of 300 feet, or with prior Government approval, 600 feet. Interpretation shall include results down to the n=6 separation if possible".

b. A new paragraph is added on page 2 as follows:

"Funds not expended in Stage I may be added to Stage II."

c. Under the heading "Description of the Work" Stage I, page 2, is revised to read:

"The work shall consist of an IP survey along six traverses each about 4,200 feet long located approximately parallel with and about 200 feet from existing traverses A, B, E, and F. In addition, one longitudinal traverse about 9,000 feet long may be run at approximately a right angle to the existing traverses, and another traverse about 4,800 feet long may be run

approximately parallel with the existing traverses. The Operator shall make a report on the interpretation of the results of the geophysical work. Locations of the existing traverses and tentative locations of the first six proposed traverses are shown on Figure 2 entitled 'Claim and composite anomaly map, Good Hope mining district, Elko County, Nevada,' attached hereto and made a part hereof."

d. Under the heading "Estimated Costs of the Work," Stage I on pages 2 and 3, is revised to read:

"Stage I

Actual Costs

Category (1) Independent Contracts		
Geophysical survey, 25,200 feet or more, including mobilization, demobilization, labor, standby time, equipment, supplies, final report		
1 job	$3,935.00	
Total Category (1)		$3,935.00
Category (2) Personal Services		
Subcategory (a) Supervision and Technical Services		
None except:		
1 outside consultant		
7 days at $140.00/day	$ 980.00	
Total Category (2)		$ 980.00

Category (7) Miscellaneous		
Transportation, outside consultant		
1,958 miles at $0.12/mile (rounded)	$ 235.00	
Per diem, outside consultant		
7 days at $20.00/day	140.00	
Total Category (7)		$ 375.00
Total Estimated Cost Stage I		$5,290.00
Government Participation at 75% (rounded)		$3,970.00"

This amendment shall not be construed to increase the estimated total cost of the Contract, the aggregate amount which the Government may be required to contribute, the amount of any item designated as maximum, nor the fixed unit cost of any item of work.

Except as amended herein Exploration Contract 2303 (OME-6854), dated April 27, 1972, shall remain in full force and effect.

Executed in quadruplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By _____
Chief, Office of Minerals Exploration

ALEXANDER VON HAFFTEN d/b/a
GREAT BASIN EXPLORATION COMPANY

By _____

Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

OFFICIAL
COPY
O. M. E.
RECEIVED
AUG 3 1972
INITIALS CODE
RMW
HK

July 31, 1972

Mr. Alexander von Hafften
Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

Re: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Dear Mr. von Hafften:

We have reviewed the report dated June 1972 by Heinrichs Geoexploration Company on the completed IP survey in the Good Hope area, and the letter of July 13, 1972, to you from Mr. E. F. Lawrence in which he recommends six drill sites.

The subject contract specifies that the location, direction, and extent of each work item shall be subject to Government approval (Exhibit A, General Provisions).

This letter is your authorization to proceed with the work in Stage II of the contract in accordance with the provisions of the contract and with the recommendations in Mr. Lawrence's letter.

Sincerely yours,

H. K. Stager
Field Officer
OME, Region II

cc: OME, Wash., D.C.
DRF
ACG RF
MP RF
Docket

RMSmith:mkh

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code
7/28	Kirkemo	120

July 28, 1972

Memorandum

To: The File

From: Robert A. Weeks

Subject: OME-6854 (Silver, Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

Justification for Amendment No. 1

The geophysical surveys authorized under Stage 1 of the subject contract have been completed, and revealed more complexity than anticipated in that the anomalies extended beyond the lines originally approved. The Field Officer gave verbal authorization to exceed the estimated lineal feet of I P surveys and a wider dipole spacing on the additional line needed to help define the anomaly.

The I P survey has been completed at a cost less than the amount estimated for it in Stage 1 of the contract.

Because of the complexities revealed by the I P survey, the services of the geological consultant have been needed more than was originally estimated. I concur with the Field Officer's recommendation that the funds not expended for the geophysical survey be made available for the additional time, travel, and per diem for the consultant.

Robert A. Weeks
Robert A. Weeks

cc: Director's reading file
Mineral Resources
OME reading file
Mr. Weeks
Mr. Kirkemo

RWeeks:cac 7/28/72

United States Department of the Interior

GEOLOGICAL SURVEY
Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

July 20, 1972

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COPY
O. M. E.
RECEIVED
JUL 24 1972
INITIALS | CODE
Cac | 120
Rus Brooks
HX

Memorandum

To: Chief, Office of Minerals Exploration
Washington, D. C.

From: Field Officer
Region II

Subject: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

The Operator requested on June 2, 1972, and I orally approved authorization to perform additional IP traverses to delineate an open-ended anomaly discovered by the traverses already completed which included all of the IP traverses specified in the contract. Two of the completed traverses--those parallel with line F--indicated an anomaly open to the east. Additional traverses are needed to locate the center of this anomaly and to select the most favorable site for proposed drill hole No. 1.

Funds are available for the additional traverses from savings in mobilization costs. The independent contractor had a crew and equipment in Reno, Nevada, at the time this job was scheduled, thereby saving mobilization from Tucson, Arizona.

Any savings not needed for the additional IP traverses should be applied to consulting services, which are now expected to exceed the original estimate owing to the added complexity revealed by the IP work.

We recommend that Contract 2303 (OME-6854) dated April 27, 1972, be amended effective June 2, 1972, as follows:

In Exhibit A:

1. Under the heading General Provisions:

   a. The first paragraph is revised to read as follows:

      The induced polarization survey shall be performed using a dipole spacing of 300 feet or, with prior Government approval, 600 feet. Interpretation shall include results down to the n = 4 separation, and to the n = 6 separation if possible.

   b. The following paragraph is added:

      Funds not expended in Stage I may be added to Stage II.

2. Under the heading Description of the Work, Stage I, the following sentence is added to the first paragraph:

   In addition, one longitudinal traverse about 9,000 feet long may be run at approximately right angles to the existing traverses, and one supplementary traverse about 4,800 feet long may be run approximately parallel with the existing traverses.

Under Estimated Costs of the Work, Stage I is revised to read as follows:

Estimated Costs of the Work

" Stage I

Actual Costs

Category (1) Independent Contracts

Geophysical survey, 25,200 feet or more, including mobilization, demobilization, labor, standby time, equipment, supplies, final report 1 job	$3,935.00	
Total Category (1)		$ 3,935.00

Category (2) Personal Services

Subcategory (a) Supervision and Technical Services

None except:

1 outside consultant 7 days at $140.00/day	$ 980.00	
Total Category (2)		$ 980.00

Category (7) Miscellaneous

Transportation, outside consultant 1,958 miles at $0.12/mile (rounded)	$ 235.00	
Per diem, outside consultant 7 days at $20.00/day	140.00	
Total Category (7)		375.00
Total Estimated Cost Stage I		$ 5,290.00
Government Participation at 75% (rounded)		$ 3,970.00

R. M. Smith
for H. K. Stager

United States Department of the Interior

GEOLOGICAL SURVEY
Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

May 22, 1972

Memorandum

To: Chief, Office of Minerals Exploration
Washington, D. C.

From: Field Officer
Region II

Subject: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada
Contract 2303

OFFICIAL COPY
O. M. E.
RECEIVED
MAY 24 1972

INITIALS	CODE
Cac	120
Gla	131
HK	120
	120

Enclosed are the Government's copy and Budget and Finance's copy of the subject contract signed by the Operator. The other copies have been properly distributed.

R M Smith
for H. K. Stager

Enclosures

Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

May 5, 1972

COPY
MAY 8 1972
cc 120 M
Zla 130
HK 120
Bureka

Mr. Alexander von Hafften
3898 Washington Street
San Francisco, California 94118

Re: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada

Dear Mr. von Hafften:

Enclosed are the original and three copies of a proposed contract to explore the Good Hope Property. The contract consists of MME Form 50 (seven pages), Annex I (two pages), one Lien and Subordination Agreements (two pages), Exhibit A (five pages), Exhibit B (one page), Exhibit C (one page), and two maps (Figures 1 and 2). All copies of the contract have been signed for the Government.

If the proposed contract is satisfactory to you, all four copies should be signed by you. The Government's copy, Budget and Finance's copy, and Field Office's copy should then be returned to this office; the Operator's copy should be retained for your own use.

The 8 percent interest accrues from the dates on which individual payments are made by the Government, and like the principal is repayable from royalty on production.

If any part of the proposed contract does not have your approval, the original and all copies should be returned to this office with the proposed changes for consideration.

Sincerely yours,

H. K. Stager
Field Officer
OME, Region II

cc: OME, Wash., D.C.
DRF
ACG RF
MP RF
Docket

RMSmith:mkh

Enclosures

Form 7
(3)

OFFICIAL FILE COPY

Date	Surname	Code
4-4-72	Neeley	
4/4/72	Kirkemo	
4/4/72	Gair	
4/4/72	Albers	
4/7/72	Menen	

APR 27 1972

Memorandum

To: Field Officer Region II

From: Chief, Office of Minerals Exploration

Subject: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada

Enclosed are the original and three copies of a proposed contract to explore the subject property. The contract consists of MME Form 50 (seven pages), Annex I (two pages), 1 Lien and Subordination Agreements (two pages), Exhibit A (five pages), Exhibit B (one page), Exhibit C (one page), and two maps (Figures 1 and 2). All copies of the contract have been signed for the Government. You should insert the date for commencement of the work. An extra copy of the contract is enclosed for field use.

If the proposed contract is satisfactory to you and the Applicant, all four copies should be signed by an authorized representative of the Applicant. Thereafter, please distribute the copies as usual.

Please advise the Applicant that the 8 percent interest accrues from the dates on which individual payments are made by the Government and like the principal is repayable from royalty on production.

If any part of the proposed contract does not have your approval or that of the Applicant, the original and all copies should be returned to this office together with the proposed changes for consideration.

Please note insertion of a revised Exhibit B prepared in accordance with recent Civil Rights legislation and instructions to us from the office of the Solicitor, and of Exhibit C, entitled "Certification of Non-segregated Facilities"

Before work begins on this project, we suggest that you review with the Operator the terms and provisions of the contract. Emphasize the importance of keeping suitable records and accounts, and documentary evidence for all costs claimed as required under Article 5(a) and (b) and Article 6 (a) (1).

Harold Kirkemo

Harold Kirkemo

Enclosures

cc: Director's reading file
Mineral Resources
OME reading file
Mr. Kirkemo
130
HKirkemo/cac 4/4/72

United States Department of the Interior

GEOLOGICAL SURVEY
Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

April 25, 1972

INITIALS	CODE
Cal	120 M
Gla	130
Hrz	120
	B Weeks

Memorandum

To: Chief, Office of Minerals Exploration
Washington, D. C.

From: Field Officer
Region II

Subject: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a/
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada

Enclosed are four copies of a certification of nonsegregated facilities signed by the independent contractor for the drilling under the proposed contract.

R M Smith
for H. K. Stager

Enclosures

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code
3/29/72	Weeks	120
		220
		120M

AIRMAIL

MAR 29 1972

Mr. Alexander von Hafften
d/b/a Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

Re: OME-6854 (Silver-Gold)
Alexander von Hafften d/b/a
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada

Dear Mr. von Hafften:

We were advised recently that inasmuch as OME contracts are classified as construction contracts, one document must be submitted to you for information and one signed by your drilling contractor and returned to us before we can forward to you an OME contract now in final preparation.

The regulations of the Secretary of Labor provide that, in order to comply with the Equal Opportunity clause, a contractor (or subcontractor) under a Federally assisted construction contract for work units exceeding $10,000 in Federal funds, must provide facilities for employees in such a manner that segregation cannot result, and the regulations require that a certification in this regard be obtained before the award of any Federally assisted construction contract or subcontract thereunder (41 U.S.C. 60-1.8). The Federal Procurement Regulations implement regulations of the Secretary of Labor and require such certification and the giving of notice to applicants and potential subcontractors.

Accordingly, we enclose for your information Exhibit A, entitled, "Notice to Prospective Federally Assisted Construction Contractors," which should have been attached to the application form, MME Form 40.

As the Government's share of estimated costs for work on your project other than that to be performed by contractors is less than $10,000, you are not required to execute a Certificate of Nonsegregated Facilities. For the same reason, the contractor for the geophysical work is not required to submit a certificate.

However, as the Government's share of the estimated cost for drilling exceeds $10,000, please ask your contractor to sign and return to you four copies of the enclosed Exhibit C, entitled, "Certification of Nonsegregated Facilities," prior to your award of a contract to the

drilling company. Please forward the signed copies to this office so that they may be attached to each copy of your contract which should be ready for transmittal in a week or two.

Sincerely yours,

Harold Kirkemo

Harold Kirkemo
Chief, Office of
Minerals Exploration

Enclosures

cc: Director's Reading File
Mineral Resources
OME Docket
OME Reading File
OME Region II w/cys Exhibit A and Exhibit C
Mr. Kirkemo

HKirkemo/gla 3-29-72

DRAFT 2/23/72
HKirkemo/gla

MME Form 50
July 1965

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

RECEIVED
MAR 28 1972
MINERAL RESOURCES and
GENERAL LEGAL SERVICES

EXPLORATION CONTRACT
(Long Form)

Docket No.	Commodity	Contract No.	County	State
OME - 6854	Silver-Gold		Elko	Nevada

It is agreed _____ (Date), between the United States of America, acting through the Department of the Interior, U. S. Geological Survey, hereinafter called the "Government," and

Alexander von Hafften d/b/a

Great Basin Exploration Company,

whose mailing address is 3898 Washington Street, San Francisco, California 94118, hereinafter called the "Operator," as follows:

ARTICLE 1. Authority and scope.--(a) This contract entered into under the authority of Public Law 701, 85th Cong., 2d sess. (72 Stat. 700; 30 U.S.C. § 641 - 646), consists of this form, the attached Annex I (land description), Exhibit A (work and costs), and the maps and documents listed. The work is a search for new or unexplored deposits of the commodity designated above. The Operator shall begin the work on or before _____ (Date), and, subject to the provisions of Article 9 and Exhibit A, shall either have completed the work within 12 months from the date of the contract or shall have incurred allowable costs (see Article 6) in a sum not less than the total cost set forth in Exhibit A.

(b) The total allowable cost of the work set forth in Exhibit A is $ 27,100.00. The Government will contribute ~~50~~ 75 percent of the allowable costs as they are incurred, in a total sum not in excess of $ 20,325.00 in accordance with the provisions of Articles 3, 4, 5, and 6. "Costs incurred" means costs that have been paid or have become due and payable, or that the Government determines have become obligations.

(c) Interest computation.--Simple interest at the rate of ____ percent shall accrue from the dates Federal funds are made available until the period specified for payment of royalty expires, or until the amount of Federal funds contributed is fully repaid with interest.

(d) The Operator shall not transfer or assign this contract or any right or obligation thereunder without the written consent of the Government.

ARTICLE 2. Operator's right in land.--(a) The Operator represents and undertakes that Annex I correctly describes the land which is the subject of this contract and the nature of the Operator's right of property and possession therein (whether as owner, lessee, or otherwise), and that such right, title, or interest is subject only to the following claims, liens, or encumbrances:

SEE ANNEX I

(b) The Subordination Agreement of the holder of any claim, lien, or encumbrance listed above and (if the Operator does not hold the legal title) the lien agreement of any holder of the legal title of the land (lessor, seller, optionor, etc.) are attached as follows:

SEE ANNEX I

(c) The Operator shall preserve and maintain his right, title, or interest in the land and his right to the possession thereof for the purposes of this contract, and shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of this contract. The Operator shall neither transfer, convey, nor surrender the land nor any right, title, or interest therein, nor permit nor suffer any claim, lien, or encumbrance thereon, without expressly referring to and providing in the instrument of conveyance, lien, or encumbrance for the preservation of the Government's right to a royalty on production and liens for the payment thereof. Two true copies of such instrument shall be furnished to the Government. If the Government's rights to royalty as provided in Article 7 have been terminated, the provisions of this paragraph (c) shall become inapplicable.

ARTICLE 3. Performance of the work.--(a) Operator's responsibility.--The work shall be performed diligently, efficiently, in a workmanlike manner in accordance with good mining standards, and in compliance with State laws governing health, safety, and liability insurance covering employment. The Operator shall provide suitable and adequate equipment, facilities, materials, supplies, and labor to complete the work as specified in Article 1(a).

(b) Independent contracts.--To the extent that the allowable costs are estimated in Exhibit A with express reference to performance by independent contractors on a unit-price basis (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations), the work may be so performed (see Article 6(a), Category (1)). Any such independent contract shall refer to some specific and identifiable part of the work, and shall be subject to all of the pertinent terms and conditions of this exploration contract; but the Government shall not be considered a party thereto, and its rights under this contract, including the right to terminate its contributions, shall not be affected thereby. Regardless of the provisions of any such independent contract, the Government will participate in payments to the independent contractor only as to work performed in accordance with the provisions of this exploration contract, and only to the extent that the Government deems the unit prices for the work under the independent contract to be reasonable.

(c) Government may inspect.--The Operator shall consult with and inform the Government on all phases of the work as it progresses. The Government may enter at all reasonable times to inspect the work under the contract and production operations during the period that royalty is payable to the Government. The Operator shall provide the Government with all reasonable means of access for such inspections.

ARTICLE 4. Contribution by the Government.-- The Government will make its contribution on the basis of the monthly vouchers referred to in Article 5(b), but all payments by the Government are provisional only, subject to audit. Until the account between the Operator and the Government is finally audited and settled and the Operator's final report has been received, the Government may withhold such sums as are necessary to protect its interests. The Government may make payments for the account of the Operator directly to independent contractors and suppliers rather than to the Operator.

ARTICLE 5. Reports, accounts, audits.--(a) Operator's records.--The Operator shall keep suitable records and accounts of the work performed and of any production in which the Government may have an interest; and shall preserve those with respect to work performed for at least three years after final payment by the Government, and those with respect to production for at least three years after any obligation to pay royalties to the Government has terminated. The Government may inspect and audit said records and accounts at any time, either by itself or by a certified public accountant. The Comptroller General of the United States or his representative, until the expiration of said three-year periods, shall have access to and the right to examine all pertinent books, documents, papers, and records of the Operator. If work under this contract 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 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.

(b) Monthly reports.--The Operator shall provide the Government with four copies of monthly reports in three sections as follows:

(1) Operator's Monthly Voucher claiming costs for work performed;

(2) Operator's Progress Report showing the number of units of the various types of work performed; and

(3) a narrative report of the work performed during the reporting period, including adequate engineering-geological maps or sketches, drill hole logs and locations, and assay reports on samples taken concurrently with advance in mineralized ground.

(Forms for reporting under (1) and (2) above will be provided by the Government; however, the original of the Operator's Monthly Voucher shall be supported by documentary evidence, such as certified copies or transcripts of payrolls and invoices, for all costs claimed under Article 6 (a) (1).)

(c) Final report.--Upon completion of the work or termination of the Government's obligation to contribute to costs, the Operator shall furnish the Government with three copies of a final report (in addition to the final monthly report). This final report shall include a geological and engineering evaluation of the results of the work performed under the contract with an estimate of the ore reserves resulting from such work, complete assay data, adequate geological and engineering maps or sketches, and a summary of the work performed and the related costs.

(d) Report of sales.--The Operator shall provide the Government with suitable accounting and documentary evidence covering all production to which the Government's royalty relates, such as two copies of smelter or concentrator settlement sheets and certified accounts of production and sale or other disposition of production.

(e) Compliance with requirements.--If the Government determines that any of the Operator's reports, records, or accounts are insufficient or incomplete, or if the Operator fails to make them, the Government may procure the preparation or completion of the same with suitable attachments as an expense of the work to which the Operator shall contribute. The Government may withhold approval and payment of any vouchers relating to insufficient or incomplete reports, records, or accounts.

ARTICLE 6. Costs.--(a) Allowable costs.--The allowable costs of the work to which the Government will contribute are limited to:

(1) the necessary, reasonable, and direct actual costs that are estimated in Exhibit A by categories as specified in this article; and

(2) fixed costs for units of work to be performed (per foot, per hour, etc.) agreed upon in lieu of actual costs and set forth in Exhibit A.

The Government will not contribute to costs under any category or subcategory omitted from the estimate of costs in Exhibit A. Any excess over any estimate which is indicated as the maximum of any category, subcategory, or item, either as to requirement or related cost; any excess over a fixed unit cost; and any excess over the total allowable cost of the work are not allowable. The Operator shall incur such excesses for his own account without contribution by the Government, but the Operator is not obligated to incur more than his agreed percentage of the total allowable cost of the work.

Any category or subcategory or element thereof not designated as a maximum in this article, or in Exhibit A may be exceeded, provided that the total allowable cost of the work, which is a maximum, is not exceeded.

CATEGORY (1)--INDEPENDENT CONTRACTS.--(See Article 3(b)). The total of this category and the average unit cost estimated for each type of work to be performed under an independent contract are maximums.

CATEGORY (2)--PERSONAL SERVICES.

Subcategory (a)--Supervision and Technical Services--All elements of this subcategory (number of supervisors, technicians, outside consultants, periods of employment, rates of pay, and total) are maximums.

Subcategory (b)--Labor.

CATEGORY (3)--OPERATING MATERIALS AND SUPPLIES.--Includes such items as drill bits and steel, explosives, fuel, pipe, power, timber, rail, and small tools costing less than $50 each.

CATEGORY (4)--OPERATING EQUIPMENT.

Subcategory (a)--Rental.--The number of each rented item [6 mine cars, 1 truck], the rate of rental [$100 per month, $5 per hour], and the total of this subcategory are maximums.

Subcategory (b)--Purchases.--The total of this subcategory is a maximum.

Subcategory (c)--Depreciation.--All elements of this subcategory (time periods, rate of depreciation, and subcategory total) are maximums.

CATEGORY (5)--INITIAL REHABILITATION AND REPAIRS.--Costs of items listed under this category include all requirements, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The total of this category is a maximum.

Subcategory (a)--Initial rehabilitation and repairs of existing buildings, fixtures, and installations (exclusive of mine workings).--The total of this subcategory is a maximum.

Subcategory (b)--Initial rehabilitation and repairs of operating equipment.--The total of this subcategory is a maximum.

CATEGORY (6)--NEW BUILDINGS, FIXTURES, AND INSTALLATIONS (EXCLUSIVE OF MINE WORKINGS).--Costs of items listed under this category include all requirements, such as labor, materials and supplies, and supervision at a rate not higher than provided for in Category (2), and shall not be duplicated under any other category. The total of this category is a maximum.

CATEGORY (7)--MISCELLANEOUS.--Includes requirements and costs that do not fall within any of the first six categories, such as repairs other than initial and maintenance of operating equipment, analytical work, prints and other reproductions, accounting, Operator's share of payroll taxes, liability insurance covering employment, travel, and communications.

(b) Nonallowable costs.--In addition to the limitations imposed by paragraph (a) of this Article 6 the Government will not contribute to the following costs:

(1) Costs of the land, such as rental, depreciation, depletion, or other costs of acquiring, owning, or holding possession;

(2) Indirect costs, such as general overhead, corporate management, interest, taxes (other than payroll and sales taxes), insurance (other than liability insurance covering employment), damages to persons, damages to property (other than necessary repairs or replacements of equipment or other property used in the work);

(3) Previous work performed or costs incurred before the date of this contract; and

(4) Deferred payments.--Any costs incurred by the Operator under any rental-purchase agreement, installment-purchase agreement, or any agreement for the purchase of goods under the provisions of which payment of the full purchase price is deferred more than 90 days from the delivery of the goods, unless the purchase agreement is approved by the Government in writing.

(c) Reductions in costs.--The Operator shall account for and give the Government credit for any incidental benefits, credits, or money received in the ordinary course of business in prosecuting the work (as by salvage or sale of materials or equipment, furnishing of room or board, furnishing of power or services to third persons, rebates or discounts on purchases, etc.), in the same ratio in which the Government contributes to costs; and such amounts shall be treated as a reduction in costs incurred so that they are available for use within the limit of the original total cost. The provision does not apply to receipts from production which are subject to the Government's royalty under the provisions of Article 7.

ARTICLE 7. Repayment by Operator.--(a) Certification.--If the Government considers that mineral or metal production from the land covered by the contract may be possible as a result of the exploration work, it shall so certify in writing to the Operator at any time not later than six months after a sufficient final report and final accounting (see Article 5) have been furnished.

(b) Royalty on production.--The Operator, whether or not the producer (for example, if the Operator either transfers or does not retains his interest in the land), shall pay to the Government a royalty on all minerals and metals mined or produced from the land as follows:

(1) irrespective of any certification of possible production--from the date of the contract until the lapse of the time within which the government may issue such certification or until the total net amount contributed by the Government is fully repaid with interest, whichever occurs first; or

(2) if the Government issues a certification of possible production--for a period of ten years from the date of the contract, or until the total net amount contributed by the Government is fully repaid with interest, whichever occurs first.

(c) Payment of royalty.--(1) The Government's royalty shall be five percent of the gross proceeds (including any bonuses, premiums, allowances, or other benefits) from the production sold, in the form sold (ore, concentrate, 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 (such as treatment processes performed by the buyer, sampling and assaying to determine the value of the production sold, and freight payable by the buyer to a carrier (not the Operator or producer)), shall be allowed as deductions in arriving at the "gross proceeds" as that term is used herein. No costs of the Operator or Producer are deductible in arriving at the "gross proceeds" as that term is here used.

The term "treatment processes" means those processes (such as milling, concentrating, smelting, refining, or equivalent, but excluding fabricating or manufacturing) applied to the crude ore or other production after it is extracted from the ground to put it into a commercially marketable form.

(2) The Government's royalty shall be computed and paid currently upon each lot sold, held, or used in integrated operations, as the case may be.

(d) Unsold production.--If any production (ore, concentrate, metal, or equivalent), after the lapse of six months from the date the ore was extracted from the ground, remains neither sold nor used 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, concentrate, metal, or equivalent) it is in when the Government elects to require computation and payment. If any production is used 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 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) Lien for payment.--To secure the payment of royalty (see Article 7(b)), the Operator hereby grants to the Government a lien upon his interest in the land and upon any production of minerals and metals therefrom until the royalty claim is extinguished by lapse of time or is fully paid.

(f) Notice to purchasers.--The Operator or producer 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 Government, and this estimate shall be final and binding upon the Operator or producer.

(g) No obligation to produce.--Nothing in this contract shall be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any production operations.

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

ARTICLE 8. Interests in purchased property.--(a) Title and ownership.--All costs under this contract shall be incurred by the Operator in the Operator's own name and for the Operator's own account; but any property acquired to the cost of which the Government contributes shall belong to the Operator and the Government jointly in proportion to their respective contributions although title thereto shall be taken in the name of the Operator.

(b) Preservation of property.--Until the final disposal of any property in which the Government has an interest, the Operator shall preserve and protect same for the best interest of the Government, and any reasonable and necessary cost thereof will be treated as an allowable cost of the exploration. After the completion of the work, termination of the Government's obligation to contribute, or when such property is not being used for the work, the Operator shall not use it elsewhere without the written consent of the Government and without paying a reasonable rental to be fixed by the Government for its proportionate interest.

(c) Disposal of property.--Upon the completion of the work, termination of the Government's obligation to contribute to costs, or when the property is no longer needed for the work, the Operator shall promptly dispose of salable or salvageable property in which the Government has an interest for the joint account of the Government and the Operator, either by return to the vendor, sale to others, purchase by the Operator, or sale or transfer to the Government at a price at least as high as could be obtained from others, unless the Government in writing waives its interest in any such property. Without advance approval of the sales price by the Government, the Operator shall not sell at any price any item of property that cost more than $500, and shall not sell at less than 25 percent of the purchase price any item of property that cost $500 or less. The Government, in lieu of approving the sales price for any such item, may itself purchase the item at the best price which the Operator is able to obtain or offers. Property remaining upon any termination of the work shall be considered in groups or categories (such as drill steel, explosives, pipe, or rail), and if the original cost of the remaining unexpended portion of any such group or category is less than $50, the Government waives its interest therein. If necessary to accomplish the disposal of any item, the Operator shall dismantle and sever it from the land, the cost thereof to be treated as a cost of the exploration.

(d) Default of the Operator re disposal.--If within 90 days after the completion of the work, termination of the Government's obligation to contribute to costs, or after the property is no longer needed for the work, the Operator has failed to sell or otherwise liquidate or dispose of any property in which the Government has an interest, the Government, at any time prior to final settlement under the contract, may:

(1) in writing extend the time within which the Operator must dispose of or liquidate the property;

(2) by written notice to the Operator, place upon such property what it determines to be a fair valuation thereof, not in excess of the cost less 1.66 percent per month from the date such property was purchased under this contract to the termination of said 90-day period; and such property shall thereupon be considered and accounted for as having been purchased by the Operator at the valuation so fixed by the Government; and

(3) enter and take possession of such property wherever it may be found, and remove and dispose of it for the joint account of the parties.

ARTICLE 9. Termination of the Government's obligations.--(a) If the Government determines that operations at any time have failed to achieve anticipated results and further work is not justified, the Government may give the Operator written notice thereof, and thereupon:

(1) the Government shall be free of all obligation to contribute to costs not then incurred other than such as may be allowable under the provisions of the contract as necessary and incidental to final accounting and reporting; and

(2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to final accounting and reporting.

(b) If the Government determines that the Operator is in default under the terms of the contract, the Government may give the Operator written notice of such default with a specification of reasonable time within which the default must be cured; and if the Operator fails to cure such default as required, thereupon:

(1) the Government shall be relieved of all obligation to contribute to costs not incurred when the notice was given, other than such as may be allowable by the provisions of the contract as necessary and incidental to final accounting and reporting; and

(2) the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to final accounting and reporting.

The Government may also avail itself of any other remedy the law may provide for breach of contract, including the right to rescind the contract and to demand repayment of all moneys contributed by the Government under the contract.

(c) The giving of any notice by the Government under the provisions of this Article 9 shall not affect the Government's rights as provided for in the contract with respect to royalty and liens to secure the payment thereof, and such rights shall be fully preserved.

(d) The determinations of the Government are subject to appeal under Article 13.

ARTICLE 10. Notices to be given by the Government may be delivered to the Operator, or may be sent by certified mail addressed to the Operator at his mailing address stated in this contract. If mailed, notices are deemed to have been delivered five days after the date of mailing.

ARTICLE 11. Officials not to benefit.--No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this contract or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE 12. Nondiscrimination in Employment. The provisions respecting nondiscrimination in employment which are required by section 301 of Executive Order 10925, dated March 6, 1961 as amended and supplemented are attached hereto as Exhibit B and are hereby incorporated in and made a part of this contract.

ARTICLE 13. Disputes.--Any dispute arising under this contract which is not disposed of by agreement shall be decided by the Director, U. S. Geological Survey, who shall reduce his decision to writing and mail or otherwise furnish a copy thereof to the Operator. The decision of the Director, U. S. Geological Survey, shall be final and conclusive unless, within 30 days from the date of receipt of such copy, the Operator mails or otherwise furnishes to the Director, U. S. Geological Survey, a written appeal addressed to the Secretary of the Interior. The decision of the Secretary or his duly authorized representative for the determination of such appeals shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent, or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence.

The term "Director, U. S. Geological Survey," as used herein includes his duly authorized representative.

ARTICLE 14. Work Hours Act of 1962 - Overtime Compensation.--This contract, to the extent that it is of a character specified in the Work Hours Act of 1962 (Public Law 87-581, 76 Stat. 357-360) and is not covered by the Walsh-Healey Public Contracts Act (41 U.S.C. 35-45), is subject to the following provisions and to all other provisions and exceptions of said Work Hours Act of 1962.

(a) Overtime requirements.--No Operator or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any laborer or mechanic to be employed on such work in excess of eight hours in any calendar day or in excess of forty hours in any workweek unless such laborer or mechanic receives compensation at a rate of not less than one and one-half times his basic rate of pay for all hours worked in excess of eight hours in any such calendar day or in excess of forty hours in any such workweek, as the case may be.

(b) Violations; liability for unpaid wages; liquidated damages.--In the event of any violation of the clause set forth in subparagraph (a) of this paragraph, the Operator and any subcontractor responsible therefor shall be liable to any affected employee for his unpaid wages. In addition, such Operator and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for

liquidated damages. Such liquidated damages shall be computed, with respect to each individual laborer or mechanic employed in violation of the clause set forth in subparagraph (a) of this paragraph, in the sum of $10 for each calendar day on which such employee was required or permitted to work in excess of eight hours or in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in subparagraph (a) of this paragraph.

(c) Withholding for unpaid wages and liquidated damages.--The U. S. Geological Survey may withhold or cause to be withheld, from any moneys payable on account of work performed by the Operator or subcontractor, such sums as may administratively be determined to be necessary to satisfy any liabilities of such Operator or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (b) of this paragraph.

ARTICLE 15. Copeland (Anti-Kickback) Act--Nonrebate of wages.--The regulations of the Secretary of Labor applicable to contractors and subcontractors (29 CFR, Part 3), made pursuant to the Copeland Act, as amended (40 U. S. C. 276c) and to aid in the enforcement of the Anti-Kickback Act (18 U. S. C. 874) are made a part of this contract by reference. The Operator will comply with these regulations and any amendments or modifications thereof and will be responsible for the submission of affidavits required of independent contractors thereunder. The foregoing shall apply except as the Secretary of Labor may specifically provide for reasonable limitations, variations, tolerances, and exemptions.

ARTICLE 16. Changes and added provision.--

Prior to the award by the Operator of any contract for work to be done pursuant to this Exploration Contract, the Operator shall require the prospective contractor to submit a Certificate of Nonsegregated Facilities in the form set forth as Exhibit C to this Contract and by reference made a part hereof.

Executed in quadruplicate the day and year first above written.

ALEXANDER VON HAFFTEN d/b/a
GREAT BASIN EXPLORATION COMPANY

(Operator)

By _____

Title _____

THE UNITED STATES OF AMERICA

By _____
Director, U. S. Geological Survey

I, _____ (Name), certify that I am the _____ secretary of the corporation named as Operator herein; that _____ (Name), who signed this contract on behalf of the Operator, was then _____ (Title) of said corporation; that said contract was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

[CORPORATE SEAL]

DRAFT 2/23/72
HKirkemo/gla

EXPLORATION CONTRACT
ALEXANDER VON HAFFTEN d/b/a
GREAT BASIN EXPLORATION COMPANY
OME-6854

ANNEX I

The land, including all rights thereto, referred to in Article 2 of the contract consists of 13 unpatented lode mining claims hereinafter called the Great Basin group, 20 unpatented lode mining claims hereinafter called the Allied group, and 320 acres more or less of fee lands, in T. 41 N., R. 49 E., MDB&M, Good Hope mining district, Elko County, Nevada. These are recorded in the office of the County Recorder, Elko, Nevada, as follows:

Name	Book	Page
Great Basin group		
Bataan No. 1	56	60
Bataan No. 2	56	61
Bataan No. 3	56	62
Bataan No. 4	56	63
Bataan No. 5	83	552
Bataan No. 6	83	553
Belleau Wood No. 1	56	64
Belleau Wood No. 2	56	65
Belleau Wood No. 3	56	66
Belleau Wood No. 4	56	67
Belleau Wood No. 5	56	68
Yorktown No. 1	56	69
Yorktown No. 2	83	551

Name	Book	Page
Allied group		
Gyro No. 1	75	365
Gyro No. 2	75	366
Gyro No. 3	75	367
Gyro No. 4	75	368
Gyro No. 5	75	369
Gyro No. 6	75	370
Gyro No. 7	75	371
Gyro No. 8	75	372
Gyro No. 9	75	373
Gyro No. 10	75	573
Copter No. 1	75	569
Copter No. 2	75	570
Copter No. 3	75	571
Copter No. 4	75	572
Copter No. 5	75	374
Copter No. 6	73*	181*
Perry No. 1	75	574
Perry No. 2	75	575
Bill No. 1	77	33
Bill No. 2	77	34

*Number refers to the Notice of Location, not the Certificate of Location.

The fee lands, all in T. 41 N., R. 49 E., MDB&M, are as follows:

SW¼SW¼ sec. 3

E½W½, NW¼NW¼, NW¼SE¼ sec. 9

W½NE¼ sec. 16

The claim groups and fee lands are shown on Figure 1 entitled "Property map, Good Hope mining district, Elko County, Nevada," attached hereto and made a part hereof.

The Operator is the owner of the Great Basin group of unpatented lode mining claims by right of Deed and Assignment, dated March 6, 1968, from Great Basin Exploration Company, a co-partnership, and Anthony L. Payne.

The Operator is in possession of the Allied group of unpatented lode mining claims and of the fee lands under the terms of a 5-year Lease Agreement, dated August 1, 1969, from Allied Properties (a corporation), the owner.

A Lien and Subordination Agreements executed by Allied Properties on October 21, 1971, is attached and made a part hereof.

EXPLORATION CONTRACT
ALEXANDER VON HAFFTEN d/b/a
GREAT BASIN EXPLORATION COMPANY
OME-6854

EXHIBIT A

The purpose of the project is to explore for disseminated silver-gold-bearing ore bodies in Tertiary volcanic rocks by conducting a geophysical survey using the induced polarization (IP) method and by drilling promising anomalies using rotary drills.

General Provisions

The induced polarization survey shall be performed using a dipole spacing of 300 feet. Interpretation shall include results down to the n = 4 separation, and to the n = 6 separation if possible.

A bulldozer no smaller than the equivalent of a Caterpillar D-8 shall be used for preparation of access roads and drill sites.

All drill holes shall be cased as necessary and completed not less than 4½-inch diameter.

All drill cuttings shall be stored in suitable containers identified by hole number and depth.

Stored samples shall be made available for Government inspection and possible use, and may be disposed of only with prior Government approval.

All drill cuttings shall be logged and significantly mineralized cuttings shall be split and one split assayed for gold and silver.

Copies of geophysical data, drill logs, true copies of assay certificates, and maps or sketches showing the work completed, the location, width, and assay value of all samples assayed, and the geological formations and structures traversed by the drill holes shall be furnished monthly to the Government.

The Operator shall provide such equipment, materials, supervision, labor, and technical services as may be required to perform the work in a satisfactory manner.

The work shall be divided into two stages. The Operator shall complete all of Stage I and as much of Stage II as is warranted by the results obtained in Stage I.

The location, direction, and extent of each work item shall be subject to Government approval.

The Government will not contribute to the cost of incomplete drill holes, casing left in a hole at the request of the Operator, or holes drilled closer than 100 feet to the outer boundary of the project area.

Description of the Work

Stage I

The work shall consist of an IP survey along six traverses each about 4,200 feet long located approximately parallel with and about 200 feet from existing traverses A, B, E, and F, and a final report with an interpretation of the results.

Locations of the existing traverses and tentative locations of the proposed traverses are shown on Figure 2 entitled "Claim and composite anomaly map, Good Hope mining district, Elko County, Nevada," attached hereto and made a part hereof.

Stage II

The drill sites and hole depths to explore the IP anomalies indicated to be most favorable by the results of Stage I and of all previous geological work shall be selected by the Operator and approved by the Government prior to undertaking any work on Stage II.

Upon approval of a drilling plan, the work shall consist of bulldozing access roads to not more than five drill sites, leveling the sites, and rotary drilling not more than five vertical holes aggregating not more than 3,000 feet.

The tentative locations of the holes are shown on Figure 2.

When drilling is completed, the Operator shall fill all trenches and pits excavated in the course of the work in order to restore the land surface to its approximate original configuration.

Estimated Costs of the Work

Stage I

Actual Costs

Category (1) Independent Contracts

Geophysical survey, approximately 25,200 feet, including mobilization, demobilization, labor, standby time, equipment, supplies, final report 1 job	$4,890.00	
Total Category (1)		$4,890.00

Category (2) Personal Services

Subcategory (a) Supervision and Technical Services

None except:

1 outside consultant

2 days @ $140.00/day	$ 280.00	
Total Category (2)		280.00

Category (7) Miscellaneous

Transportation, outside consultant		
665 miles @ $0.12/mile	$ 80.00	
Per diem, outside consultant		
2 days @ $20.00/day	40.00	
Total Category (7)		120.00
Total Estimated Cost Stage I		$5,290.00
Government Participation at 75% (rounded)		$3,970.00

Stage II

Actual Costs

Category (1) Independent Contracts

Mobilization and demobilization	
One bulldozer	$ 250.00
Bulldozing access roads and drill sites, 24 hours at $30.00/hour	720.00
Mobilization, demobilization of drilling equipment	240.00

Rotary drilling, 3,000 feet		15,750.00	
Price per foot			
Depth, feet	Price		
0-300	$4.50		
300-600	6.00		
Reaming, setting and pulling casing			
12 hours at $25.00/hour		300.00	
Casing lost in hole			
184 feet at $1.25/foot		230.00	
Reaming bits			
2 bits at $115.00/bit		230.00	
Cementing, drilling cement			
36 hours at $25.00/hour		900.00	
Cement			
105 sacks at $2.00/sack		210.00	
Additives			
30 sacks at $9.00/sack		270.00	
Total - Category (1)			$19,100.00
Category (2) Personal Services			
Subcategory (a) Supervision and Technical Services			
None except:			
1 Outside consultant			
8 days at $140.00/day		$1,120.00	
Total - Category (2)			$1,120.00

Category (7) Miscellaneous

None except:

Travel, outside consultant		
2,660 miles at $0.12/mile	$ 319.00	
Per diem, outside consultant		
8 days at $20.00/day	160.00	
Sample sacks, cloth		
620 sacks at $0.30/sack	186.00	
Assays for gold and silver		
185 samples at $5.00/sample	925.00	
Total - Category (7)		1,590.00
Total Estimated Cost Stage II		$21,810.00
Government Participation at 75% (rounded)		$16,355.00

SUMMARY

Total Estimated Cost of Stage I	$ 5,290.00
Government Participation at 75%	$ 3,970.00
Total Estimated Cost of Stage II	$21,810.00
Government Participation at 75%	$16,355.00
Total Estimated Cost of the Project	$27,100.00
Government Participation at 75%	$20,325.00

United States Department of the Interior

GEOLOGICAL SURVEY
Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

January 28, 1972

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Memorandum

To: Chief, Office of Minerals Exploration
Washington, D. C.

From: Field Officer
Region II

Subject: OME-6854 (Silver-Gold)
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada

Enclosed are copies of additional documents you requested to support or clarify statements in the Application Report relating to the following items:

1. Ownership. Deed 9 August 1965 from R. A. Hughes to Great Basin Exploration Company, a co-partnership, for claims located by Hughes. Deed 24 July 1967 from A. L. Payne to Great Basin Exploration Company, a co-partnership, for claims located by Payne. Deed and Assignment 6 March 1968 from A. L. Payne to A. von Hafften dissolving the co-partnership and conveying all his interest in the Great Basin group to von Hafften who is continuing to do business as Great Basin Exploration Company.

2. Proof of Labor for 1971 confirming that the mining claims are valid.

3. Claim map showing location of all claims of the Allied group except George No. 1, which covers the Buckeye and Ohio Mine (section 16) and is shown on Figure 1 of the Application Report.

4. Financial statement--letter of intent signed by von Hafften confirming that the Applicant (Great Basin Exploration Company) can furnish its share of the costs.

If the Government prefers to exclude from the contract area some of the land included in the Lien and Subordination Agreements, then we suggest the following parcels which are not contiguous with the mining claims or necessary for the project.

T. 41 N., R. 49 E., MDB&M

Section 2 - E½ of E½, W½ of NE¼, NE¼ of NW½

Section 16 - W½ of NE¼, S½ of SW¼, NW¼ of SW¼

Of the unpatented lode mining claims of the Allied group, only the Bill No. 1, Bill No. 2, Perry No. 1, and Perry No. 2 are essential to the project. These four claims are shown on Figure 2 of the Application Report. We recommend, however, that all other claims of the Allied group be included in the project area, inasmuch as we have no strong justification for relinquishing the Government's rights to royalties, however slight their potential may be.

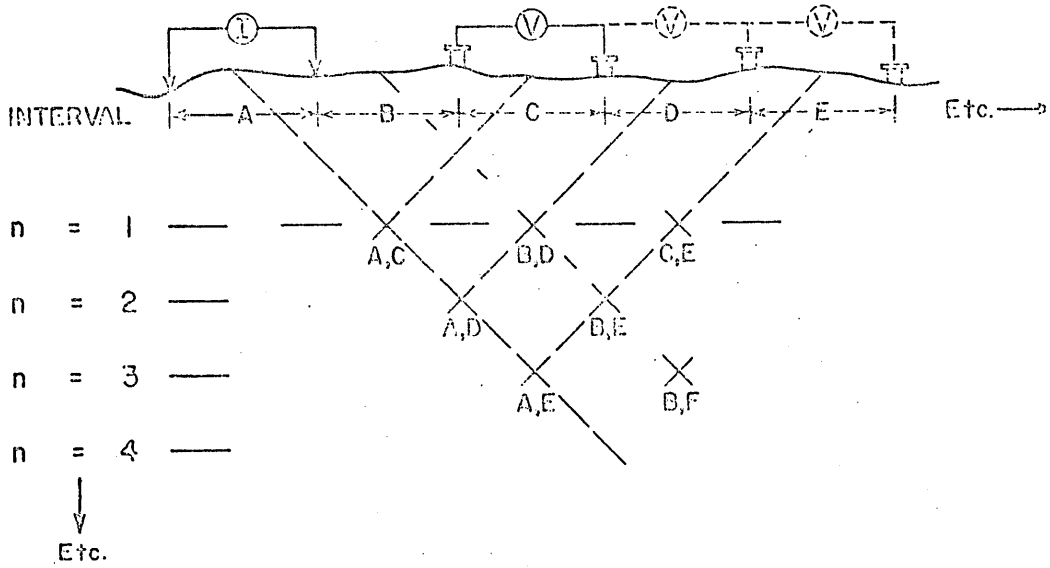
Additional claims are not warranted for the IP survey. IP lines 4,200 feet long on the surface explore areas 2,400 feet long at the n = 4 separation, which areas are entirely within the boundaries of the claims.

Although the generator and receiving voltmeters at the ends of the lines occupy sites on the public domain outside the Applicant's claims for a few hours, the ground directly below them is not explored (see illustration attached), and is not benefited by the work. To stake additional claims in order to own the land temporarily would be an unnecessary expense and of doubtful legal validity.

Government participation in work outside the claim boundaries which is necessary to accomplish exploration within the boundaries is analogous in principle to participation in the costs of mobilization and demobilization of bulldozers or drilling equipment. We consider that these costs are allowable under Article 6(a) of the contract, and are not disallowed under Article 6(b) or by Title 30.

R. M. Smith
for H. K. Stager

Enclosures



AT DATA POINTS A,C; A,D; A,E; Etc PLOT APPROPRIATE $\rho(W_1)$ WITH PFE SHOWN AS AN EXPONENT.
MAKE SECOND SIMILAR PLOT SHOWING MCF's.

FIG. 2. Field technique.

ALEXANDER VON HAFFTEN
369 PINE STREET
SAN FRANCISCO, CALIFORNIA 94104

January 19, 1972

Mr. Roscoe Smith
Office of Minerals Exploration
United States Geological Survey
345 Middlefield Road
Menlo Park, California

RE: OME Loan #6854

Dear Mr. Smith:

If Great Basin Exploration Company's loan application is approved, I will personally make arrangements to furnish Great Basin with sufficient funds to enable them to provide their share of the total contract cost; namely, twenty-five percent.

Very truly yours,

Alexander von Hafften

Alexander von Hafften

AVH:CAI

UNITED STATES

DEPARTMENT OF THE INTERIOR

ROGERS C.B. MORTON, SECRETARY

GEOLOGICAL SURVEY

OFFICE OF MINERALS EXPLORATION

REPORT OF EXAMINATION

REGION II

SUPPLEMENT TO APPLICATION REPORT

OME-6854 (Silver-Gold)
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada

By

R. M. Smith
Geologist
OME, Region II

Original report dated
October 28, 1971

ON-SITE REPORT SUPPLEMENT

The environmental impact of the proposed modified program was analyzed in accordance with procedures suggested in Circular 645 published in 1971 by the U. S. Geological Survey. Using the rating system proposed therein, where magnitude and importance of possible impact each range from 1 (lowest) to 10 (highest), and is either plus (beneficial) or minus (harmful), all proposed actions affecting the Good Hope mining district are either plus 1 or minus 1.

Assessment of environmental impact[1]

Proposed exploration project OME-6854

Good Hope mining district, Elko County, Nevada

1. The objective of the proposed project is to explore by Induced Polarization (I.P.) Surveys followed by rotary drilling from prepared surface sites for concealed ore bodies of disseminated silver minerals in volcanic rocks of Tertiary age. The need for silver in industry and the arts is self-evident.

The probability of a significant discovery by the proposed project is comparatively good. Alternative methods of exploration such as geochemical surveys, other types of geophysical surveys, and wildcat drilling would be less effectual and also would result in a somewhat greater environmental impact.

2. The Good Hope mining district covers an area of one township (T. 41 N., R. 49 E., MDBM) 6 miles square in Elko County, Nevada. It is within the Great Basin of the Great American Desert, at altitudes of 6,000 to 7,000 feet, and is snowbound nearly half of the year. It has been uninhabited since 1903 except for itinerant prospectors, cattle, and sheep. Game animals may be present, but only ticks, ants, and flies are in evidence. Soil and slope wash are thin, and vegetation is sparse, consisting mainly of sagebrush, small clumps of grass, and a few small stands of aspen in the higher canyons. Chino Creek, which drains the area, may be perennial.

---

[1] Leopold, L. B., Clarke, F. E., Hanshaw, B. B., and Balsley, J. R., 1971, A procedure for evaluating environmental impact: U. S. Geol. Survey Circ. 645, 13 p., 1 plate.

3. The proposed exploration consists of two activities: an I.P. survey and diamond drilling. The first requires no modification of the environment. Drilling requires a few hundred yards of access roads which will alter the land form. Since slopes are gentle, grading will result in a few embankments 1 to 3 feet high.

4. The impact on the environment is minimal. The I.P. survey will have no detrimental impact, and the access roads will be virtually indistinguishable within a few years. Their effect on the grazing value of the land will be insignificant. Drainage is not affected, and erosion will be modified only slightly and only temporarily.

Junk disposal is implicit in human occupation. Broken machinery and empty bottles will be unsightly for a time if not buried. Considering, however, that "The junk piles of one generation are the treasures of the next," it is not certain whether this impact should be rated plus or minus in the following "matrix."

Assessment of environmental impact

Proposed exploration project OME-6854

Good Hope mining district, Elko County, Nevada

Conditions, environmental	Actions, proposed or consequential: Roads and trails	Diamond drilling	Junk disposal	Other I.P. survey
Mineral resources		+1 / +1		+1 / +1
Land form	1 / 1			
Erosion	1 / 1			
Grass, shrubs, insects	1 / 1	1 / 1		
Scenic views	1 / 1		1 / 1	
Employment	+1 / +1	+1 / +1		+1 / +1

Explanation

Slash - indicates possible impact

Numbers - (+ indicates beneficial impact)

Upper left: magnitude of impact rated from 1 (least) to 10 (greatest)

Lower right: importance of impact rated from 1 (least) to 10 (greatest)

UNITED STATES
DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY
Office of Minerals Exploration
345 Middlefield Road
Menlo Park, California 94025

October 28, 1971

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Memorandum

To: Chief, Office of Minerals Exploration
Washington, D. C.

From: Field Officer
Region II

Subject: OME-6854 (Silver-Gold)
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada

Enclosed is an Application Report on the subject property recommending an OME contract providing for a supplemental geophysical survey followed by rotary drilling at an estimated cost of $27,100.00. Also enclosed are copies of the Applicant's revised proposal, supporting bids, Lien and Subordination Agreements, a financial statement, and drafts of a suggested Annex I and Exhibit A together with five extra copies of Figures 1 and 2 for your use if a contract is granted.

For the proposed bulldozing, a D-8 is considered necessary to be effective in the silicified areas.

If a contract is prepared in time to be signed by the Applicant by November 5, the work could be started on or before November 15, 1971; otherwise, the starting date should be June 1, 1972. The completion time in either case should be 12 months to allow for weather, report preparation, and availability of crews and equipment.

R. M. Smith
for H. K. Stager

Enclosures

UNITED STATES

DEPARTMENT OF THE INTERIOR

ROGERS C.B. MORTON, SECRETARY

GEOLOGICAL SURVEY

OFFICE OF MINERALS EXPLORATION

REPORT OF EXAMINATION

REGION II

APPLICATION REPORT

OME-6854 (Silver-Gold)
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada

By

R. M. Smith
Geologist
OME, Region II

October 28, 1971

ON-SITE REPORT

INTRODUCTION

Great Basin Exploration Company, Alexander von Hafften, President, 3898 Washington Street, San Francisco, California 94118, applied to the Office of Minerals Exploration, Docket OME-6854, for financial assistance in a $19,957.00 program to explore by drilling for silver-gold ore at the Bataan-Belleau Wood group of 13 claims in the Good Hope mining district, Elko County, Nevada. A field examination was authorized by OME and was made June 24, 1971, by R. M. Smith, accompanied by the Applicant's consulting geologist, Dr. Edmond F. Lawrence.

Outcrops in the claims area and the Good Hope district were examined and compared with geologic reports and maps of the district which had been prepared by R. D. Knox as a M.S. thesis. No samples were taken because production records, although incomplete, are more informative. One specimen of fossiliferous limestone was collected for age determination.

The proposed work was subsequently discussed with Mr. von Hafften, Dr. Lawrence, R. D. Knox, and with W. E. Davis (geophysicist, U. S. Geological Survey). A revised $27,100.00 program was mutually agreed upon. The Applicant submitted additional maps, a revised cost estimate, bids from two independent geophysics contractors and from two bulldozer contractors, a financial statement, and Lien and Subordination Agreements from the owner.

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The silver ore bodies in the Good Hope district are narrow veins along steep north- and northwest-striking faults in volcanic rocks of Tertiary age. The largest ore body mined was about 150 feet long, up to 5 feet wide, and was mined down dip for perhaps 100 feet. The ore was composed of pyrite,

arsenopyrite, stibnite, and pyrargyrite in a quartz gangue. The grade of ore mined is not known but total production may have been $100,000 in silver from as much as 5,000 tons of ore.

The largest ore body mined was in the Buckeye and Ohio Mine in the south-central part of the district. The Applicant's property, however, is in the north-central part of the district. It covers most of a northwest-trending zone of hydrothermal alteration 2,000 feet wide and 6,000 feet long. Within and on each side of the zone, geophysical and geochemical anomalies suggest the possibility of several deposits of disseminated sulfides.

There are no measured, indicated, or inferred reserves of ore grade on the Applicant's property, or in the district, but it is reasonable to infer several relatively small bodies of disseminated sulfides of unknown silver content in localities indicated by the geophysical and geochemical anomalies.

Induced Polarization (IP) surveys indicate eight anomalous localities, five of them exceeding 7 percent Frequency Effect (PFE). The anomalies are small and are indicated only along single survey lines which are spaced so far apart that the anomalies do not extend from one line to the next. Their lateral position and extent, therefore, are not known, and there is no assurance that any one of them could be hit with a single drill hole. The IP responses are large enough, however, to warrant closer spaced IP measurements to locate the largest response and to determine the lateral extent of anomalies.

I recommend, therefore, that the Government enter into an OME contract to provide 75 percent of the costs of a program of supplemental IP surveys to be followed by drilling as warranted.

LOCATION, ACCESS, FACILITIES

The Good Hope Property is in the Good Hope mining district, Elko County, Nevada, at altitudes of 6,000 to 6,400 feet in the northwest foothills of the Tuscarora Mountains. The property includes the area of the Good Hope Mine shown on the topographic map (1961) of the Mt. Blitzen 15-minute quadrangle.

The district is accessible by passenger car during dry weather but may be snowbound at times in winter. Driving time from Elko, Nevada, is 2½ hours (100 miles). State Highway 11 is paved 66 miles to Deep Creek. Four miles north of Deep Creek turn left (west) on a graded dirt road 19 miles to the I.L. ranch, then left (west and south) on the Midas road 5 miles, then left (south) on an unimproved road 6 miles to the Good Hope mine.

All necessary equipment, supplies, and services are available in Elko, Nevada, Reno, Nevada, or Salt Lake City, Utah, except independent contractors for geophysical surveys. Bids were received from Heinrichs Geoexploration Company and McPhar Geophysics, Inc., both of Tucson, Arizona.

PROPERTY

History and Production

The Good Hope mining district now includes the earlier Amazon Mine and district, and the Aurora district which included the area of the Good Hope, Buckeye-Ohio, Snyder, and Page and Kelly Mines. Only the Amazon, Good Hope, and the Buckeye and Ohio can now be identified on the ground.

The district "... is said to have produced over $100,000 in silver" (Emmons, 1910, p. 65, USGS Bull. 408), most of it from the Buckeye and Ohio during 1882-1884. Little, if any, mining has been done since 1903.

Ownership

The land included in the project area consists of 13 unpatented lode mining claims in secs. 3, 4, 8, 9, and 10, T. 41 N., R. 49 E., MDB&M, owned by the Applicant, and 21 unpatented lode mining claims and 720 acres of fee land in the same township (see Fig. 1) leased to the Applicant by Allied Properties of San Francisco, California. A copy of this lease is included in the application. In the event of an OME contract to extend the IP survey, Lien and Subordination Agreements have been obtained for all of the pertinent area except part of the S½ of the NE¼ of section 9 which is not necessary to the drilling project and is part of the public domain.

Development

There are no surface structures, and all the mines are inaccessible. Access roads have been bulldozed to the proposed sites of holes 3-4 and 5.

GEOLOGY

Geologic Setting

The oldest rock unit exposed in the district is quartzite of the Valmy(?) or Vinini(?) Formation of Ordovician age. It is overlain unconformably by volcanic rocks of Miocene(?) age which are overlain locally by erosion remnants of limestone containing Lymnaea-like fresh-water snails (gastropods) and elsewhere by volcanics of Pliocene(?) age. The older (Miocene) volcanics are locally mineralized.

Ore Deposits

The ore bodies are narrow quartz veins along faults that strike north or northwest and dip steeply west or southeast. They are confined to the older volcanics. The largest ore bodies mined were at the Buckeye and Ohio Mine

where two intersecting quartz veins as much as 5 feet wide contained pyrite, arsenopyrite, freibergite, stibnite, and dark ruby silver. A sample (Lawrence, 1963, p. 62, Nevada Bur. Mines Bull. 61) across 36 inches of vein material assayed 7.56 oz. silver, 14.1 percent antimony, and a trace of gold. The depth mined is not known, but probably did not exceed 100 feet.

On the Applicant's property, a mile north of the Buckeye and Ohio, the Good Hope Mine and one other--name unknown--were evidently less than 100 feet deep and produced very little. Fragments of ore contain early barren white quartz cut by irregular stringers of sulfide-bearing bluish quartz and by late barren white crustification quartz.

On the west side of the district, southwest of the Applicant's claims, barite veins as much as 3 feet wide occur in the older volcanics.

A zone of surface alteration of the older volcanics, notably silicification, is roughly coextensive with the Applicant's claims. The zone trends northwest, is about 2,000 feet wide, and more than 6,000 feet long. Argillization is also prominent in this zone, but it may be supergene and related to the shallow sea or lake in which the fresh-water limestone was deposited.

Sampling

Selected samples of quartz from dumps on the Applicant's claims assayed as high as $62 per ton in silver, and lower assays were obtained from seven other localities related to veins in the zone of alteration.

Geochemical sampling of the Applicant's claims indicates anomalous concentrations of silver in three localities, mercury in four localities, and arsenic in five localities. All three metals coincide in one locality at the north end of Bataan 1 claim (Figure 2). Silver and arsenic coincide roughly in one locality near the Good Hope Mine on Belleau Wood 2 claim,

and silver coincides with mercury near the north end of the Belleau Wood 3 claim.

Geophysical Surveys

Magnetic, VLF electromagnetic, and Induced Polarization surveys were conducted as a M.S. thesis project (Knox, 1970, 76 p., Univ. of Calif., Riverside), of which only the IP and magnetic surveys gave results directly applicable to exploration for silver. IP anomalies were detected in five localities on the Applicant's claims and in three other areas outside the claim area. Magnetic anomalies do not coincide with the IP anomalies, suggesting that the IP responses are not due to magnetite.

Ore Reserves

There are no measured, indicated, or inferred ore reserves in the Good Hope district. From the geological, geochemical, and geophysical surveys it is reasonable to infer several small bodies of disseminated sulfides of unknown silver content, but it is not possible to pinpoint their positions close enough to hit them with a drill hole.

EXPLORATION

In its original application, the Applicant proposed to test four localities by drilling five vertical holes to depths of 300 to 600 feet.

Hole	Location	Depth	Target
1	Belleau Wood 3	500	IP
2	Bataan 2	600	IP
3-4	Bataan 1	300 or 600	IP, Ag, Hg, As
5	Bataan 1	400	IP, Ag, Hg, As
6	Belleau Wood 1	600	IP, Ag, As
	Total	2,400 or 2,700	

One additional hole (No. 7) to test the Buckeye and Ohio veins at depth is no longer included in the proposed OME project.

The Applicant infers from the following geological relationships that silver minerals in commercial quantities may be disseminated in the wall rocks near the veins at depths of 300 to 700 feet. He considers the area of proposed Hole 1 to be most favorable because of the greater number of quartz veins.

1. Hydrothermal alteration--mainly silicification--of the wall rocks in the altered zone indicates that brecciation and mineralization were extensive.

2. Quartz veins and veinlets in the altered zone containing pyrite, arsenopyrite, stibnite, and small amounts of pyrargyrite and cinnabar indicate that sulfide mineralization occurred. (Silver-antimony ore produced from the Buckeye and Ohio veins was a mile from the zone to be explored, and is not directly relevant.)

3. Induced polarization surveys across the altered zone gave weak to moderate anomalies which indicate possible disseminated sulfide bodies in eight localities at depths of 300 to 700 feet. A survey for comparison across the Buckeye and Ohio veins (line G-G') gave a weak anomaly in the area of the veins.

4. Geochemical anomalies of silver, mercury, and arsenic coincide with each other and also with an IP anomaly in one locality. Silver and arsenic coincide roughly in one locality, and silver and mercury coincide in one locality.

5. Geologic similarity with the Calico silver district in San Bernardino County, California, where an extensive low-grade disseminated silver deposit occurs in volcanic rocks in a zone of alteration that includes silicification and baritization (Calif. Div. Mines and Geol., Mineral Inf. Service, Jan. 1967, v. 20, no. 1, p. 5).

Analysis of Applicant's Proposal

Induced Polarization surveys, which respond preferentially to large disseminated or massive deposits of minerals with metallic luster, are more diagnostic of disseminated sulfides than any other geophysical method. Magnetite, however, cannot be distinguished from sulfides, and some clay minerals may give weak anomalies which normally do not obscure strong anomalies from metallic minerals.

On the Applicant's property the type of deposit is inferred from the weak to moderate IP anomalies to be disseminated rather than massive, probably less than three percent sulfides. The minerals responsible for the IP anomalies are inferred from surface outcrops, from mine reports, and from geochemical surveys, to be mainly pyrite and arsenopyrite accompanied by small amounts of pyrargyrite, stibnite, and cinnabar. Magnetite is fairly abundant (2-4 percent) in andesite flows and intrusives, but the highest magnetic anomalies do not coincide with IP anomalies.

The IP survey of the Applicant's property is an excellent reconnaissance job. Spacing of the survey lines (as much as 1,800 feet) is so great, however, that correlation between lines is unreliable for lack of intermediate control points.

Because the distance on each side of a survey line at which a mineralized body might be detected is 450 feet (1.5 times the electrode spread of 300 feet), and because the better anomalies are indicated by only one or two readings on each of one or two levels, their exact locations and sizes are not known. Two or three holes might be needed just to find each anomaly. Even if found with the first hole, there is no way to predict where to drill the second. Moreover, the anomalies mapped may not represent the largest IP responses which would mark the centers of the mineral deposits. Additional parallel survey lines 200 feet on each side of the existing lines are desirable "... to locate the largest response and determine the lateral extent of anomalies" (Davis, W. E., 1971, written communication).

If, by a more detailed IP survey, the reconnaissance anomalies are confirmed, their centers located more precisely, and the best ones identified, then one drill hole in the center of each anomaly should answer the question of whether the mineralized bodies are of commercial grade. Additional holes to delineate the size and grade of each mineralized body could then be spotted from the data at hand. I consider the drilling originally proposed to be premature, and according to OME regulations to be prospecting rather than exploration.

These considerations were discussed with the Applicant's representatives who concurred and submitted a revised proposal for a two-phase program. The first phase consists of six lines of supplemental IP surveys. The second phase consists of drilling the four most favorable localities. Estimated cost of the revised program is $27,100.00.

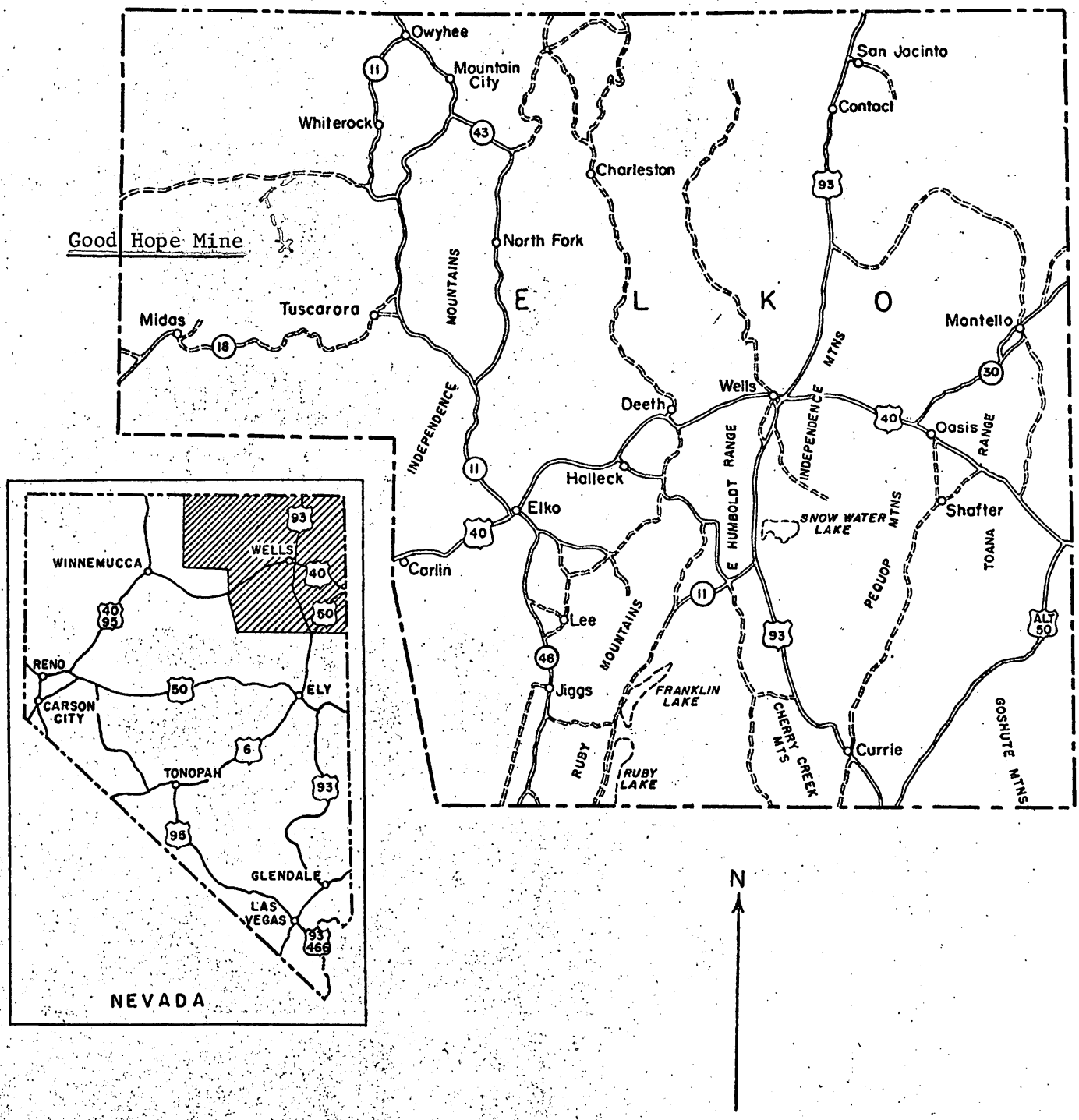

Figure A. INDEX MAP OF ELKO COUNTY, NEVADA

0 25 50 75 MILES

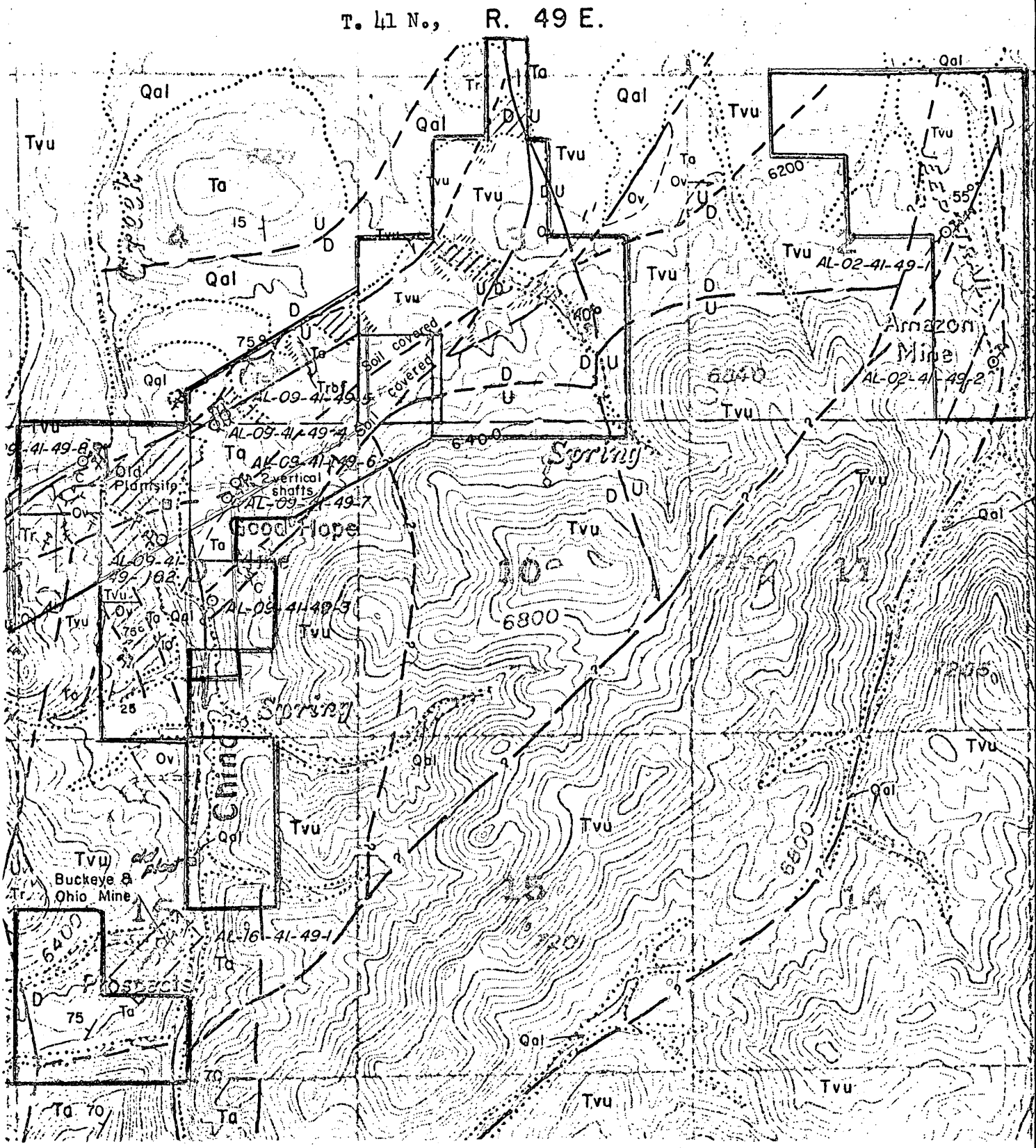

Figure 1. Property map, Good Hope mining district, Elko County, Nevada

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OME-6854 (Silver-Gold)
Great Basin Exploration Company

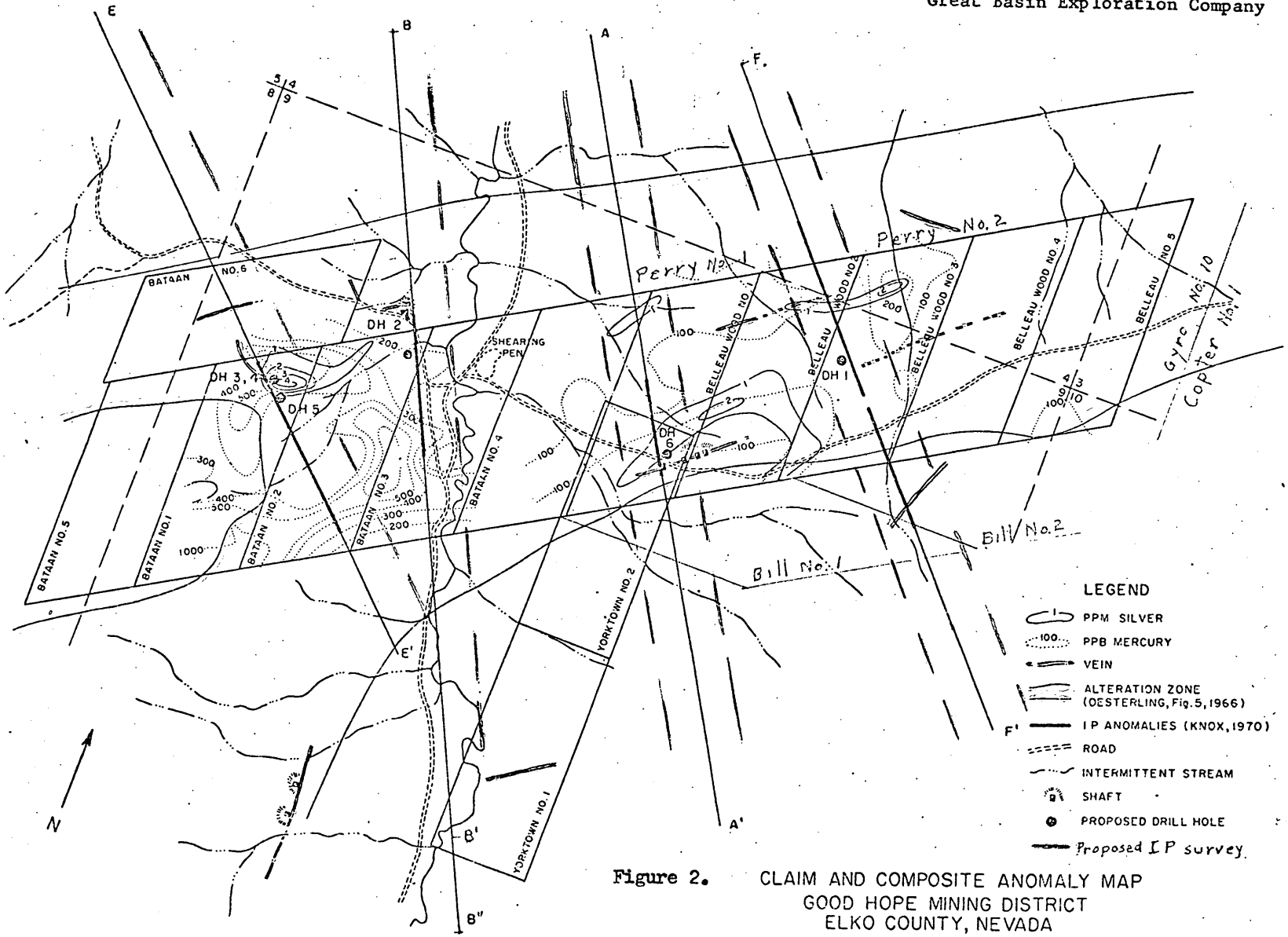

Figure 2. CLAIM AND COMPOSITE ANOMALY MAP
GOOD HOPE MINING DISTRICT
ELKO COUNTY, NEVADA

2/8/68 R. HUGHES AND A. PAYNE

GREAT BASIN EXPLORATION COMPANY
3898 WASHINGTON STREET
SAN FRANCISCO, CALIFORNIA 94118

RECEIVED
JUN 18 1971
OFFICE OF MINERALS EXPLORATION
U.S. GEOLOGICAL SURVEY
MENLO PARK, CALIF.

June 17, 1971

OME-6854

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Mr. Harold K. Stager
Office of Minerals Exploration
United States Geological Survey
345 Middlefield Road
Menlo Park, California

RE: OME-6854

Dear Mr. Stager:

Mr. Harold Kirkemo, Chief, Office of Minerals Exploration, has notified me that the Great Basin Exploration Company application for an OME loan covering the Good Hope area has been sent to your office. For that reason, I am enclosing two (2) copies of a letter dated June 14, 1971 addressed to the Great BAsin Exploration Company from Guy Terry, Assistant Vice President - Assistant Branch Manager of the First National Bank of Nevada, and two (2) copies of a letter addressed to the Great Basin Exploration Company from Donald A. Oliveira, Assistant Vice President of the Wells Fargo Bank in San Francisco which is also dated June 14, 1971.

Both these letters are in response to the request of Great Basin Exploration Company for a loan for the purpose of conducting a drilling program at Good Hope. Both banking institutions were unable to grant Great Basin Exploration Company a loan in the amount of $20,000.00 for this purpose.

Please let me know if you have any questions concerning these communications.

Very truly yours,

Alexander von Hafften

AVH:CAI
Enclosures

CC: Edmond Lawrence

WELLS FARGO BANK
NATIONAL ASSOCIATION
SAN FRANCISCO, CALIFORNIA 94120

June 14, 1971

Mr. Alexander von Hafften
President
Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

Dear Alex:

Thank you for your letter of June 1 enclosing a copy of the corporation's unaudited figures for the year ending December 31, 1970, which you have supplied to support your request for a $20,000 loan. We have given full consideration to your request; however, based upon the figures presented, it does not appear that we will be able to accommodate you.

Your consideration in thinking of us is greatly appreciated and hopefully we will be able to be of assistance on one of your other projects.

Sincerely yours,

DONALD A. OLIVEIRA
Assistant Vice President

/slo

FIRST NATIONAL BANK
OF NEVADA

GUY TERRY
ASSISTANT VICE PRESIDENT
AND ASSISTANT BRANCH MANAGER

June 14, 1971

Mr. Alexander von Hafften, President
Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

Dear Mr. von Hafften:

Thank you for your letter of June 1, in which you applied for a $20,000 loan from this bank.

We are sorry to inform you that we would be unable to grant your loan request as it is not our policy to make loans of this type.

Sincerely yours,

Guy Terry
Assistant Vice President -
Assistant Branch Manager

/mmb

SECOND AND VIRGINIA OFFICE
204 NORTH VIRGINIA, BOX 461, RENO, NEVADA 89504 (702) 784-3217

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code
6/14/71		120
		220
6/14	cal	120M

AIRMAIL

JUN 14 1971

Memorandum

To: Field Officer, Region II

From: Chief, Office of Minerals Exploration

Subject: OME-6854 (Silver-Gold)
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada.

The subject application is referred to you for review and recommendations. I understand that plans will be made for a field examination possibly next week.

In the event the property merits a recommendation for a contract, the following items should be considered:

1. In letters to the banks reference is made to a financial statement of the Great Basin Exploration Company as of December 31, 1970. Inasmuch as such a statement exists, please ask for a copy.

2. A. L. Payne in his report of August 1967, on page 12, second full paragraph, notes that the property situation is complicated enough to require a complete review of the county land records before undertaking any negotiation for land. Has this situation been cleared up with the Lease Agreement between Great Basin Exploration Co., and Allied Properties (successor to Allied Livestock ?)?

3. Under Item 6 Experience, it is stated that Mr. Alexander von Hafften owns the mining claims held by Great Basin Exploration Company. Lien and Subordination Agreements for these claims should be executed by Mr. von Hafften on behalf of Great Basin.

4. Under Item 5 Exploration Work, the description of the exploration is confusing because reference is made to a 2-stage program and to five lines of holes, but only single holes (except holes 3 and 4 which are at the same site) are shown at the drill sites on the map by R. Hughes, dated Feb. 8, 1968. Hole No. 7, line G, is listed but is not shown on the map. Hole No. 2 is on unidentified land outside the boundaries of the Applicant's claims.

5. The locations of the samples for which assay data are submitted are not well described with respect to the structures (?) at the sites of the proposed drill holes. Are the hole locations based solely on geochemical and geophysical data? One drill hole into an anomalous area does not determine reserves. The pattern of wide-spaced single holes 1, 2, and 6 is more like prospecting than exploring.

Harold Kirkemo
gla

Harold Kirkemo

cc: Director's Reading File
Mineral Resources
OME docket
OME Reading File
Mr. Kirkemo
130

HKirkemo/gla 6-14-71

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code
6/14/71		120
		220
		120M

JUN 14 1971

AIRMAIL

Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

Re: OME-6854 (Silver-Gold)
Great Basin Exploration Company
Good Hope Property
Elko County, Nevada

Gentlemen:

The application for assistance in exploring the subject property has been reviewed by the Washington Office and referred to Mr. Harold K. Stager, Field Officer, Region II, Office of Minerals Exploration, U. S. Geological Survey, Building 2, 345 Middlefield Road, Menlo Park, California 94025.

We understand that arrangements are being made for a field examination, possibly next week.

Sincerely yours,

Harold Kirkemo
glc

Harold Kirkemo
Chief, Office of
Minerals Exploration

cc: Director's Reading File
Mineral Resources
OME docket
OME Reading File
OME Region II
Mr. Kirkemo

GLAult/a 6-14-71

June 11, 1971

Great Basin Exploration Company
3898 Washington Street
San Francisco, California 94118

Subject: OME-6854

Gentlemen:

Your application for exploration assistance, dated June 7, 1971, submitted to our office at Menlo Park, California, has been assigned Docket No. OME-6854.

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

Sincerely yours,

Harold Kirkemo
Chief, Office of
Minerals Exploration

Copy to Region II

FINAL REPORT

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GEOPHYSICAL AND DRILLING EXPLORATION
GOOD HOPE PROPERTY
ELKO COUNTY, NEVADA

Exploration Contract 2303
Docket No. OME-6854
(Silver-Gold)

ALEXANDER VON HAFFTEN
GREAT BASIN EXPLORATION COMPANY
3898 Washington Street
San Francisco, California 94118

FINAL REPORT

GEOPHYSICAL AND DRILLING EXPLORATION
GOOD HOPE PROPERTY
ELKO COUNTY, NEVADA

Exploration Contract 2303
Docket No. OME-6854
(Silver-Gold)

ALEXANDER VON HAFFTEN
GREAT BASIN EXPLORATION COMPANY
3898 Washington Street
San Francisco, California 94118

RECEIVED
DEC 13 1972
OFFICE OF MINERALS EXPLORATION
U.S. GEOLOGICAL SURVEY
MENLO PARK, CALIF.

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INTRODUCTION

Geophysical and rotary drilling exploration on the Good Hope property, Elko County, Nevada, was completed in October, 1972 under an exploration contract between the United States Government, Department of Interior (U. S. Geological Survey, Office of Mineral Exploration) and Alexander von Hafften, d/b/a, Great Basin Exploration Company of San Francisco, California. Work done under Exploration Contract 2303, Docket No. OME-6854 (Silver-Gold) was to explore for disseminated silver-gold-bearing ore bodies in Tertiary volcanic rocks by conducting a geophysical survey using the induced polarization (IP) method and by drilling promising anomalies using rotary drilling. Under terms of the contract, the Government loaned Great Basin Exploration Company seventy-five percent of the funds estimated for completing the program scheduled in the contract.

The induced polarization survey was conducted by Heinrichs Geoexploration Company of Tucson, Arizona. Preparation of access roads and drill sites was done by Vega Construction and Trucking Company of Elko, Nevada. Eaklund Drilling Company of Carlin, Nevada, did the rotary drilling, and all assaying of samples from the drill holes was done by Union Assay Office, Inc. of Salt Lake City, Utah. Field supervision, sample preparation, and all geologic work was accomplished by an outside consultant, Dr. Edmond F. Lawrence, Mining Geologist, of Reno, Nevada. Financial control and administration was by Mr. Alexander von Hafften of San Francisco, California.

OPERATIONAL SUMMARY

Induced polarization (IP) surveys were conducted over the Good Hope property, Elko County, Nevada, by Heinrichs Geoexploration Company of Tucson, Arizona during the interim May 30 to June 10, 1972. Eight lines were run, Lines H, I, J, K, L, M and O on a 300-foot dipole spacing and Line N on a 600-foot spacing. All lines were oriented northwesterly to cross the main geologic trends except Line N which was oriented northeasterly along the zone of interest. The dual frequency IP technique was used with sending frequency pairs of 3.0 with 0.3 hz on some lines and 1.0 with 0.1 hz on others as indicated on the sectional data sheets. A GEOEX MK-7 IP system was used to obtain the data. The array used was the collinear dipole-dipole electrode configuration with "n" intervals ranging from 1 through 6. Copies of the resulting report by Heinrichs Geoexploration Company have been submitted previously to the Office of Mineral Exploration by Great Basin Exploration Company.

In accordance with the letter from Mr. Roscoe M. Smith of the Office of Mineral Exploration, dated July 31, 1972, authorizing Great Basin Exploration Company to proceed with the work in Stage II of the contract, bulldozing and drilling contractors were contacted. Access roads and drill sites were prepared with a Catapillar 46-A (D-8) bulldozer by Vega Construction and Trucking Company of Elko, Nevada. Care was taken to minimize any damage to the surface. Drilling was commenced on August 28, 1972 by Eaklund Drilling Company of Carlin, Nevada. In accordance with the contract and subsequent amendments, nine holes were drilled as follows:

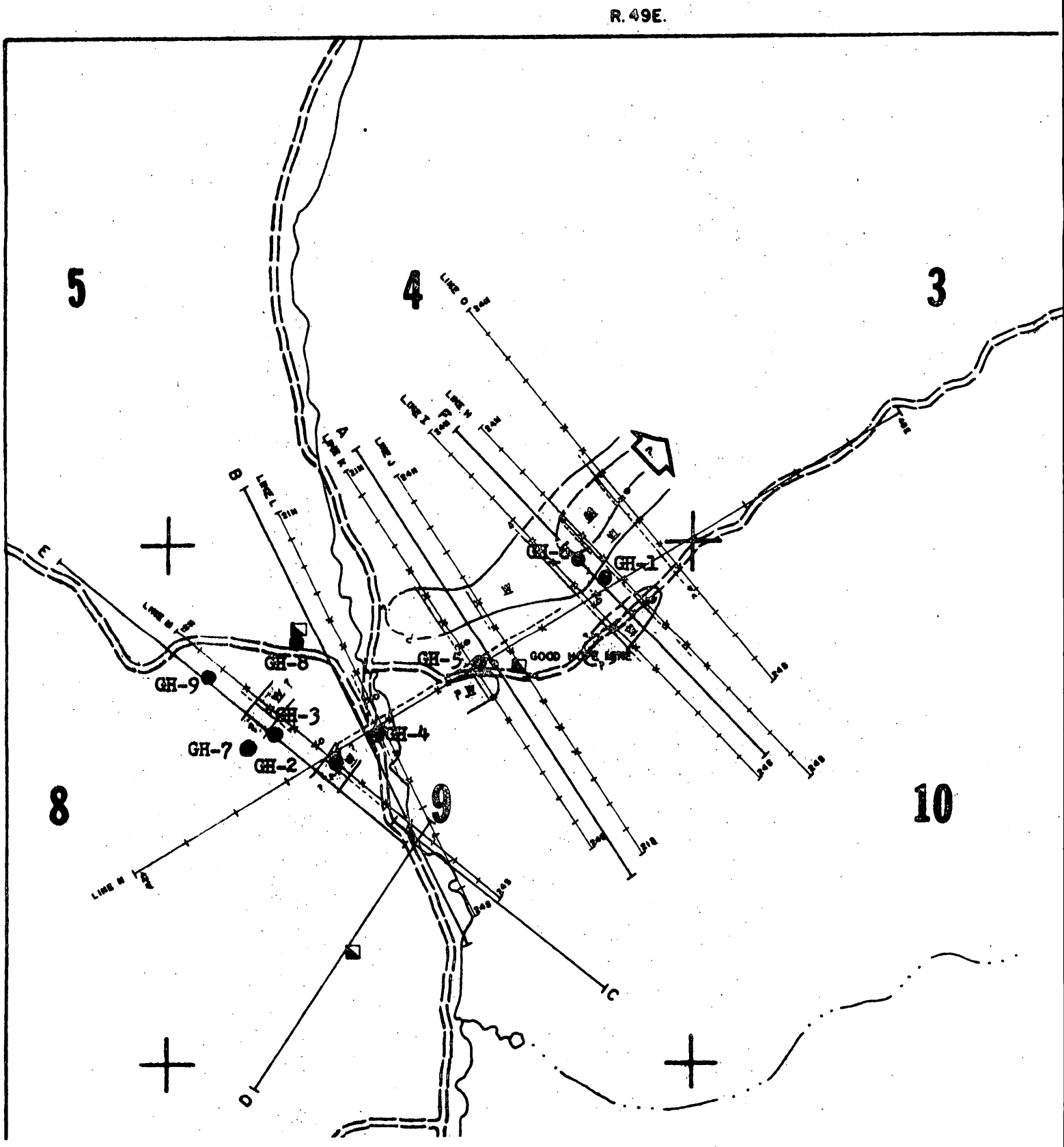

Figure 1 Location of rotary drill holes, Good Hope Mining District, Elko County, Nevada, showing relationship to induced polarization anomalies (Heinrichs, 1972).

Drill Hole No.	Total Depth
1	600 Feet
2	560 "
3	510 "
4	600 "
5	360 "
6	140 "
7	200 "
8	93 "
9	60 "
Total Footage	3,123 Feet

A Mayhew drill rig and a Mission hammerdril was used by Eaklund Drilling Company to drill all of the holes. Each hole was completed not less than 5 inches in diameter. Holes Nos. 1 through 5 were cased as necessary. Casing was removed from Hole No. 1, but was left in Holes Nos. 2 through 4. All drill cuttings were logged by an outside consultant, Dr. Edmond F. Lawrence, Mining Geologist. Splits were taken of significantly mineralized cuttings for assaying by Union Assay Office, Inc. of Salt Lake City, Utah for silver and gold. The balance of the drill cuttings have been split, with one portion being stored in suitable containers and identified by hole number and depth in Reno, Nevada. The rest of the samples have been stored in canvas sample bags and identified by hole number and depth at Good Hope, Nevada. These samples are available for Government inspection and possible use. Drill logs and true copies of assay certificates showing sample intervals have been made a part of this final report. Stage II of the exploration contract was completed in October, 1972.

F I N A N C I A L S U M M A R Y

The cost for each item of work in Stages I and II, and the total cost for the completed project under Exploration Contract No. 2303, Docket No. OME-6854 (Silver-Gold) has been summarized on page 5 of this report. All drilling costs have been tabulated on page 6, and all assaying charges by Union Assay Office, Inc. of Salt Lake City on page 7. Other items in the summary are self-explanatory. The Government participation under the contract is seventy-five percent of the cost of each item.

The total estimated cost of the project under the contract was $27,100.00. The total actual cost of the work performed under this contract was $27,019.91. The Government participation at seventy-five percent is $20,264.93, while the cost to Great Basin Exploration Company is $6,754.98.

SUMMARY OF WORK PERFORMED AND RELATED COSTS

STAGE I		
Catagory 1:		
Geophysical survey		$ 3,935.00
Catagory 2:		
Outside consultant, 7 days @$140.00		980.00
Catagory 7:		
Transportation, outside consultant, 1,958 miles @0.12		234.96
Per diem, outside consultant, 7 days @$20.00		140.00
Total actual cost, Catagories 1, 2, & 7 (Stage I)		$ 5,289.96
STAGE II		
Catagory 1:		
Mobilization & demobilization, one bulldozer		$ 250.00
Bulldozing access roads - 19 hrs. @$30.00		570.00
Mobilization & demobilization of drilling equipment		250.00
Rotary drilling, 3,123 feet; - 0 - 300 feet	$8,968.50	
300 - 600 "	6,780.00	15,748.50
Reaming, setting and pulling casing, 6 hrs.		150.00
Casing lost in hole, 70 feet @$1.25		87.50
Cement, 5 sacks @$2.25		11.25
Additives		51.40
Catagory 2:		
Outside consultant, 19 days @$140.00		2,660.00
Catagory 7:		
Travel, outside consultant, 3,990 miles @0.12		478.80
Per diem, outside consultant, 19 days @$20.00		380.00
Sample sacks for storage, 300 sacks @0.30		186.00
Assays for gold and silver, 245 assays @$3.50		857.50
Sample sacks - 245 additional sacks for assays @0.20		49.00
Total actual cost, Catagories 1, 2, & 7 (Stage II)		$21,729.95
Total actual cost, Stages I & II		$27,019.91

SUMMARY OF DRILLING COSTS

Drilling:

Drill Hole Number	Total Depth	0 - 300 feet @ $4.50/ft. Feet	Cost	300 - 600 feet @ $6.00/ft. Feet	Cost
1	600	300	$1,350.00	300	$1,800.00
2	560	300	1,350.00	260	1,560.00
3	510	300	1,350.00	210	1,260.00
4	600	300	1,350.00	300	1,800.00
5	360	300	1,350.00	60	360.00
6	140	140	630.00		
7	200	200	900.00		
8	93	93	418.50		
9	60	60	270.00		
	3,123	1,793	$8,968.50	1,130	$6,780.00

Drill Hole Number	Reaming, setting, pulling casing: Hours	Cost @ $25.00/hr.	Casing lost in hole: Feet	Cost @ $1.25/ft.
1	2	$ 50.00		
2	1	25.00	20	$ 25.00
3	1	25.00	20	25.00
4	1	25.00	20	25.00
5	1	25.00	10	12.50
		$150.00		$ 87.50

Drill Hole Number	Cement: Sacks	Cost @ $2.25/sack
1	2	$ 4.50
2	1	2.25
4	1	2.25
5	1	2.25
		$11.25

Additives:

4 sacks mud	@ $4.15	$16.60
1 sack mud	@ 4.15	4.15
5 gals additive	@ 6.13	30.65
		$51.40

Mobilization and demobilization of drilling equipment:

From Carlin, Nevada to Good Hope	$250.00
	$250.00

Total Drilling Cost - Stage II $16,298.65

SUMMARY OF COSTS FOR ASSAYING

Drill Hole Number	Number of Assays	Cost @ $3.50/Assay
1	33	$115.50
2	36	126.00
3	21	73.50
4	40	140.00
5	16	56.00
6	28	98.00
7	40	140.00
8	19	66.50
9	12	42.00
	245	$857.50

GEOLOGIC REPORT

BY

EDMOND F. LAWRENCE

MINING GEOLOGIST

The Good Hope property of Great Basin Exploration Company is located in northern Elko County, approximately ninty-five miles by road northwesterly from Elko, Nevada. The geography and geology has been described in a report by Knox (1970), a copy of which has been submitted to the Office of Mineral Exploration.

Geology

The Good Hope Mining District lies in an area of Tertiary volcanics consisting of Miocene and Pliocene welded tuffs, Miocene andesite, and Pliocene dacite. There are three outcrops of limestone that have been tentatively correlated with the Miocene Humboldt Formation (Knox, 1070, p. 14). There is one outcrop of Ordovician Vinini (or Valmy) quartzite on the northeast edge of the district. This formation probably underlies the Tertiary volcanic rocks in most of the area.

The Miocene welded tuffs have been intensely silicified and argillized. Most of this alteration is spatially associated with Miocene andesitic intrusives. Knox (1970, p. 14) concluded that the addesite is directly related to the mineralization, and that hydrothermal solutions were either introduced simultaneously with the intrusion of the andesite, or the intrusive may have provided paths for later transfer of the ore solutions from depth. There are numerous random veinlets and several larger veins containing pyrite, arsenopyrite, pyrargyrite, and freibergite in a gangue of quartz and sparse calcite. Approximately $100,000 in silver has been mined from the area.

Geochemical Surveys

Payne (1967) selected the Good Hope District for geochemical exploration because of its similarity to the Tuscarora district. He used arsenic, mercury and silver as indicators, and delineated several anomalies which coincide with the anomalous zones in the IP surveys by Knox and Heinrichs. Oesterling (1966) also ran geochemical surveys over the area, and outlined two geochemical anomalies.

Geophysical Surveys

Knox (1970, p. 55) conducted magnetic, electromagnetic (VLF), and induced polarization (IP) surveys over the mineralized areas, and made suggestions for exploration. Lawrence (letter report, 1971) made certain recommendations for exploring the area. Based on these recommendations, Great Basin Exploration Company applied for assistance from the Office of Mineral Exploration in June, 1971. During these negotiations, it was agreed that further geophysical work would be desirable to help delineate the anomalies discovered by Knox. Geophysical surveys consisting of induced polarization (IP) and resistivity methods were conducted by Heinrichs Geoexploration Company during the interim May 30 to June 10, 1972 under Stage I of the contract. Anomalies were noted by Heinrichs on all eight lines, and generally confirmed the earlier work by Knox. A description of these anomalies and recommendations for future work were made in a report, copies of which have been submitted to the Office of Mineral Exploration by Great Basin Exploration Company.

Drilling Program

At the conclusion of the geophysical surveys under Stage I of the contract, the geophysical data was reviewed by Lawrence (letter, July 13, 1972) and recommendations were made for drilling five holes under Stage II of the contract. The location of these proposed drill holes was based on integrated

geophysical, geochemical, and geological data, including the recommendations made by Heinrichs Geoexploration Company, Richard Knox, and Dr. Tsvi Meidav, Professor of Geophysics. These recommendations were reviewed by the Office of Mineral Exploration, and Great Basin Exploration Company was authorized to proceed with Stage II of the contract. Based upon geologic data obtained from the earlier holes, it was recommended that four additional holes be drilled under an amendment to the original contract. Nine holes were drilled for a total footage of 3,123 feet. The objective, description and results of the nine holes are as follows:

Good Hope No. 1 Rotary Drill Hole

Drilled at F-2200 plus 100 feet northeast, which is equivalent to H-500N plus 100 feet southwest. This hole was drilled to intercept the zone of highest PFE (percent frequency effects) at the n-4 or n-5 level. It was recommended by the field geophysicist for a depth of 450 to 600 feet. The veins and faults on the surface at F-1820 appear to be dipping to the south. Payne (1967) showed both mercury and silver anomalies in this area.

This drill hole intercepted 225 feet of quartz latite tuff from the surface, 85 feet of andesite, and 290 feet of quartz latite tuff to the bottom of the hole (see P. A-1). The tuff was oxidized to 20 feet, and gray in color from 20 to 135 feet. It became darker in color from 135 feet to the contact at 225 feet. The tuff beneath the andesite is also darker in color, becoming lighter in color away from the contact.

No silver-gold mineralization was observed in the drill cuttings from the hole. Only traces of silver were indicated in the assays, while gold in trace amounts was fairly consistent throughout the hole. Cinnabar was observed in trace amounts near the surface. Arsenopyrite occurred sporadically as grains in the groundmass and along fractures. Some pyrite was observed in the upper

geophysical, geochemical, and geological data, including the recommendations made by Heinrichs Geoexploration Company, Richard Knox, and Dr. Tsvi Meidav, Professor of Geophysics. These recommendations were reviewed by the Office of Mineral Exploration, and Great Basin Exploration Company was authorized to proceed with Stage II of the contract. Based upon geologic data obtained from the earlier holes, it was recommended that four additional holes be drilled under an amendment to the original contract. Nine holes were drilled for a total footage of 3,123 feet. The objective, description and results of the nine holes are as follows:

Good Hope No. 1 Rotary Drill Hole

Drilled at F-2200 plus 100 feet northeast, which is equivalent to H-500N plus 100 feet southwest. This hole was drilled to intercept the zone of highest PFE (percent frequency effects) at the n-4 or n-5 level. It was recommended by the field geophysicist for a depth of 450 to 600 feet. The veins and faults on the surface at F-1820 appear to be dipping to the south. Payne (1967) showed both mercury and silver anomalies in this area.

This drill hole intercepted 225 feet of quartz latite tuff from the surface, 85 feet of andesite, and 290 feet of quartz latite tuff to the bottom of the hole (see P. A-1). The tuff was oxidized to 20 feet, and gray in color from 20 to 135 feet. It became darker in color from 135 feet to the contact at 225 feet. The tuff beneath the andesite is also darker in color, becoming lighter in color away from the contact.

No silver-gold mineralization was observed in the drill cuttings from the hole. Only traces of silver were indicated in the assays, while gold in trace amounts was fairly consistent throughout the hole. Cinnabar was observed in trace amounts near the surface. Arsenopyrite occurred sporadically as grains in the groundmass and along fractures. Some pyrite was observed in the upper

part of the hole, but was more plentiful nearer the bottom. It occurred as one percent to two percent at 500 to 550 feet and three to six percent at 550 to 600 feet. The amount of pyrite observed would probably account for the IP anomaly. Good Hope No. 6 Drill Hole was drilled approximately 390 feet north of this hole to further test the IP anomaly near the surface in the area of the mercury, arsenic, and silver geochemical anomalies.

Good Hope No. 2 Rotary Drill Hole

Good Gope No. 2 Rotary Drill Hole was drilled along Line M at 300S, which would be 200 feet northeast from E-3300. This hole was drilled to intercept the zone of highest PFE (percent frequency effects) at the n-4 level. This is in an area of quartz veinlets in highly silicified tuff. It was recommended by the field geophysicist for a depth of 450 feet, with a maximum of 600 feet.

This hole intercepted quartz latite tuff at 0 to 215 feet, welded andesitic tuff at 215 to 260 feet, welded quartz latite tuff at 260 to 400 feet, andesite at 400 to 420 feet, and quartz latite tuff at 420 to the bottom of the hole at 560 feet. This rock contains one to seven percent pyrite at 85 to 215 feet; ½ to 3 percent at 215 to 400 feet, 10 to 20 percent at 400 to 420 feet, and 1 to 4 percent pyrite at 400 to 560 feet. No other sulfides or silver minerals were observed in the cuttings. A few traces of gold and silver were found in the assays in the upper part of the hole. The amount of pyrite observed in this hole should be enough to account for the IP anomaly in this area. Judging from the cutting, no significant mineralization was found.

Good Hope No. 3 Rotary Drill Hole

Good Hope No. 3 Drill Hole was drilled at E-2600, which would be 200 feet southwest of M-400 N. This hole was drilled to intercept the zone of

highest PFE (percent freguency effects) near the area of high arsenic, mercury, and silver anomalies. The tuff in this area is highly silicified and contains quartz veinlets.

The drill hole intercepted quartz latite tuff at 0 to 180 feet, andesitic tuff at 180 to 267 feet, andesite at 267 to 420 feet, and andesitic tuff at 420 to 510 feet. The rock contains a trace of pyrite to 110 feet; two to four percent at 110 to 180 feet, four to five percent at 180 to 267 feet, one to four percent at 267 to 420 feet, one to two percent at 420 to 475 feet, and traces to one-half percent at 475 to 510 feet. Arsenopyrite was seen as occasional grains. A few traces of cinnabar and pyrargyrite were observed at 345 to 355 feet.

The amount of pyrite observed in this hole is probably enough to account for the IP anomaly along this line. Judging from the cuttings, no significant mineralization was found.

Good Hope No. 4 Rotary Drill Hole

Good Hope No. 4 Drill Hole was drilled at L-300S plus 100 feet southwest, which is opposite B-2400. It was drilled to explore the zone of highest PFE (percent frequency effects).

This hole cut silicified quartz latite tuff at 0 to 25 feet, greenish gray andesitic tuff at 25 to 80 feet, andesite at 80 to 305 feet, andesitic tuff at 305 to 530 feet, and quartz latitic tuff at 530 to 600 feet. These cuttings contained a trace to two percent pyrite at 0 to 80 feet, traces to five percent at 80 to 305 feet, traces to one percent to 425 feet, one to two percent at 425 to 530 feet, and two to four percent at 530 to 600 feet. No other sulfides or silver minerals were observed in the hole. The assays showed 0.01 ounces gold per ton at 505 to 510 feet, and traces in two other

samples; and traces of silver in only two samples. Judging from the cuttings, no significant mineralization was found in this hole.

Good Hope No. 5 Rotary Drill Hole

Good Hope No. 5 Drill Hole was drilled at A-2750 plus 80 feet west. It was drilled to explore the zone of higher PFE (percent frequency effects) in the area of the old Good Hope mine. It was recommended by the field geophysicist that this hole should cut the zone at 250 feet, or a maximum depth of 400 feet. It was moved to the west because of slightly higher PFE along Line K. Also, this was in an arsenic and silver anomaly (Payne, 1967).

Andesite was found from the surface to 25 feet, quartz latite tuff at 25 to 180 feet, and andesitic(?) tuff at 180 to the bottom at 360 feet. Minor amounts of magnetite were disseminated in the andesite. Traces to one percent pyrite were found in the cuttings at 25 to 180 feet, and traces to two percent at 180 to 360 feet. No other sulfides or silver minerals were observed. The assays revealed 0.01 ounces of gold and 2.4 ounces of silver at 95 to 100 feet and traces in four other samples. Judging from the cuttings, no significant mineralization was found.

Good Hope No. 6 Rotary Drill Hole

Good Hope No. 6 Drill Hole was placed at F-1820 feet, directly on a spot of silicified quartz latite tuff with numerous quartz veinlets that contained trace amounts of pyrargyrite, pyrite, and arsenopyrite at the surface. This was also the zone of highest PFE (percent frequency effects) at the surface, and was apparently at the nearest-surface expression of the same zone that dipped southward toward Good Hope No. 1 Drill Hole. This appeared to be the same zone cut near the bottom of that hole. Also, this spot was near the center of the silver, mercury, and arsenic anomalies described by Payne (1967).

Oxidized tuff was cut at 0 to 35 feet, and greenish gray quartz latite

tuff at 35 to 140 feet. Traces to three percent pyrite and trace amounts of arsenopyrite were found in this hole. Traces of pyrargyrite were observed at 35 to 40 feet and at 80 to 85 feet. The assays showed some gold at 0 to 50 feet, with 0.400 ounces of gold per ton and no silver at 35 to 40 feet. The section from 0 to 25 feet contained 0.01 to 0.02 ounces of gold per ton and traces to 0.2 ounces of silver. Although the one sample may be of economic interest, the low tenor of the rock, both above and below, would make this of doubtful value. There is a possibility that further drilling might outline an ore body of economic value, but the lack of values in Drill Hole No. 1 only 380 feet to the south would discourage further drilling.

Good Hope No. 7 Rotary Drill Hole

Good Hope No. 7 Drill Hole was drilled at a distance of 168 feet in a S30°E direction from the northwest corner of Bataan No. 1 mining claim. It is approximately 280 feet in a S56°W direction from Good Hope No. 3 Drill Hole. This hole is in a highly silicified quartz latite with considerable iron oxide, and numerous quartz veinlets along the northwesterly striking shear zone.

The hole cut silicified quartz latite tuff at 0 to 95 feet and gray quartz latite tuff at 95 to 200 feet. There were trace amounts of pyrite at 35 to 95 feet, and traces to two percent at 95 to 200 feet. Traces of arsenopyrite were found at 95 to 100 feet. No other sulfides or silver minerals were observed. Assays revealed trace amounts of gold and silver scattered throughout the hole, but none of economic value.

Judging from the cuttings, no significant mineralization was found in the hole.

Good Hope No. 8 Rotary Drill Hole

Good Hope No. 8 Drill Hole was located S35°W - 142 feet from B-1500,

to explore for a possible mineralized zone between the two old mining shafts where ruby silver and other sulfides had been found on the dumps. Grab samples from these dumps assayed 0.015 ounces of gold and 11.00 ounces of silver per ton. It is also in the near-surface expression of the IP anomaly that dips southward to Good Hope No. 4 Drill Hole.

This hole cut 93 feet of quartz latitite tuff, of which the upper 35 feet was oxidized. It contained traces to two percent pyrite, and trace amounts of arsenopyrite. Pyrargyrite occurred as traces. Assays revealed trace amounts of gold and silver in the upper 70 feet of the hole.

Judging from the cuttings, no significant mineralization was observed in this hole.

Good Hope No. 9 Rotary Drill Hole

Good Hope No. 9 Drill Hole was located on Line E at 1950 feet plus 50 feet to the east for the purpose of testing the intersection of two veins for the possibility of an ore shoot raking to the northeast. It is also in the area of the strong arsenic, mercury, and silver anomalies (Payne, 1967).

Sixty feet of quartz latite tuff was cut in this hole. Pyrite was present only in trace amounts. Traces of pyrargyrite were seen in the cutting at 20 to 40 feet, and a few grains of cinnabar was found at 45 to 50 feet. Assays revealed trace amounts of gold and silver throughout the hole

Judging from the drill cuttings, no significant mineralization was observed in this hole.

Summary

The drilling program at Good Hope under Exploration Contract 2303, Docket No. OME-6854 (Silver-Gold) did not reveal any significant mineralization, with the possible exception of the one sample interval at 35 to 40 feet in Good Hope No. 6 Drill Hole that assayed 0.04 ounces of gold per ton

and no silver. This appeared to be a sporadic occurrence. Pyrargyrite (ruby silver) was observed in cuttings from sample intervals in several of the holes, but was also too sporadic to be of economic interest. Only one sample at 95 to 100 feet in Good Hope No. 5 Drill Hole assayed over one ounce per ton in silver.

Enough pyrite was observed in all of the holes to account for the induced polarization (IP) anomalies found by Knox and by Heinrichs. The depth estimations made by Knox and Heinrichs were amazingly accurate.

The widespread mineralization observed at the surface in the Good Hope Mining District appear to consist principally of pyrite, with a small amount of arsenopyrite, and minor amounts of gold and silver. A few traces of cinnabar and pyrargyrite were observed on the surface and in the drill cuttings. Quartz veinlets with minor calcite occur throughout the area and in the drill holes. The andesite appear to be intrusive, and the pyrite mineralization is spatially associated with it. The welded tuffs are chloritized near the contacts with the andesite. The widespread alteration halo over the area appear to be due to argillization and silicification. Some of the clay alteration is the result of surface weathering.

EDMOND F. LAWRENCE
P. O. Box 8044
University Station
Reno, Nevada 89507

November 20, 1972

R E F E R E N C E S

Heinrichs, 1972, Induced polarization survey in the Good Hope area, Elko County, Nevada, Heinrichs Geoexploration Company, 6 p.

Knox, Richard D., 1970, Geological and geophysical investigations of the Good Hope Mining District, Elko County, Nevada, Master Thesis, University of California, Riverside, California, 76 p.

Oesterling, William A., 1966, Silver potential of Allied properties in the Good Hope District, Elko County, Nevada, private report, 13 p.

Payne, Anthony L., 1967, Geological report, Good Hope Mining District, Elko County, Nevada, private report, 26 p.

A P P E N D I X

Good Hope No. 1
Rotary Drill Hole
August, 1972

Descriptive Drill Log:

Feet	Description
0 - 20	Quartz-latite(?) tuff, buff in color, with 5%-10% shards; highly argillized with limonitic stains; traces cinnabar, traces pyrite.
20 - 40	Quartz-latitic tuff, gray to buff-gray in color, occasional grains of pyrite.
40 - 135	Quartz-latite tuff, gray in color, with anhedral to subhedral crystals of plagioclase, 3%-10% lithic fragments, and occasional glass shards; slightly to moderately argillized and completely argillized at 65 feet; occasional grains of arsenopyrite at 85-90 feet and at 130-135 feet; a few scattered grains of pyrite at 40-85 feet, traces to ½% at 85-105 feet and 1% to 2% at 105-135 feet.
135 - 225	Quartz-latitic tuff, darker gray in color, gray black at 200-225 feet; traces pyrite with minute veinlets of quartz and pyrite at 165-170 feet; traces arsenopyrite at 150-155 and 185-190 feet.
225 - 310	Andesite(?), gray-black in color, with 30% to 40% euhedral laths of plagioclase; chloritized, with 3% to 10% calcite, moderately argillized; almost completely argillized at 275-285 feet; traces of pyrite, except 1% to 2% at 275-305 feet; pyrite occurs as disseminated grains, blebs and small pods; traces of arsenopyrite at 270-275, 285-295 and 300-305 feet; 3% to 10% calcite.
310 - 430	Quartz-latitic(?) tuff, gray in color; 10% to 40% subhedral to euhedral crystals of plagioclase, 1% to 5% hornblende crystals, and glass shards; chloritized and argillized, with minor amounts calcite; traces pyrite, with minute veinlets of quartz and pyrite at 320-325 feet and 1% pyrite at 410-415 feet; less than ½% arsenopyrite at 380-385 feet.
430 - 500	Quartz-latitic tuff, greenish gray in color, with 10% to 40% crystals of plagioclase; feldspars soft and chalky; traces to ½% pyrite and several minute veinlets of pyrite at 440-445 feet.
500 - 600	Quartz-latitic tuff, welded, gray in color; propylitized with 5% to 10% calcite; 1% to 2% pyrite at 500-550 feet, and 3% to 6% at 550-600 feet; traces arsenopyrite at 575-580 feet and 590-595 feet.

Bottom

Telephone 800-3048

Mail Sample Serial 25042-25056

ASSAY REPORT

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GERALDINE A. WANLASS, Secretary
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Salt Lake City, Utah 84110

Great Basin Exploration Company
Mine 3898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS September 12, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Per Cent	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH 1-1	None	None	10 -	20 feet							
1-2	Trace	0.1	85 -	90 "							
1-3	None	None	115 -	120 "							
1-4	Trace	None	120 -	130 "							
1-5	Trace	None	230 -	240 "							
1-6	Trace	None	250 -	260 "							
1-7	None	None	260 -	270 "							
1-8	Trace	None	280 -	290 "							
1-9	Trace	None	450 -	455 "							
1-10	Trace	None	455 -	460 "							
1-11	None	0.2	460 -	465 "							
1-12	None	None	490 -	495 "							
1-13	None	None	495 -	500 "							
1-14	None	None	500 -	505 "							
1-15	Trace	None	505 -	510 "							
1-16	None	None	510 -	515 "							
1-17	Trace	0.2	515 -	520 "							

Remarks

Charges $ 59.50

Glen P. Williams

Good Hope No. 2
Rotary Drill Hole
September, 1972

Descriptive Drill Log:

Feet	Description
0 - 25	Quartz latite tuff, welded, oxidized, reddish brown in color; 10% to 20% plagioclase laths and 5% to 10% glass shards; completely argillized, a few scattered pseudomorphs of limonite after pyrite.
25 - 85	Quartz latite tuff, white in color, with some yellowish brown staining by limonite; some pyrophyllite at 30-60 feet; 3% to 10% calcite as an alteration product; no sulfides noted.
85 - 215	Quartz latite tuff, gray in color, 10% to 20% plagioclase, 3% quartz, and 5% to 10% glass shards, with occasional biotite and hornblende; ½% pyrite at 85-95 feet, 1% to 2% at 95-125 feet, ½% at 125-140 feet, 5% to 7% at 140-160, 2% to 3% at 160-195 feet, and 1% at 195-215 feet; pyrite occurring as minute pods, narrow veinlets, and disseminated grains in the groundmass; occasional trace of arsenopyrite.
215 - 260	Welded andesitic(?) tuff, gray in color; with ½% to 2% pyrite as small pods, narrow veinlets, and disseminated grains; chloritized and argillized, with 3% to 5% calcite.
260 - 400	Welded quartz latite tuff, lighter gray in color; with 20% to 30% subhedral to euhedral plagioclase laths and 2% to 3% glass shards; 1% to 3% pyrite, usually subhedral to euhedral, occurring as minute pods, veinlets and disseminated grains.
400 - 420	Andesite(?), black in color, aphanitic, with 10% to 20% pyrite as minute randomly oriented veinlets, and as minute pods and individual grains; partly chloritized.
420 - 560	Quartz latite tuff, gray in color; with 10% to 20% plagioclase laths, 2% to 5% quartz and 3% to 5% glass shards; chloritized and argillized, with 3% to 15% calcite; 2% to 4% pyrite at 420-430 feet; 1% to 2% at 430-530 feet, and 1% at 530-560 feet.

Bottom

Telephone 363-3302

Hand Sample Serial 29296-29313

ASSAY REPORT

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P. O. Box 1528
Salt Lake City, Utah 84110

Mine Great Basin Exploration Co.
3898 Washington St.
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS October 5, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Per Cent	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH 2-3	Trace	None	10 - 15 feet								
2-9	None	None	40 - 45 "								
2-23	None	None	110 - 115 "								
2-24	None	None	115 - 120 "								
2-28	Trace	0.1	135 - 140 "								
2-31	None	None	150 - 155 "								
2-32	None	None	155 - 160 "								
2-33	None	0.1	160 - 165 "								
2-34	None	0.2	165 - 170 "								
2-40	None	0.1	195 - 200 "								
2-44	None	None	215 - 220 "								
2-45	None	0.4	220 - 225 "								
2-46	None	None	225 - 230 "								
2-47	None	1.0	230 - 235 "								
2-59	None	0.2	290 - 295 "								
2-60	None	0.2	295 - 300 "								
2-68	None	None	335 - 340 "								
2-69	None	None	340 - 345 "								

Remarks

Charges $ 63.00

Glen P. Williams

Telephone 363-3302

Hand Sample Serial 29314-29331

ASSAY REPORT

UNION ASSAY OFFICE, Inc.

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Salt Lake City, Utah 84110

Mine Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS

October 5, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Per Cent	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH 2-73	None	None	360 -	365 "							
2-74	None	None	365 -	370 "							
2-79	None	None	390 -	395 "							
2-80	None	None	395 -	400 "							
2-81	None	None	400 -	405 "							
2-82	None	None	400 -	410 "							
2-83	None	None	410 -	415 "							
2-84	None	None	415 -	420 "							
2-85	Trace	0.3	420 -	425 "							
2-91	None	None	450 -	455 "							
2-92	None	None	455 -	460 "							
2-93	None	None	460 -	465 "							
2-98	None	None	485 -	490 "							
2-99	None	0.1	490 -	495 "							
2-106	None	None	525 -	530 "							
2-108	None	0.2	535 -	540 "							
2-109	None	None	540 -	545 "							
2-112	None	None	555 -	560 "							

Remarks

Charges $ 63.00

Glen P. Williams

Good Hope No. 3
Rotary Drill Hole
September, 1972

Descriptive Drill Log:

Feet	Description
0 - 10	Alluvium
10 - 110	Silicified quartz latite tuff, buff in color; 10% to 20% plagioclase and minor amounts glass shards; 5% to 20% limonite and traces of carbonate; partly argillized at 10-35 feet; ½% pyrite at 10-30 feet, with only traces at 35-110 feet.
110 - 180	Quartz latitic(?) tuff, gray in color, partly argillized with 2% to 3% calcite, almost completely argillized at 175-180 feet. 2% to 4% pyrite as disseminated grains and minute veinlets, occasional grains of arsenopyrite.
180 - 267	Tuff(?), andesitic, gray in color; moderately argillized, with small amounts of calcite; 4% to 5% pyrite as disseminated grains, small pods and veinlets.
267 - 420	Andesite, gray in color, with numerous subhedral to euhedral phenocrysts of plagioclase; slightly argillized; 265-290 feet: 3% pyrite 290-345 feet: traces to 1% pyrite 345-360 feet: 2% to 4% pyrite 360-420 feet: traces to 1% pyrite traces pyrargyrite at 345-355 feet; trace cinnabar at 350-355 feet; tuffaceous texture at 320 to 420 feet.
420 - 475	Andesitic tuff, gray in color; slightly argillized with 3% calcite; 1% to 2% pyrite as disseminated grains, small pods and minute veinlets.
475 - 510	Andesitic(?) tuff with considerable magnetite as disseminated grains; 15% calcite at 475-480 feet and 5% at 480-510 feet; traces to ½% pyrite as disseminated grains.

Bottom

Telephone 363-3302

Hand Sample Serial 27425-27452

ASSAY REPORT

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Salt Lake City, Utah 84110

Mine Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS

September 22, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Wet on Ore	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH-3-1	Trace	None	0 -	5 "							
2	Trace	0.2	5 -	10 "							
3	Trace	None	10 -	15 "							
4	Trace	None	15 -	20 "							
5	Trace	None	20 -	25 "							
GH-3-23	Trace	None	110 -	115 "							
24	Trace	None	115 -	120 "							
25	Trace	None	120 -	125 "							
26	None	None	125 -	130 "							
27	None	None	130 -	135 "							
28	None	None	135 -	140 "							
29	None	None	140 -	145 "							
30	None	None	145 -	150 "							
GH-3-41	None	None	200 -	205 "							
42	Trace	None	205 -	210 "							
43	None	None	210 -	215 "							
44	None	None	215 -	220 "							
45	None	None	220 -	225 "							
46	None	None	225 -	230 "							

Remarks

Charges $ 98.00

G. P. Williams

Telephone 363-3302

Hand
Sample Serial....27453-27473...

ASSAY REPORT
UNION ASSAY OFFICE, Inc.

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GERALDINE A. WANLASS, Secretary
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Salt Lake City, Utah 84110

Mine Great Basin Exploration Company
3898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS

September 22, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Wet on Ore	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH-3-47	None	None	230 -	235 feet							
" 48	None	None	235 -	240 "							
" 49	None	None	240 -	245 "							
" 50	None	None	245 -	250 "							
" 51	None	None	250 -	255 "							
" 52	None	None	255 -	260 "							
" 53	None	None	260 -	265 "							
GH-3-65	None	None	320 -	325 "							
" 66	None	None	325 -	330 "							
" 67	None	None	330 -	335 "							
" 68	None	None	335 -	340 "							
" 69	None	None	340 -	345 "							
" 70	None	0.1	345 -	350 "							
" 71	None	None	350 -	355 "							
" 72	None	None	355 -	360 "							
GH-3-81	None	None	400 -	405 "							
GH-3-95	None	None	470 -	475 "							
GH-3-98	None	None	485 -	490 "							
GH-3-100	None	None	495 -	500 "							
" 101	None	None	500 -	505 "							
" 102	None	None	505 -	510 "							

Good Hope No. 4
Rotary Drill Hole
September, 1972

Descriptive Drill Log:

Feet	Description
0 - 10	Silicified tuff, oxidized; reddish brown in color, a few pseudomorphs of limonite after pyrite.
10 - 25	Silicified tuff, quartz-latitic, gray in color, with shards of glass, biotite fresh; slightly argillized at 10-15 feet, but highly argillized at 15-25 feet; 1% to 2% pyrite as disseminated grains.
25 - 80	Andesitic(?) tuff, greenish gray in color; very fine-grained, with numerous minute plagioclase crystals, plagioclase usually soft and argillized; trace to ½% pyrite as disseminated grains.
80 - 305	Andesite with numerous minute phenocrysts of plagioclase, and a few subhedral to euhedral phenocrysts of hornblende; greenish gray in color; groundmass usually highly chloritized and argillized, with 5% to 10% calcite; occasional areas of celadonite; three to five feet of andesitic tuff interlayered at 265-270 feet; 80-125 feet: less than ½% pyrite as disseminated grains 125-130 feet: 5% pyrite as small pods and veinlets, with calcite 130-150 feet: ½% to 1% pyrite as disseminated grains 150-200 feet: traces of pyrite 200-305 feet: ½% pyrite as disseminated grains
305 - 365	Andesitic tuff(?), greenish-gray in color; occasional lithic fragments and a few glass shards; similar to 25-80 feet above; ½% to 1% pyrite, usually as disseminated grains, but in calcite veinlets at 330-360 feet; 5% to 15% calcite.
365 - 425	Same as above, except with only a trace to ½% pyrite; at 410-415 feet, a quartz veinlet with small amounts pyrite and calcite.
425 - 530	Andesitic tuff, argillized, with numerous veinlets of calcite; 30% to 40% calcite at 490-520 feet. 425-480 feet: 1% pyrite as disseminated grains and in minute veinlets, usually associated with calcite 480-485 feet: 2% pyrite 485-530 feet: less than ½% pyrite
530 - 600	Quartz-latitic(?) tuff, moderately silicified, with some argillization; slightly chloritized in places; with 2% to 4% pyrite as disseminated grains and as numerous veinlets containing calcite and occasional quartz; pyrite up to ½ inch across.

Bottom

Telephone 363-3302

Hand Sample Serial....26359-26370.....

ASSAY REPORT

UNION ASSAY OFFICE, Inc.

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L. G. HALL, Vice President
G. P. WILLIAMS, Treasurer
GERALDINE A. WANLASS, Secretary
P. O. Box 1528
Salt Lake City, Utah 84110

Mine ...Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS September 15, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Wot on Ore	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH 4-2	None	None	5 -	10 feet							
4-24	None	None	115 -	120 "							
4-25	None	None	120 -	125 "							
4-26	None	None	125 -	130 "							
4-80	None	None	395 -	400 "							
4-92	None	None	455 -	460 "							
4-93	None	None	460 -	465 "							
4-96	None	None	475 -	480 "							
4-102	None	None	505 -	510 "							
4-103	None	None	510 -	515 "							
4-107	None	None	530 -	535 "							
4-109	None	None	540 -	545 "							
GH-4-112	0.010	0.1	555 -	560 feet							
113	None	None	560 -	565 "							
114	None	None	565 -	570 "							
115	Trace	None	570 -	575 "							
116	None	0.1	575 -	580 "							
117	None	None	580 -	585 "							
118	Trace	None	585 -	590 "							
119	None	None	590 -	595 "							
120	None	None	595 -	600 "							

Good Hope No. 5
Rotary Drill Hole
September, 1972

Descriptive Drill Log:

Feet	Description
0 - 25	Andesite(?), black in color; with 10% to 35% subhedral to euhedral phenocysts of plagioclase; partly chloritized and argillized, with 5% calcite; minor amounts of magnetite as minute grains.
25 - 180	Quartz latite tuff, gray in color, with 5% to 10% plagioclase crystals, 3% to 5% glass shards and scattered lithic fragments; partly argillized and chloritized, with 10% calcite at 130 feet, 5% calcite at 130-160 feet and 1% at 160-185 feet; traces to ½% pyrite at 55-70 feet, 1% at 70-80 feet, trace to ½% at 80-160 feet, 1% at 160-170 feet, and traces at 170-180 feet; pyrite occuring as minute veinlets and disseminated grains.
180 - 360	Andesitic(?) tuff, dark gray to greenish gray in color, with 20% to 40% subhedral to euhedral plagioclase laths, 1% to 5% hornblende crystals and occasional glass shards; chloritized and partly argillized; 1% pyrite at 180-190 feet, traces at 190-210 feet, 3% at 210-250 feet, 1% to 2% at 250-270 feet, ½% to 1% at 270-305 feet, traces at 305-315 feet, 1% to 2% at 305-360 feet; pyrite occurring as minute pods, narrow veinlets, and disseminated grains.

Bottom

Telephone 363-3302

Hand Sample Serial 32853-32868

ASSAY REPORT

UNION ASSAY OFFICE, Inc.

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G. P. WILLIAMS, Treasurer
GERALDINE A. WANLASS, Secretary

P. O. Box 1528
Salt Lake City, Utah 84110

Mine Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS

November 7, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Per Cent	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH-5											
12	None	0.1	55 -	60 feet							
19	Trace	None	90 -	95 "							
20	0.010	2.4	95 -	100 "							
31	None	0.4	150 -	155 "							
32	Trace	0.1	155 -	160 "							
39	None	None	190 -	195 "							
40	None	None	195 -	200 "							
46	None	None	225 -	230 "							
47	None	None	230 -	235 "							
48	None	None	235 -	240 "							
52	None	None	255 -	260 "							
53	None	None	260 -	265 "							
58	None	None	285 -	290 "							
70	None	0.2	345 -	350 "							
71	None	None	350 -	355 "							
72	None	None	355 -	360 "							

Remarks

Charges $ 56.00

Glenn P. Williams

Good Hope No. 6
Rotary Drill Hole
October, 1972

Descriptive Drill Log:

Feet	Description
0 - 35	Quartz latite tuff, silicified, buff in color; with 10% to 20% plagioclase subhedral to euhedral crystals and 3% to 5% glass shards; a few scattered pseudomorphs of limonite after pyrite; slightly chloritized in places; partly argillized; 1% pyrite at 30-35 feet.
35 - 140	Quartz latite tuff, greenish gray in color; highly argillized, and partly chloritized with up to 3% calcite; 2% to 3% pyrite at 35-55 feet, 1% at 75-80 feet and trace amounts in balance; trace of arsenopyrite at 35-40 feet; traces of pyrargyrite at 35-40 feet and 80-85 feet.

Bottom

Mine Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

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P. O. Box 1528
Salt Lake City, Utah 84110

RESULTS PER TON OF 2000 POUNDS

November 7, 1972

ASSAY REPORT
UNION ASSAY OFFICE, Inc.

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Wet on Ore	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH-6											
1	0.010	0.2	0 -	5 Feet							
2	0.010	0.2	5 -	10 "							
3	0.010	0.2	10 -	15 "							
4	0.020	None	15 -	20 "							
5	0.010	None	20 -	25 "							
6	Trace	None	25 -	30 "							
7	0.020	0.1	30 -	35 "							
8	0.400	None	35 -	40 "							
9	0.030	None	40 -	45 "							
10	Trace	None	45 -	50 "							
11	None	0.1	50 -	55 "							
12	None	None	55 -	60 "							
13	None	0.1	60 -	65 "							
14	None	None	65 -	70 "							
15	None	None	70 -	75 "							
16	None	None	75 -	80 "							
17	None	None	80 -	85 "							
18	None	None	85 -	90 "							
19	Trace	None	90 -	95 "							
20	None	None	95 -	100 "							
21	None	0.1	100 -	105 "							
22	None	None	105 -	110 "							
23	Trace	0.1	110 -	115 "							
24	None	None	115 -	120 "							
25	None	0.1	120 -	125 "							
26	None	None	125 -	130 "							
27	None	None	130 -	135 "							

Good Hope No. 7
Rotary Drill Hole
October, 1972

Descriptive Drill Log:

Feet	Description
0 - 95	Silicified quartz latite tuff, buff in color, with 10% to 20% plagioclase, 3% to 5% quartz crystals and 5% to 10% glass shards; welded; groundmass appears to have been highly silicified before weathering, presently highly argillized, plagioclase soft and chalky; stained yellowish brown by limonite, with a few pseudomorphs of limonite after pyrite; several quartz veinlets up to ¼ inch wide; one quartz vein one-half inch wide containing minor pyrite at 60-65 feet; traces pyrite at 35-95 feet.
95 - 200	Quartz latite tuff, gray in color, with 10% to 25% plagioclase laths, 3% to 5% quartz crystals and 5% glass shards; welded; shows some oxidation; highly argillized to bottom of hole, with small amounts chlorite at 105-200 feet; 1% to 2% pyrite at 95-110 feet, ½% to 1% at 110-145 feet, trace at 145-170 feet, trace to ½% at 120-195 feet, 1% at 190-195 feet, and trace at 195-200 feet; traces of arsenopyrite at 95-100 feet; pyrite usually disseminated, but occasionally in minute veinlets.
Bottom	

Telephone 363-3302

Hand Sample Serial 33011-33026

ASSAY REPORT

UNION ASSAY OFFICE, Inc.

W. C. WANLASS, President
L. G. HALL, Vice President
G. P. WILLIAMS, Treasurer
GERALDINE A. WANLASS, Secretary
P. O. Box 1528
Salt Lake City, Utah 84110

Mine Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS

November 8, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Per Cent	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
CH-7											
1	None	0.3	0 -	5 Feet							
2	None	0.1	5 -	10 "							
3	Trace	0.1	10 -	15 "							
4	Trace	0.1	15 -	20 "							
5	Trace	None	20 -	25 "							
6	Trace	0.1	25 -	30 "							
7	Trace	0.1	30 -	35 "							
8	Trace	0.1	35 -	40 "							
9	Trace	0.1	40 -	45 "							
10	Trace	None	45 -	50 "							
11	Trace	0.2	50 -	55 "							
12	Trace	None	55 -	60 "							
13	Trace	0.1	60 -	65 "							
14	Trace	None	65 -	70 "							
15	Trace	0.1	70 -	75 "							
16	Trace	0.1	75 -	80 "							

Remarks

Charges $ 56.00

Glen P. Williams

Telephone 363-3302

Hand Sample Serial 33305-33328

ASSAY REPORT
UNION ASSAY OFFICE, Inc.

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L. G. HALL, Vice President
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P. O. Box 1528
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Name Great Basin Exploration Co.
~~3898 Washington Street~~
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS

November 10, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Wet on Ore	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH-7											
17	Trace	None	80 -	85 Feet							
18	None	None	85 -	90 "							
19	None	0.1	90 -	95 "							
20	Trace	0.1	95 -	100 "							
21	None	None	100 -	105 "							
22	None	0.2	105 -	110 "							
23	Trace	None	110 -	115 "							
24	0.010	None	115 -	120 "							
25	Trace	None	120 -	125 "							
26	Trace	0.2	125 -	130 "							
27	None	None	130 -	135 "							
28	None	0.1	135 -	140 "							
29	None	None	140 -	145 "							
30	None	None	145 -	150 "							
31	None	None	150 -	155 "							
32	None	None	155 -	160 "							
33	None	None	160 -	165 "							
34	Trace	None	165 -	170 "							
35	Trace	0.2	170 -	175 "							
36	Trace	None	175 -	180 "							
37	None	0.1	180 -	185 "							
38	Trace	None	185 -	190 "							
39	None	0.1	190 -	195 "							
40	Trace	None	195 -	200							

Good Hope No. 8
Rotary Drill Hole
October, 1972

Descriptive Drill Log:

Feet	Description
0 - 30	Quartz latite tuff, buff in color; groundmass completely argillized with relict plagioclase crystals; apparently 20% plagioclase laths and 5% glass shards; groundmass appears to have been silicified before argillization; 10% chlorite and 3% calcite; a few pseudomorphs of limonite after pyrite.
30 - 93	Quartz latite tuff, gray in color; with 10%-25% plagioclase laths, occasional quartz grains, and 5% glass shards; 1% to 2% pyrite at 30-50 feet, and trace to 1% at 50-93 feet; pyrite occurs as disseminated grains, small pods and minute veinlets; traces of arsenopyrite, usually as spangles along fractures; trace of pyrargyrite; some oxidation to bottom of hole.
Bottom	

Telephone 363-3302

Hand Sample Serial 33329-33347

ASSAY REPORT
UNION ASSAY OFFICE, Inc.

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Salt Lake City, Utah 84110

Mine Great Basin Exploration Co.
~~3898 Washington Street~~
San Francisco, CA 94118

RESULTS PER TON OF 2000 POUNDS

November 10, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Wet on Ore	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH-8											
1	Trace	0.2	0 -	5 Feet							
2	Trace	0.5	5 -	10 "							
3	None	None	10 -	15 "							
4	Trace	None	15 -	20 "							
5	Trace	0.3	20 -	25 "							
6	Trace	0.5	25 -	30 "							
7	Trace	0.4	30 -	35 "							
8	Trace	0.7	35 -	40 "							
9	Trace	0.2	40 -	45 "							
10	Trace	0.1	45 -	50 "							
11	Trace	None	50 -	55 "							
12	0.010	0.4	55 -	60 "							
13	Trace	None	60 -	65 "							
14	Trace	0.5	65 -	70 "							
15	None	None	70 -	75 "							
16	None	None	75 -	80 "							
17	None	None	80 -	85 "							
18	None	None	85 -	90 "							
19	None	None	90 -	93							

Good Hope No. 9
Rotary Drill Hole
October, 1972

Descriptive Drill Log:

Feet	Description
0 - 25	Quartz latite tuff, with 5% to 10% glass shards; buff in color; almost completely argillized to a montmorillionitic clay, some yellowish brown stains of limonite.
25 - 60	Quartz latite tuff, yellowish brown to reddish in color; 10% to 30% laths of plagioclase, usually soft and chalky, 5% to 10% glass shards; occasional grains of pyrite; traces of pyrargyrite at 20-40 feet; small amounts manganese oxide at 25-30 feet; traces cinnabar at 45-50 feet.

Bottom

Telephone 363-3302

Hand Sample Serial 33348-33359

Mine Great Basin Exploration Co.
3898 Washington Street
San Francisco, CA 94118

ASSAY REPORT

UNION ASSAY OFFICE, Inc.

W. C. WANLASS, President
L. G. HALL, Vice President
G. P. WILLIAMS, Treasurer
GERALDINE A. WANLASS, Secretary

P. O. Box 1528
Salt Lake City, Utah 84110

RESULTS PER TON OF 2000 POUNDS

November 10, 1972

NUMBER	GOLD Ozs. per Ton	SILVER Ozs. per Ton	LEAD Wet on Ore	COPPER Per Cent	INSOL. Per Cent	ZINC Per Cent	SULPHUR Per Cent	IRON Per Cent	LIME Per Cent	Per Cent	Per Cent
GH-9											
1	Trace	0.1	0 -	5 Feet							
2	Trace	None	5 -	10 "							
3	Trace	None	10 -	15 "							
4	Trace	None	15 -	20 "							
5	Trace	None	20 -	25 "							
6	Trace	0.1	25 -	30 "							
7	None	0.1	30 -	35 "							
8	None	0.2	35 -	40 "							
9	None	0.1	40 -	45 "							
10	None	0.1	45 -	50 "							
11	None	0.2	50 -	55 "							
12	None	None	55 -	60							

Remarks

Charges $ 42.00

Glen P. Williams

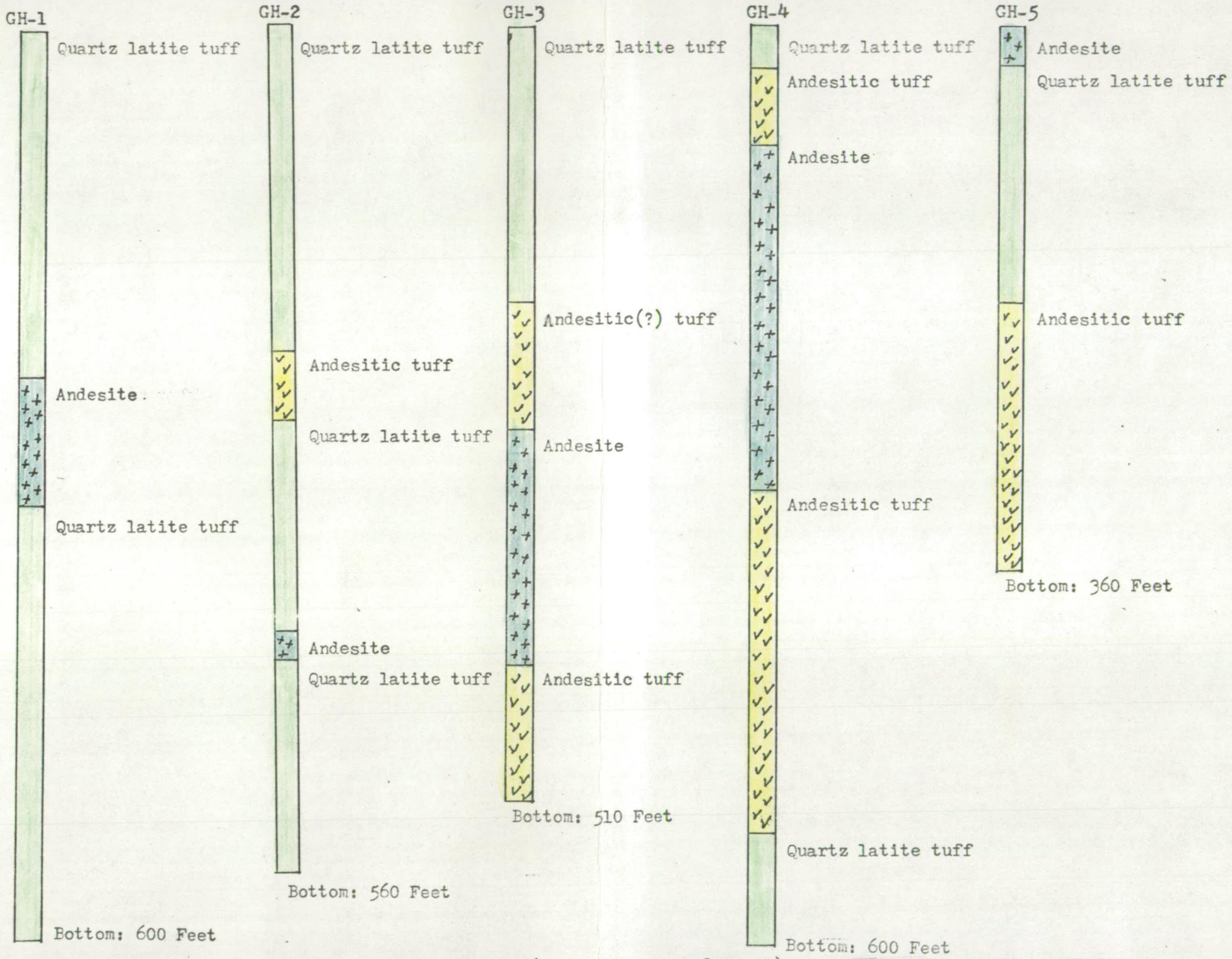

Figure 2. Drill logs, Good Hope No. 1 through 5 (Scale: 1 inch = 80 feet)

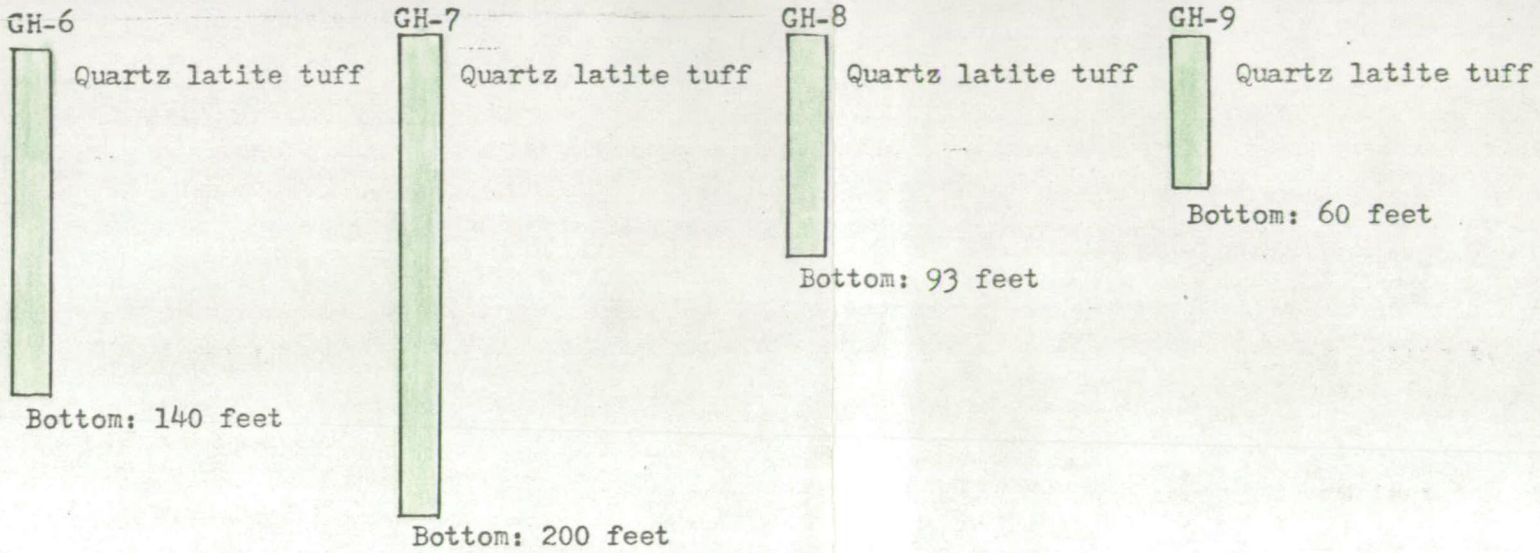

Figure 3. Drill logs, Good Hope No. 6 through 9 (Scale: 1 inch = 80 feet)

INDUCED POLARIZATION SURVEY

IN THE

GOOD HOPE MINE AREA

ELKO COUNTY, NEVADA

FOR

GREAT BASIN EXPLORATION COMPANY

JUNE 1972

by

Heinrichs GEOEXploration Company
P. O. Box 5964, Tucson, Arizona 85703
Tel: 623-0578

GEOEX Job # 718

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INTRODUCTION

At the request of Mr. Alexander von Hafften of Great Basin Exploration Company, Heinrichs GEOEXploration Company conducted an induced polarization (IP) survey in the Good Hope Mine Area, Elko County, Nevada. The field work was conducted during the interim May 30 to June 10, 1972.

Eight lines were run, Lines H, I, J, K, L, M and O on a 300 foot dipole spacing and Line N on a 600 foot spacing. All lines were oriented northwesterly to cross the main geologic trends except Line N which was oriented northeasterly along the zone of interest.

The dual frequency IP technique was used with sending frequency pairs of 3.0 with 0.3 hz on some lines and 1.0 with 0.1 hz on others as indicated on the sectional data sheets. A GEOEX MK-7 IP system was utilized to obtain the data. The array used was the collinear dipole-dipole electrode configuration with "n" intervals ranging from 1 through 6.

The purpose of this survey was to help map the sub-surface sulfide distribution in the vicinity of the Good Hope Mine to aid in positioning drilling targets. This survey partially detailed IP reconnaissance coverage obtained previously by Mr. R. D. Knox. All line locations are plotted on the attached plan, however only the GEOEX data is presented and interpreted.

The data are presented on sectional data sheets, one for each line, showing resistivity, percent frequency effect (PFE) and metallic conduction factor (MCF) contoured in section with self potential (SP) in profile form. An "Induced Polarization Location and Interpretation Plan" is also included showing the surface projected interpretation in plan and overlays the

1" = 1000' Geologic Map of the Good Hope Mining District by R. D. Knox and E. F. Lawrence. For additional details concerning theory, interpretation and presentation, see the "Basis of the Induced Polarization Method" appended to this report.

GEOEX personnel involved in the field work were W. Freeman, geophysicist-crew chief and K. Ritchie, technical assistant. Report and interpretation are by C. Ludwig, Senior Geophysicist assisted by the GEOEX staff. Appreciation is hereby expressed for the helpful technical assistance to the field crew by Mr. Knox and Dr. Lawrence.

CONCLUSIONS

Anomalous IP effects are present on all eight lines and appear to define several zones trending more or less northeasterly. The strongest response is noted on Lines H and O in an open-ended moderate strength zone projecting northeasterly located about 1500 to 2000 feet NNE of the Good Hope Mine.

There is a suggestion that the anomalism present is defining two sub-parallel northeast trending zones, a weak and discontinuous zone to the southeast which would trend through the Good Hope Mine if continuous and a stronger zone about 900 feet northwest thereof in part containing the moderate strength anomalism noted on Lines H and O. Chino Creek may somehow be related to the slight weakening of anomalism on Line L between Lines K and M. Line N, on 600' dipoles, essentially runs between the two sub-parallel anomalies and shows only very weak and background strength effects.

There is no obvious response on Line J relating to the Good Hope Mine which is near station 1.5N. However, weakly anomalous response centered near 4.5S on Line K several hundred feet southwest of the mine, may be related to the Good Hope mineralization or associated structure.

Most of the IP anomalism present suggests a rather shallow depth to the source material; in most cases within about 150 feet of the surface. Moderately strong anomalism near 1.5N on Line O, however, is somewhat deeper, perhaps 300 or so feet to its top.

The strength of IP response is such as to suggest the probability of sulfide mineralization being the cause. However, non-sulfide causes cannot

be ruled out and iron and manganese oxides, graphite or even certain clays could be the cause of the anomalism. If sulfide caused, the strength of response could be of direct economic interest providing the ratio of concentration of ore sulfides, such as chalcopyrite or molybdenite, to non-ore sulfides, such as pyrite, is reasonably high. Of course, if the polarizable material has a precious metal association, even non-ore polarizers could be of considerable significance.

The widths of the anomalous zones are somewhat variable and indefinite because of gradational boundaries but generally appear to aggregate at least 300 feet total geophysical width. Because of the gradational patterns, no really meaningful estimates of the polarizable source geometry (dip and shape) can be made. However, the depth persistance of the IP sources appears to extend to at least 400 or 500 feet below surface.

No obvious geologic formational correlation with the anomalous zones is present, i.e., the anomalism appears to transect several formations. However, the anomalism does seem to trend parallel to the strike of the steep fault at the Good Hope Mine.

The apparent resistivity pattern is fairly complex. There is a suggesion that the IP anomalism relates to slightly more resistive zones - perhaps caused by silicification.

The self potential response shows only minor background variations on all traverses. This lack of SP response suggests a lack of actively oxidizing relatively interconnected sulfides within several hundred feet of the surface. This lack of SP response is not in conflict with the IP results in that the IP anomalism is likely reflecting a source too disseminated to give an appreciable SP response at the surface.

RECOMMENDATIONS

Because of the encouraging geophysical results and their possible correlation with the Good Hope mineralization and/or structure, some drilling is recommended to further prospect the area.

The surface projected anomalism on the plan map can be used for picking drill sites to test the IP response at depth. At least one hole should be drilled in the moderate strength anomaly on Lines H and O plus a hole to the southwest on the same anomaly trend to test it in a weaker portion.

Also, the discontinuous zone to the southeast probably warrants several drill tests.

In all cases, the drilling should weigh in any available geologic information to help establish the exact drilling locations and depths. Also, please see the "Comments on Drilling IP Targets" section of this report for further suggestions.

The weaker fringes of the IP anomaly should be given some consideration. In fact, in many mining areas, the weaker IP zones are of more interest than the stronger portions which may only be reflecting highly pyritic zones. In this area, because of the rather low overall indicated polarizer concentration, initial attention should be focused on the stronger anomalism in the hope that it would have the highest probability of being economically interesting unless there is geologic evidence to the contrary.

Further detailed IP coverage should be considered, particularly if encouragement is obtained from drilling based on the results of this survey. Reconnaissance IP along the projected strike of the zone both to the north-

east and southwest may also be worthwhile in that the response obtained to date is not closed off in either direction.

Respectfully submitted,
HEINRICHS GEOEXPLORATION COMPANY

Chris S. Ludwig

Chris S. Ludwig
Senior Geophysicist

P. O. Box 5964
Tucson, Arizona 85703
June 1972
GEOEX Job # 718

COMMENTS ON DRILLING IP TARGETS

To maximize the probability that a recommended drill hole will intersect the source of an induced polarization anomaly, the following points should be considered:

1. The anomaly has been caused by some physical property, hopefully a polarizable body containing economically interesting metallic mineralization, and this property should be determined before abandoning the anomaly.

2. Location of drill holes should be made relative to the actual sending and receiving electrode positions as they exist on the ground.

3. Due to inherent limitations in the IP method, depth interpretations are only approximate and the determination of dip is severely limited, particularly for angles greater than 45°. Also, targets can generally be laterally resolved no finer than the station spacing (dipole length). Because of these limitations, targets less than one dipole spacing in width, particularly when steeply dipping or deeper than the dipole length, may be difficult to intersect. In these cases, several drill holes in a fence line should be considered. For the steeply dipping cases, angle drilling may also prove advantageous, mainly where the direction of dip can be geologically inferred and the drill hole oriented such that an optimum intersection of the zone of interest is obtained.

4. An observed anomaly can be the effect of a polarizable body laterally offset to the side of a line and therefore, if practical, drilling should be confined to those portions of the anomalous zones well defined by several lines. Also, it should be noted that a single line cannot define the strike direction of an elongate anomalous zone - another reason for utilizing several parallel lines.

5. Logging of the drill core must be done with special care to note the quantity of <u>all</u> possible polarizable material such as pyrite, graphite, magnetite, manganese oxides and clay minerals as well as the polarizable ore minerals. The anomalous source could conceivably be overlooked if the core is not carefully logged.

6. Typical sections of core representing the gross physical properties of material encountered in the drilling should be tested in the laboratory for their IP parameters, if there is some doubt about confirmation of the anomalous source.

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BASIS OF THE INDUCED POLARIZATION METHOD

The induced polarization method is based on the electrical properties exhibited by electronic or metallic conductors embedded in an ionic or electrolytic conducting matrix. These properties are noticed in that the potential across a block of this dual conduction mode material will increase with time, approaching a constant value, when a constant current is made to flow through the block. This phenomenon occurs because at the boundaries between the two conductor types, electrolytic ions have to give up or take on electrons thereby requiring an additional force (overvoltage) over that which would be needed with only one mode of conduction; showing up as a building of potential across the block with time as more ions are backed up. This potential approaches a constant value when an equilibrium is established between the ions backed up at the boundaries and those flowing across the boundaries. Therefore, from the preceeding discussion, it is seen that the gross effect is quite similar to the charging of a leaky capacitor and for most applications, it is proper to use this model as a guide. These capacitive-like properties are normally measured by one of three different field techniques.

In the time domain (pulse) method, a steady direct current is imposed in the ground for a few seconds and abruptly terminated so that the resulting capacitive-like voltage decay (discharge) curve can be measured or recorded. Usually, the voltage decay curve is integrated with respect to time to give the area under the decay curve in units of volt-seconds. This value is then normalized by the primary voltage measured while the steady current is on. The more area determined, the more capacitance or polarization the ground exhibits.

In the frequency domain (dual frequency) method, the percentage difference between the impedance (AC resistance) offered to a lower and higher frequency is measured. A capacitor offers a lower impedance to a higher frequency than it does to a lower frequency, therefore, the percentage difference between the impedances will increase with increased polarization.

A third technique is to measure the phase angle or delay between an introduced current wave-form and the received voltage wave. This phase delay also increases as polarization increases.

Almost all metallic lustered minerals, including most sulfides, for example: pyrite, chalcopyrite, chalcocite, bornite, and molybdenite are electrical conductors. The rocks and groundwater, with which they permeate or are permeated, are also ionic conductors; therefore, if an electrical current is made to flow through a sulfide deposit, it will polarize and often can be detected by the three methods described above.

The induced polarization property is not entirely unique with sulfides since magnetite, graphite (which are both metallic lustered) and some clays will exhibit it; however, with sufficient geological and geophysical data, effects due to sulfides can generally be interpreted apart from non-sulfide anomalism. The type of sulfide however, say pyrite, as distinct from chalcopyrite, cannot yet be distinguished with present induced polarization techniques since all types give quite similar response.

The I.P. technique was developed primarily for porphyry type deposits and is perhaps the only reliable means of detecting hidden disseminated sulfides. However, the I.P. method works just as well or perhaps better on semi-massive to massive sulfides, contrary to some of the earlier thinking, for it generally gives increased response with increased volume percentage of sulfide.

FIELD TECHNIQUES AND INTERPRETATION

For routine exploration, we prefer and use the dual frequency system because of its greater simplicity of instrumentation, operation, and greater accuracy as well as simplicity of interpretation. However, all three methods give basically the same results and the choice is either a matter of opinion or highly technical reasons and therefore should be left to the particular application and the geophysicist's discretion.

The two frequencies we most commonly use are 0.05 and 3.0 cycles per second, or so called "D.C." and "A.C." modes respectively. Other frequencies are available with our equipment and are occasionally used when desired. The usual frequency range used is from about 0.01 cps to 10 cps. The lower frequency limit is due to naturally existing, time-varying, telluric (natural earth) currents, and electrode polarization. The upper limit is determined by electromagnetic coupling effects which increase rapidly with increasing frequency.

In our standard reconnaissance field practice, five equally spaced collinear current electrodes are placed in the ground by burying aluminum foil in pits wetted with brine to insure good electrical contact. Observations are made using a symmetrical dipole-dipole electrode configuration where the distance (a) between adjacent receiver (potential) electrode pairs (or dipoles) is kept equal to the distance between adjacent sender (or current) electrode pairs. Generally the receiving dipole is separated by one to six dipole units

("n" separation) from the sending dipole. Figures 1 and 2 indicate this configuration and resulting data plotting positions. A precisely controlled square wave current is sent through a sending dipole at 0.05 and 3.0 cycles per second from which, at the receiving dipole, a "D.C." and an "A.C." voltage is measured respectively. By knowing the geometry involved (the dipole length or spacing and the separation distance between the two receiving-sending dipole pairs), along with the two voltages, an apparent "D.C." and an "A.C." resistivity can be calculated. From these apparent resistivities, their percentage difference is determined, thus giving the Percent Frequency Effect (PFE). A third quantity porportional to PFE and inversely porportional to "D.C." resistivity, called Metallic Conduction Factor (MCF) is computed in order to somewhat normalize PFE for variations in ground conductivity purely as a technical interpretational aid. Formulas for these various quantities are given on page 5.

Selection of electrode spacings [(a) in Fig. 1] is determined by the objectives to be reached in a given survey. This spacing will range from very small (50 ft. or less) for very detailed and shallow surveys, up to 1,000 ft., or occasionally more, for broad, deep reconnaissance work. Other factors involved in the selection of spacing are concerned with the anticipated physical geometry of any possibly existing mineral occurrence. This includes consideration of expected depth of burial to the top of the deposit, the dimensions of the deposit itself, its orientation, strike and dip, etc., as well as its expected electrical properties.

In general, the greater the dipole spacing and "n" separation, the greater the depth penetration and the less the resolution. An average rule of thumb, with a good contrast of electrical properties, using the symmetrical co-linear dipole-dipole system, and having data from 1 through 4 in "n" separations, is that two times the dipole length is the maximum depth of detectable penetration for a body having two or three of its dimensions large in relation to the dipole spacing. However, a body having two or three of its dimensions less than the dipole spacing, and buried more than one spacing probably will not be detectable. A zone, regardless of orientation, having a dimension less than 0.1 the dipole spacing likely will not be detected. Also, zones differing by less than about 30% in electrical conductivity will not be very easily resolved by resistivity measurements, but may still be detected if a polarization contrast exists.

To illustrate the above in more concrete terms, consider a dipole spacing of 1,000 ft. for the following: An overburden of more than 2,000 ft. would likely not allow enough current penetration into bedrock to detect even a large and highly mineralized zone in the bedrock. Also, a sulfide zone lying completely within 200 ft. of the surface generally would not be detected. A spherical or elongated cylindrical body whose diameter is much less than 1,000 ft. would be just out of the range of detectability. A dike-like or sill-like zone whose width is less than

100 ft. probably would not be detected regardless of how it lies relative to the spread.

So far, only the maximum and minimum limits of detection and resolution relative to the various geological and geometrical configurations have been discussed, thus omitting optimum conditions. Generally, we attempt to make the dipole spacing one or two times the expected depth to the target in order to obtain a good electrical response. Of course, where it is suspected that the zone has a good depth extent, say two or three dipole spacings, as is typical of most porphyry type copper deposits, a spacing considerably more than two times the expected depth to sub-outcrop can be used to obtain broader and more rapid coverage, as long as we do not exceed the width. Because of these factors, we usually use 500 to 1,000 ft. dipole spacings in prospecting for porphyry-type deposits.

The field data are interpreted after plotting the PFE, MCF and resistivity as in Figures 1 and 2. These values are then contoured in sections, the resistivity and metallic conduction factor logarithmically (because of the usual large variations in magnitude) and the percent frequency effect on a constant interval. This two dimensional method of plotting gives an additional advantage over the standard profile methods in that easily recognizable patterns are associated with various subsurface geometrical configurations and that lateral variations can be separated from vertical effects. See the four appended examples of plotted field and theoretical sectional data sheets.

It should be realized that there is no definite relation between the vertical scale on these plots and actual subsurface depth. The data point values are a complexly weighted average of the electrical contrast distribution in the vicinity of the sending-receiving dipole pair and contain depth as well as lateral information. About all that can be said is that by increasing the dipole length and the dipole separation ("n" separation) more volume of ground is being affected and therefore more depth penetration.

There are cases where the depth to a subsurface feature can be determined fairly precisely as in the two horizontal layer situation. The field data is compared with theoretical type curves for various resistivity contrasts between the top and bottom layer and various thickness of the top layer until a close match is found. This enables the depth to the bottom layer in the field to be determined as well as the true resistivity of both layers. A major limitation of this interpretational technique is that only a few simple geometric cases related to a relatively few numbers of layers have been theorectically developed. However, extremely valuable information can still be derived in alluvial and lake bed applications for depth to bedrock and groundwater purposes, etc.

In interpreting PFE's, values of 0 to 4% are usually considered background, 4 to 8% marginally anomalous, and 8 to 40% plus definitely anomalous, but they must be considered in light of the associated resistivity. Very low resistivities give an

increased background frequency effect due to an electromagnetic inductive coupling interference phenomenon that must be corrected for. The MCF tends to correct any high resistivity increased background effects, but tends to amplify the electromagnetic frequency effects making a correction imperative.

FORMULAS: $PFE = [\rho_{dc}/\rho_{ac} - 1]\ 100$

Where PFE is Percent Frequency Effect, ρ_{dc} is the apparent resistivity at the lower frequency and ρ_{ac} is the higher frequency apparent resistivity.

$$\rho = 2\pi VK_n/I$$

Where ρ is either ρ_{dc} or ρ_{ac} depending on frequency of the current I which is measured in amperes. The potential V, arising from I, is measured in volts. K_n is the geometric factor given by:

$$K_n = \tfrac{1}{2}an(n+1)(n+2) \quad \text{(Only for dipole-dipole arrays.)}$$

Where "a" is the dipole spacing in feet and "n" is the number of dipoles separating the sending and receiving dipoles; this gives, for apparent resistivity:

$$\rho = [2\pi V/I][\tfrac{1}{2}an(n+1)(n+2)]$$

from which we see that ρ is in units of ohm-feet. However, the apparent resistivity usually is plotted: $\rho/2\pi$

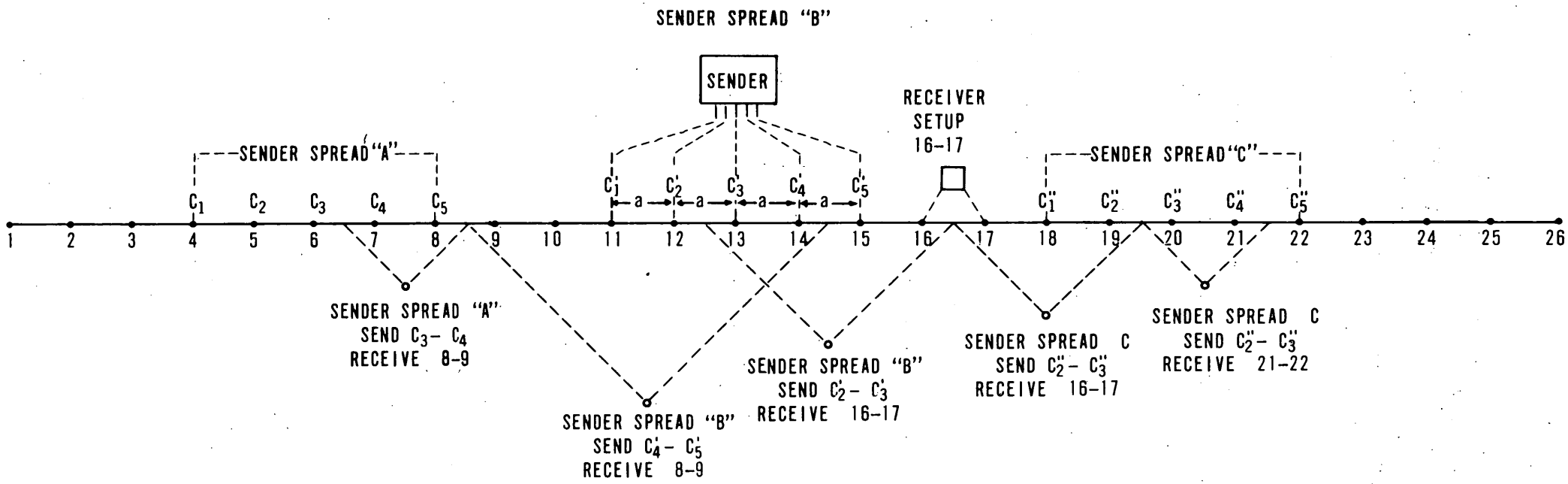
$$\rho/2\pi = VK_n/I = [V/I][\tfrac{1}{2}an\ (n+1)(n+2)]$$

$$MCF = 1000 \times PFE/[\rho_{dc}/2\pi]$$

Where MCF is the Metallic Conduction Factor and $\rho_{dc}/2\pi$ is apparent "D.C." resistivity.

References:
1. Wait, James R., "Overvoltage Research and Geophysical Applications", Pergamon Press, 1959.
2. "Mining Geophysics", Society of Exploration Geophysicists, Vol. I, Case Histories, October 1966.

Published by W. E. Heinrichs, Jr., et al., Engineering and Mining Journal, September 1967.

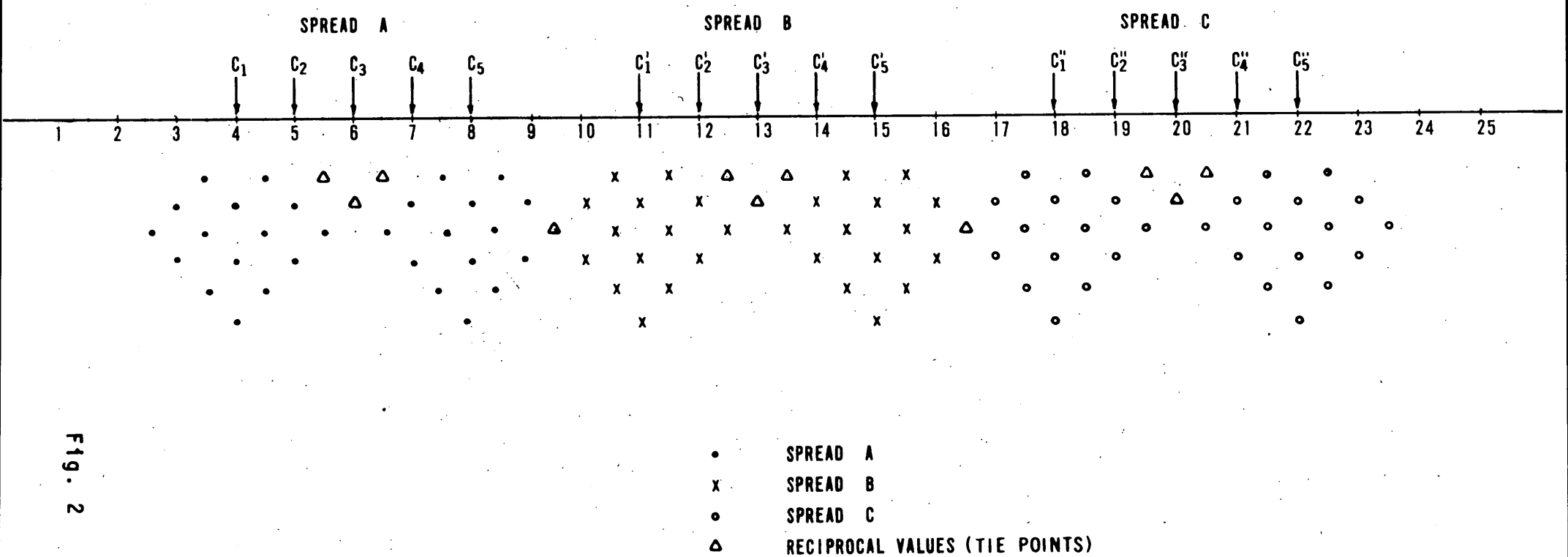


SCHEMATIC DIAGRAM ILLUSTRATING THE METHOD OF OBTAINING AND PLOTTING DIPOLE-DIPOLE I.P. DATA

Diagram shows three separate current electrode spreads along a traverse line. In normal procedure, there are three dipole separations between current electrode spreads. The receiver setups are moved outwards from the ends of each current electrode spread usually until three dipole spacings separate the potential electrode setup from the near end of the spread. Current is "sent" to each possible pair of electrodes for each receiver setup. For instance, in Sender Spread "B" when the receiver setup is between 14 and 15 only $C'_3 - C'_2$ and $C'_2 - C'_1$ can be "sent" so that data at 1 and 2 dipole separations is obtained respectively When the receiver is setup between 16 and 17; $C'_5 - C'_4$, $C'_4 - C'_3$, $C'_3 - C'_2$ and $C'_1 - C'_2$ are sent and data is obtained for 3, 4, 5 and 6 dipole separations respectively. Each sender spread provides 33 data points.

Fig. 1

(DATA POINTS OBTAINED FROM THE THREE SPREADS OF FIGURE 1)



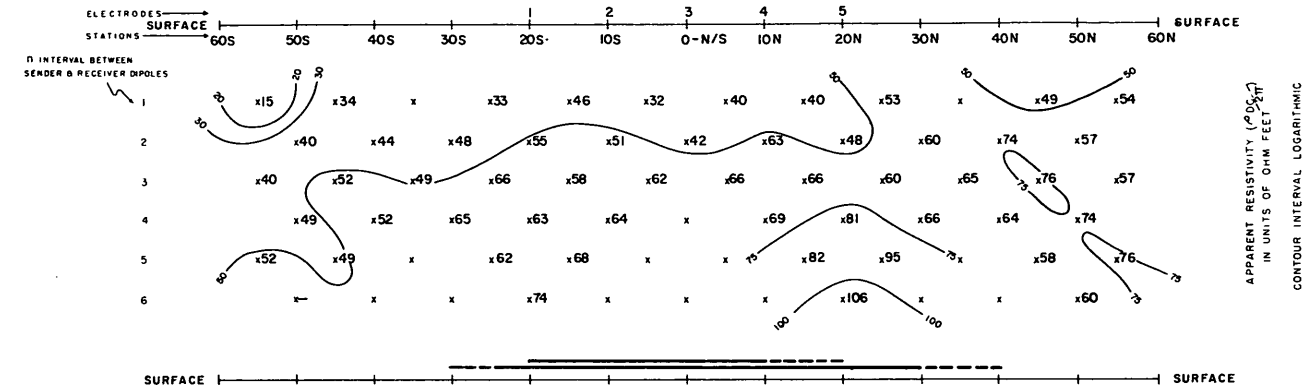
• SPREAD A

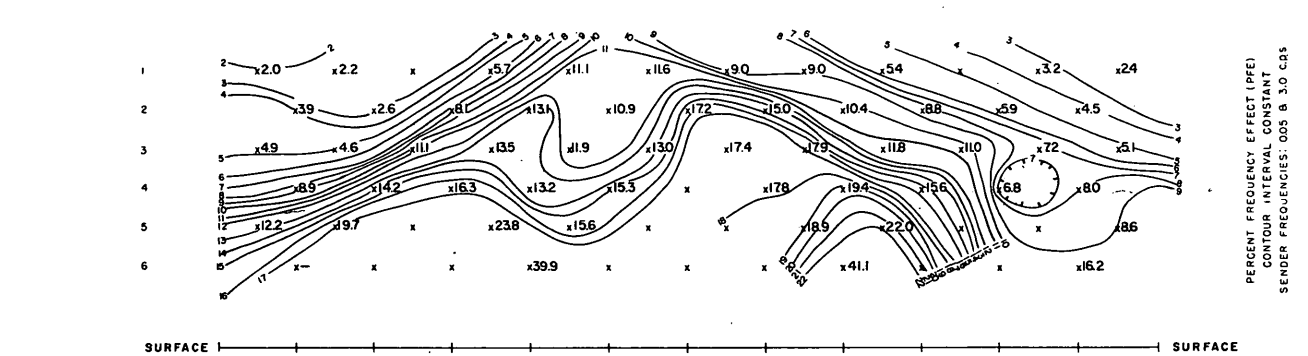
x SPREAD B

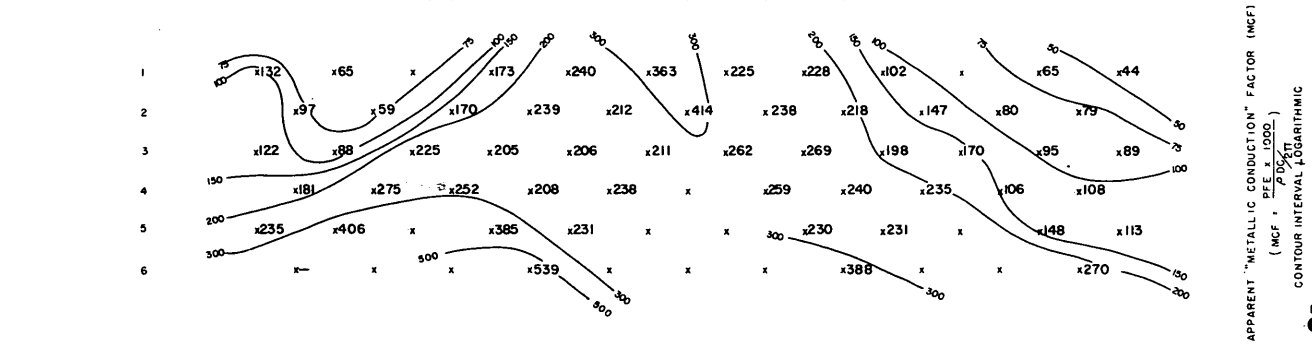
o SPREAD C

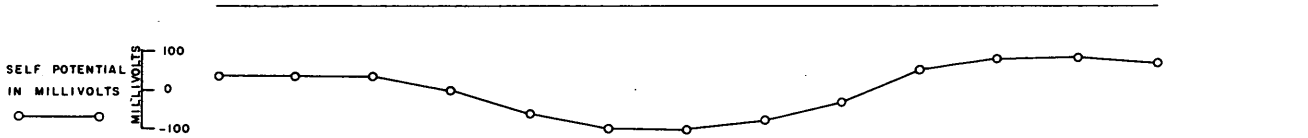
Δ RECIPROCAL VALUES (TIE POINTS)

Fig. 2

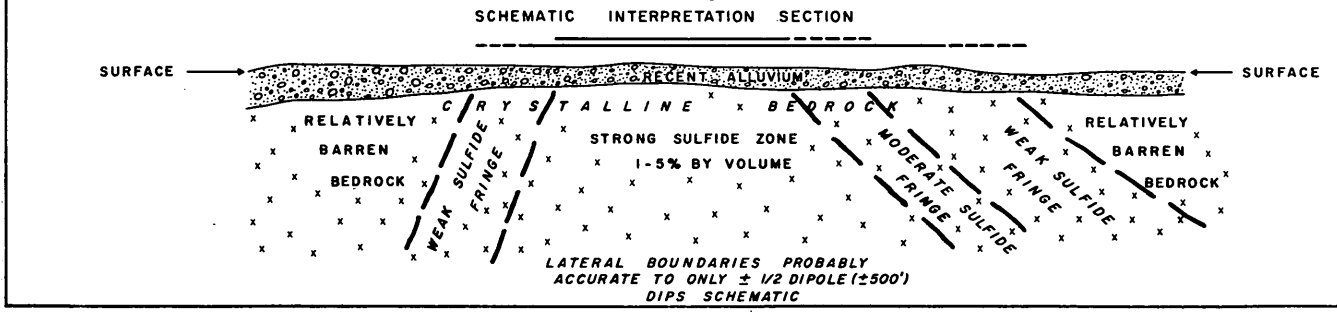




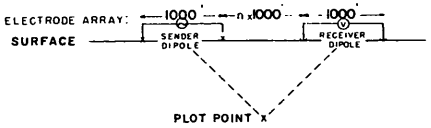




SCHEMATIC INTERPRETATION SECTION



EXPLANATION



RELATIVE ANOMALY STRENGTH

LOOKING WEST

PIMA MINING DISTRICT
PIMA COUNTY, ARIZONA

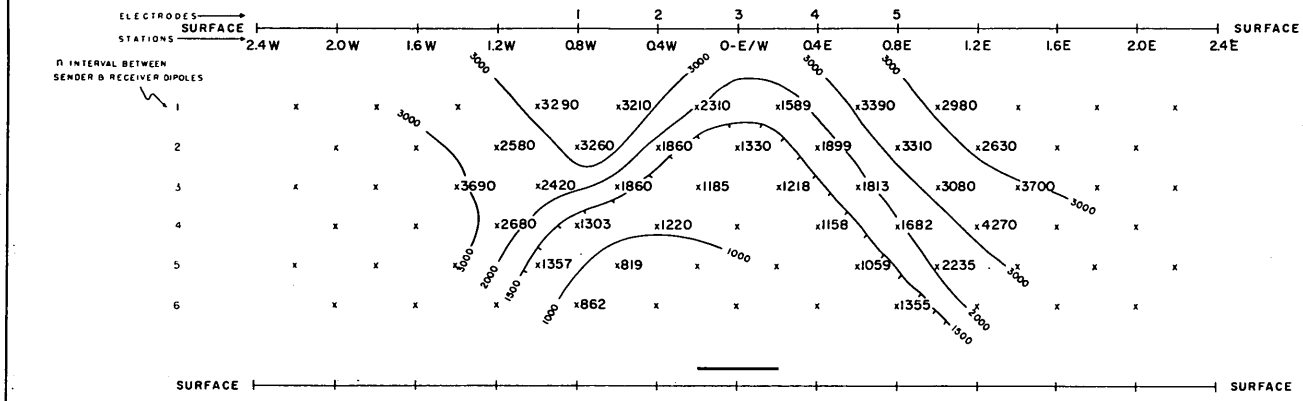
SECTIONAL DATA SHEET
LINE NO. —
INDUCED POLARIZATION TRAVERSE

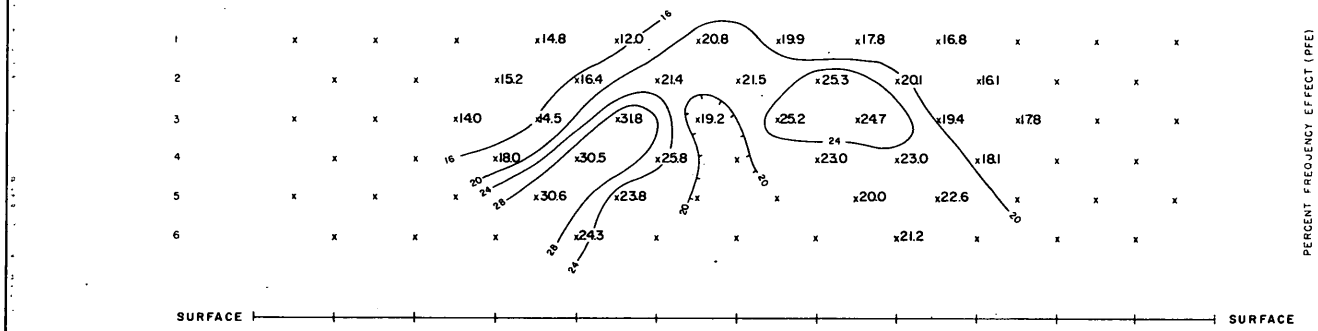
[redacted] DATE: —

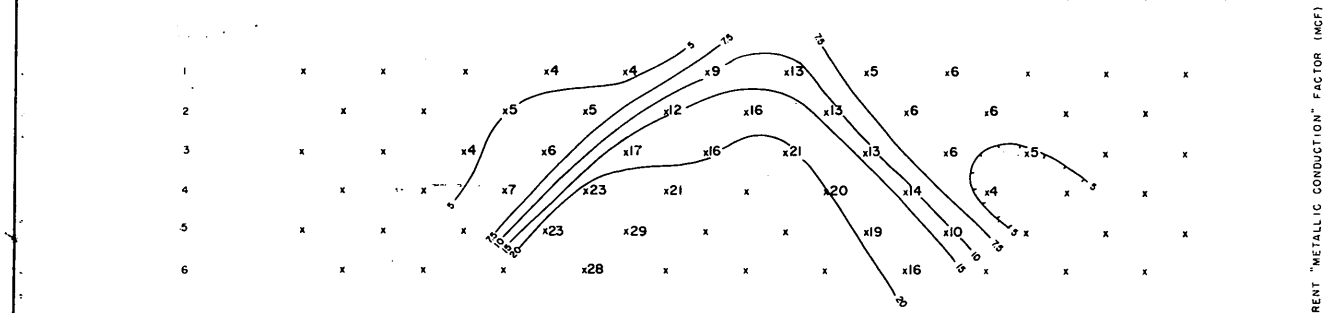
FOR

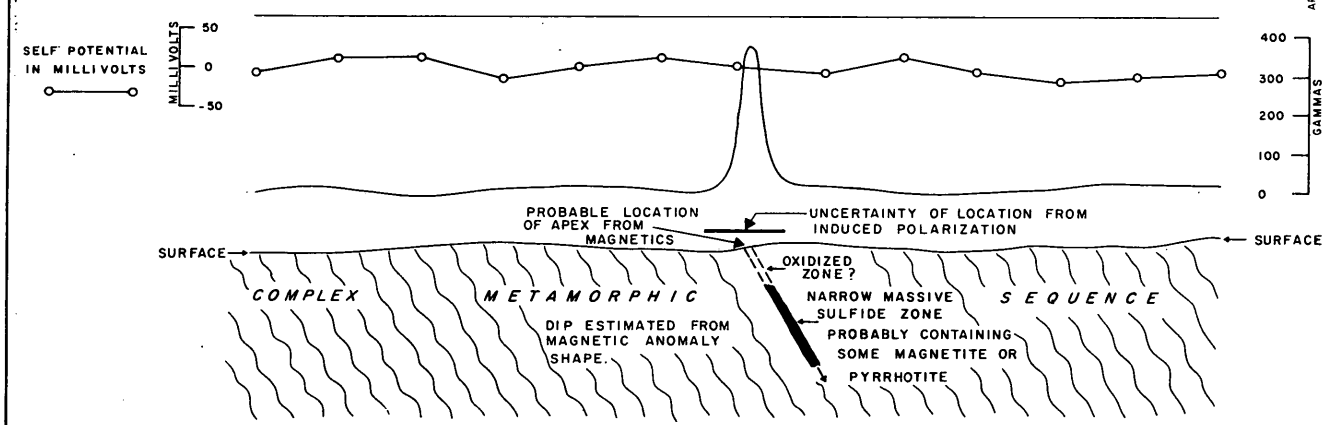
HEINRICHS
GEOEXPLORATION COMPANY
POST OFFICE BOX [redacted], TUCSON, ARIZONA, 85703
Phone. 602 623- 578 5964 Cable GEOEX Tucson
vancouver
sydney
geophysical engineers

ACTUAL FIELD EXAMPLE OF INDUCED POLARIZATION TRAVERSE OVER DISSEMINATED PORPHYRY TYPE SULFIDE MINERALIZATION

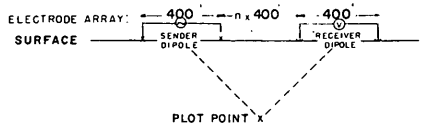




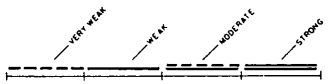




EXPLANATION



RELATIVE ANOMALY STRENGTH



LOOKING NORTH

MASSIVE SULFIDE VEIN

APPALACHIAN SULFIDE DISTRICT

SECTIONAL DATA SHEET

LINE NO. —

INDUCED POLARIZATION TRAVERSE

[redacted] DATE: —

FOR

HEINRICHS
GEOEXPLORATION COMPANY
POST OFFICE BOX [redacted], TUCSON, ARIZONA, 85703
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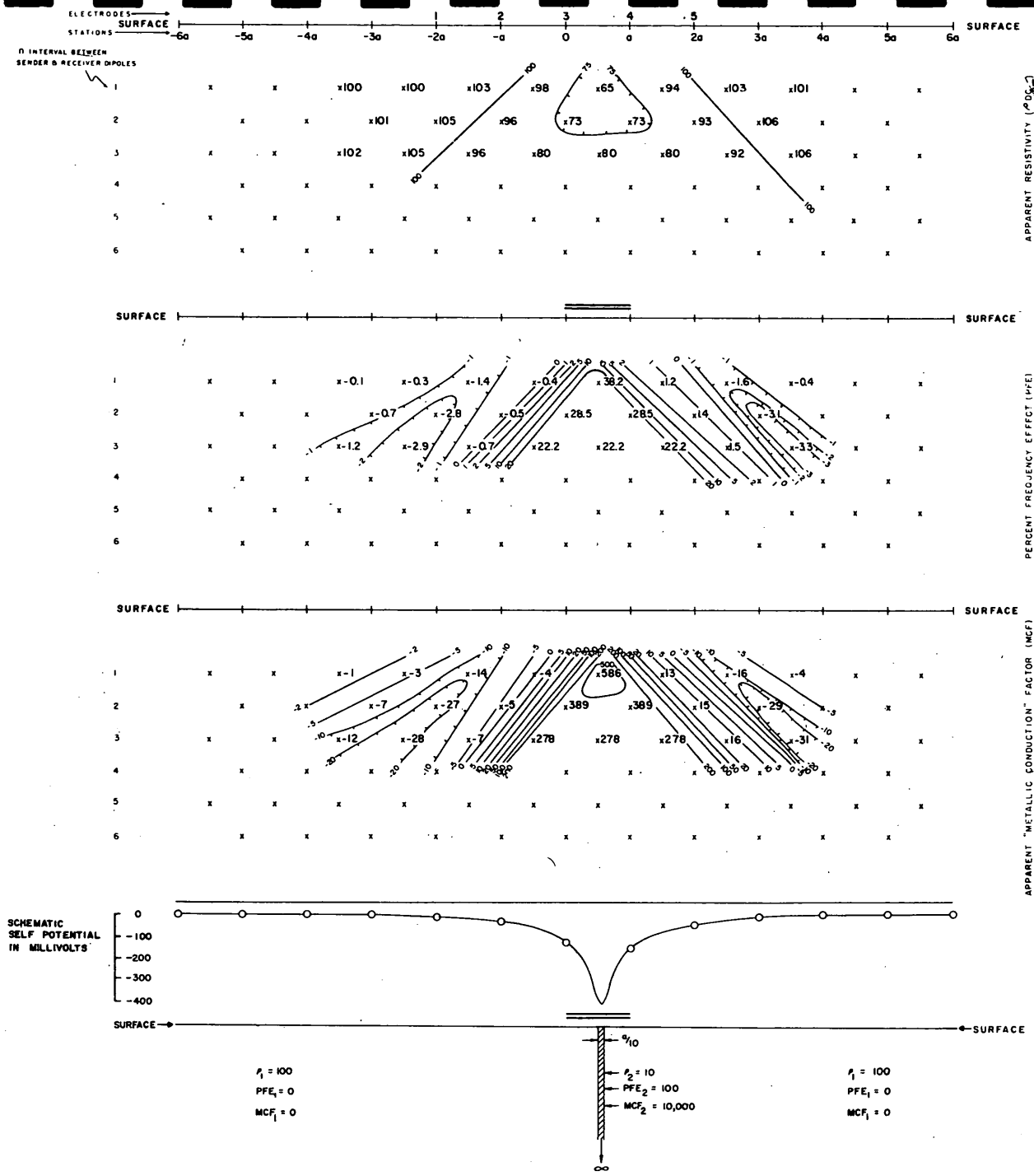
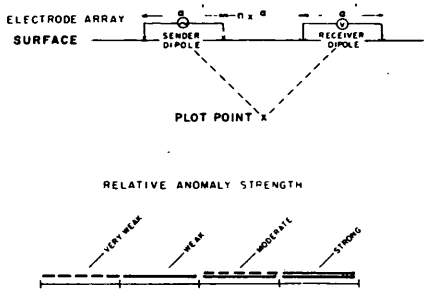
vancouver
sydney
geophysical engineers

ACTUAL FIELD EXAMPLE OF COMBINED INDUCED POLARIZATION, RESISTIVITY, MAGNETIC AND SELF POTENTIAL SURVEY ACROSS A NARROW-STEEPLY DIPPING MASSIVE SULFIDE VEIN.

NOTE: INDUCED POLARIZATION ANOMALY ONLY INDICATES A STEEP BUT UNKNOWN DIP. DEPTH TO SULFIDES PROBABLY BETWEEN 200 AND 400 FEET BASED ON ROUNDED APPEARANCE OF INDUCED POLARIZATION ANOMALY AND LACK OF SELF POTENTIAL RESPONSE.



EXPLANATION



LOOKING NORMAL TO STRIKE

VERTICAL
TABULAR BODY

SECTIONAL DATA SHEET
LINE NO. ——
INDUCED POLARIZATION TRAVERSE

SCALE: 4" = a DATE: ——

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Phone: 602/623-0578 Cable: GEOEX, Tucson
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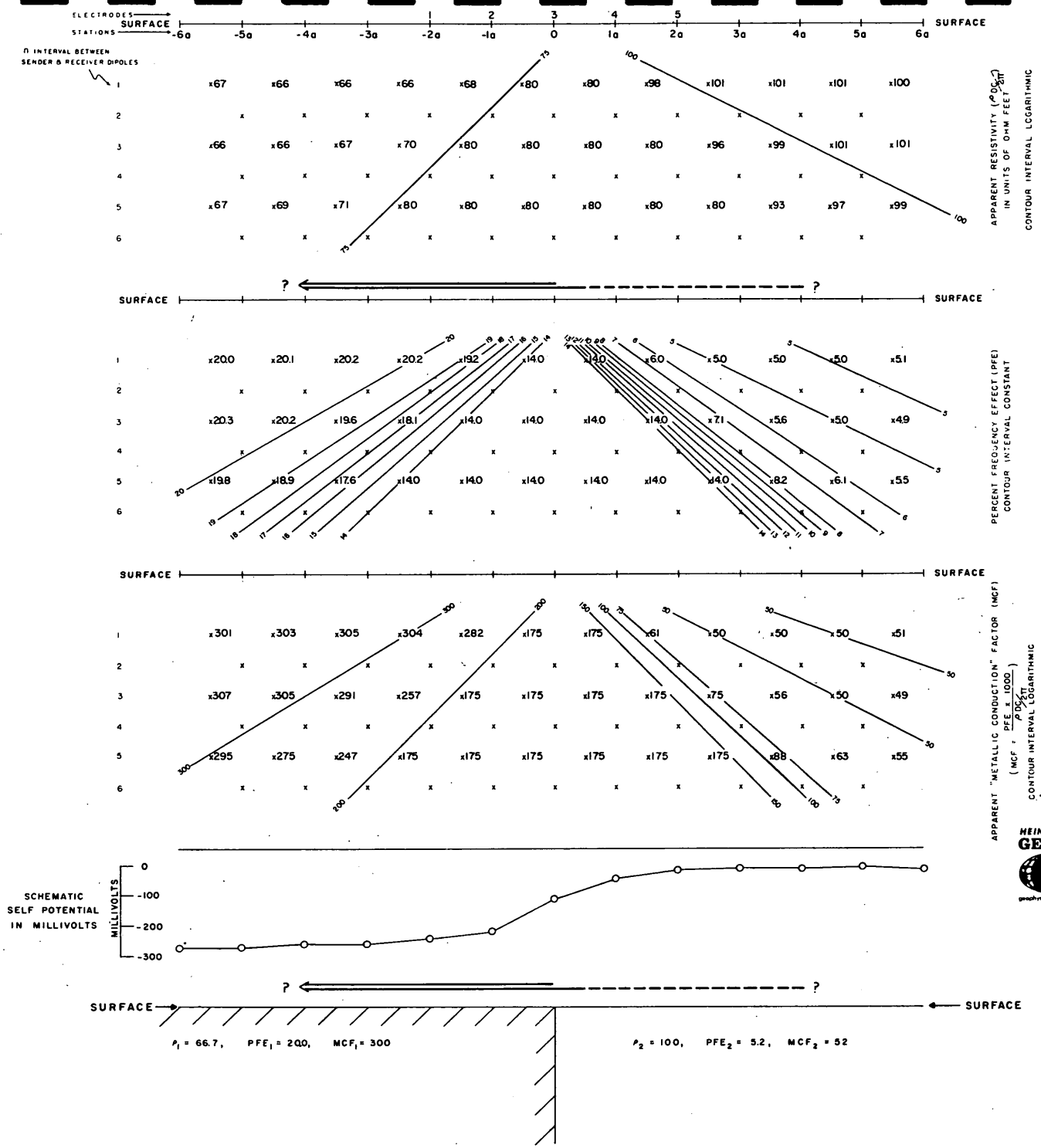
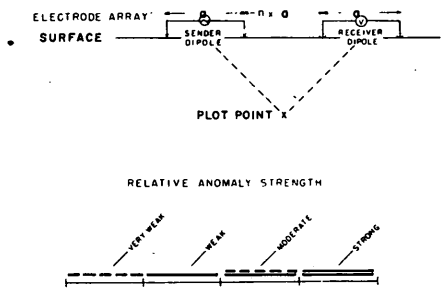
vancouver
sydney

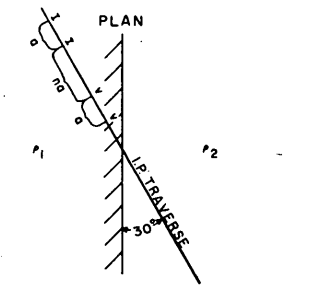
THEORETICAL DIPOLE-DIPOLE INDUCED POLARIZATION RESPONSE OVER A CONDUCTIVE VERTICAL TABULAR SULFIDE BODY CROSSED NORMAL TO THE STRIKE [HAVING A THICKNESS OF 1/10 THE ELECTRODE SPACING (a), A RESISTIVITY CONTRAST OF 10:1, A BACKGROUND RESISTIVITY (ρ_1) OF 100, A BACKGROUND PFE_1 OF 0, AND A PFE_2 OF 100 IN THE SULFIDE ZONE]



EXPLANATION



LOOKING 60° FROM STRIKE OF INTERFACE



VERTICAL INTERFACE

SECTIONAL DATA SHEET

LINE NO. ——

INDUCED POLARIZATION TRAVERSE

SCALE: 4" = a DATE: ——

FOR

HEINRICHS GEOEXPLORATION COMPANY
geophysical engineers
POST OFFICE BOX
Phone: 602/623-0578
TUCSON, ARIZONA, 85703
Cable: GEOEX, Tucson
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THEORETICAL INDUCED POLARIZATION TRAVERSE ACROSS A VERTICAL INTERFACE AT 30° – DIPOLE-DIPOLE ELECTRODE ARRAY.

July voucher

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O. M. E.
RECEIVED
AUG 14 1972

INITIALS	CODE
Cal	120 M
HK	~~120~~
Bob	~~Bu~~

Standard Form 63 (rev.)
March 1959
63-103

MEMORANDUM OF CALL

Date	Time

TO—

☐ YOU WERE CALLED BY— ☐ YOU WERE VISITED BY—

TELEPHONE:	Number or code	Extension

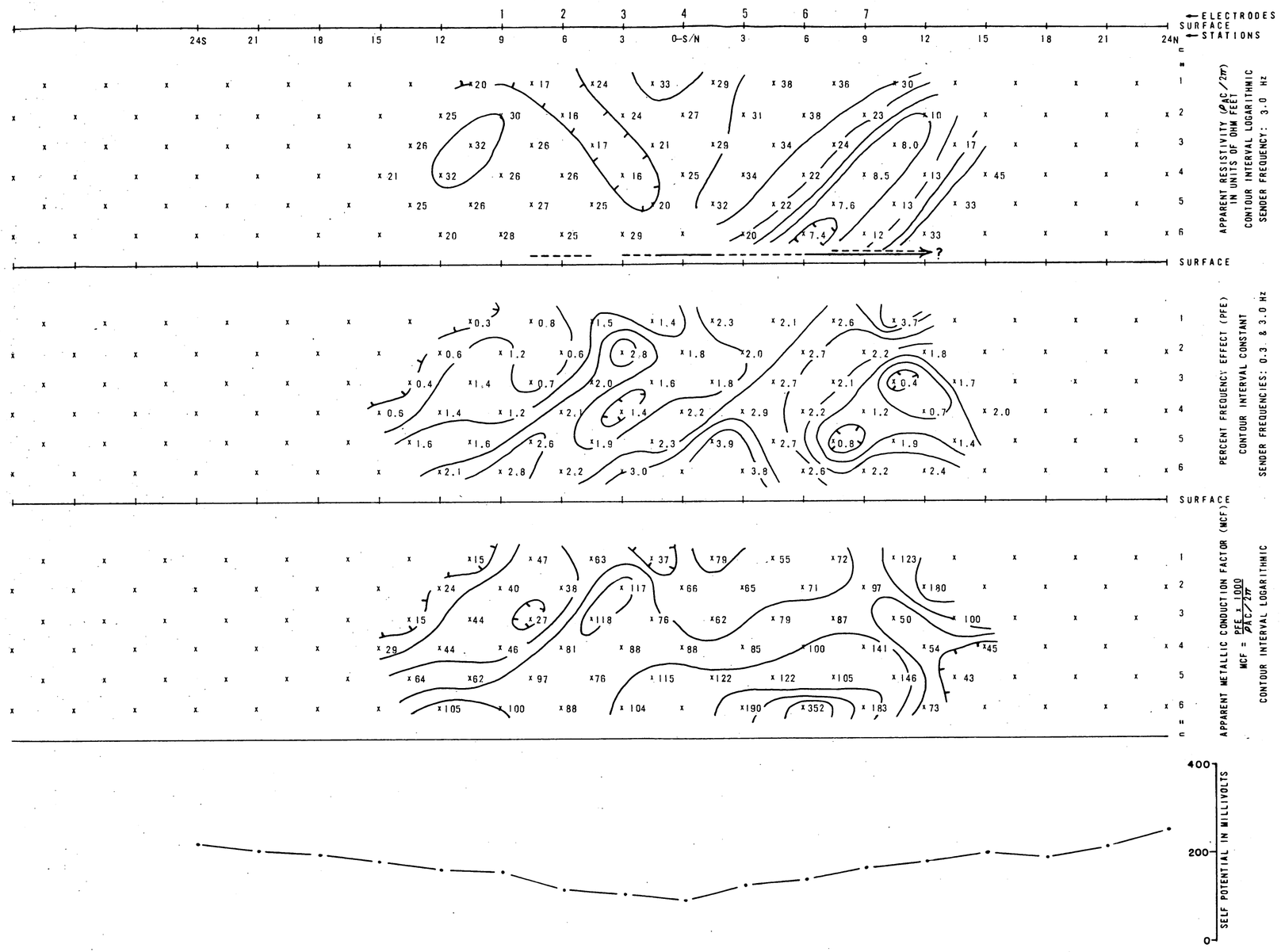
☐ PLEASE CALL
☐ WILL CALL AGAIN
☐ RETURNING YOUR CALL
☐ IS REFERRED TO YOU BY:

☐ WAITING TO SEE YOU
☐ WISHES AN APPOINTMENT

LEFT THIS MESSAGE: _____

	Received By—

U.S. GOVERNMENT PRINTING OFFICE: 1959 OF—512919



719-72

LINE NO.
H
SPREAD(S)
1

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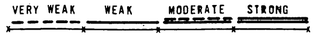
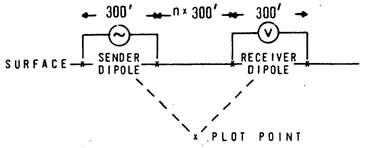
RELATIVE ANOMALY STRENGTH



DIPOLE DIPOLE ELECTRODE ARRAY



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LOOKING
S 47° W
DATE
MAY 1972

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AUSTRALIA
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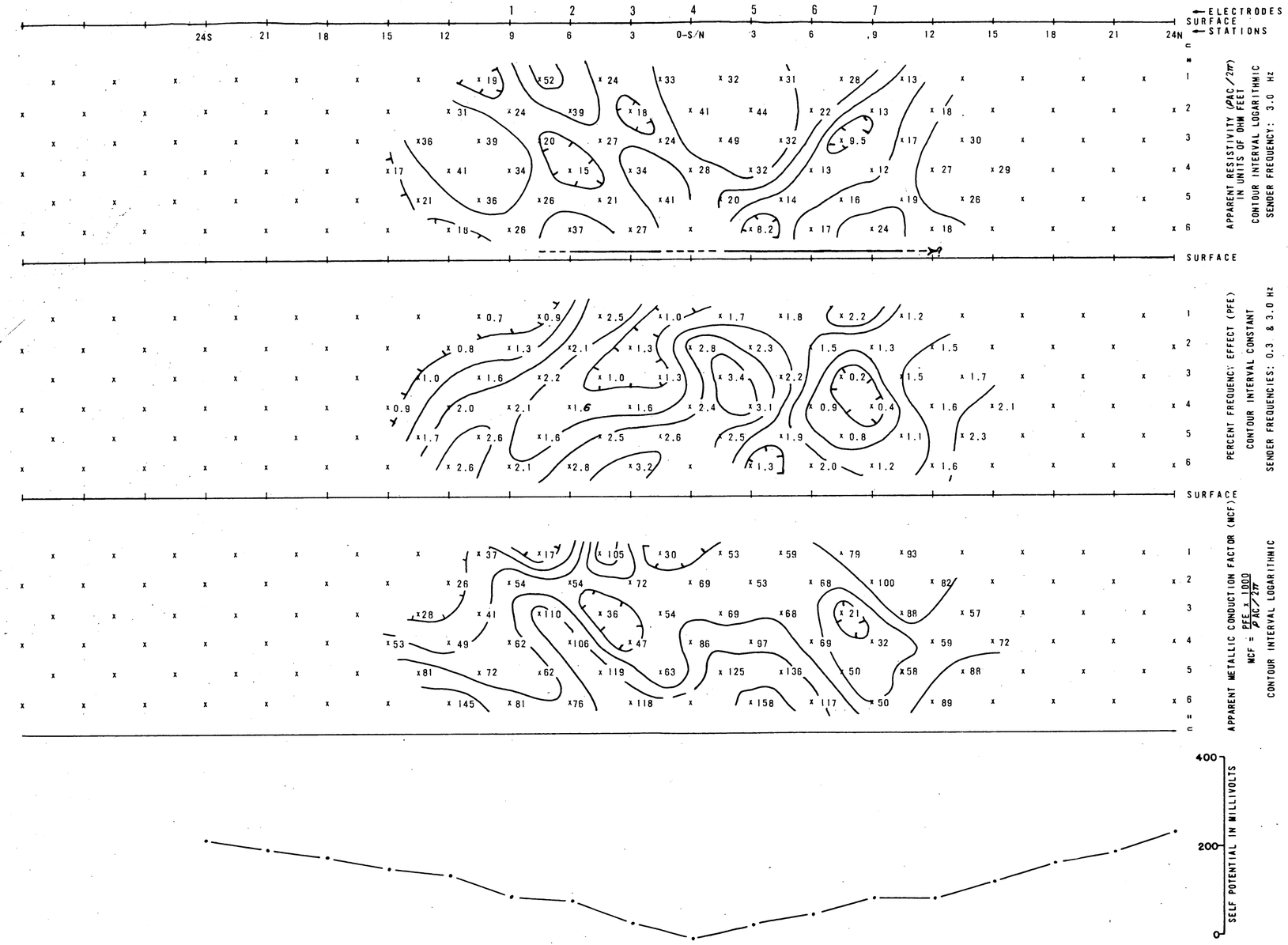
Cable: GEOEX, Tucson



718-72

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I

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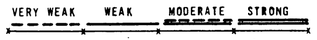
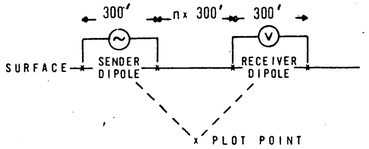
RELATIVE ANOMALY STRENGTH



DIPOLE DIPOLE ELECTRODE ARRAY



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DATE
MAY 1972

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GEOPHYSICAL ENGINEERS
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LINE NO.
J
SPREAD(S)
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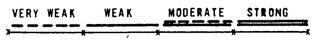
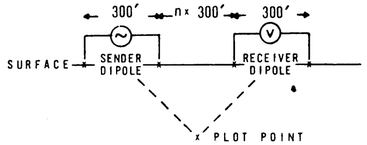
RELATIVE ANOMALY STRENGTH



DIPOLE DIPOLE ELECTRODE ARRAY



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GOOD HOPE MINE
LOOKING
S 55° W
DATE
JUNE 1972

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GEOPHYSICAL ENGINEERS
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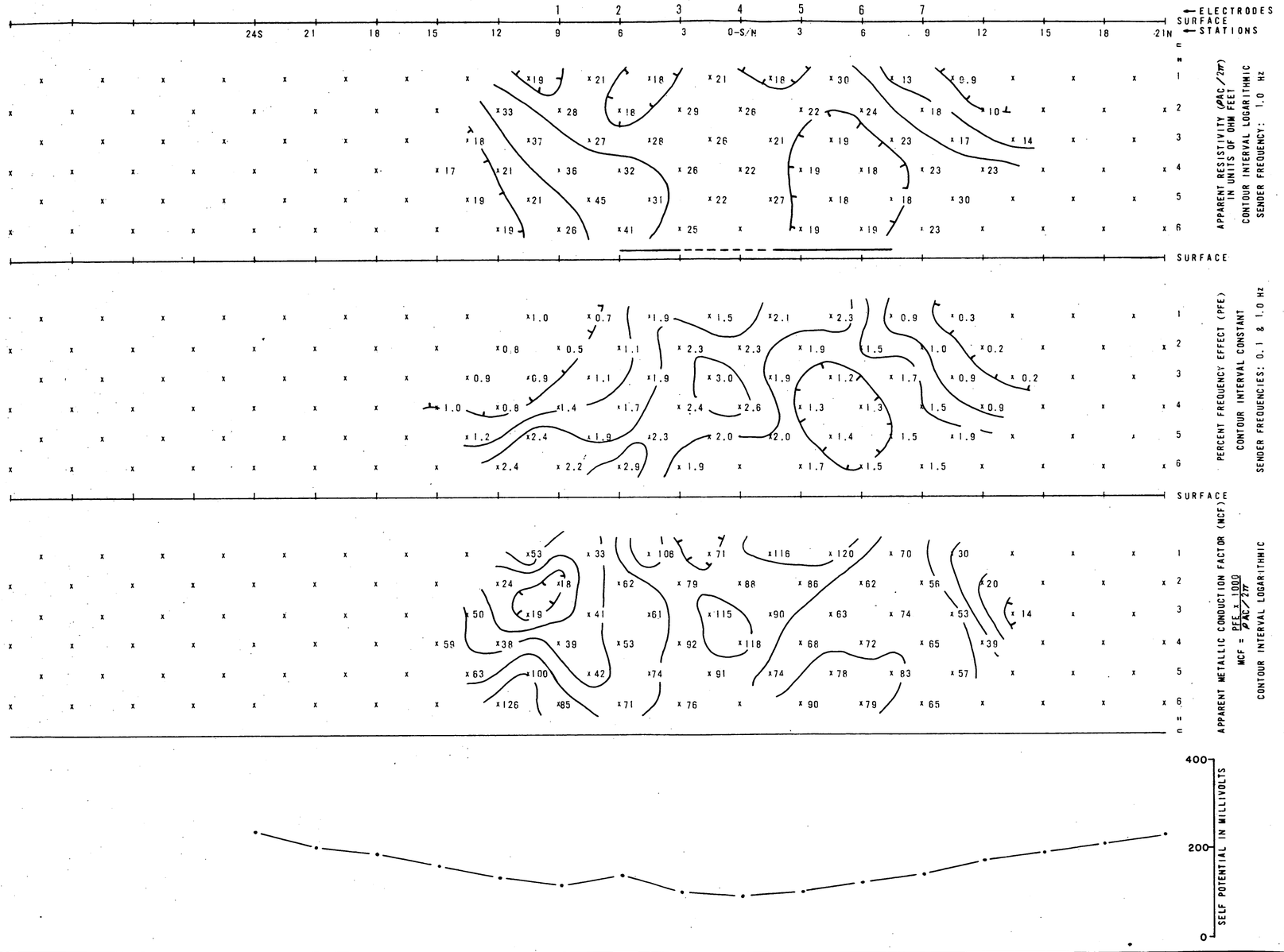
U.S.A.
Post Office Box 5964
Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX, Tucson



719-72

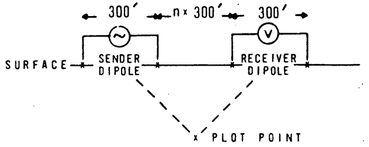
LINE NO.
K
SPREAD(S)
1

INDUCED POLARIZATION TRAVERSE SECTIONAL DATA SHEET
for
GREAT BASIN EXPLORATION COMPANY

RELATIVE ANOMALY STRENGTH

VERY WEAK | WEAK | MODERATE | STRONG

DIPOLE DIPOLE ELECTRODE ARRAY



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S 55° W
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Post Office Box 5964
Tucson, Arizona 85703
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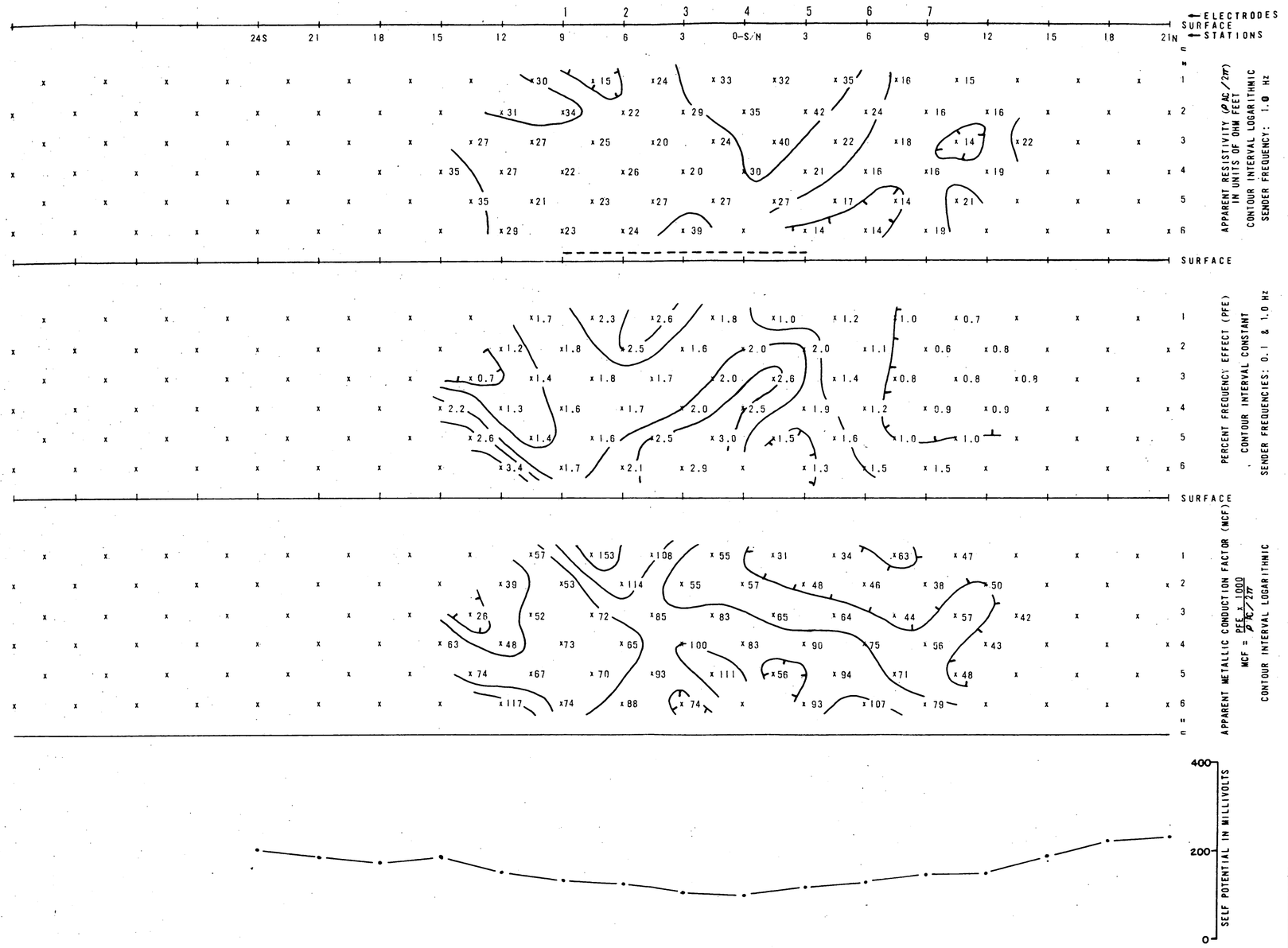
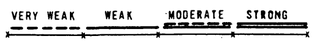


718-72

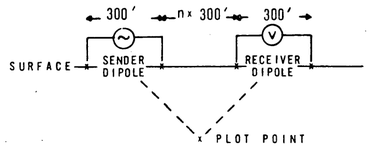
LINE NO.
L
SPREAD(S)
1

INDUCED POLARIZATION TRAVERSE SECTIONAL DATA SHEET for GREAT BASIN EXPLORATION COMPANY

RELATIVE ANOMALY STRENGTH



DIPOLE DIPOLE ELECTRODE ARRAY



AREA
GOOD HOPE MINE
LOOKING
S 58° W
DATE
JUNE 1972

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GEOEXPLORATION COMPANY
GEOPHYSICAL ENGINEERS
AUSTRALIA
(SYDNEY)
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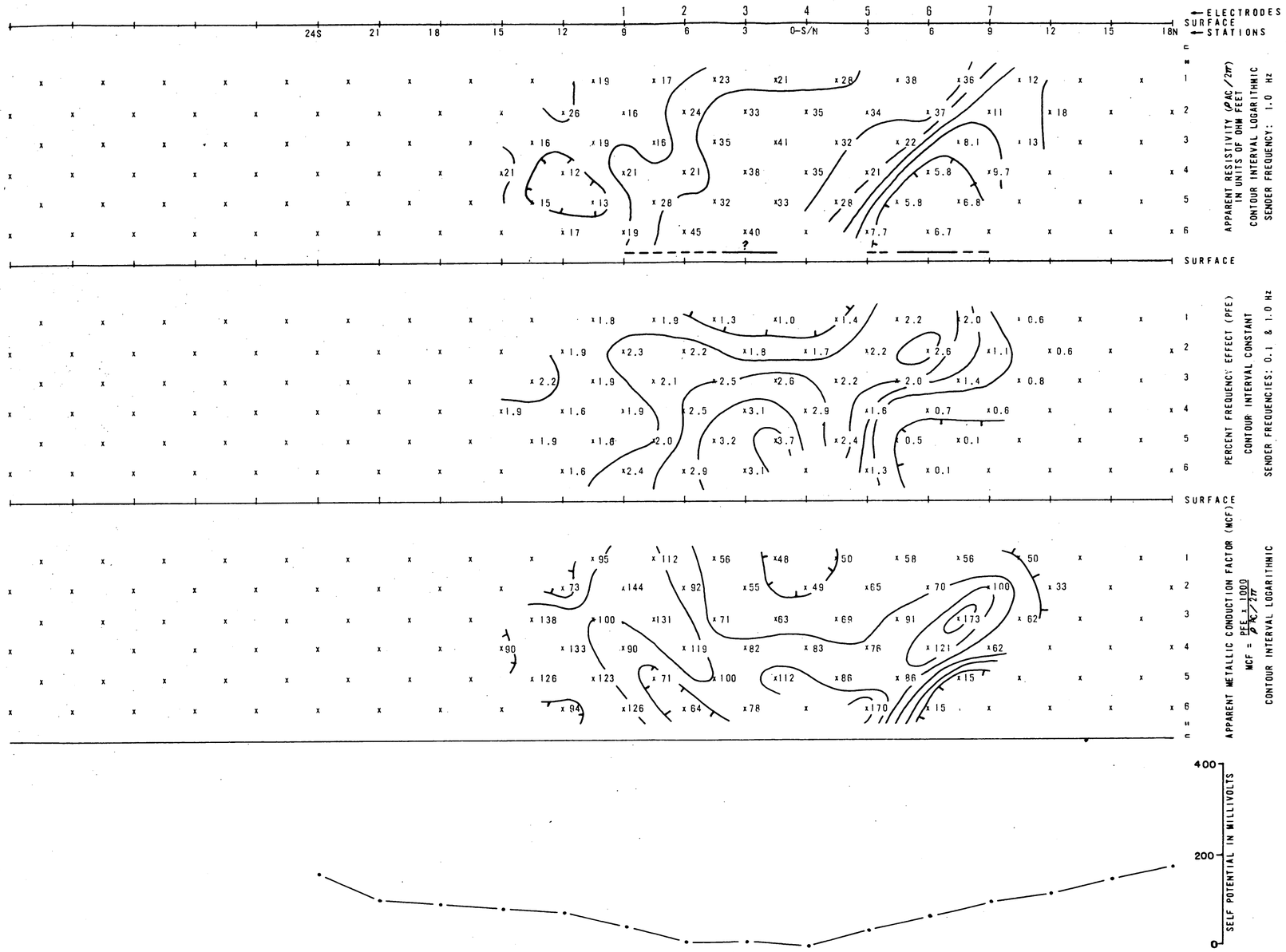
U.S.A.
Post Office Box 5964
Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX, Tucson



718-72

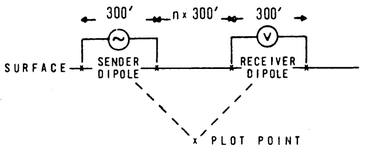
LINE NO.
M
SPREAD(S)
1

INDUCED POLARIZATION TRAVERSE SECTIONAL DATA SHEET for GREAT BASIN EXPLORATION COMPANY

RELATIVE ANOMALY STRENGTH

VERY WEAK — WEAK — MODERATE — STRONG

DIPOLE DIPOLE ELECTRODE ARRAY



AREA
GOOD HOPE MINE
LOOKING
S 40° W
DATE
JUNE 1972

HEINRICHS
GEOEXPLORATION COMPANY
GEOPHYSICAL ENGINEERS
AUSTRALIA
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U.S.A.
Post Office Box 5964
Tucson, Arizona 85703
Phone: (602) 623-0578
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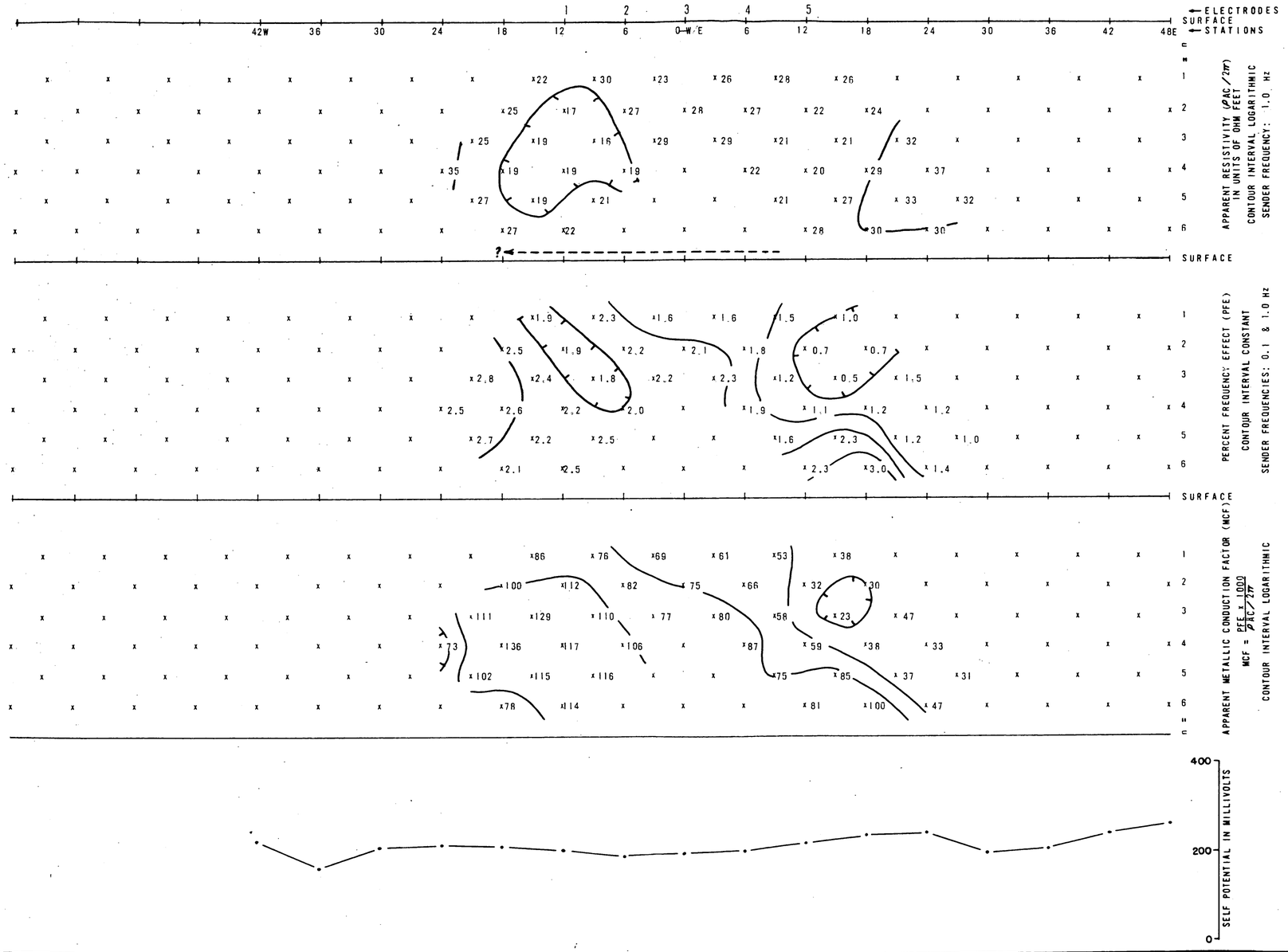


719-72

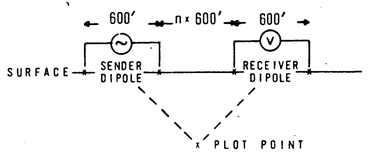
LINE NO.
N
SPREAD(S)
1

INDUCED POLARIZATION TRAVERSE SECTIONAL DATA SHEET for GREAT BASIN EXPLORATION COMPANY

RELATIVE ANOMALY STRENGTH

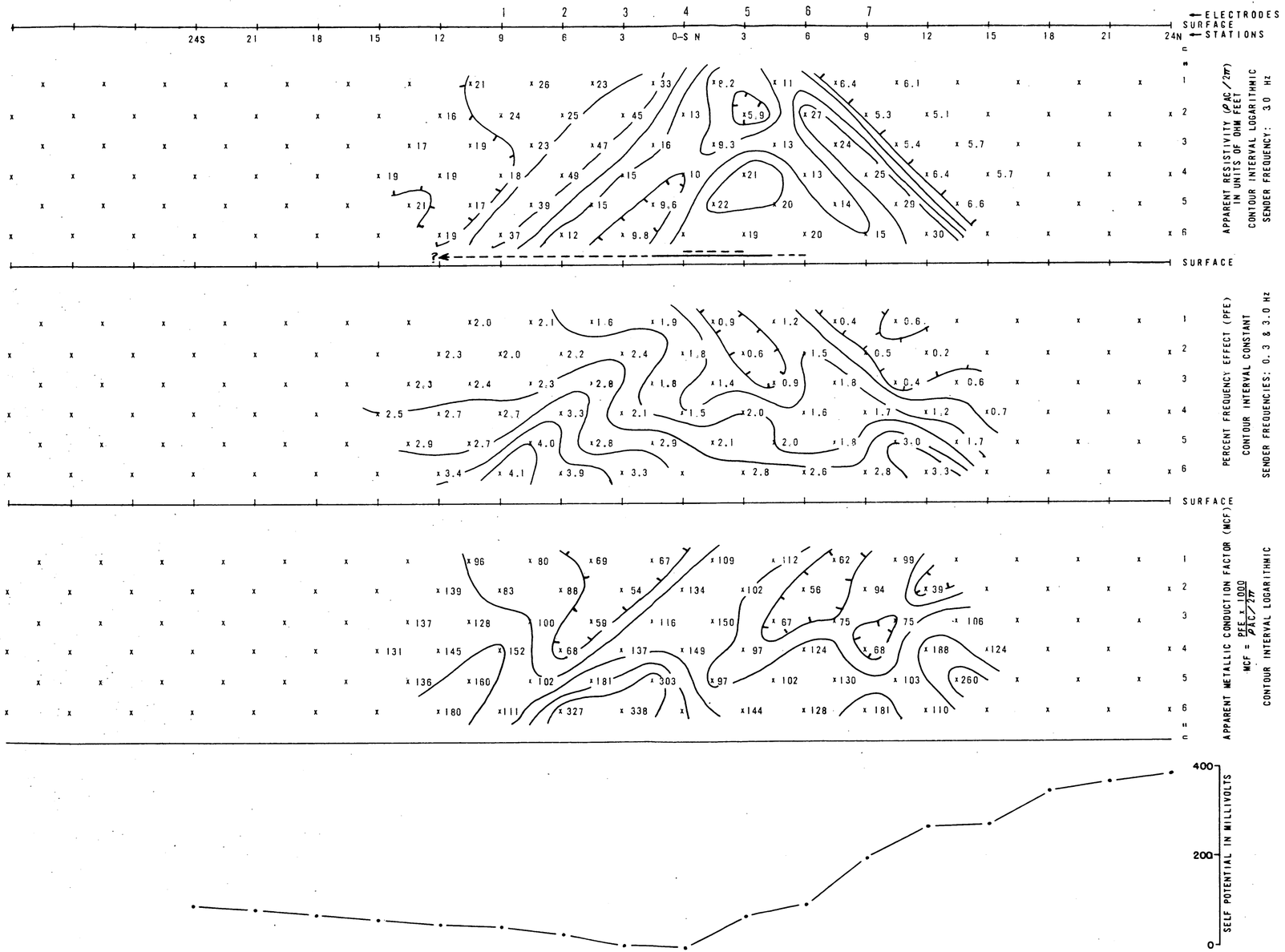
VERY WEAK — WEAK — MODERATE — STRONG

DIPOLE DIPOLE ELECTRODE ARRAY



AREA
GOOD HOPE MINE
LOOKING
N 29° W
DATE
JUNE 1972

HEINRICHS
GEOEXPLORATION COMPANY
GEOPHYSICAL ENGINEERS
AUSTRALIA
(SYDNEY)
39 Hume Street
Crows Nest, NSW
Phone: 439-1793
U.S.A.
Post Office Box 5964
Tucson, Arizona 85703
Phone: (602) 623-0578
Cable: GEOEX, Tucson

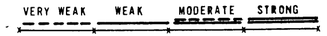


718-72

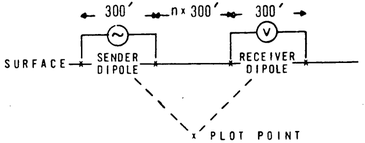
LINE NO.
0
SPREAD(S)
1

INDUCED POLARIZATION TRAVERSE SECTIONAL DATA SHEET for GREAT BASIN EXPLORATION COMPANY

RELATIVE ANOMALY STRENGTH



DIPOLE DIPOLE ELECTRODE ARRAY



AREA
GOOD HOPE MINE
LOOKING
S 50° W
DATE
JUNE 1972

HEINRICHS
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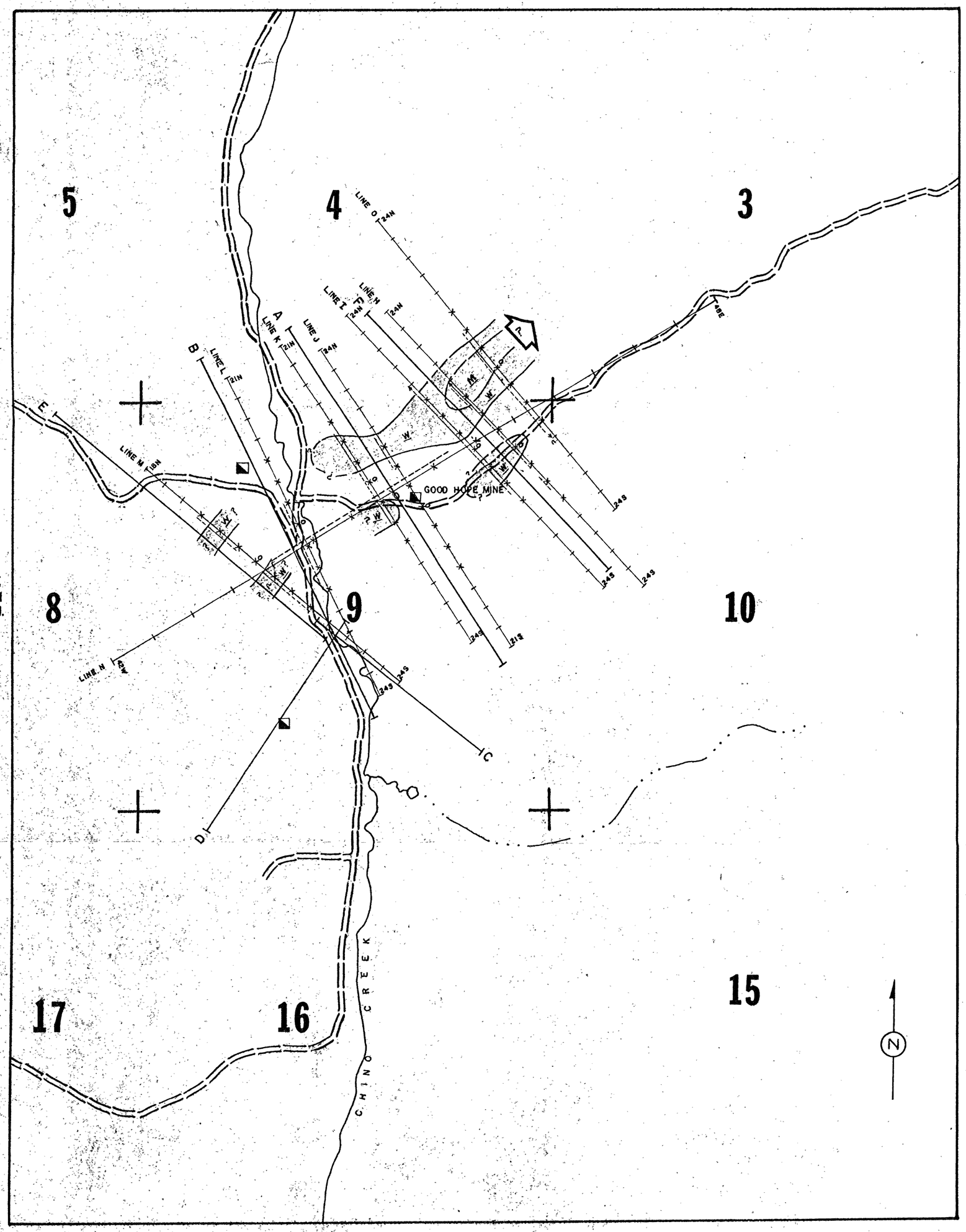

RELATIVE ANOMALY STRENGTH

I.P. Line — very weak, weak, moderate, strong — stations, electrodes

M W SCHEMATIC ZONES OF EQUAL RELATIVE ANOMALY STRENGTH

W WEAK

M MODERATE

SECTION CORNER

8 SECTION NUMBER

ROAD

VERTICAL SHAFT

NOTE: BASE MAP DATA SUPPLIED BY CLIENT. OVERLAYS GEOLOGIC MAP OF GOOD HOPE MINING DISTRICT BY R.D.KNOX AND E.F.LAWRENCE. (PLATE I)
R.D.KNOX I.P. LINES ARE INDICATED BY LETTERS A THROUGH E.

HEINRICHS GEOEXPLORATION COMPANY
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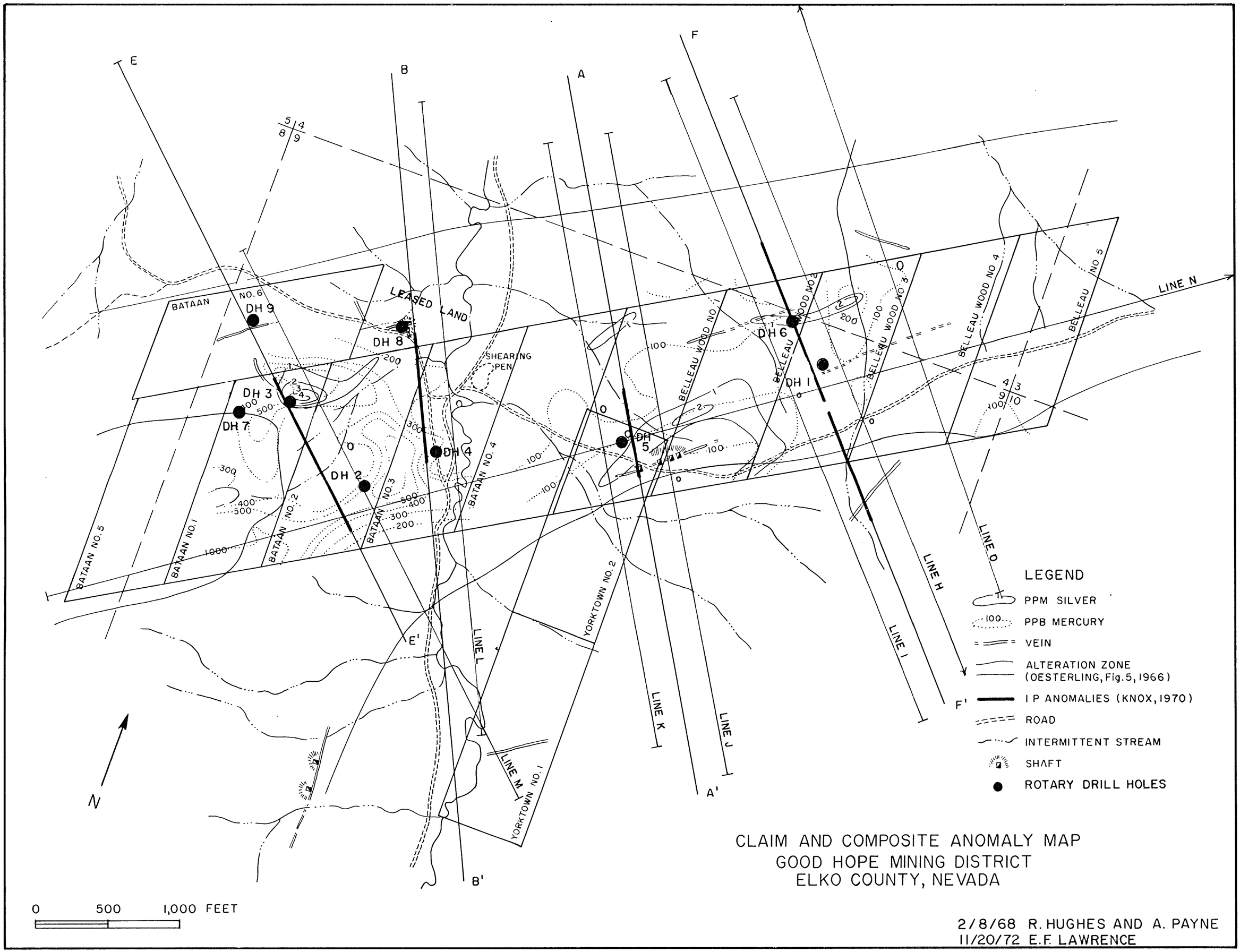
Vancouver Sydney
geophysical engineers

INDUCED POLARIZATION LOCATION AND INTERPRETATION PLAN OF GOOD HOPE MINE AREA ELKO COUNTY, NEVADA.

FOR GREAT BASIN EXPLORATION COMPANY

SCALE 1" = 1000' | DRAWN BY | DATE JUNE 1972



2/8/68 R. HUGHES AND A. PAYNE
11/20/72 E.F. LAWRENCE

PLATE I MAP SHOW LOCATION OF DRILL HOLES

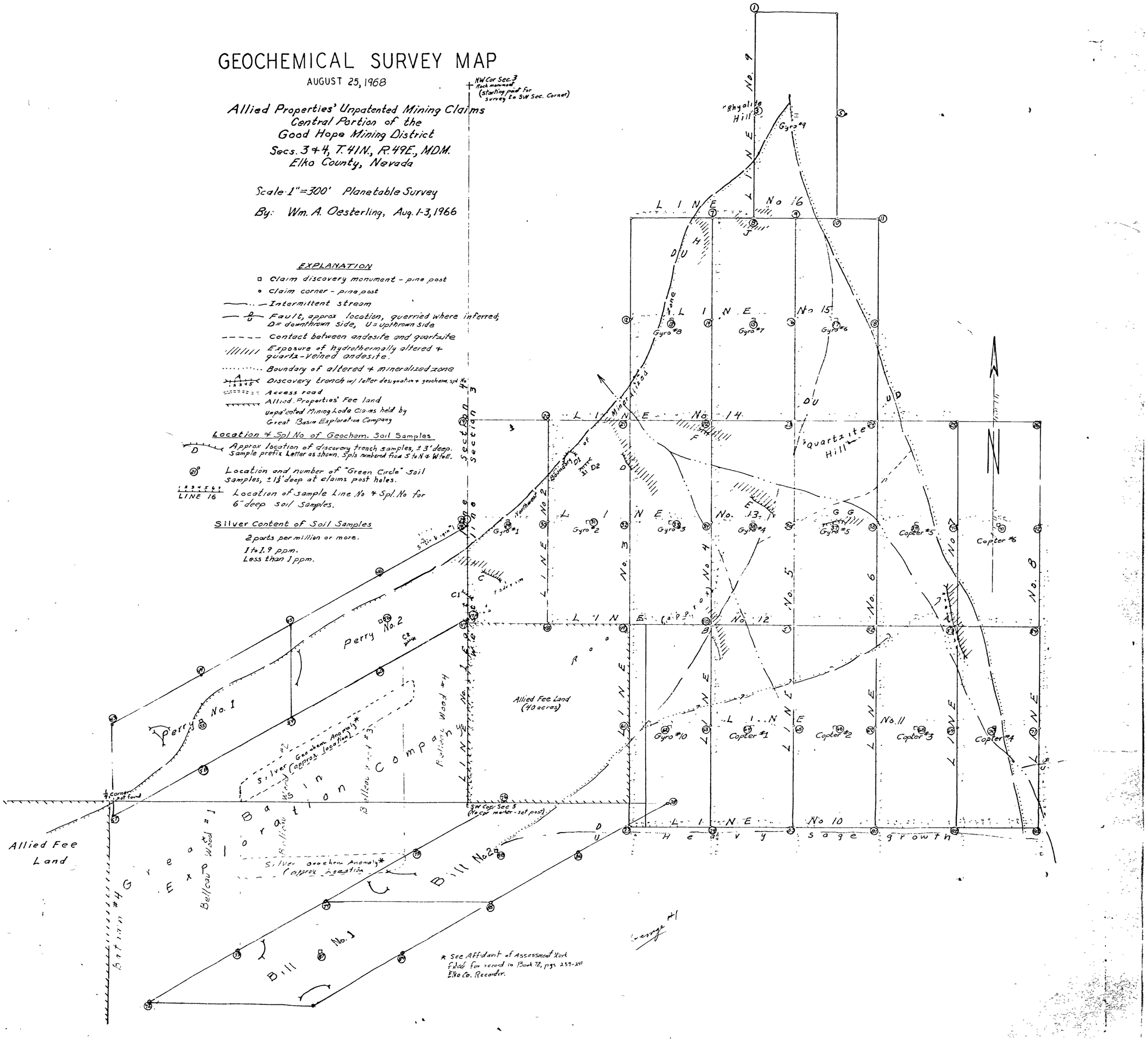
GEOCHEMICAL SURVEY MAP

AUGUST 25, 1968

Allied Properties' Unpatented Mining Claims
Central Portion of the
Good Hope Mining District
Secs. 3 & 4, T. 41N., R. 49E., MDM.
Elko County, Nevada

Scale 1" = 300' Planetable Survey

By: Wm. A. Oesterling, Aug. 1-3, 1966



* See Affidavit of Assessment Work Filed for record in Book 72, pgs. 239-241 Elko Co. Recorder.