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# Miami Copper Company

Division Tennessee Corporation

Miami, Arizona

B. R. Coit

Vice President and General Manager

P.O. Box 100

Zip Code 85539

August  
14th  
1967

Mr. Walter F. Heinrichs, Jr.  
President and General Manager  
Heinrichs Geoexploration Company  
P. O. Box 5671  
Tucson, Arizona 85703



Dear Walt:

Thank you for the letter of August 11, 1967 from you and Chris.

We have not done sufficient field work since our session on June 26 to have additional questions. We thought that meeting quite satisfactory. Until we do have other questions or unless you have something to add to your previous reports we have no reason to impose on your time by requesting a conference.

Perhaps our follow-up on the data and reports at hand will call for a conference on further work. We hope so.

With best personal regards,

Very truly yours,

W. W. SIMMONS  
Chief Geologist

WWS-dh

# Miami Copper Company

Division Tennessee Corporation

Miami, Arizona

B. R. Coit

Vice President and General Manager

P.O. Box 100  
Zip Code 85539

August  
10th  
1967



Mr. Chris S. Ludwig  
Senior Geophysicist  
Heinrichs Geoporation Company  
P. O. Box 5671  
Tucson, Arizona 85203

Dear Mr. Ludwig:

I acknowledge receipt of your report on the Induced Polarization survey, Phase 2, at Mineral Mountain, near Florence, Arizona and also the sepi maps.

I have approved your second billing on this job dated August 9, and forwarded it to our Purchasing and Accounting Departments. I assume this is the final billing and we can close this account.

I will be most appreciative of any comments you care to make concerning this project in line with my letter of July 25th to your firm.

Very truly yours,

A handwritten signature in cursive script, appearing to read "W. W. Simmons".

W. W. SIMMONS  
Chief Geologist

WWS:dh

Handwritten initials "dh" in a cursive style.

# Miami Copper Company

Division Tennessee Corporation

Miami, Arizona

B. R. Coit

Vice President and General Manager

P.O. Box 100  
Zip Code 85539

August  
9th  
1967

Mr. Chris S. Ludwig  
Senior Geophysicist  
Heinrichs Geoporation Company  
P. O. Box 5671  
Tucson, Arizona 85703



Dear Mr. Ludwig:

Hole No. 1 at Mineral Mountain drilled bedrock at a length of 1022 feet. The rock is unaltered, unmineralized gray granite. The hole bottomed at a length of 1090 feet. We are abandoning the project.

Thank you for your interest in the project. Perhaps the results will be more rewarding next time. We are disappointed, of course, but if we knew where to explore life might be too simple.

Very truly yours,

A handwritten signature in cursive script, appearing to read "W. W. Simmons".

W. W. SIMMONS  
Chief Geologist

WWS-dh

# Miami Copper Company

Division Tennessee Corporation

Miami, Arizona

B. R. Coit

Vice President and General Manager

P.O. Box 100  
Zip Code 85539

August  
8th  
1967

Mr. Chris S. Ludwig  
Senior Geophysicist  
Heinrichs Geoexploration Company  
P. O. Box 5671  
Tucson, Arizona



Dear Mr. Ludwig:

As requested in your report of the Induced Polarization survey near Florence, Arizona, Phase II there follows a copy of our monthly report of the drill hole currently in progress.

<u>"From-To</u>	<u>Type Drill</u>	<u>Rock Type</u>	<u>Remarks</u>
0-235	Rock bit	Alluvium	schist, granite,
235-415	Core	Alluvium	hematite, magnetite, very little pyrite. estimate- 50% schist 30% granite 20% sand, cementing material

The alluvium is generally cemented or lithified well enough for good, +90%, core recovery. The hole has kept open without undue difficulty."

At noon today the hole length was 970 feet. At about 875 feet the rock fragments are about 1/2 the size of those above i-e +2-3 inches to -1 inch. The matrix is even more lithified.

Mr. Chris S. Ludwig

-2-

August 8, 1967

We have spread the core on the ground at the drill site. You are free to inspect or sample as you wish.

Very truly yours,

A handwritten signature in cursive script, appearing to read 'W. W. Simmons', written in dark ink.

W. W. SIMMONS,  
Chief Geologist

WWS-dh



July 6, 1967

**HEINRICHS GEOEXPLORATION COMPANY**

806 WEST GRANT ROAD, TUCSON, ARIZONA, 85703. P.O. BOX 5671. PHONE: (AREA CODE 602) 623-0578

Miami Copper Company  
P. O. Box 100  
Miami, Arizona 85539

Attn: Mr. W. W. Simmons, Chief Geologist

Re: Your letter 3 July 1967 regarding proposed additional electrical geophysics at Mineral Mountain, northeast of Florence, Arizona.

Gentlemen:

Confirming above reference and telephone communication with Mr. Simmons of the same date, we herewith propose for our mutual understanding and agreement as follows:

Beginning on or about Monday, July 10, 1967, GEOEX will furnish one basic induced polarization electrical geophysical crew and equipment. Initially, and as feasible, we intend to utilize an extra high powered sender. Based on experience from the earlier work, this is considered desirable and recommended for maximum information and reliability.

It is understood that tentatively Lines 11, 12, 13 and 14 are to be tied to and extended to the west, with one 5 - electrode 1,000 ft. dipole setup each. Line 13 will be run first, and depending on results, alternatives to extending Line 11 will be considered and invoked if mutually considered preferable.

Charges will be at the base rate of \$350.00 per work day utilizing the extra high powered equipment and a five man crew. A three man crew at \$300.00 per day, four men, \$325.00 and six men, \$375.00. Vehicle charges will be at the rate of \$11.00 per day plus \$0.12 per mile per vehicle and two vehicles will be used. Directly incidental supplies, communications and living expenses at our cost. Final compilation, interpretation and report will be \$120.00 per Tucson staff day. Total charges are estimated \$4,400.00 including report.

Mobilization and demobilization travel, excessive

Miami Copper Co.

- 2 -

July 6, 1967

weather delay and standby charges all will be one half the daily rate. Breakdown of our equipment in excess of one hour per day will be made up or not charged.

Mr. Keith Henson, party chief will be in charge of the crew. Others of our technical staff will be available as needed or requested.

All property permits, brushing and trespassing - liability and related costs incurred on behalf of Miami are assumed by Miami.

Charges for extra equipment and personnel mutually desired, will be extra.

GEOEX will hold Miami harmless from all Workmen's Compensation, public liability and property damage liability incurred by GEOEX employees.

Preliminary reports or copies of rough field plotting sheets will be available as work progresses. Field completion is anticipated on or about July 20 1967 and final report on or about July 28, 1967.

Billings may be submitted periodically, with final billing after delivery of final report.

Indication of your understanding and approval of the above by executing the attached carbon copy as provided below and returning it to us will be most appreciated.

Faithfully,  
HEINRICHS GEOEXPLORATION CO.

  
Walter E. Heinrichs, Jr.  
President & General Manager

J  
cc: Extra Encl.

Accepted:   
MIAMI COPPER COMPANY

by:   
(Title)

PURCHASE ORDER  
**MIAMI COPPER COMPANY**  
 DIVISION TENNESSEE CORPORATION

P. O. BOX 100  
 MIAMI, ARIZONA 85539

July 11, 1967

F

Heinrichs Geopxploration Company  
 P.O. Box 5671  
 Tucson, Arizona 85703

SHIPPING DIRECTIONS

Show Purchase Order No. and the following address on all packages and all papers in connection with this shipment.

**MIAMI COPPER CO.**  
 DIVISION TENNESSEE CORPORATION  
 P. O. Box 100  
 Miami, Arizona 85539

If terms are not marked on invoice we will deduct 2% for cash in ten days.  
 Mail **INVOICE IN TRIPPLICATE** and **BILL OF LADING** to this office at time of shipment.  
 Please acknowledge receipt of this order stating date or approximate date of shipment.

Ship Via:

**ORDER N° 48665**

QUANTITY	DESCRIPTION	ITEM	PRICE
	<p>Induced Polarization Survey near Mineral Mountain, Pinal County, Arizona.</p> <p>Work to be done as per letters: W. W. Simmons to Heinrichs 7/3/67, Heinrichs to W. W. Simmons 7/6/67. Approved copy of letter 7/6/67 attached.</p> <div style="text-align: center; margin-top: 20px;">  <p>MIAMI COPPER COMPANY            DIVISION TENNESSEE CORPORATION</p> <p style="font-size: 1.5em; font-family: cursive;"><i>A. G. Philp</i></p> <p>A. G. Philp            Purchasing Agent</p> </div>	1.	rej-c/o

**N° 48665**

August 4, 1967

Mr. W. W. Simmons  
Chief Geologist  
Miami Copper Company  
P. O. Box 100  
Miami, Arizona

Dear Mr. Simmons:

Enclosed is an original and two copies of Induced Polarization Survey - Phase II, Magnetic Survey Area #1 (Florence) Pinal County, Arizona.

Sepias will follow under separate cover.

If you have any questions, please let us know.

Very truly yours,

HEINRICHS GEOEXPLORATION COMPANY

*Chris S. Ludwig*  
Chris S. Ludwig  
Senior Geophysicist

CEL: jc  
Enclosures  
Via certified mail  
#636227

No. 636227

<b>INSTRUCTIONS TO DELIVERING EMPLOYEE</b>		
<input checked="" type="checkbox"/> Show to whom and date delivered	<input type="checkbox"/> Show to whom, date, and address where delivered	<input type="checkbox"/> Deliver ONLY to addressee
(Additional charges required for these services)		

**RECEIPT**

Received the numbered article described below.

REGISTERED NO.	SIGNATURE OR NAME OF ADDRESSEE (Must always be filled in)
CERTIFIED NO. 636227	1 <i>Mr. W. W. Simmons</i>
INSURED NO.	2 <i>J. S. Helt</i>
DATE DELIVERED AUG 7 1967	SHOW WHERE DELIVERED (only if requested)

**INDUCED POLARIZATION SURVEY - PHASE II  
MAGNETIC SURVEY AREA #1 ( FLORENCE )  
PINAL COUNTY, ARIZONA**

**For  
Miami Copper Company**

**July 1967**

**By  
Heinrichs Geoexploration Company  
P. O. Box 5671 Tucson, Arizona 85703  
Phone: 623-0578 Area Code: 602**

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<b>Induced Polarization Location and Interpretation Plan</b>	
<b>Sectional Data Sheets (Spreads 1 and 2)</b>	
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## INTRODUCTION

At the request of Mr. Simmons of Miami Copper Company, Miami, Arizona, Heinrichs Geoexploration Company of Tucson, Arizona conducted and completed an extension (Phase II) of the Area #1 induced polarization survey done during April and June 1967 on the aerial magnetic survey west of Mineral Mountain near Florence, Pinal County, Arizona. This additional field work was done in the interim July 10 to July 19, 1967.

The Phase II work consists of one additional spread tied to the west ends of each of Lines 12, 13, and 14. This gives a total of 21,000 feet of new surface coverage and an equal footage of new subsurface plotted data.

The new work was continued on the same frequencies and dipole spacing so as to tie with the previous survey. However, extra high powered sending equipment was utilized to raise the signal level further above the natural electrical noise, thereby improving data quality. This was done because of marginal nature of anomalism previously noted and because of previous difficulty with low resistivities, and low signal to noise ratios.

The purpose of this extension was to gather further information as to extent, strike and cause of a poorly defined anomalous zone seen on the western ends of the original work done on Lines 11, 12, 13, and 14.

Results are presented on sectional data sheets one for each line showing both spreads. A revised plan is also included.

Heinrichs personnel involved in the field work were K. Henson, geophysical crew chief, S. Cruze, D. Swanson and G. Leavitt, technical assistants. Report and interpretation by the Tucson Geoex staff under the supervision of Chris S. Ludwig, Senior Geophysicist.

## CONCLUSIONS, RECOMMENDATIONS, AND INTERPRETATION

The Phase I anomalism was verified by the Phase II survey and is now at least partly indicated to be technical and not necessarily due to mineral ore potential. The most technically interesting zone crossed so far is centered near 50W Line 14 where a weak but definite anomaly comes near the surface (relative to a 1,000 foot dipole spacing) to within 500 feet. However, the resistivity picture very strongly suggests a crystalline bedrock depth in excess of 1,500 feet thereby forcing the polarizing body to apparently lie wholly or mostly within the alluvium or Gila conglomerate. Although relatively rare, minor anomalism can arise in recent sediments particularly if sandy with a thin layer of clay coating the quartz grains. The amplitude of anomalism is in the typical range for this clay-sand effect. Also, intercalated volcanic ash (particularly bentonite beds) can give weak non-sulfide polarization response in some environments.

At about 55W on Line 13 along with 50W and 70W on Line 12, similar anomalism to that seen on Line 14 occurs, however, somewhat deeper and weaker. This suggests a NNW-SSE to N-S trend for the anomalous source plus indicating a relatively narrow source - say less than 1,000 feet wide. Therefore, one possible source for the anomaly could be a buried stream channel in the recent sediments. There is no resistivity pattern associated with this anomaly to suggest a rock type different from the surrounding sediments as the anomaly source.

Self potentials show fairly strong variations, particularly on the second spreads. This probably results from the necessity of using very large contact electrodes with the extra highly powered gear. Such pits can set up electro-chemical reactions giving artificial self potentials.

On Line 13, the weak anomaly west of 20 W on the Phase I work was shown to be cut off immediately rather than extending west as hoped. In fact, the center of the anomaly is now believed to be

near 20W. The source of this anomaly is deeper than the Line 14 anomaly and the bedrock appears shallow. Therefore, this zone has more chance of resulting from a bedrock sulfide deposit than the Line 14 zone.

Apparently a drill hole programmed to reach bedrock is underway at this time at or near Station 20W, Line 13. This hole will have to go to at least 1,000 feet to intersect the polarizing body. Bedrock depth is difficult to predict here because of the "three layer" situation but is likely on the order of 750 to 1,000 feet assuming the lower high resistivity layer is bedrock rather than a high resistivity recent sediment layer. If not, bedrock could be in excess of 1,500 feet below surface.

It is recommended that no further electrical work be undertaken unless encouraging results are found in the 20W Line 13 drilling.

This drill hole should go to bedrock unless the alluvium is in excess of 1,200 feet. If encouraging sulfide mineralization is seen, detailed I.P. to delineate the body is recommended along with drilling a 750 foot hole at 50W on Line 14 to test the significance of the nearer surface anomaly.

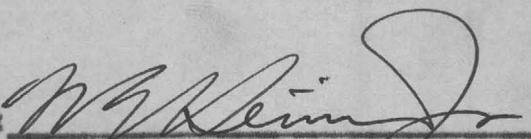
If the present drilling results are negative, we would probably not suggest drilling the Line 14 anomaly but we would want to more carefully review the present drilling results before making the recommendation.

In any case we strongly recommend and request complete and detailed feedback of the drilling and geologic results in order to refine our interpretation and provide you with maximum ultimate benefit from the geophysical data.

Respectfully submitted,

HEINRICHS GEOEXPLORATION COMPANY

*Chris S. Ludwig*  
Chris S. Ludwig  
Senior Geophysicist

APPROVED: 

Walter E. Heinrichs, Jr.

July 6, 1967

Miami Copper Company  
P. O. Box 100  
Miami, Arizona 85539

Attn: Mr. W. W. Simmons, Chief Geologist

Re: Your letter 3 July 1967 regarding proposed additional electrical geophysics at Mineral Mountain, northeast of Florence, Arizona.

Gentlemen:

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Mobilization and demobilization travel, excessive

Miami Copper Co.

- 2 -

July 6, 1967

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Faithfully,  
HEINRICHS GEOEXPLORATION CO.

Walter E. Heinrichs, Jr.  
President & General Manager

j  
cc: Extra Encl.

Accepted: \_\_\_\_\_  
MIAMI COPPER COMPANY

by: \_\_\_\_\_  
(Title)