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R. E. MIERITZ - Modero

Blucher, Arthur G.
3149 E. Pima Rd.
Tucson 85716 - 793-2762

Report to E+E.
Feb. 23, 1970

Index Map
Regional Map
Geologic Mineralization Map
Drill logs
Photos.

MILLER FIELDS
OMICRON SHEET
BOTTOM COMPLETE

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APPENDIX

Plate 1--- Index Map of South Central Arizona.

Plate 2--- Surface Geologic and Topographic Map of Madero Property

Plate 3--- Assay and Geologic Map of Madero Mine Workings.

Composite Drill Log Number M-1

Composite Drill Log Number M-2

Composite Drill Log Number M-3

CONCLUSIONS

Diamond drill exploration of the Madero property was completed on ~~May~~ April 30, 1957. The conclusions drawn from the results of the program are as follows.

(1) The copper mineralization encountered in the area through drilling is not of sufficient economic magnitude to be considered as a potential deposit of the metal,

(2) that the main northeast trending copper mineralized fissure exposed in the workings has provided a limited influence of copper mineralization into the walls,

(3) that existing copper mineralization is limited primarily to the fractures rather than as disseminations within the schist and

(4) that no further exploration be considered.

INTRODUCTION

The Madero property includes thirty nine (39) contiguous lode claims which are located approximately four(4) airmiles south of Miami, Arizona near the head of Pinto Creek in the Pinal mountains.

This property was geologically studied and explored to ascertain the existance of wide spread low grade copper mineralization. Mine workings and surface geology for several hundred feet surrounding the main adit were mapped and examined in some detail.

A three phase diamond drill program was designed to adequately test indicate the lateral and vertical extent of the suspected copper mineralization. The program was so designed that completion of succeeding phases were dependent on results of previous phases. Moreover, its design was governed by the desire for the greatest amount of information obtainable for the least amount of expenditure.

GEOLOGY

General:

Geology of the area is that of Pre-Cambrian granite and schist intruded by a much later coarse grained tertiary granite and late Cretaceous (?) quartz diorite sills and dikes. The only sediments in the area are those of Pre-Cambrian quartzite, limestone and shale which outcrop approximately ten miles to the north and south of the claims. No major structural features controlling or influencing mineralization were observed on or in the immediate vicinity of the property.

Local:

Underlying the Madero property is a highly silicified Pre-Cambrian schist intruded on the west by a very coarse grained Tertiary granite and on the south and east by a crystalline Pre-Cambrian granite. A Cretaceous (?) quartz diorite sill of unknown thickness occupies the southern one third of the claims and underlies the schist which outcrops on the northern two thirds of the claims. This Pre-Cambrian schist is fractured in many directions and several of these fractures are mineralized with about a quarter of an inch of quartz, pyrite, chalcopyrite and little malachite. A N 20° W striking set of fractures appear to be the stronger and in most cases the more mineralized set. Very little disseminated copper mineralization was observed in the core from the drill holes.

The quartz diorite sill underlying the schist is also highly fractured in several directions. Along these fractures is a coating of pyrite and calcite with a few blebs of chalcopyrite and possably bornite. No dominating fracture patterns or other structures controlling mineralization in the diorite were observed in surface examinations.

Mineralization in the area is attributed, by many, to the Tertiary granite boardering the property on the west. With the supposed source of

mineralization so near and the highly fractured schist and quartz diorite mineralized as observed, it appeared quite possable that an ore body could exist within the property.

DEVELOPMENT

The property is sparsely developed by underground workings and an old churn drill hole of unknown depth and results.

The underground workings consist of a 520 foot adit drift, some short cross cuts and two winzes, one 30 feet deep and the other 48 feet.

Previous reports indicated sampling of the underground workings averaged 1.0% copper. No mention was made however to the oxide content.

EXPLORATION PROGRAM

To evaluate the Madero property with as little expense as possable, five diamond drill holes were proposed as three phases, each succeeding phase dependednt on the results of the previous phase. Phase one involved drilling two holes about 500 feet from the portal, one cutting the schistosity and major mineralized fractures to the right and the second on to the left. Phase two included two drill holes directed in the same manner as phase onebut located near the 48 foot winze 250 feet from

from the portal. Phase three consisted of one vertical hole located near the interior winze.

Since results of phase one were discouraging, phase two was not initated. Phase three, consisting of a 196 foot vertical drill hole near the deeper winze was completed to intersect the schist-quartz diorite contact at depth, penetrate the diorite to some extent and test the strength of mineralization within the diorite.

RESULTS OF EXPLORATION

The first two holes, (M-1 and M-2), located 500 feet from the portal, were directed perpendicular to the major N 20° W striking fractures and at a -4° angle. These holes were so placed to evaluate the extent of mineralization in an east-west direction for a width of 600 feet. Diamond drill holes M-1 striking N 70° E showed an appreciable decrease in mineralization from 0.41% copper in the first 90.0 feet to 0.34% copper in the last 210.0 feet. Diamond drill hole M-2 striking S 70° W, indicated sporatic mineralization in the first 180.0 feet with three zones of 30 feet, 110 feet and 40 feet showed copper contents of 0.40%, 0.20%, and 0.29% respectively. The last 121 feet showed a slight decrease to 0.26% copper (see plate 3) .

The third diamond drill hole (phase 3) was located 300 feet from the face and directed vertically down (see plate 2) . A depth of 196 feet was reached without encountering the quartz diorite. The entire hole averaged 0.33% copper. A surface grab sample of the mineralized quartz diorite 500 feet southeast of the portal assayed 0.10% copper.

DIAMOND DRILLING

General:

Drilling at the project was completed under contract by Boyles Bros. Drilling Co., southwest division, of Phoenix, Arizona. A total of 797 feet were drilled in three holes. Drilling was started on March 19 and completed on April 30, 1957.

Drilling Method:

All drill holes were collared BX size and drilled AX size to completion. Cement was used to regain water loss or correct any caving conditions encountered. Use of this corrective measure was limited to three occurances. Except for the usual standpipe, no casing or reaming was necessary. For the most part, the ridgid type standard 10 foot core barrel was used. When core recovery dropped below 70% the non-rotating type barrel was employed. The latter type proved quite successful

in much of the silicified but altered schist encountered in the drilling. Core runs were usually limited to 5 foot lengths and dry blocking was used if the barrel had not already blocked itself at this length. Sludge runs were minimized at 3 feet, maximized at 9 feet and most always terminated at the end of a core run.

Drill Operation:

Drills were operated on a two 8 hour shift basis for six days a week. Shifts worked were from 8:00 AM to 4:00 PM to midnite. Each crew consisted of a driller and his helper. A seperate shift report supplied by the company was completed by the drillers for their respective shift. In addition to the usual required information of depth of run, condition of hole, size hole etc, operational information as drilling time, cement time, repair time etc were also a part of the shift report. A copy of the shift report is included in the appendix.

A total of 59 shifts were employed during the exploration period. The following is a breakdown of the time consumed for each drill operation and their respective percentage to the total time:

Moving in and out----------15.2%

Setting up and tearing down----- 6.7%
three holes

Drilling time----------56.0%

Cementing time---------- 5.1%

Equipment time----------17.0%

Total----------100.0%

A 16 foot shift average was drilled. This does not include moving in and out time but does include drilling, cementing, repair, setting up, and tearing down time.

SAMPLING PROCEDURE

Core:

Drill core received from the hole was placed in 4 foot long wooden core boxed at the drill rig by the drillers. The end of each run was properly identified by marking the bottom depth on a small wood block and placing in the trough at the end of the core run. Each box had a 40 foot core capacity. After a previous days recovery of core, the sampler, working on a day light shift basis, transferred the core to 2 foot long cardboard boxes. The 10 foot capacity cardboard boxes were transported to the writers office for visual examination and sample preparation.

Visual examination of the core included geologic logging of rock type, strength of alteration, type and strength of metallic or non-metallic mineralization, and measuring of core recovery.

Core runs varied from one to 10 feet. Core

samples however consisted of combined core runs to coincide with ends of sludge runs wherever possible. Core samples thusly taken varied from three to nine feet as the extremes. Ninety percent of the core samples taken were five feet in length.

Sludge:

Sludge was collected from all drilling except the first 35 feet of hole M-1 and for such runs where no water return was possible. Two, three-compartment, 28 gallon, metal tanks were used for sludge collection. While one tank was being filled, the second tank was settling, decanted sludge removed and transfered to a metallic, non-rusting bread pan.

Sludge samples covered run lengths from 3 to 9 feet, however, constant efforts were stressed for a 5 foot length. In most instances, ends of core and sludge runs were matched to ease calculations of combined core-sludge assays. All sludge samples were properly identified with begining and ending depths.

Sludge samples were either open fire or sun dried. The dried material was transferred to paper bags and transported to the writers office for weighing and sample preparation. The weight of each sample was recorded as pounds and tenths of pounds on the shift report.

After weighing, the material was split with a Jones type dry splitter to receive about one half pound of the material for storage and one half pound for assaying.

SAMPLE PREPARATION

Core:

All core was split with an E. J. Longyear core splitter. One half of the core was retained in the card board core boxes for storage and future reference at the writers office at 307 E. Indian School Rd., Phoenix, Arizona. The other half was prepared for assaying.

The coarse split core was crushed to pulverizer size, split in half, one half for storage and the other half pulverized for assaying. The portion for storage was placed in waxed quart size, cylindrical ice cream paper containers, covered and identified by hole and depth. The remaining portion was pulverized, assayed and the balance of pulp put in a 4 inch by 7 inch sample envelope for storage.

Sludge:

After sludge samples had been weighed, the material was split with a Jones type dry splitter to receive about one half pound of the material for storage and a similar amount for assaying. The balance of the crude sludge was disposed of.

The portion reserved for storage was placed in 4 inch by 7 inch sample envelope which in turn was placed in a similar wax container used for the crushed core storage.

ASSAYING

All samples prepared for assaying were identified only by a sample number. Both core and sludge samples were sent to Magma Copper Company at Superior, Arizona. The company's assay laboratory used the accepted short iodide method on all total copper determinations.

Had material of ore grade been encountered by the drilling, adequate check samples would have veen sent to another assay firm of good repute. Moreover, composite samples would have been prepared and assayed for gold, silver, total and oxide copper, molybdenum, silica, alumina and iron.

The pulp of both core and sludge not used by the assay office was returned to the writers office for storage.

SAMPLE STORAGE

The following is a condensed review of the various type samples stored at the writers office in Phoenix, Arizona:

Core:

1. Split core in 2 foot long, 10 foot capacity core boxes.
2. Crushed core, - ¼ inch, in cylindrical waxed paper containers.
3. Rejected pulp in 4 inch by 7 inch sample envelopes which had been assayed.

Sludge:

1. Approximately ½ pound of crude sludge in 4 inch by 7 inch sample envelopes placed in cylindrical waxed paper containers.
2. Rejected pulp in 4 inch by 7 inch sample envelopes which had been assayed.

All precautions have been taken to properly identify each sample and to protect same from possible oxidation of the copper sulphide minerals.

RECORDS

Records maintained during the project were (1) shift report, (2) sample identification record, (3) composite log.

Shift Report:

This report was maintained primarily by the driller for each shift. The information contained therein is operational, geologic and sample data. This form is included in the appendix.

Sample Identification Record:

Both core and sludge samples sent to the assayer were identified only by a number. These numbers

were intered in a book along with the corresponding notation of core or sludge and the limiting depths. As assay certificates were received, the samples were identified through the identification record. This proceedure prevented our assays from becoming common place knowledge.

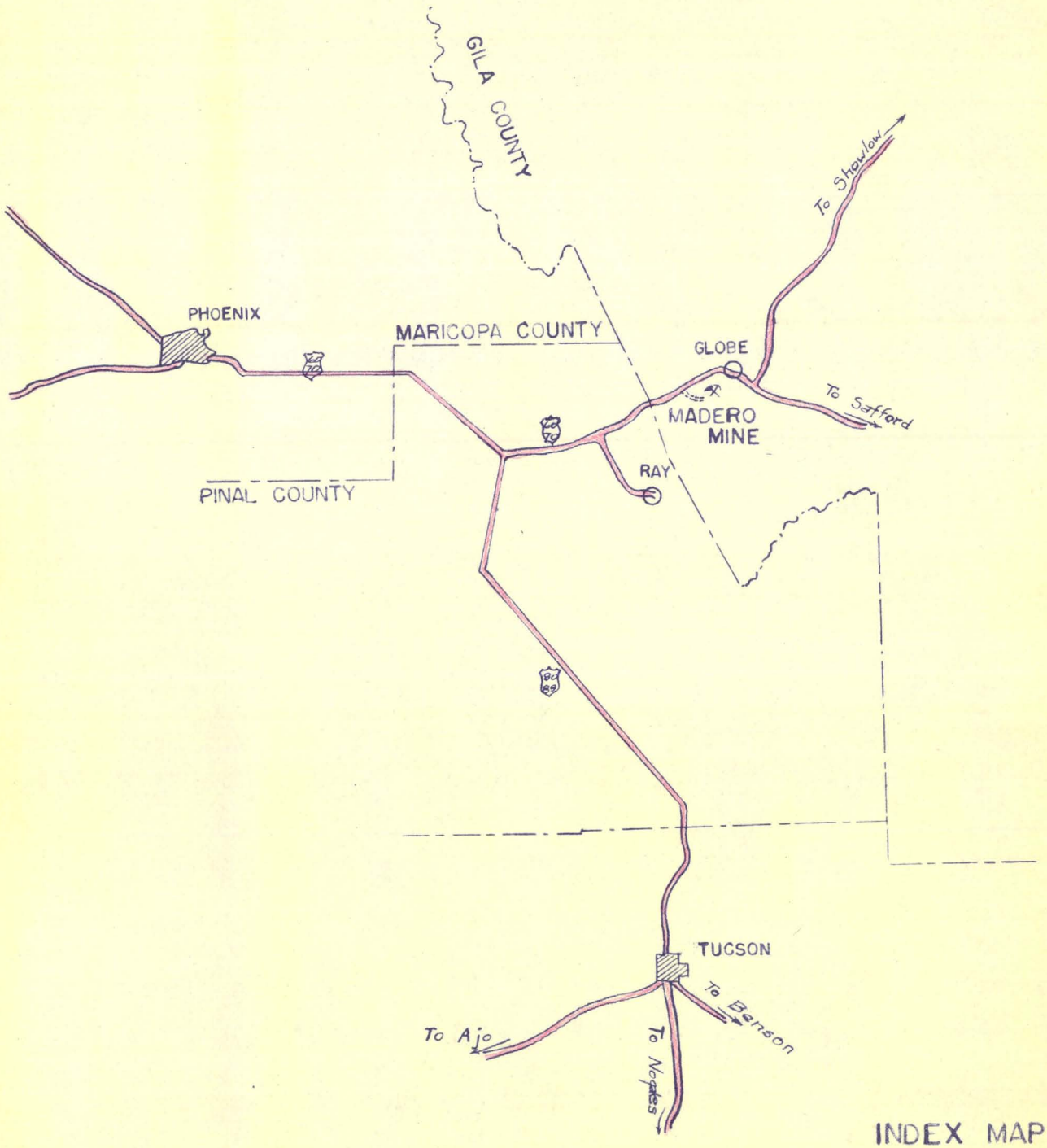
Composite Log:

The record includes such information as (1) drill hole location data, (2) geologic logging, (3) drill hole cross-section, (4) graphic core recovery and (5) assay values.

A record of each hole has been prepared and included in the appendix.

Respectifully submitted,

R. E. Mieritz,
Mining Consultant
Phoenix, Arizona



INDEX MAP
OF
SOUTH CENTRAL ARIZ.

SCALE: 1" = 21 MILES

0 10 20 30 40

NOTE:

Federal Highways
Graveled County Roads

MAY 1957

R. E. M.

PLATE I

HOLE No. _____

DIAMOND DRILL SHIFT REPORT

FILE NO. _____

PROPERTY _____

DATE _____ 19 ____

DRILL No. _____

SHIFT _____

SIZE OF BIT - NUMBER - FROM - TO - ACCUML. TOTAL

DRILLER _____

_____

HELPER _____

_____

WATER - DEPTH ENCOUNTERED _____ FEET

CASING LOWERED - SIZE - FROM - TO

LOST - WATER AT _____ FEET

_____ FEET

_____

_____ FEET

_____

CASING REMOVED _____ FEET

EMPLOYMENT OF TIME

MOVING AND SETTING UP _____

CEMENT USED - TYPE _____ QUANTITY _____

DRILLING _____

DRILLING CEMENT - FROM _____ TO _____

SETTING CASING _____

CEMENTING HOLE - FROM _____ TO _____

EQUIPMENT REPAIR _____

DRILLING MUD - FROM _____ TO _____

OTHER DELAYS _____

REAMING HOLE - FROM _____ TO _____

SAMPLES

DEPTH		RECOVERIES			HARDNESS OF ROCK V.H. VERY HARD H-HARD M-MEDIUM S-SOFT V.S. VERY SOFT	CONDITION OF HOLE	COLOR OF SLUDGE	DRY WEIGHT		SP. GR.	REMARKS
FROM	TO	% CORE	% SLUDGE	% WATER				CORE	SLUDGE	CORE	

GENERAL REMARKS

DEPTH OF HOLE AT BEGINNING OF SHIFT _____

SAMPLES LEFT IN SLUDGE BOX _____

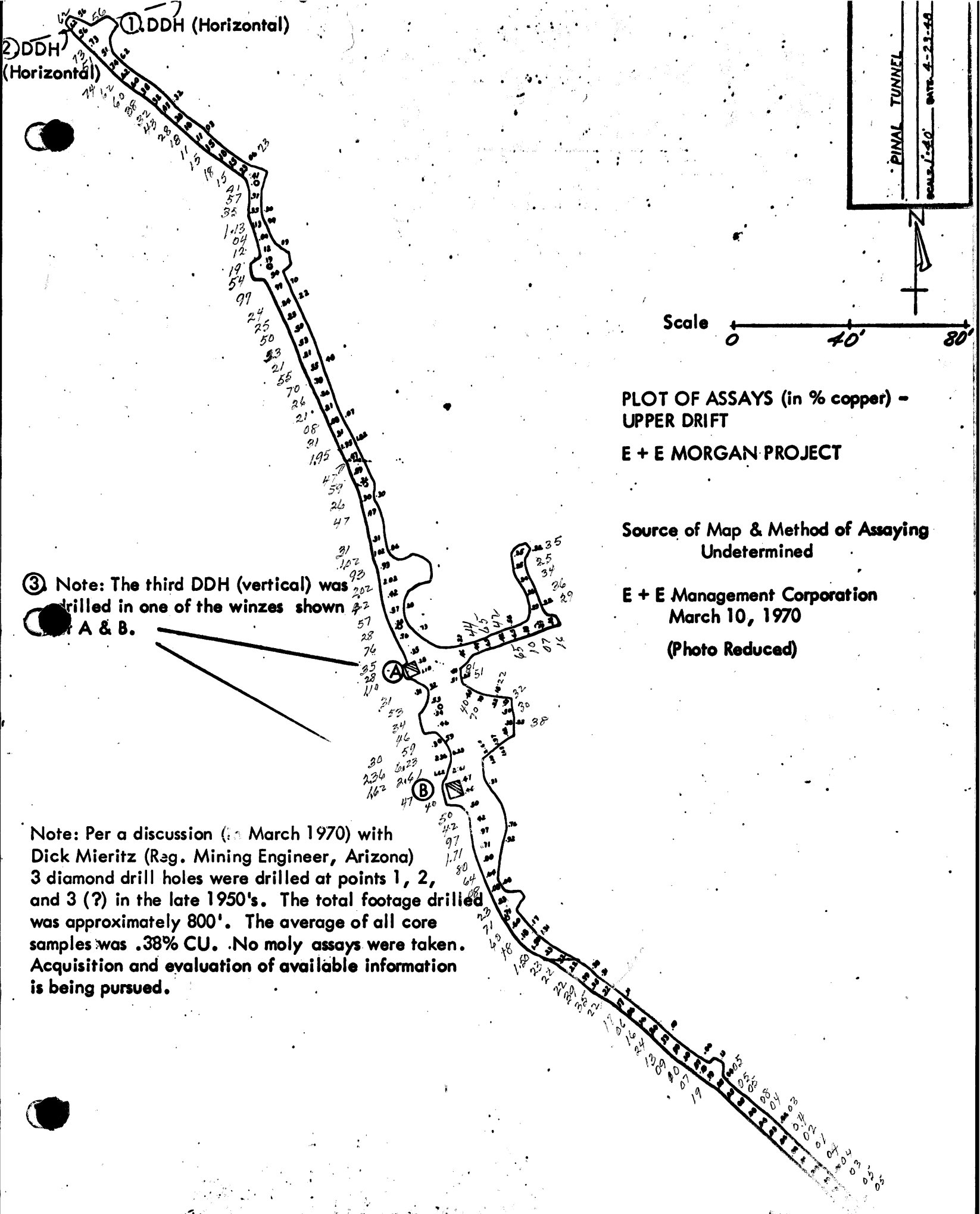
DEPTH OF HOLE AT END OF SHIFT _____

SAMPLES CANNED _____

TOTAL LOADS OF WATER HAULED DURING SHIFT _____

SAMPLER _____

WATER ON HAND _____ GALLONS



PLOT OF ASSAYS (in % copper) - UPPER DRIFT

E + E MORGAN PROJECT

Source of Map & Method of Assaying Undetermined

E + E Management Corporation
March 10, 1970

(Photo Reduced)

Note: Per a discussion (in March 1970) with Dick Mieritz (Reg. Mining Engineer, Arizona) 3 diamond drill holes were drilled at points 1, 2, and 3 (?) in the late 1950's. The total footage drilled was approximately 800'. The average of all core samples was .38% CU. No moly assays were taken. Acquisition and evaluation of available information is being pursued.

E+E MANAGEMENT CORPORATION
SAN FRANCISCO · PHOENIX

April 21, 1970

Mr. Richard E. Mieritz
5822 North 22nd Place
Phoenix, Arizona 85016

Dear Mr. Mieritz:

Your letter of April 18, 1970 has been received. It is the desire of E + E Management Corporation to retain your services to evaluate the underground workings on what is known as the Morgan Prospect on Madero Mountain, Arizona.

We would want all available data tabulated and correlated with existing work, with the primary intent of demonstrating the reserve potential for the particular area of this prospect as related to the underground working.

Your recommendations for further exploration and development would also be appreciated. Transportation will be provided by E + E. Your report will be included in our overall technical report as it relates to the prospect. We estimate that it will require 3 to 6 days of your time including 1 to 2 days field effort to prepare such a report.

Respectfully yours,

E + E MANAGEMENT CORPORATION

Wayne Erickson
President

mh

PO 2047
85251

945-5420

PHOENIX: 132 EAST STETSON · SCOTTSDALE, ARIZONA 85251 · (602) 945-8575

AN

EVALUATION REPORT

of the

PHYSICAL EXPLORATION

completed on

E + E MANAGEMENTS'

MORGAN PROJECT

Gila County, Arizona

by

Richard E. Mieritz
Mining Consultant
Phoenix, Arizona

April 25, 1970

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FUTURE POSSIBILITIES	7
RECOMMENDATIONS	8

Included Maps and Records

Map No. 1, - SURFACE MAP, Drill Hole Sites - Geology
Map No. 2, - SUPERIMPOSED GEOPHYSICAL ANOMALIES
Map No. 3, - PROJECTION MAP, Exploration Drill Holes
Map No. 4, - ASSAY and GEOLOGIC MAP, Madero Mine
Composite Drill Log, Hole M-1
Composite Drill Log, Hole M-2
Composite Drill Log, Hole M-3

INTRODUCTION

At the request of and authorization by Mr. Wayne Erickson of and for E + E Management Corporation, Scottsdale, Arizona, the writer completed a review and study of the Morgan Project using all exploratory, geological and geophysical data available in E + E files as well as exploratory data from the writers files.

In Short, E + E desires to be advised relative abandonment of the Project, to continue exploration towards a possible successful end if such is justified and warranted as a result of the writers study and conclusions, and also to demonstrate a present tonnage and grade reserve as indicated by all exploratory work completed to date.

The available data reviewed and studied included the following reports:

(1) - Geologic Report dated February 23, 1970 by Arthur G. Blucher, Mining Geologist, Tucson, Arizona.

(2) - Geophysical, Geological and Geochemical Report dated January, 1970 by Heinrichs Geoexploration Co., Registered Mining Engineers and Geophysicists, Tucson, Arizona.

(3) - Geologic and Exploration Report dated May, 1957 by Richard E. Mieritz, Registered Mining Engineer, Phoenix, Arizona.

The writer compared the three geologic reports, correlated the geochemical and geophysical surveys and compared their results with the prevailing geologic conditions. Correlations and comparisons of the drilling results (four surface drill holes by E + E and three underground drill holes by Consolidated Uranium Corp. in early 1957) were also made and again compared with the aforementioned surveys and the surface geologic conditions.

CONCLUSIONS

Having once again visited the Morgan property after 13 years and having reviewed and studied all the available information mentioned above, the writer concludes:

(1) - Recent surface drilling results, copper content-wise, are poor and they do not enhance the property status nor have the results changed the original overall concept held by the writer.

(2) - The geophysical and geochemical rock chip surveys have not identified to any degree a major "target" of interest. These surveys have, however, as interpreted by the writer, identified and pinpointed a "minor target" which is also identifiable by surface geology.

(3) - It has been calculated that a "mineralized reserve" of 4,620,000 tons of 0.352% copper, 0.005% molybdenum, 0.10 oz/ton silver and 0.01 oz/ton gold exists around the Final Adit and this tonnage is considered a submarginal position.

(4) - The "minor target" mentioned in conclusion (2) must be explored by detailed surface geologic mapping, a detailed, close spaced soil geochemical survey and then, if warranted, drilled.

(5) - Abandonment of the Project should not be considered until

the "minor target" has been adequately defined, explored and evaluated.

FORWARD

Predecessors Messrs. Blucher and Heinrichs have reported on the Project as regards geology, mineralization, drilling results, results of their respective phase and work and have provided recommendations leading toward additional work because it was indicated that several questions remained unanswered.

Since much has been previously written on the aforementioned aspects of the Project and exploratory work, the writer will limit his discussion or submissions to justifying the presented conclusions. Repition of facts are herein included only if they will aid and further clarify the particular condition or situation.

During the time of reviewing and studying these reports, the writer has encountered an inequality: Blucher has termed the rock surrounding the Pinal Adit at depth and that encountered in the drill holes as a gneissic quartz diorite while the surface map indicates the rock is schist. Heinrichs and the writer, both classify this rock on the surface and at depth as a schist, preferably the Pinal Schist.

This inconsistency could create confusion and wrong interpretations. The writer thus has some concern as regards the rock classification shown in the drill logs by Blucher.

HISTORY

The Morgan property, formerly known as the Madero property, has been under scrutiny for many years. Miami Copper Co. drilled two holes before 1950. (one hole was found but the second has not been located)

In early 1957, Consolidated Uranium Co. acquired the property and under the direction of the writer, surface and underground geology was mapped and three underground diamond drill holes were completed. (Holes M-1, M-2 and M-3 on Map Nos. 1 and 4)

At that time a three phase exploration program of diamond drilling was designed to explore and develop the area but the program was "cut short" when the results of the three underground holes (first phase) indicated what was at that time submarginal mineralization. The property was dropped.

Apparently the property lay dormant until early 1970 when E + E obtained an option, had geophysical and geochemical surveys completed as well as completing four exploratory diamond drill holes.

AREA OF INTEREST

Heinrichs' work, Bluchers' work and the writers early work all agree that the area of interest and conducive to copper mineralization is that

area surrounding the present underground workings now known as the Pinal Adit, a 520 foot long adit driven on a strong structural feature hosting copper oxide and sulphide minerals.

This is the area of recent concentrated work by Blucher and Heinrich - as well as the early work by Consolidated Uranium Co.

Other than the above area, Heinrichs has indicated an isolated, moderate I.P. anomaly over Schist approximately 2300 feet SSW of Madero Peak or approximately 2000 feet east of the Pinal Adit. Lack of other relative and identifying information to substantiate a "target", prompts the writer to place this "area of interest" in the far background as regards priority.

Blucher mentioned an area below Morgan Peak but failed to expound on the criteria present to justify the area as a target.

GEOLOGY

This subject has been discussed by both Blucher and Heinrichs as part of their work.

Simply stated, rock types in the "area of interest" are diorite, schist and a granite differentiate. The latter two are weakly to moderately mineralized with copper, molybdenum, gold and silver. The former is very sparsely mineralized, mostly with pyrite. A sample of the diorite near the old lower Adit and taken by the writer in early 1957, assayed 0.01% copper.

A granite differentiate just south of Morgan Peak - as mapped by Blucher - was field examined.

MINERALIZATION

Oxide and sulphide copper minerals occur along the schistosity of the schist, along the transverse fractures in the schist and also in part as disseminations in the schist as well as in very thin quartz veinlets which the writer believes is part of the "mineralization" period.

Some oxidation of the sulphide copper minerals has occurred in place. Oxidation of the pyrite - to limonite - has also occurred and this is noticeable as yellow to cream limonite staining of the schist. Oxidation of the ferro-magnesium minerals in the schist creats the tan to brown limonites, also visible in the schist. These latter, darker tones would have a tendency to "cloud" the true color of the former mentioned lighter tints. There is <u>no</u> evidence of a leaching process to produce a zone of secondary copper enrichment at depth.

The sparse presence of pyrite in the schist surrounding the Pinal Adit prohibits the thought at this time, that "secondary enrichment" at depth - in this area - would be possible. Therefor, the weak to moderate copper mineralization encountered in the drill holes is the "normal" type and strength mineralization that can be expected within the drill-

ed depths. Widely spaced structural schistosity features, probably planes of weakness, will have slightly greater copper mineral concentrations as shown on Map No. 3. The writer strongly suspects that the copper mineralization will gradually increase - perhaps up to 100% - horizontally in a northerly direction beyond the two horizontal underground drill holes and towards the schist-granite differentiate contact.

Considerable pyrite phenocrysts are present in the granite differentiate located just below Morgan Peak. Here the pyrite has oxidized to a deep brown-black limonite but has retained its original cubic crystalline habit. Deep red and black limonites (limonites of copper sulphides) are also present. These residual conditions indicate that the process of oxidation is proceeding but has not reached the stage of "leaching". This in turn suggests that primary sulphides are very near the present surface. Both limonite types occur in closely spaced, (¼ to 1 inch wide) quartz veinlets in the granite differentiate and the adjoining schist to some degree. In general, the surface mineralization expression is good and the degree of feldspar alteration (about 30%) in the granite differentiate is good.

EXPLORATION and RESULTS

The Pinal Adit, driven some 40 to 50 years ago, explored the strongly silicified and moderately mineralized N. 20° W. structure for a length of approximately 520 feet. Seventy nine samples, taken by E + E, covering the last 400 feet to the face of the Adit average 0.55% copper. Several single samples assayed 1.00% or better with one sample assaying as high as 2.36% copper.

Prior to 1950, Miami Copper Co. drilled two churn holes. Results of this exploration are not known relative copper values, depth of holes, etc.

In early 1957, Consolidated Uranium Corp. explored the property by diamond drilling three underground holes, M-1, M-2 and M-3. (See Map Nos. 1, 2, 3 and 4) Holes M-1 and M-2 were horizontal and drilled to the right and left at the face of the Adit. Hole M-3 was drilled at -90° in the floor of the Adit just a few feet north of the winze nearest the portal. (See Map No. 4) Assay values are shown on Map No. 4.

In early 1970, E + E caused to have completed two geophysical surveys, (magnetic and I. P.), a geochemical rock chip survey for copper and molybdenum and the diamond drilling of four, -90° surface holes.

Unfortunately, the results of the geophysical surveys do not, for the most part, in the opinion of the writer, reflect to depth the geological and mineralogical evidence exposed on the surface, yet, several anomalies were indicated. An exception to this thought is Area "A", Map No. 2, where a magnetic high is coincidental with a geochemical high and the I. P. zone "C" is offset slightly to the east but in general is parallel to the trend of the mineralization in the Pinal Adit. The writer feels these criteria are a weak reflection and extension of the mineralized zone known to exist around the Pinal Adit. The high of area "A" definitely reflects the magnetite of the granite differentiate visible on the surface and viewed by the writer accompanied by

Elsewhere, with some immagination, the magnetic survey results, coupled with the known rock types on the surface, do reflect these rock types and their contacts.

Assay values in hole M-1 arithmetically averaged 0.371% copper for its entire length of 300 feet. Hole M-2 averaged 0.348% copper for its entire length of 301 feet. Hole M-3 averaged 0.257% copper for the first 143 feet and 0.190% for the next 47 feet while the last 6 feet assayed 0.65% copper. In the case of holes M-1 and M-2, the writer assumed equal weight for both the AX size core and sludge assays to determine the average grade per sample or zone. This proceedure is not exactly correct but it is adequate at this time and for the purpose of this report. (See Map No. 4).

Unfortunately, the four drill holes completed by E + E provide a minimum amount of information for two reasons: (1) due to the general strike and dip of the schist and mineralization in the "area of interest", drill holes should have been directed approximately N. 70° E. and at an angle of -60° E. With this method the holes would have been normal to the strike and would crosscut a wider width or zone of the schistosity, and (2) that the positions of the holes were not in the best interest to obtain maximum information for the amount of drilling completed.

A 500 foot vertical hole only intersects or crosscuts a 250 foot width of a 60° dipping schistosity where as a 500 foot -60° hole, more normal to the schistosity, would crosscut 450 feet of the schistosity.

Except for some very short intervals, the copper content in the core was very poor - basically negative. Comparing these results, particularly holes 3 and 4, with the results obtained by the underground drilling, there is a definite, pronounced difference which prompts the writer to suspect some abnormalties.

The use of angle holes would have provided information over a greater width of intersection than the vertical holes, particularly true for holes 3 and 4. Apparently no sludge was collected and in this type of mineralization, collection of sludge is important as evidenced by the spread of copper content between core and sludge of holes M-1 and M-2. Sludge was not collected from hole M-3 and a review of the assays from this hole indicate a lower copper content than that received from holes M-1 and M-2. The writer attributes this difference to the "washing of the core" and that "softer zones" of lesser core recovery contained copper mineralization which was also "washed away". (Please note core recoveries and assays in included Composite Drill Logs M-1, M-2 and M-3). Vertical hole M-3 compares favorably, value-wise, with holes 3 and 4, but even here there is a slight favor for hole M-3. It should be mentioned that the underground drilling was completed using conventional, non-rotating corebarrel drilling--not wireline, and this would account for the slightly lower core recovery.

A change of assayers during the drilling of hole 2 may also create a low assay value and it is strongly suggested that check assays of samples from all holes be completed by a reputable assayer accepted by the mining industry. These checks should include samples containing 0.02% to

0.90% copper in order to cover "the range" and general mode of the mineralization of concern. Accuracy in this range is extremely critical and important.

Samples from holes M-1, M-2 and M-3 were copper assayed by the Magma Copper Corp. Assay Office. The writer uses Jacobs Assay Office, Tucson, when ever possible. No molybdenum assays were completed for the samples from these holes, however, had the results been higher, composite samples would have been prepared and assayed for molybdenum, gold and silver.

MINERALIZED RESERVES

The economics of ore deposits are constantly changing due to more efficient operation and the price of the products produced. The average copper content of 0.35% in year 1957 was not considered economical. Today however, such a grade is economical with adequate tonnage to back it up as is now demonstrated by Duval Sulphur with its new Sierrita operation.

The writer has calculated a tonnage but will term it "mineralized reserves" rather than ore reserves because at this stage of the program, the reserve factor is not sufficiently great to be considered "ore" and economically feasible. The calculated tonnage could, however, be a significant contribution to an adjacent mineralized body of higher copper content if such might exist.

The writer has calculated a "mineralized reserve" of 4,620,000 tons as defined by drill holes M-1, M-2 and M-3 and as limited by drill holes 3 and 4. The average grade of this reserve is 0.352% copper, 0.005% molybdenum, 0.10 oz/ton silver and 0.01 oz/ton gold. The contents of the last three metals are estimates but could be quite reliable since they are typical contents of the present operating open pit low grade copper mines in Arizona.

The "reserves" were calculated as two blocks, "A" and "B". (Map No. 1) Block "A" has a triangular shape in plan with hole M-3 as one vertex and a depth of 260 feet each in holes M-1 and M-2 as the other vertices. Height-wise, a distance of 100 feet vertically up and a distance of 140 feet vertically down from the Adit floor were used. (See Map No. 3) The calculation is:

$$\frac{\frac{1}{2} \times 520 \times 300 \times 240}{12} = 3{,}120{,}000 \text{ tons.}$$

Block "B" is rectangular in plan and section. Its breadth is 520 feet, (260 feet in each of holes M-1 and M-2), height-wise, 150 feet vertically up and 140 feet vertically down from the Adit floor and depth-wise, this mineralization can only be safely projected 120 feet north of holes M-1 and M-2--ahead of the face.
The calculation is:

$$\frac{520 \times 290 \times 120}{12} = 1{,}500{,}000 \text{ tons}$$

A 12 cubic foot factor is used for "in place" material.

Grade-wise, core and sludge assays of holes M-1 and M-2 were combined on an equal weighting. (Not technically accurate but satisfactory for

this phase) The resulting "zonal" values were weighted (value x footage) to obtain the average copper content for each hole to depth used and also for the entire 520 feet. Hole M-1 averaged 0.371 % copper and hole M-2 averaged 0.348 % copper. Hole M-3 averaged 0.257% copper for the first 143 feet. The average for holes M-1 and M-2 for 520 feet was 0.360%.

To determine the average grade for block "A", 15% weight or influence was applied to the average grade of hole M-3 and 85% weight applied to the average grade of holes M-1 and M-2 with a resulting grade of 0.35%.

Block "B" has an average grade of 0.36% copper projected for 120 feet north of holes M-1 and M-2. Weighting blocks "A" and "B" by tonnage and grade, the average grade for the entire volume is 0.352% copper for 4,620,000 tons.

This reserve and grade is too small to be considered as economic and operation feasible. Additional reserves of higher grade must be developed if possible.

FUTURE POSSIBILITIES

For the most part, neither the geophysics nor the geochemical surveys, coupled with observable geology, nor the past surface drilling present or identify a "major target" area. Without a recognizable and justifyable "target", expenditures of time, energy and expense are ill-considered.

The present status of the property, in the opinion of the writer, is one of being "on the fence". The possibility of developing a 100,000,000 ton deposit of 0.35% copper in this area is very remote and that is the magnitude which must be considered for a feasible operation. In this frame of mind, the property should be abandoned.

On the brighter side of the fence is the fact that a "minor" target does exist which must be explored before abandonment is enforced. This target" is identified by coincidental "highs" of the magnetic survey, the I. P. survey and the geochemical rock chip survey - maeger as it is - and most important of all, substantiated by know, observable surface geology.

This "target" is designated "A" on Map No. 2. It not only has the coincidental highs but also the presence of a granite differentiate containing moderate limonites after pyrite and copper minerals - mostly in closely spaced, thin quartz veinlets. Present also is the contact with the mineralized schist of the Pinal Adit. A further interesting fact is that target area "A" is directly on strike line with the Adit mineralization but some 400 feet north to its center (the magnetic high). The "mineral reserve" block "B" is "open" in this direction--ahead of the Adit face.

RECOMMENDATIONS

When a target has as many "coincidental" features as Target "A", it

must be seriously considered and systematically explored and, if warranted, developed.

Basically, three phases are required: (1) detailed geologic mapping of target "A" area which is outlined in red on Map No. 2, (2) completion of a soil geochemical survey on a 100 foot grid and the results compared to the detailed geologic mapping and the existing magnetic survey results, and, (3) diamond drilling the area providing results of phase 1 and 2 are positive and still accentuate the target.

Phase 1 and 2, if positive, would then suggest the proper drill hole locations, their directions and angles. Planning of phase 3 at this time would accomplish nothing concrete exploration-wise nor expenditure-wise.

The surface indications as observed by the writer during a very brief examination of the target area prompts the thought that E + E has a 50-50 chance of developing a moderate tonnage of a higher grade reserve than presently indicated around the Pinal Adit.

It was mentioned earlier in this report that check assays should be completed on the diamond drill core samples from holes 1 thru 4. It is recommended that this be done after phases 1 and 2 have been completed and the results indicate that phase 3 be commenced -- that a target still exists. Composite samples for molybdenum, gold and silver could also be prepared.

If abandonment is indicated, such check work would not be necessary.

Respectfully submitted,

Richard E. Mierits,
Mining Consultant,
Phoenix, Arizona

April 25, 1970

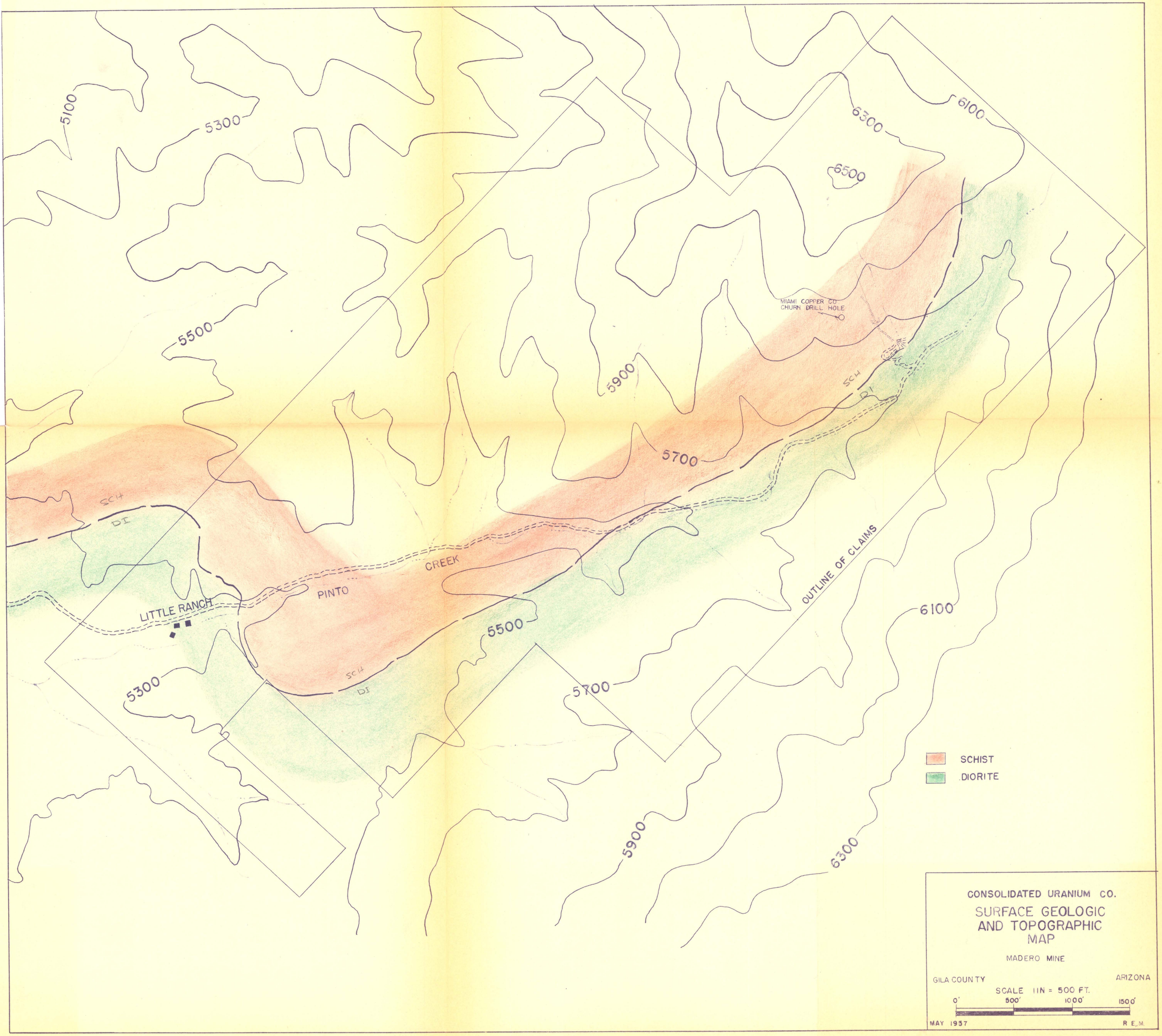

5100
5300
5500
5900
5700
6300
6500
6100
MIAMI COPPER CO.
CHURN DRILL HOLE
SCH
DI
PINTO
CREEK
LITTLE RANCH
OUTLINE OF CLAIMS
SCHIST
DIORITE
CONSOLIDATED URANIUM CO.
SURFACE GEOLOGIC
AND TOPOGRAPHIC
MAP
MADERO MINE
GILA COUNTY
ARIZONA
SCALE 1IN = 500 FT.
0'
500'
1000'
1500'
MAY 1937
R.E.M.

PLATE 2

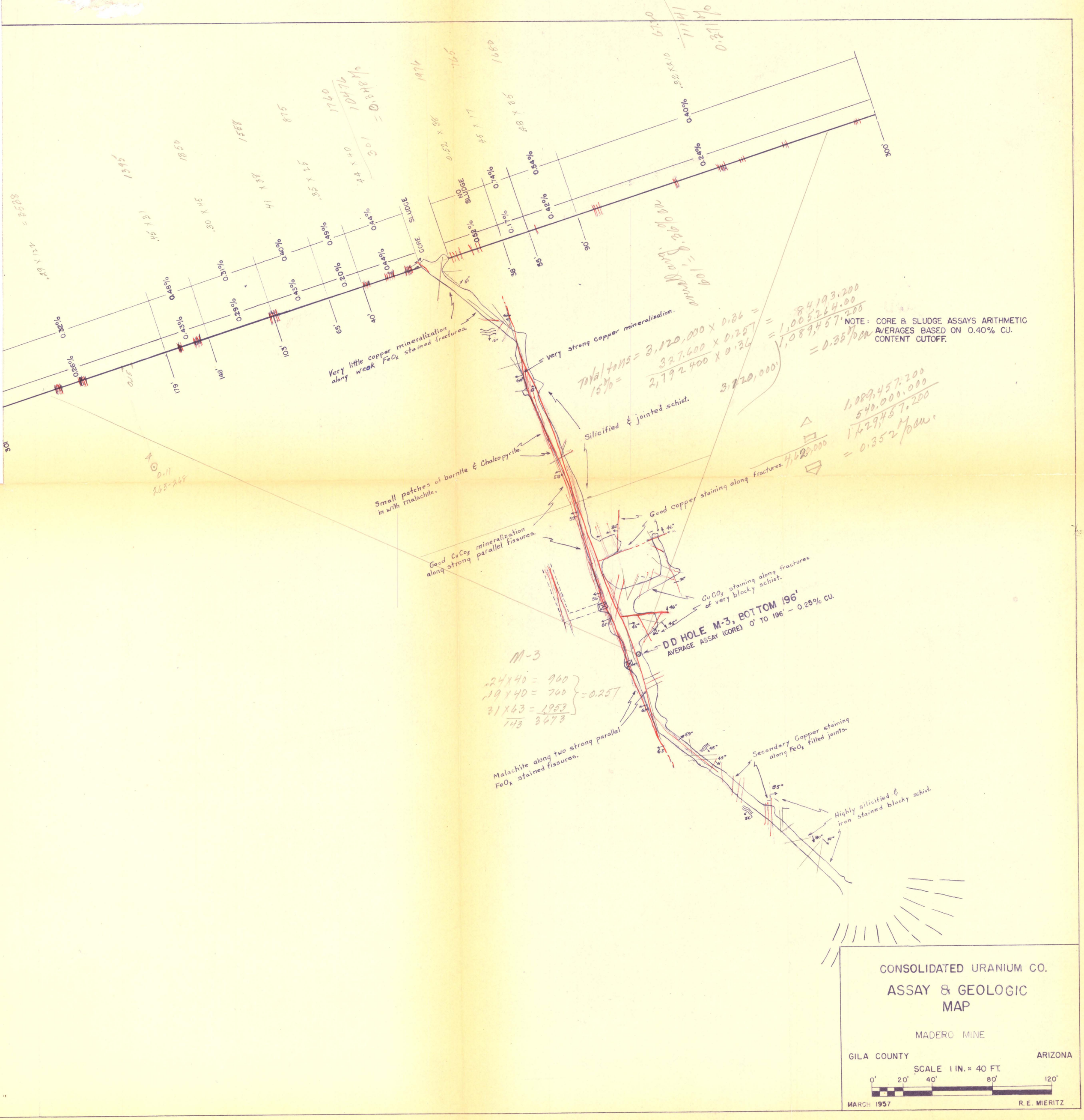

DD HOLE M-3, BOTTOM 196'
AVERAGE ASSAY (CORE) 0' TO 196' – 0.26% CU.
NOTE: CORE & SLUDGE ASSAYS ARITHMETIC AVERAGES BASED ON 0.40% CU. CONTENT CUTOFF.
CORE
SLUDGE
NO SLUDGE
Very little copper mineralization along weak FeOx stained fractures.
very strong copper mineralization.
Silicified & jointed schist.
Small patches of bornite & Chalcopyrite in with Malachite.
Good CuCO3 mineralization along strong parallel fissures.
Good copper staining along fractures.
CuCO3 staining along fractures of very blocky schist.
Malachite along two strong parallel FeOx stained fissures.
Secondary Copper staining along FeOx filled joints.
Highly silicified & iron stained blocky schist.
CONSOLIDATED URANIUM CO.
ASSAY & GEOLOGIC MAP
MADERO MINE
GILA COUNTY
ARIZONA
SCALE 1 IN. = 40 FT.
0' 20' 40' 80' 120'
MARCH 1957
R. E. MIERITZ

PLATE 3

COMPOSITE DIAMOND DRILL LOG

HOLE Nº M-1

COMPANY: CONSOLIDATED URANIUM COMPANY MINE: MADERO CLAIM: MADERO NO. 1 DISTRICT:

COUNTY: GILA STATE: ARIZONA TWS: 1 S RGE: 14E SEC: N.S. E.W.

BEARING: N70°E ANGLE: -4° ELEVATION: FT. T.D.: 300 FT. DATE STARTED: 3-19-57 DATE COMP: 4-4-57

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: CASING:	CORE SIZE	CORE RUNS	CORE REC.%	MINERALIZATION	ASSAYS % CU.
5					BX				0.18
10									0.40
15									0.20
20						20			1.76
25									0.22
30									0.36
35									0.40
40						40			0.62
45									0.22
50									0.12
55									0.16
60						60			0.46
65									0.60
70									0.08
75									0.54
80						80			0.44
85									0.44
90									0.40
95									0.30
100			HIGHLY SILICIFIED, LIGHT GRAY SCHIST WITH INTERMITTENT DARK TO MEDIUM GRAY BANDS FROM 3' TO 10' THICK. QUARTZ IS THE PREDOMINANT MINERAL, 80 TO 90%, BUT DECREASES IN PERCENTAGE WHERE SCHIST BECOMES DARK WITH BANDS OF BIOTITE, HORNBLEND, & AUGITE (?),				100			0.26
105									0.29
110									0.20
115									0.44
120						120			0.18
125									0.10
130									0.16
135			COPPER & IRON MINERALIZATION IS PRIMARILY CONFINED TO VERY SMALL QUARTZ STRINGERS (1/4" OR LESS) CONTAINING PYRITE, CHALCOPRITE, MALACHITE, & IRON OXIDES.						0.08
140						140			0.16
145					AX				0.30
150									0.24
155									0.26
160						160			0.30
165									0.32
170									0.25
175									0.15
180						180			0.30
185									0.80
190									0.40
195									0.25
200						200			0.40
205									0.27
210									0.25
215									0.20
220						220			0.12
225									0.15
230									0.10
235									0.30
240						240			0.18
245									0.12
250									0.30
255									0.15
260						260			0.10
265									0.15
270									0.15
275									0.12
280						280			0.25
285									0.20
290									0.20
295									
300						300			

20% 60% 100%

$CuFeS_2$ CuO_x FeS_2 QUARTZ

COMPOSITE DIAMOND DRILL LOG

HOLE Nº M-2

COMPANY: CONSOLIDATE URANIUM COMPANY MINE: MADERO CLAIM: MADERO NO. 1 DISTRICT:

COUNTY: GILA STATE: ARIZONA TWS: 1 S RGE: 14 E SEC: N.S. E.W.

BEARING: S 70° W ANGLE: -4° ELEVATION: FT. T.D.: 301 FT. DATE STARTED: 4-5-57 DATE COMP: 4-17-57

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: ——— CASING: — —	CORE SIZE	CORE RUNS	CORE REC.%	MINERALIZATION	ASSAYS % CU.
5					BX				0.25
10									0.95
15									0.12
20						20			0.35
25									0.50
30									0.30
35									0.55
40						40			0.15
45									0.15
50									0.30
55									0.20
60						60			0.40
65									0.40
70									0.45
75						80			0.30
80									0.40
85									0.65
90						100			0.25
95									0.30
100			HIGHLY SILICIFIED, LIGHT GRAY SCHIST WITH INTERMITTENT DARK TO MEDIUM GRAY BANDS FROM 3' TO 10' THICK. QUARTZ IS THE PREDOMINANT MINERAL, 80 TO 90%, BUT DECREASES IN PERCENTAGE WHERE SCHIST BECOMES DARK WITH BANDS OF BIOTITE, HORNBLEND & AUGITE (?).						0.32
105									0.45
110						120			0.25
115									0.20
120									0.20
125									0.20
130			COPPER & IRON MINERALIZATION IS PRIMARILY CONFINED TO VERY SMALL QUARTZ STRINGERS (1/4" OR LESS) CONTAINING PYRITE, CHALCOPYRITE, MALACHITE, & IRON OXIDES.						0.55
135					AX	140			0.65
140									0.30
145									0.25
150									0.40
155						160			0.30
160									0.25
165									0.35
170									0.50
175						180			0.15
180									0.25
185									0.15
190									0.25
195									0.35
200						200			0.40
205									0.40
210									0.20
215									0.25
220						220			0.40
225									0.20
230									0.15
235									0.20
240						240			0.25
245									0.20
250									0.15
255									0.15
260						260			0.10
265									
270									
275									
280						280			
285									
290									
295									
300						300			
301									

20% 60% 100%

CUFeS2 CUO FeS2 QUARTZ

COMPOSITE DIAMOND DRILL LOG

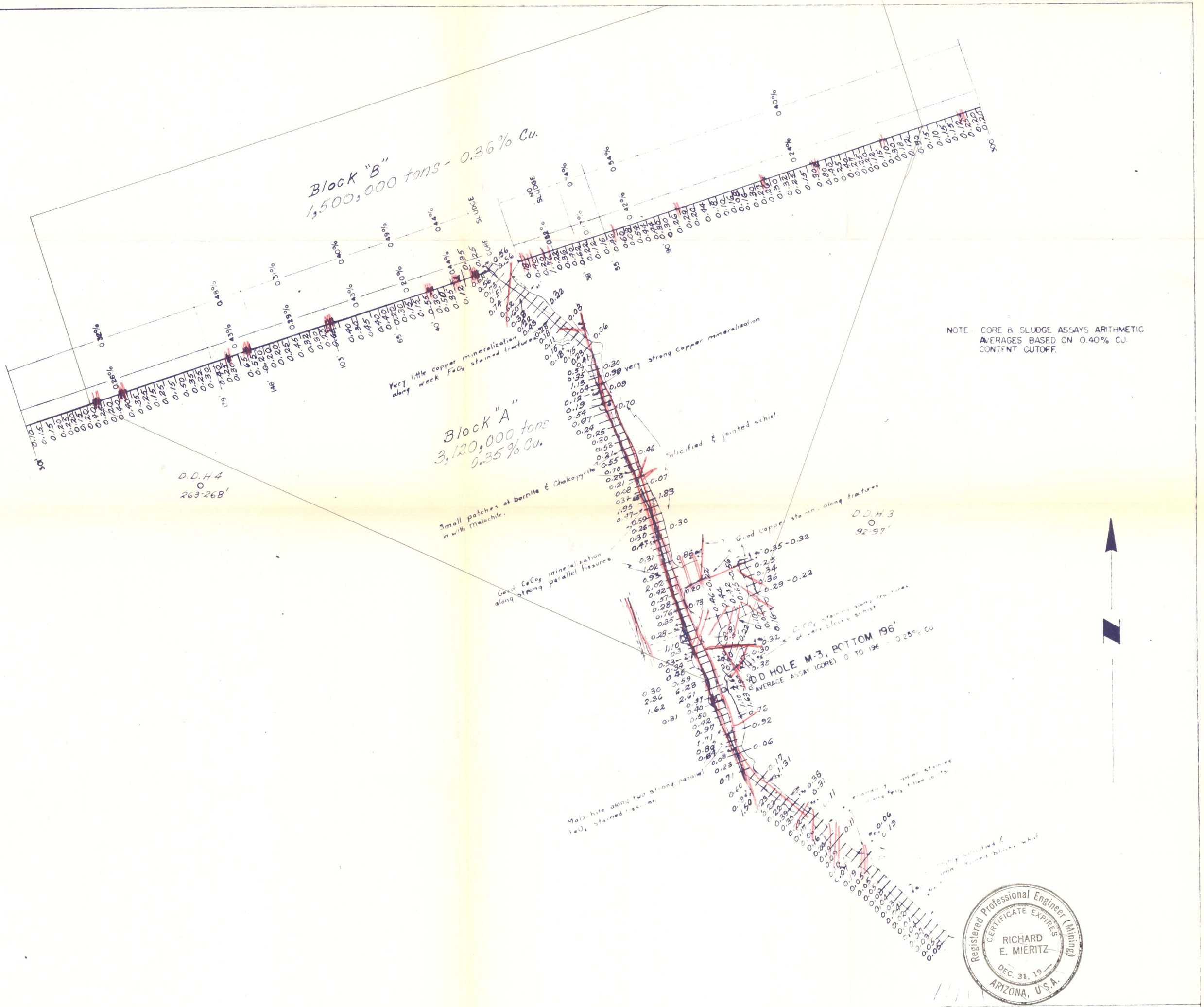
HOLE Nº M-3

COMPANY: CONSOLIDATED URANIUM COMPANY MINE: MADERO CLAIM: MADERO NO. 1 DISTRICT:

COUNTY: GILA STATE: ARIZONA TWS: 1S RGE: 14 E SEC: N.S. E.W.

BEARING: VERTICAL ANGLE: 90° ELEVATION: FT. T.D.: 196 FT. DATE STARTED: 4-23-57 DATE COMP: 4-30-57

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: ——— CASING: – –	CORE SIZE	CORE RUNS	CORE REC%	MINERALIZATION	ASSAYS % CU.		
5					BX				0.30		
10									0.20		
15											
20						20			0.15	0.24	
25											
30									0.20		
35									0.35		
40						40				40	
45									0.15		
50									0.20		
55											
60						60			0.15	0.19	
65											
70									0.20		
75									0.25		
80						80				80	
85									0.40		
90									0.20		
95									0.30		
100					AX	100					
105			HIGHLY SILICIFIED, LIGHT GRAY SCHIST WITH INTERMITT-						0.45		
110			ENT DARK TO MEDIUM GRAY BANDS FROM 3' TO 10' THICK						0.35	0.31	
115			QUARTZ IS THE PREDOMINANT MINERAL, 80 TO 90%,						0.30		
120			BUT DECREASES IN PERCENTAGE WHERE SCHIST BECOMES			120			0.10		
125			DARK WITH BANDS OF BIOTITE, HORNBLEND, & AUGITE (?).						0.35		
130									0.30		
135			COPPER & IRON MINERALIZATION IS PRIMARILY CONFINED						0.35		
140			TO VERY SMALL QUARTZ STRINGERS (1/4" OR LESS)			140				143	
145			CONTAINING PYRITE, CHALCOPYRITE, MALACHITE, &						0.15		
150			IRON OXIDES.						0.20		
155									0.25		
160						160					
165									0.15		
170									0.30	0.19	
175											
180						180			0.10		
185									0.20		
190									0.65	190	
195											
200						200					
205							20%				
210							60%				
215							100%				
220						220		$CuFeS_2$			
225								FeS_2			
230											
235								CuO_x			
240						240					
245								QUARTZ			
250											
255											
260						260					
265											
270											
275											
280						280					
285											
290											
295											
300						300					



NOTE: CORE & SLUDGE ASSAYS ARITHMETIC AVERAGES BASED ON 0.40% CU. CONTENT CUTOFF.

CONSOLIDATED URANIUM CO.

ASSAY & GEOLOGIC MAP

MADERO MINE

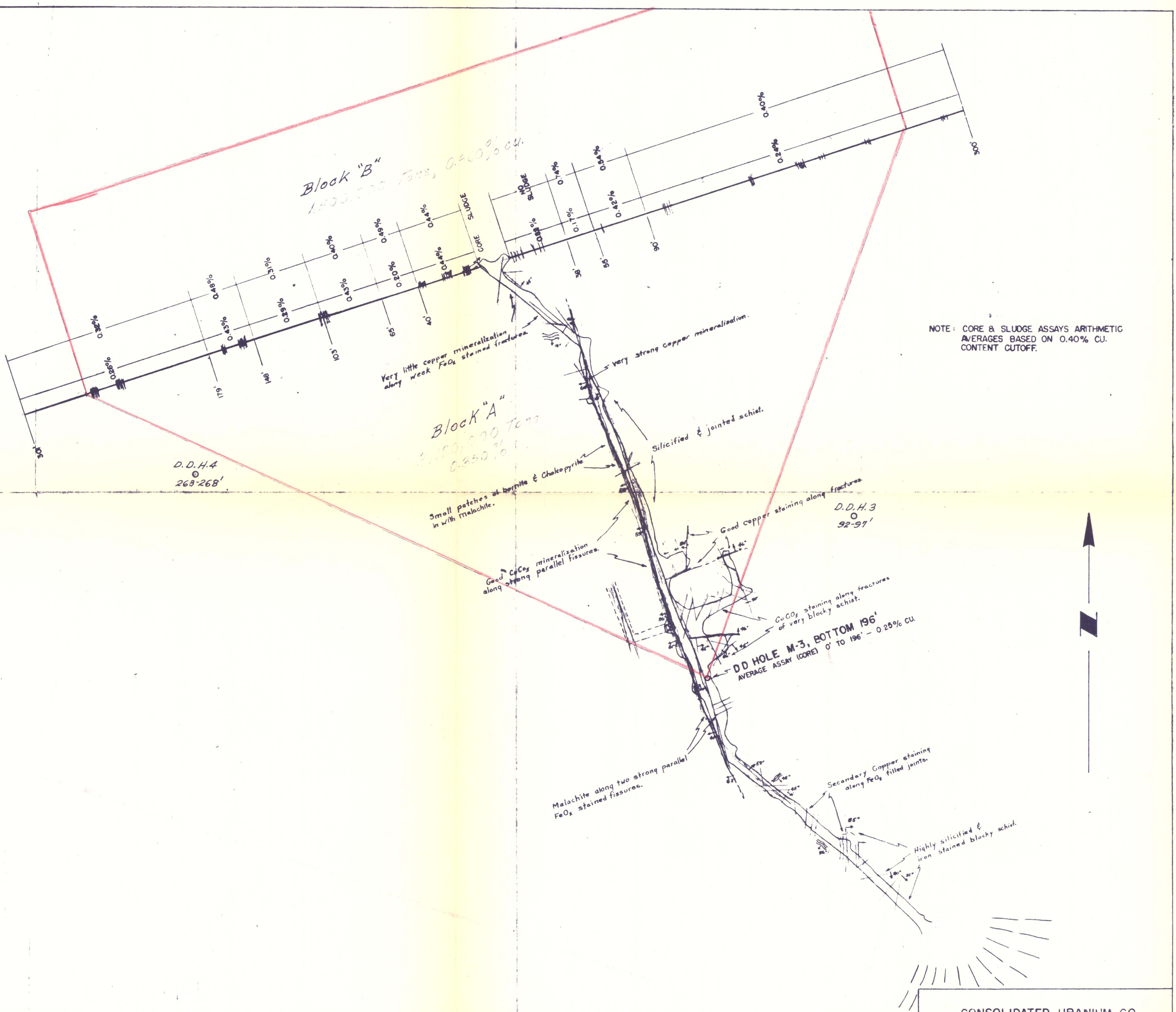
GILA COUNTY ARIZONA

SCALE 1 IN. = 40 FT

0' 20' 40' 80' 120'

MARCH, 1957 R. E. MIERITZ

PLATE 3 Map 6



NOTE: CORE & SLUDGE ASSAYS ARITHMETIC AVERAGES BASED ON 0.40% CU. CONTENT CUTOFF.

CONSOLIDATED URANIUM CO.

ASSAY & GEOLOGIC MAP

MADERO MINE

GILA COUNTY ARIZONA

SCALE 1 IN. = 40 FT.

0' 20' 40' 80' 120'

MARCH 1957 R.E. MIERITZ

COMPOSITE DIAMOND DRILL LOG

HOLE Nº M-1

COMPANY: CONSOLIDATED URANIUM COMPANY MINE: MADERO CLAIM: MADERO NO. 1 DISTRICT:

COUNTY: GILA STATE: ARIZONA TWS: 1 S RGE: 14E SEC: N.S. E.W.

BEARING: N70ºE ANGLE: -4° ELEVATION: FT. T.D.: 300 FT. DATE STARTED: 3-19-57 DATE COMP: 4-4-57

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: CASING:	CORE SIZE	CORE RUNS	CORE REC%	MINERALIZATION	ASSAYS % CU.
5					BX				0.18
10									0.40
15									0.20
20						20			1.76
25									0.22
30									0.36
35									0.40
40						40			0.62
45									0.22
50									0.12
55									0.16
60						60			0.46
65									0.60
70									0.08
75									0.54
80						80			0.44
85									0.44
90									0.40
95									0.30
100			HIGHLY SILICIFIED, LIGHT GRAY SCHIST WITH INTERMITTENT DARK TO MEDIUM GRAY BANDS FROM 3' TO 10' THICK. QUARTZ IS THE PREDOMINANT MINERAL, 80 TO 90 %; BUT DECREASES IN PERCENTAGE WHERE SCHIST BECOMES DARK WITH BANDS OF BIOTITE, HORNBLEND, & AUGITE (?),			100			0.26
105									0.29
110									0.20
115									0.44
120						120			0.18
125									0.10
130									0.16
135									0.08
140			COPPER & IRON MINERALIZATION IS PRIMARILY CONFINED TO VERY SMALL QUARTZ STRINGERS (1/4" OR LESS) CONTAINING PYRITE, CHALCOPRITE, MALACHITE, & IRON OXIDES.			140			0.16
145									0.30
150					AX				0.24
155									0.26
160						160			0.30
165									0.32
170									0.25
175									0.15
180						180			0.30
185									0.80
190									0.40
195									0.25
200						200			0.40
205									0.27
210									0.25
215									0.20
220						220			0.12
225									0.15
230									0.10
235									0.30
240						240			0.18
245									0.12
250									0.30
255									0.15
260						260			0.10
265									0.15
270									0.15
275									0.12
280						280			0.25
285									0.20
290									0.20
295									
300						300			

20 % 60 % 100 % CUFeS2 CuOx FeS2 QUARTZ

COMPOSITE DIAMOND DRILL LOG

HOLE Nº M-2

COMPANY: CONSOLIDATE URANIUM COMPANY MINE: MADERO CLAIM: MADERO NO. 1 DISTRICT:

COUNTY: GILA STATE: ARIZONA TWS: 1 S RGE: 14 E SEC: N.S. E.W.

BEARING: S 70° W ANGLE: -4° ELEVATION: FT. T.D.: 301 FT. DATE STARTED: 4-5-57 DATE COMP: 4-17-57

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: CASING:	CORE SIZE	CORE RUNS	CORE REC%	MINERALIZATION	ASSAYS % CU.
5			HIGHLY SILICIFIED, LIGHT GRAY SCHIST WITH INTERMITTENT DARK TO MEDIUM GRAY BANDS FROM 3' TO 10' THICK. QUARTZ IS THE PREDOMINANT MINERAL, 80 TO 90%, BUT DECREASES IN PERCENTAGE WHERE SCHIST BECOMES DARK WITH BANDS OF BIOTITE, HORNBLEND & AUGITE (?). COPPER & IRON MINERALIZATION IS PRIMARILY CONFINED TO VERY SMALL QUARTZ STRINGERS (1/4" OR LESS) CONTAINING PYRITE, CHALCOPYRITE, MALACHITE, & IRON OXIDES.		BX				0.25
10									0.95
15									
20						20			0.12
25									0.35
30									0.50
35									0.30
40						40			0.55
45									0.15
50									0.15
55									0.30
60						60			0.20
65									0.40
70									0.40
75									0.45
80						80			0.30
85									0.40
90									0.65
95									0.25
100						100			0.30
105									0.32
110									0.45
115									0.25
120						120			0.20
125									0.20
130									0.20
135									0.55
140					AX	140			0.65
145									0.30
150									0.25
155									0.40
160						160			0.30
165									0.25
170									0.35
175									0.50
180						180			0.15
185									0.25
190									0.15
195									0.25
200						200			0.35
205									0.40
210									0.40
215									0.20
220						220			0.25
225									0.40
230									0.20
235									0.15
240						240			0.20
245									0.25
250									0.20
255									0.15
260						260			0.15
265									0.10
270									
275									
280						280			
285									
290									
295									
300						300			
301									

20% 60% 100%

CuFeS2 CuO FeS2 QUARTZ

B-8

COMPOSITE DIAMOND DRILL LOG

HOLE Nº M-3

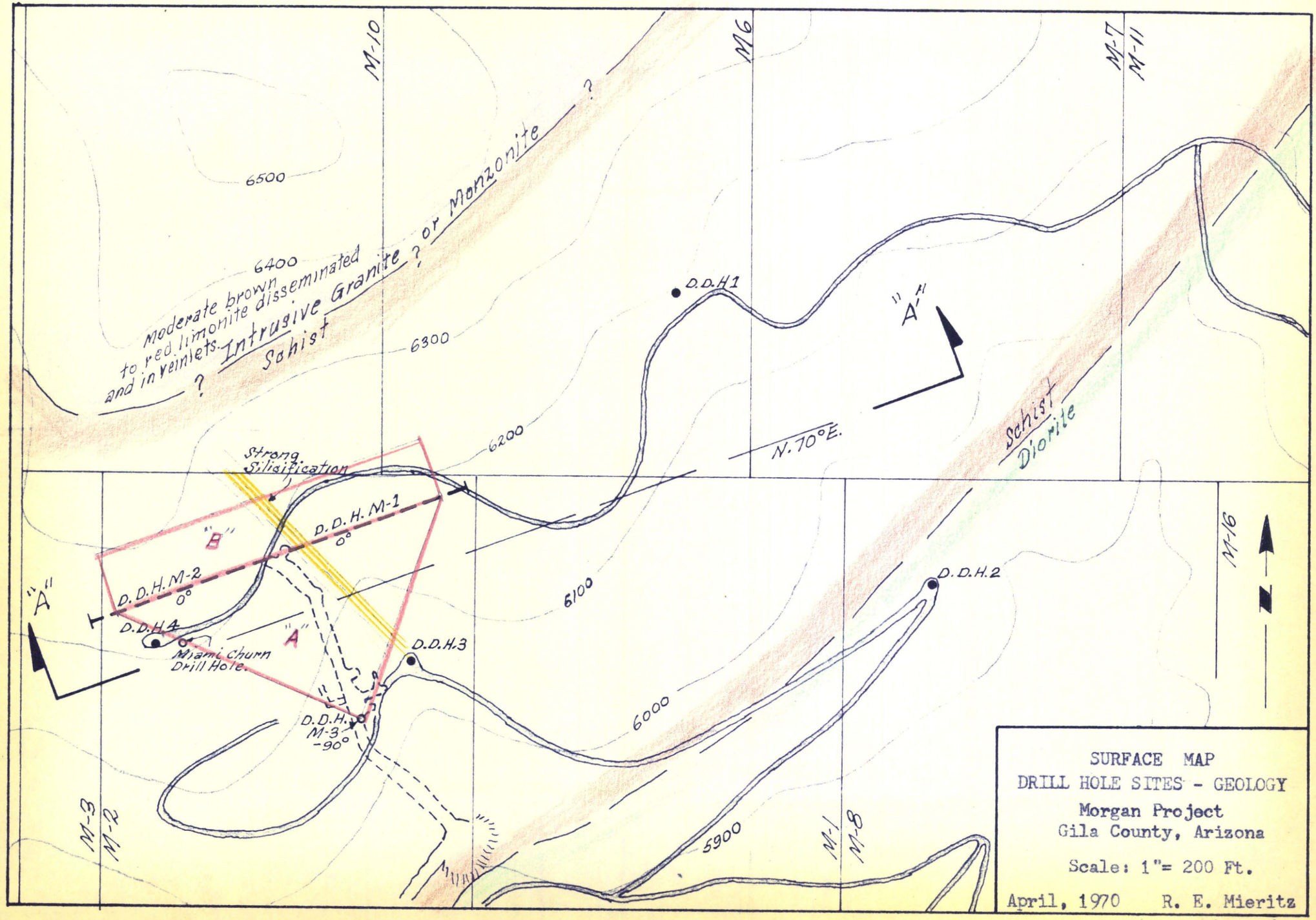
COMPANY: CONSOLIDATED URANIUM COMPANY MINE: MADERO CLAIM: MADERO NO. 1 DISTRICT:

COUNTY: GILA STATE: ARIZONA TWS: 1S RGE: 14 E SEC: N.S. E.W.

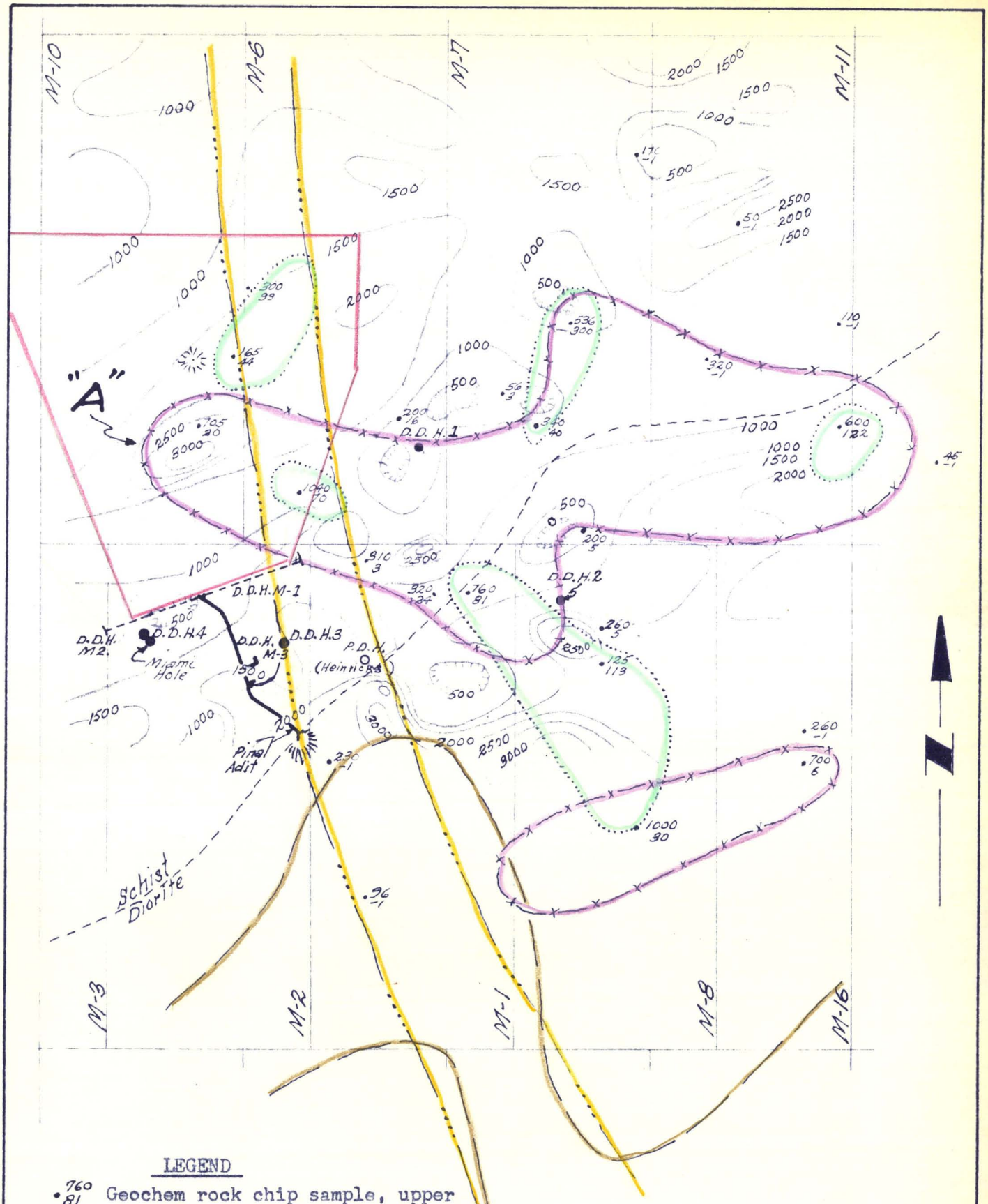
BEARING: VERTICAL ANGLE: 90° ELEVATION: FT. T.D.: 196 FT. DATE STARTED: 4-23-57 DATE COMP: 4-30-57

DEPTH	ELEV.	ROCK TYPE	GEOLOGIC DESCRIPTION & REMARKS	HOLE: ——— CASING: – –	CORE SIZE	CORE RUNS	CORE REC.%	MINERALIZATION	ASSAYS % CU.
5					BX				0.30
10									0.20
15									
20						20			0.15
25									
30									0.20
35									0.35
40						40			
45									0.15
50									0.20
55									
60						60			0.15
65									
70									0.20
75									0.25
80						80			0.40
85									0.20
90									
95									0.30
100			HIGHLY SILICIFIED, LIGHT GRAY SCHIST WITH INTERMITT-		AX	100			0.45
105			ENT DARK TO MEDIUM GRAY BANDS FROM 3' TO 10' THICK						0.35
110			QUARTZ IS THE PREDOMINANT MINERAL, 80 TO 90%,						0.30
115			BUT DECREASES IN PERCENTAGE WHERE SCHIST BECOMES			120			0.10
120			DARK WITH BANDS OF BIOTITE, HORNBLEND, & AUGITE (?).						0.35
125									0.30
130			COPPER & IRON MINERALIZATION IS PRIMARILY CONFINED						0.35
135			TO VERY SMALL QUARTZ STRINGERS (1/4" OR LESS)			140			0.15
140			CONTAINING PYRITE, CHALCOPYRITE, MALACHITE, &						0.20
145			IRON OXIDES.						0.25
150									
155						160			0.15
160									0.30
165									0.10
170						180			0.20
175									0.65
180									
185									
190									
195									
200						200	20%	CUFeS2	
205							60%	FeS2	
210							100%	CUOx	
215								QUARTZ	
220						220			
225									
230									
235									
240						240			
245									
250									
255									
260						260			
265									
270									
275									
280						280			
285									
290									
295									
300						300			

B-9


M-10
M6
M-7
M-11
6500
6400
6300
6200
6100
6000
5900
Moderate brown to red limonite disseminated and in veinlets.
Intrusive Granite ? or Monzonite ?
Schist ?
D.D.H1
"A"
N.70°E.
Schist
Diorite
Strong Silicification
D.D.H. M-1
0°
"B"
D.D.H. M-2
0°
D.D.H4
Miami churn Drill Hole.
"A"
"A"
D.D.H.3
D.D.H. M-3 -90°
D.D.H.2
M-16
N
M-3
M-2
M-1
M-8
SURFACE MAP
DRILL HOLE SITES - GEOLOGY
Morgan Project
Gila County, Arizona
Scale: 1"= 200 Ft.
April, 1970 R. E. Mieritz

Map. 1



LEGEND

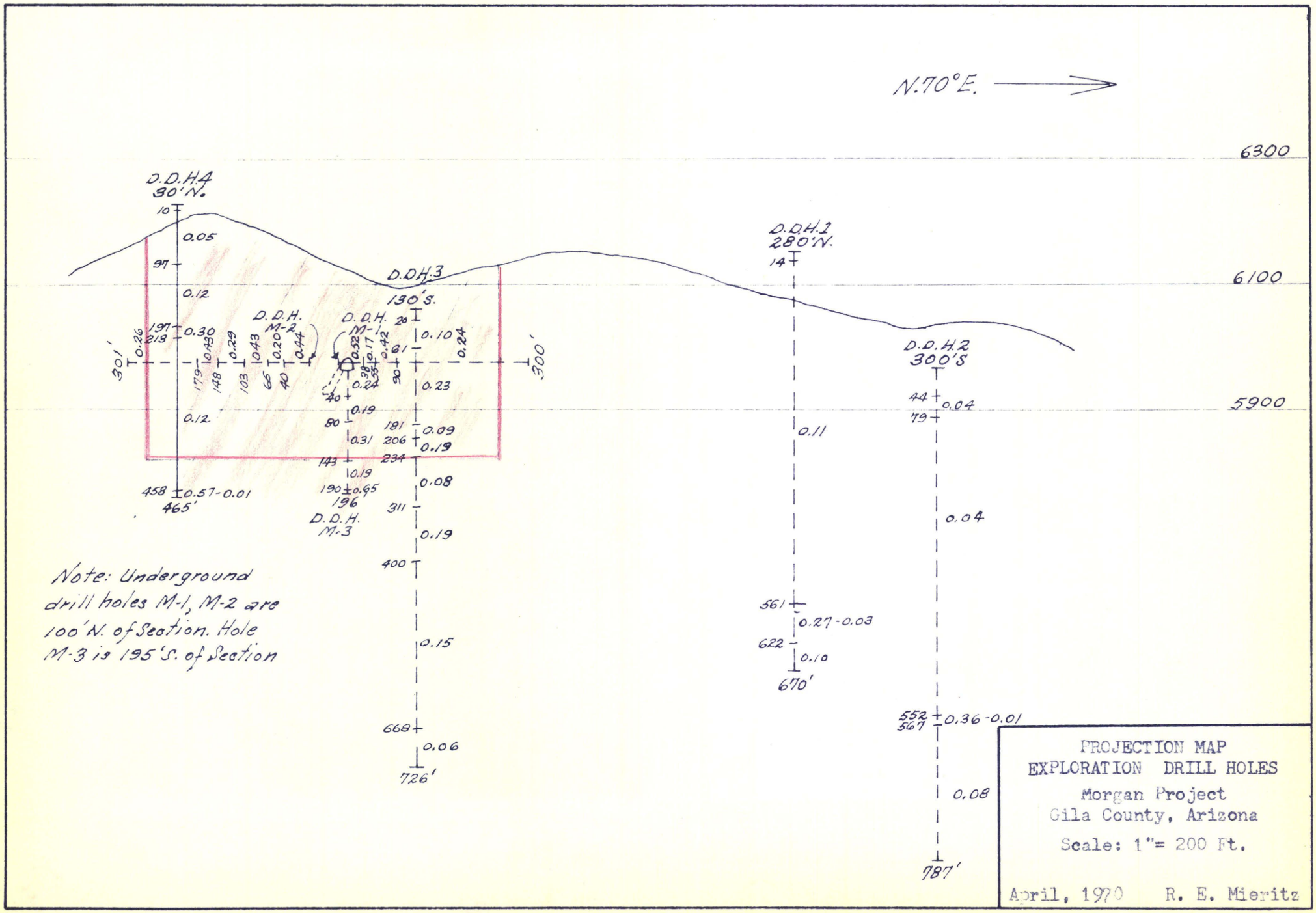
- 760 / 81 Geochem rock chip sample, upper is ppm copper, lower is ppm moly.
- Copper Geochem Anomaly, 300 ppm +
- Moly Geochem Anomaly, 30 ppm +
- 500 Magnetic Anomaly, 500 gamma Interval.
- I. P. Anomaly, Zone "A" and "B".
- I. P. Anomaly, Zone "C"
- D.D.H.3 E. + E. Surface Drill Holes
- D.D.H.M1 Early Underground Drill Holes.

SUPERIMPOSED
GEOPHYSICAL ANOMALIES
Morgan Project
Gila County, Arizona

Scale: 1"= 400 Ft.

April, 1970 R. E. Mieritz

Map. 2


N.70°E.
6300
6100
5900
D.D.H.4
90'N.
D.D.H.3
130'S.
D.D.H.1
280'N.
D.D.H.2
300'S
D.D.H.
M-2
D.D.H.
M-1
D.D.H.
M-3
301'
300'
465'
196
670'
726'
787'
Note: Underground drill holes M-1, M-2 are 100'N. of Section. Hole M-3 is 195'S. of Section
PROJECTION MAP
EXPLORATION DRILL HOLES
Morgan Project
Gila County, Arizona
Scale: 1"= 200 Ft.
April, 1970 R. E. Mieritz

Map. 3

HEINRICHS
GEOEXPLORATION COMPANY
POST OFFICE BOX 5671, TUCSON, ARIZONA, 85703
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geophysical engineers
vancouver
sydney

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: $\rho/2\pi$

$$\rho/2\pi = VK_n/I = [V/I][\tfrac{1}{2}an\ (n+1)(n+2)]$$

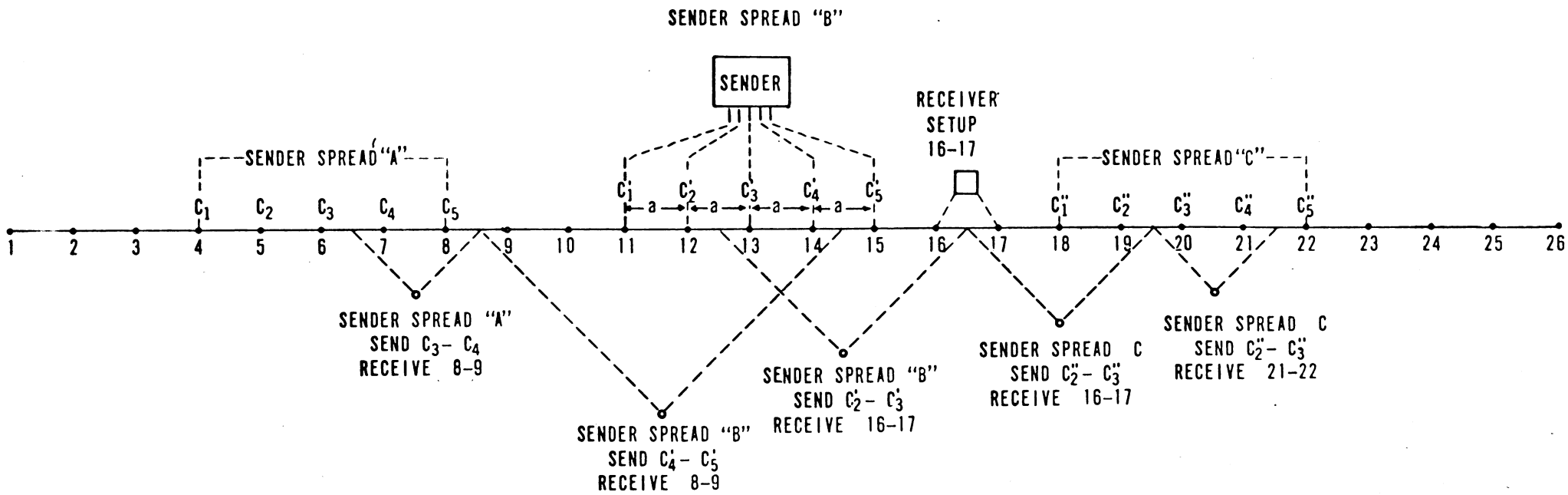
$$MCF = 1000 \times PFE/[\rho_{dc}/2\pi]$$

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.

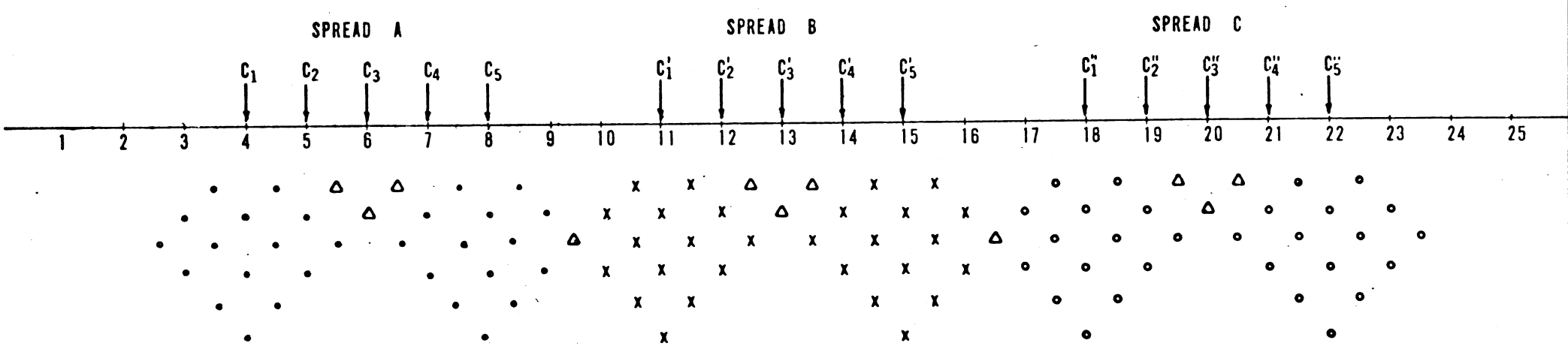


SCHEMATIC DIAGRAM ILLUSTRATING THE METHOD OF OBTAINING AND PLOTTING DIPOLE-DIPOLE I.P. DATA

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)



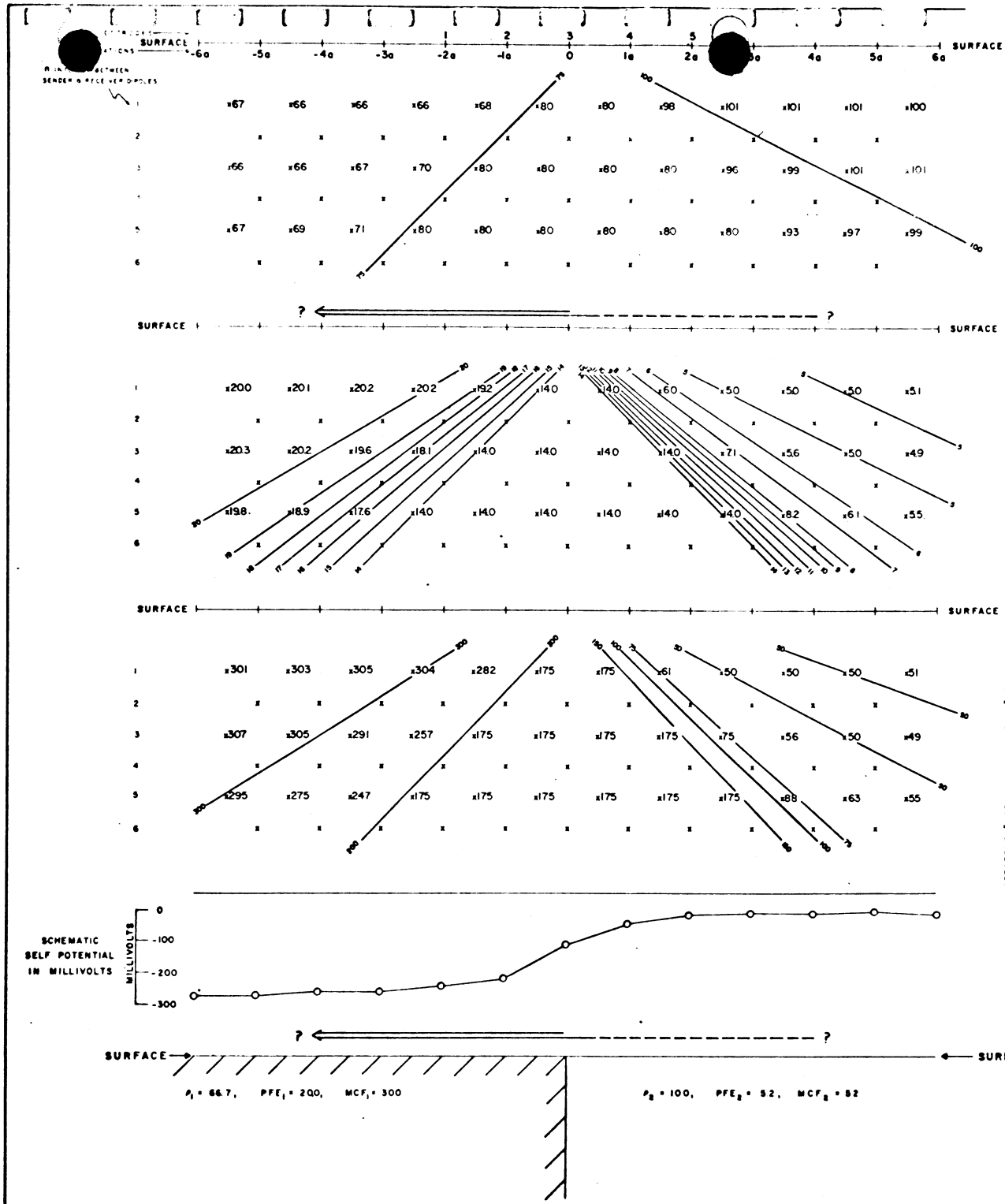
• SPREAD A

x SPREAD B

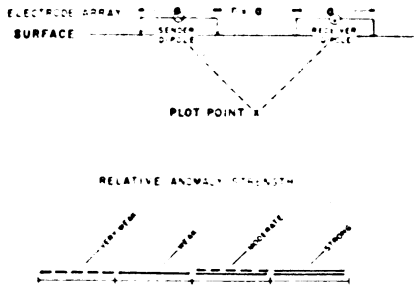
o SPREAD C

△ RECIPROCAL VALUES (TIE POINTS)

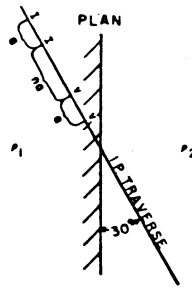
Fig. 2



EXPLANATION



LOOKING 60° FROM STRIKE OF INTERFACE



VERTICAL INTERFACE

SECTIONAL DATA SHEET

LINE NO. ——

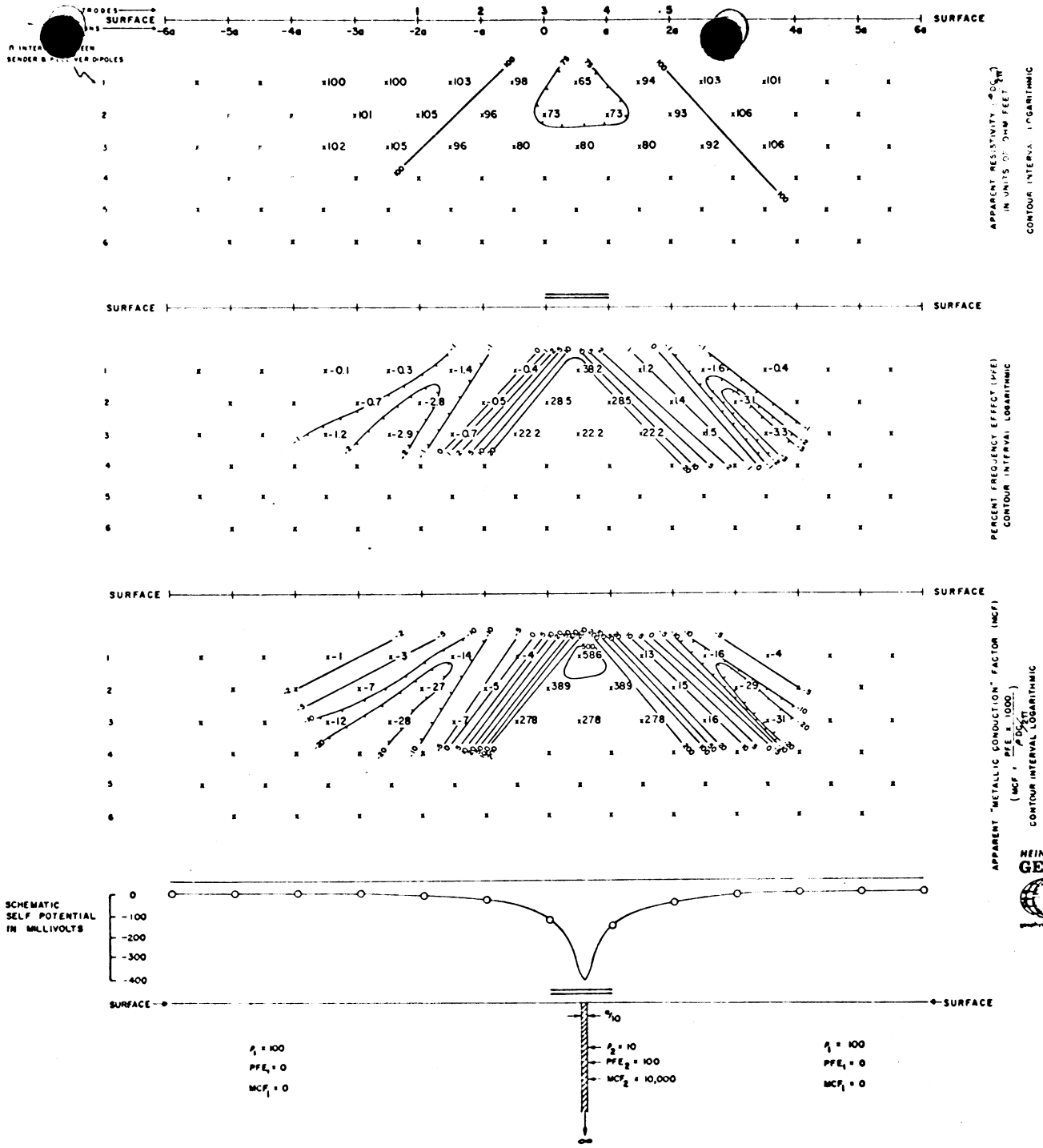
INDUCED POLARIZATION TRAVERSE

[redacted] DATE: ——

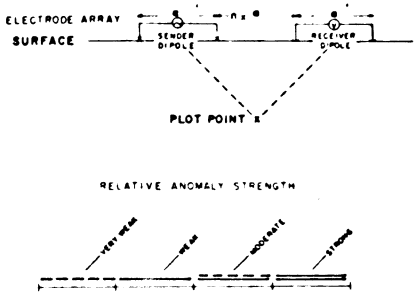
FOR

HEINRICHS
GEOEXPLORATION COMPANY
POST OFFICE BOX 5071, TUCSON, ARIZONA, 85703
Phone: 602/623-0578 Cable: GEOEX, Tucson
vancouver
sydney

THEORETICAL INDUCED POLARIZATION TRAVERSE ACROSS A VERTICAL INTERFACE AT 30°-DIPOLE-DIPOLE ELECTRODE ARRAY.



EXPLANATION



LOOKING NORMAL TO STRIKE

VERTICAL
TABULAR BODY

SECTIONAL DATA SHEET

LINE NO. ——

INDUCED POLARIZATION TRAVERSE

~~SCALE: "~~

DATE: ——

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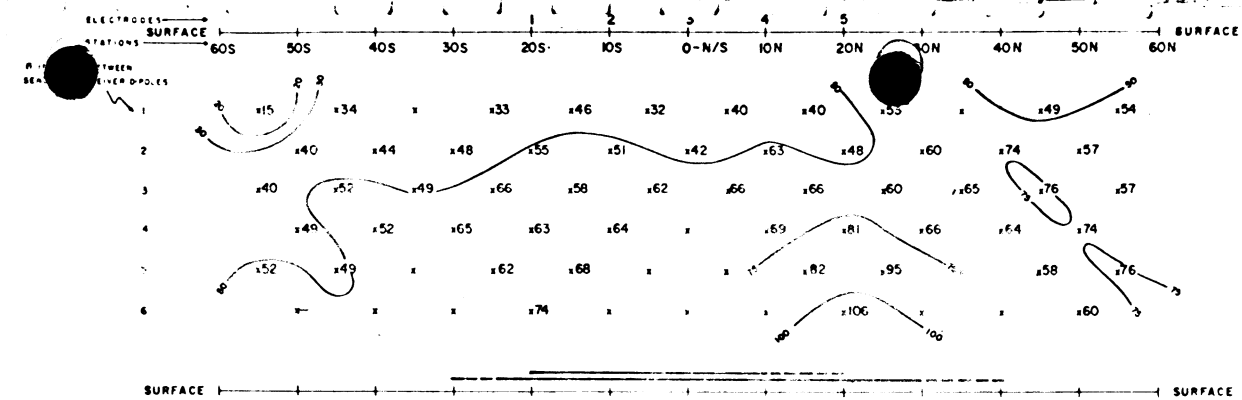
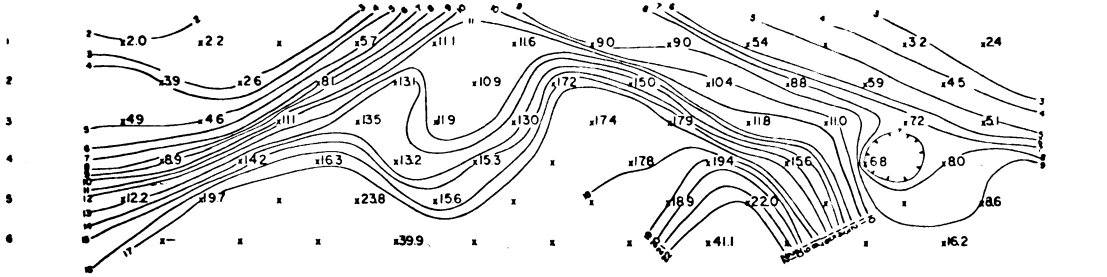
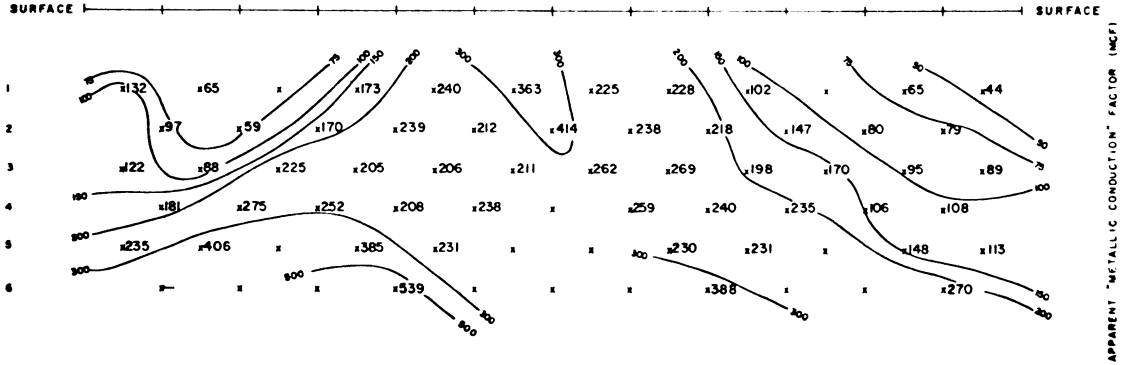
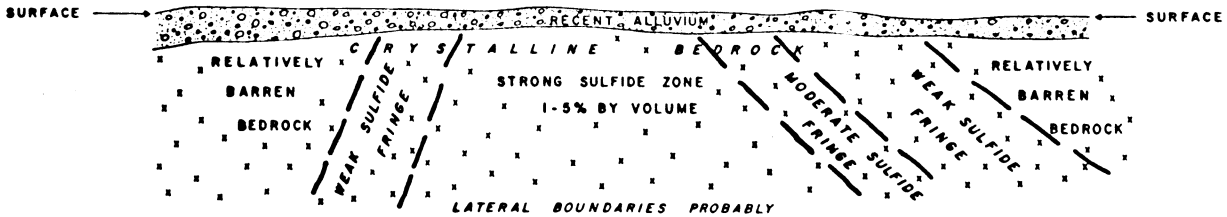
THEORETICAL DIPOLE-DIPOLE INDUCED POLARIZATION RESPONSE OVER A CONDUCTIVE VERTICAL TABULAR SULFIDE BODY CROSSED NORMAL TO THE STRIKE [HAVING A THICKNESS OF 1/10 THE ELECTRODE SPACING (a), A RESISTIVITY CONTRAST OF 10:1, A BACKGROUND RESISTIVITY (ρ_1) OF 100, A BACKGROUND PFE_1 OF 0, AND A PFE_2 OF 100 IN THE SULFIDE ZONE]





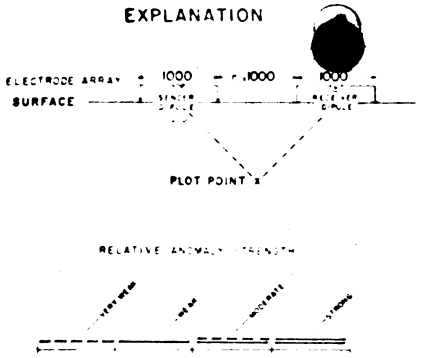


SCHEMATIC INTERPRETATION SECTION



LATERAL BOUNDARIES PROBABLY ACCURATE TO ONLY ± 1/2 DIPOLE (±500')
DIPS SCHEMATIC

EXPLANATION



LOOKING WEST

PIMA MINING DISTRICT
PIMA COUNTY, ARIZONA

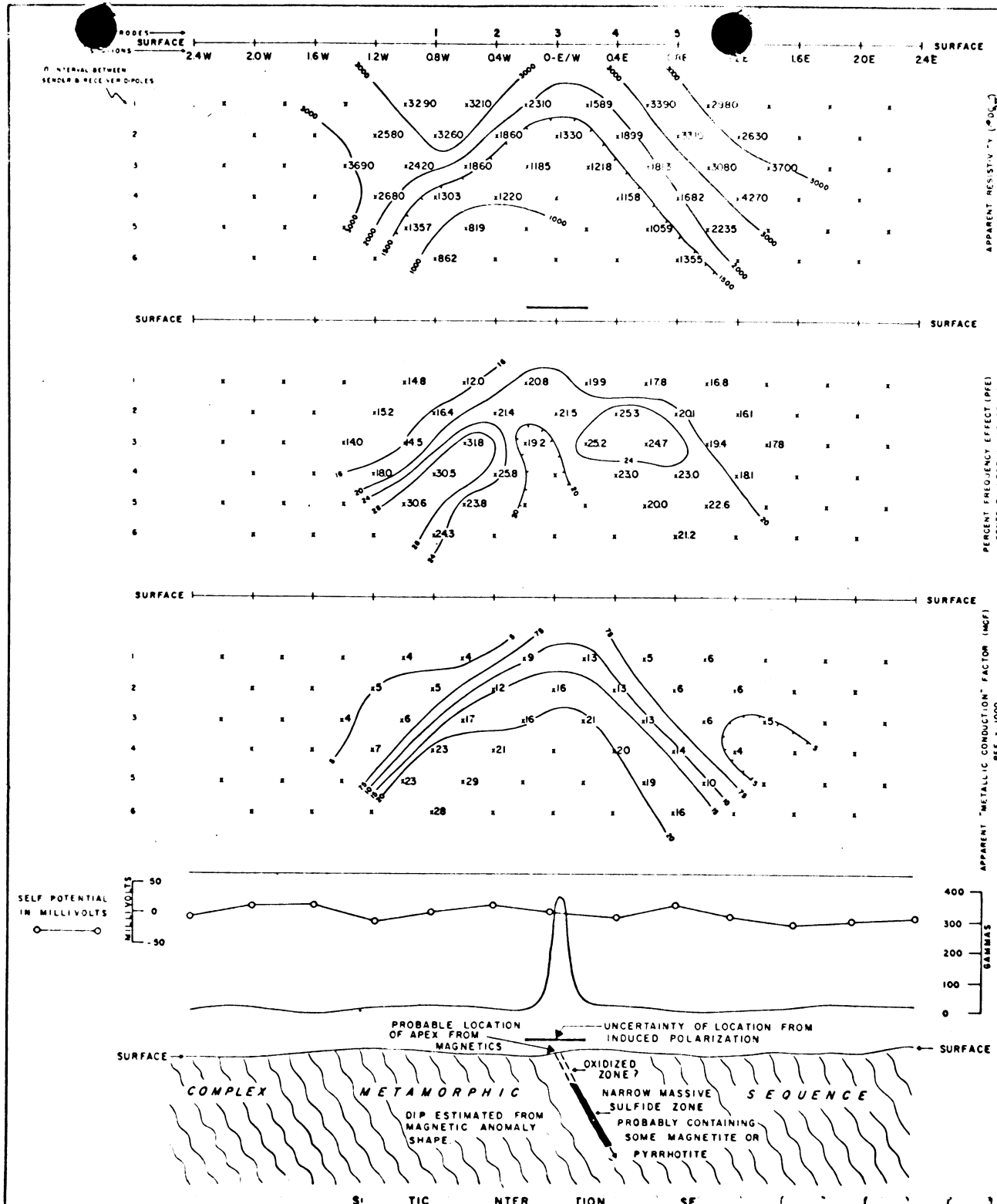
SECTIONAL DATA SHEET
LINE NO. —
INDUCED POLARIZATION TRAVERSE

~~SCALE: 1" = 1000'~~ DATE: —

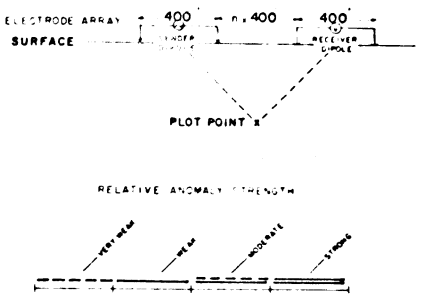
FOR

HEINRICHS
GEOEXPLORATION COMPANY
POST OFFICE BOX 5671, TUCSON, ARIZONA, 85703
Phone: 602/623-0578 Cable: GEOEX, Tucson
vancouver
sydney

ACTUAL FIELD EXAMPLE OF INDUCED POLARIZATION TRAVERSE OVER DISSEMINATED PORPHYRY TYPE SULFIDE MINERALIZATION



EXPLANATION



LOOKING NORTH

MASSIVE SULFIDE VEIN
APPALACHIAN SULFIDE DISTRICT

SECTIONAL DATA SHEET
LINE NO. —
INDUCED POLARIZATION TRAVERSE

~~SCALE: 1"=50'~~ DATE: —

FOR

HEINRICHS
GEOEXPLORATION COMPANY
POST OFFICE BOX 5671, TUCSON ARIZONA, 85703
Phone: 602/623-0578 Cable: GEOEX, Tucson
vancouver sydney

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.

25M 11-56

Boyles Bros. Drilling Company

SALT LAKE CITY 15, UTAH

Shift Report

Job: De Soto - Miami No. 6-39

Shift: Day Date: 3-13-57

Hole No. Location

Depth at end of shift - - - - feet

Depth at beginning of shift - - feet

Distance drilled - - - - - - feet

Amount of core recovered - - feet

Distance reamed for casing - - feet

Casing put in - - feet

Standpipe put in - feet

Cemented - - - - - - - - feet

Drilled Cement - - - - - feet

Geology

FROM	TO	FEET	MATERIAL

REMARKS: Cleaned road of rocks & unloaded equipment

Butler - Stewart
Operator.

Time Slip

Date 3-13 Shift Day Hole No.

Driller: Butler - Stewart

Helper: Lynch

CHARGE NO.	HRS.	COMMENTS
5	8	

25M 11-56

Boyles Bros. Drilling Company

SALT LAKE CITY 15, UTAH

Shift Report

Job De Soto - Miami No. 6-39

Shift Day Date 3-14-57

Hole No. Location

Depth at end of shift - - - - feet

Depth at beginning of shift - - feet

Distance drilled - - - - - - feet

Amount of core recovered - - feet

Distance reamed for casing - - feet

Casing put in - - feet

Standpipe put in - feet

Cemented - - - - - - - - feet

Drilled Cement - - - - - - feet

Geology

FROM	TO	FEET	MATERIAL

REMARKS: Carried part of equipment into drift. Leveled compressor hard water line to drill site.

Butler - Stewart
Operator.

Time Slip

Date 3-14 Shift Day Hole No.

Driller Butler - Stewart

Helper Lynch - McKinnon

CHARGE NO.	HRS.	COMMENTS
5	8	

25M 11-56

Boyles Bros. Drilling Company

SALT LAKE CITY 15, UTAH

Shift Report

Job De Soto - Miami No. 6-39

Shift Day Date 3-15-57

Hole No. Location

Depth at end of shift - - - - feet

Depth at beginning of shift - - feet

Distance drilled - - - - - - feet

Amount of core recovered - - feet

Distance reamed for casing - - feet

Casing put in - - feet

Standpipe put in - feet

Cemented - - - - - - - - feet

Drilled Cement - - - - - feet

Geology

FROM	TO	FEET	MATERIAL

REMARKS: Repaired and laid air-line to drill site. Moved rest of equipment to drill site.

Butler - Stewart
Operator.

Time Slip

Date 3-15 Shift Day Hole No.

Driller Butler - Stewart

Helper Lynch - McKennon

CHARGE NO.	HRS.	COMMENTS
5	8	

25M 11-56

Boyles Bros. Drilling Company

SALT LAKE CITY 15, UTAH

Shift Report

Job De Soto - Miami No. 6-39

Shift Day Date 3-16-57

Hole No. Location

Depth at end of shift - - - - feet

Depth at beginning of shift - - feet

Distance drilled - - - - - - feet

Amount of core recovered - - feet

Distance reamed for casing - - feet

Casing put in - - feet

Standpipe put in - feet

Cemented - - - - - - - - feet

Drilled Cement - - - - - feet

Geology

FROM	TO	FEET	MATERIAL

REMARKS: Finished setting up and repaired lines.

Boyles - Stewart
Operator.

Time Slip

Date 3-16-57 Shift Day Hole No. 6-39

Driller Boyles - Stewart

Helper Lynch - McKennon

CHARGE NO.	HRS.	COMMENTS
5	8	

25M 11-56

Boyles Bros. Drilling Company

SALT LAKE CITY 15, UTAH

Shift Report

Job: Desoto - Miami No. 6-39

Shift: Day Date: 3-18-57

Hole No.: M-1 Location: Madero Prop

Depth at end of shift - - - - ..... feet

Depth at beginning of shift - - ..... feet

Distance drilled - - - - - - ..... feet

Amount of core recovered - - ..... feet

Distance reamed for casing - - ..... feet

.....Casing put in - - ..... feet

.....Standpipe put in - ..... feet

Cemented - - - - - - - - - ..... feet

Drilled Cement - - - - - - ..... feet

Geology

FROM	TO	FEET	MATERIAL

REMARKS: Tried to start supply pump & was unable to do so. Called Mech.

no swing shift

Butler

Operator.

Time Slip

Date 3-18 Shift Day Hole No. M-1

Driller: Butler

Helper: Lynch

CHARGE NO.	HRS.	COMMENTS
5	8	

25M 11-56

Boyles Bros. Drilling Company

SALT LAKE CITY 15, UTAH

Shift Report

Job: DeSoto - Miami No. 6-39

Shift: Day Date: 3-19-57

Hole No.: M-1 Location: Madero - Prop.

Depth at end of shift - - - - ..... feet

Depth at beginning of shift - - ..... feet

Distance drilled - - - - - - ..... feet

Amount of core recovered - - ..... feet

Distance reamed for casing - - ..... feet

..... Casing put in - - ..... feet

..... Standpipe put in - ..... feet

Cemented - - - - - - - - ..... feet

Drilled Cement - - - - - ..... feet

Geology

FROM	TO	FEET	MATERIAL

REMARKS: Mech. brought another pump out. Valves were stuck in it. Was able to get going for swing shift

Butler

Operator.

Time Slip

Date 3-19 Shift Day Hole No. M-1

Driller: Butler

Helper: Lynch

CHARGE NO.	HRS.	COMMENTS
5	8	

25M 11-56

Boyles Bros. Drilling Company
SALT LAKE CITY 15, UTAH

Shift Report

Job: De Soto - Miami No. 6-39
Shift: Swing Date: 3-19-57
Hole No.: M-1 Location: Madero Prop.
Depth at end of shift - - - - 19 feet
Depth at beginning of shift - - 0 feet
Distance drilled - - - - - - 19 feet
Amount of core recovered - - 19 feet
Distance reamed for casing - - feet
AX Casing put in - - 10 feet
Standpipe put in - feet
Cemented - - - - - - - - feet
Drilled Cement - - - - - - feet

Geology

FROM	TO	FEET	MATERIAL
0	10	10	BX
10	19	9	AX

REMARKS: Collared hole at 10'.

Stewart
Operator.

Time Slip

Date 3-19 Shift Swing Hole No. M-1
Driller: Stewart
Helper: Mc Kennon

CHARGE NO.	HRS.	COMMENTS
1	8	

25M 11-56

Boyles Bros. Drilling Company

SALT LAKE CITY 15, UTAH

Shift Report

Job De Soto - Miami No. 6-39

Shift Day Date 3-20-57

Hole No. M-1 Location Madero - Prop

Depth at end of shift - - - - 55 feet

Depth at beginning of shift - - 19 feet

Distance drilled - - - - - - 36 feet

Amount of core recovered - - 32 feet

Distance reamed for casing - - ..... feet

..... Casing put in - - ..... feet

..... Standpipe put in - ..... feet

Cemented - - - - - - - - ..... feet

Drilled Cement - - - - - - ..... feet

Geology

FROM	TO	FEET	MATERIAL
19	55	36	Ax

REMARKS:

Butler

Operator.

Time Slip

Date 3-20 Shift Day Hole No. M-1

Driller Butler

Helper Lynch

CHARGE NO.	HRS.	COMMENTS
1	8	

25M 11-56

Boyles Bros. Drilling Company

SALT LAKE CITY 15, UTAH

Shift Report

Job De Soto - Miami No. 6-39

Shift Swing Date 3-20-57

Hole No. M-1 Location Madero-Prop

Depth at end of shift - - - - 81 feet

Depth at beginning of shift - - 55 feet

Distance drilled - - - - - - 26 feet

Amount of core recovered - - 22 feet

Distance reamed for casing - - ..... feet

.....Casing put in - - ..... feet

.....Standpipe put in - ..... feet

Cemented - - - - - - - - ..... feet

Drilled Cement - - - - - - ..... feet

Geology

FROM	TO	FEET	MATERIAL
55	81	26	Ay

REMARKS: Helper dropped rod on driller's toe

Stewart
Operator.

Time Slip

Date 3-20 Shift Swing Hole No. M-1

Driller Stewart

Helper Mc Kennon

CHARGE NO.	HRS.	COMMENTS
1	8	

25M 11-56

Boyles Bros. Drilling Company
SALT LAKE CITY 15, UTAH

Shift Report

Job: De Soto - Miami No. 6-39
Shift: Day Date: 3-21-57
Hole No.: M-1 Location: Madero-Prop
Depth at end of shift - - - - ..... feet
Depth at beginning of shift - - ..... feet
Distance drilled - - - - - - ..... feet
Amount of core recovered - - ..... feet
Distance reamed for casing - - ..... feet
..... Casing put in - - ..... feet
..... Standpipe put in - ..... feet
Cemented - - - - - - - - ..... feet
Drilled Cement - - - - - - ..... feet

Geology

FROM	TO	FEET	MATERIAL

REMARKS: Had to go to Y mes after short rods 3½" to drill slusher pin hole. Helper fixed flat on power wagon I cleaned up.
No night shift. Dr. would not release Stewart
Butler
Operator.

Time Slip

Date 3-21 Shift Day Hole No. M-1
Driller Butler
Helper Lynch

CHARGE NO.	HRS.	COMMENTS
5	8	

25M 11-56

Boyles Bros. Drilling Company

SALT LAKE CITY 15, UTAH

Shift Report

Job: De Soto - Miami No. 6-39

Shift: Day Date: 3-22-57

Hole No.: M-1 Location: Madera Prob

Depth at end of shift - - - - ..... feet

Depth at beginning of shift - - ..... feet

Distance drilled - - - - - - ..... feet

Amount of core recovered - - ..... feet

Distance reamed for casing - - ..... feet

..... Casing put in - - ..... feet

..... Standpipe put in - ..... feet

Cemented - - - - - - - - ..... feet

Drilled Cement - - - - - - ..... feet

Geology

FROM	TO	FEET	MATERIAL

REMARKS: 4 hrs. repairing pump (Valves stuck) 4 hrs. repairing water & air lines

Butler

Operator.

Time Slip

Date 3-22 Shift Day Hole No. M-1

Driller: Butler

Helper: Lynch

CHARGE NO.	HRS.	COMMENTS
5	8	

25M 11-56

Boyles Bros. Drilling Company

SALT LAKE CITY 15, UTAH

Shift Report

Job: Deste mini No. 6-39

Shift: Swing Date: 3/22/57

Hole No. Location

Depth at end of shift - - - - 99 feet

Depth at beginning of shift - - 81 feet

Distance drilled - - - - - 18 feet

Amount of core recovered - - 16 feet

Distance reamed for casing - - feet

Casing put in - - feet

Standpipe put in - feet

Cemented - - - - - - - - feet

Drilled Cement - - - - - feet

Geology

FROM	TO	FEET	MATERIAL
81	99	18	A x Core

REMARKS:

Stewart

Operator.

Time Slip

Date 3/22/57 Shift Swing Hole No.

Driller Stewart

Helper Jones

CHARGE NO.	HRS.	COMMENTS
1	8	

25M 11-56

Boyles Bros. Drilling Company

SALT LAKE CITY 15, UTAH

Shift Report

Job: De Soto - Miami No. 6-39

Shift: Day Date: 3-23-57

Hole No. M-1 Location: Makers Prob.

Depth at end of shift - - - - 121 feet

Depth at beginning of shift - - 99 feet

Distance drilled - - - - - 22 feet

Amount of core recovered - - 18 feet

Distance reamed for casing - - ..... feet

.....Casing put in - - ..... feet

.....Standpipe put in - ..... feet

Cemented - - - - - - - - ..... feet

Drilled Cement - - - - - ..... feet

Geology

FROM	TO	FEET	MATERIAL
99	121	22	AX.

REMARKS: Hole caving last 10'
Series 'D'

Butler
Operator.

Time Slip

Date 3-23 Shift Day Hole No. M-1

Driller Butler

Helper Lynch

CHARGE NO.	HRS.	COMMENTS
1	8	

25M 11-56

Boyles Bros. Drilling Company

SALT LAKE CITY 15, UTAH

Shift Report

Job Postomiami No.

Shift Swing Date 3/23/57

Hole No. Location

Depth at end of shift - - - - feet

Depth at beginning of shift - - feet

Distance drilled - - - - - - feet

Amount of core recovered - - feet

Distance reamed for casing - - feet

Casing put in - - feet

Standpipe put in - feet

Cemented 121-111 - - 10 feet

Drilled Cement - - - - - - feet

Geology

FROM	TO	FEET	MATERIAL

REMARKS:

1 Sack Lumite

coarse cave 4 FT to

cave in bottom 6 FT

could not set to bottom

Operator.

Time Slip

Date 3/23/57 Shift Swing Hole No.

Driller

Helper Jones

CHARGE NO.	HRS.	COMMENTS
9	6	
1	2	
	8	

25M 11-56

Boyles Bros. Drilling Company

SALT LAKE CITY 15, UTAH

Shift Report

Job Desta Miami No.

Shift Day Date 3-25-57

Hole No. Location

Depth at end of shift - - - - 123 feet

Depth at beginning of shift - - 121 feet

Distance drilled - - - - - 2 feet

Amount of core recovered - - 1.5 feet

Distance reamed for casing - - feet

Casing put in - - feet

Standpipe put in - feet

Cemented - - - - - - - - feet

Drilled Cement From 110-121 - 10 feet

Geology

FROM	TO	FEET	MATERIAL
121	123	2	AX core

REMARKS: Air Hose Broke

Repaired at 3 Hrs.

[illegible]

Operator.

Time Slip

Date 3-25-57 Shift Day Hole No.

Driller [illegible]

Helper [illegible]

CHARGE NO.	HRS.	COMMENTS
1	5	
3	3	
	8	

25M 11-56

Boyles Bros. Drilling Company

SALT LAKE CITY 15, UTAH

Shift Report

Job: De Soto - Miami No. 6-39

Shift: Swing Date: 3-25-57

Hole No.: M-1 Location: Maduro - Prop.

Depth at end of shift - - - - ..... feet

Depth at beginning of shift - - ..... feet

Distance drilled - - - - - - ..... feet

Amount of core recovered - - ..... feet

Distance reamed for casing - - ..... feet

..... Casing put in - - ..... feet

..... Standpipe put in - ..... feet

Cemented - - - - - - - - ..... feet

Drilled Cement - - - - - ..... feet

Geology

FROM	TO	FEET	MATERIAL

REMARKS: No work as I could not get repairs for Air hose.

Carter

Operator.

Time Slip

Date Shift Hole No.

Driller

Helper

CHARGE NO.	HRS.	COMMENTS

De Soto Copper Corp.
Rm. 340
411 - N. Central
Phoenix, Ariz.

Magma Copper Company

ASSAY CERTIFICATE "A"

Date 3/28/57

No.	LOCATION & REMARKS		CU %	AG OZ.	AU OZ.				
Sample #1	Core Hole #1	0 -	0.18						
2	" "	10	0.40						
3	" "	15	0.20						
4	" "	19	1.76						
5	" "	24	0.22						
6	" "	29	0.36						
7	" "	34	0.40						
8	" "	39	0.62						
9	" "	43	0.22						
10	" "	48	0.12						
11	" "	55	0.16						
12	" "	62	0.46						
13	" "	66	0.60		Madero				
14	" "	71	0.08						
15	Sludge "	34-39	0.80						
16	" "	43	0.80						
17	" "	48	0.80						
18	" "	55	0.55						

M. C. Davis
CHIEF CHEMIST

De Soto Copper Co
Rm. 340
4th - N. Central
Phoenix, Ariz.

Magma Copper Company

ASSAY CERTIFICATE "A"

Date 3/28/57

No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
Sample #19	Study Hole #1 55-60	0.45						
20	" " 65	0.55						
21	" " 70	0.35						
22	" " 75	0.25						
23	" " 81	0.30						
	Madero							

5

CHIEF CHEMIST

De Soto Copper Co.
Rm - 340
411 - N. Central
Phoenix, Arizona

Magma Copper Company

ASSAY CERTIFICATE "A"

Date 3-28-52

No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
Sample #24	Core Hole #1 - 71-76	0.54						
25	" " 81	0.44						
26	" " 86	0.44						
27	" " 90	0.40						
28	" " 95	0.30						
29	" " 103	0.26						
30	" " 108	0.29						
31	" " 111	0.20						
32	" " 116	0.44						
33	" " 126	0.18						
34	" " 131	0.10						
35	" " 136	0.16						
36	" " 139	0.08						
37	" " 143	0.16						
38	" " 151	0.30						
39	" " 154	0.24						
40	" " 161	0.26						
41	Sludge 81-86	0.94						

18

Madero

[illegible]
CHIEF CHEMIST

De Soto Copper Co
Rm 340
411 N. Central
Phoenix, Ariz.

Magma Copper Company

ASSAY CERTIFICATE "A"

Date 3-29-59

No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
42	Sludge Hole #1-86-91	0.88						
43	95	0.46						
44	99	0.76						
45	111-116	0.58						
46	121	0.54						

5

M. E. Morris
CHIEF CHEMIST

De Soto Copper Co
Rm 340
411 N Central
Phoenix, Ariz.

~~Magma Copper Company~~

ASSAY CERTIFICATE "A"

Date 4-1-57

No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
	mg 1	0.10						
	Purpose material.							

M. B. Hani
CHIEF CHEMIST

De Soto Copper Co
Rm. 340
411 N. Central
Phoenix, Ariz.

Magma Copper Company

ASSAY CERTIFICATE "A"

Date 4-9-57

No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
Sample 47	Hole M-1-Core - 161 - 167	0.30						
48	167 172	0.32						
49	172 176	0.25						
50	176 184	0.15						
51	184 191	0.30						
53	197 201	0.40						
54	201 205	0.25						
55	205 209	0.40						
52	191 197	0.80						

Madera
Consolidated

M-9

M. A. Jones
CHIEF CHEMIST

De. Soto Copper Co.
Rm- 340
411- N. Central
Phoenix, Ariz

MAGMA COPPER COMPANY

MILL ASSAY CERTIFICATE

DATE 4-11-57

NO. Samples	LOCATION	CU. %	AG. OZ.	AU. OZ.	CA.O %	SI.O2 %	%MOISTURE	REMARKS
73	Hole M1 Sludge 232-236	0.25						
75	" " Core 209-214	0.27						
76	" " " 214-218	0.25						
77	" " " 218-221	0.20						
78	" " " 221-226	0.12						
79	" " " 226-232	0.15						
80	" " " 232-236	0.10						
81	" " " 236-241	0.30						
82	" " " 241-246	0.18						
83	" " 246-251	0.12						
84	" " 251-258	0.30						
85	" " 258-263	0.15						
86	" " 263-269	0.10						
87	" " 269-274	0.15						
88	" " 274-279	0.15						
89	" " 279-284	0.12						

M-16

M. B. Lani
ASSAYER

De Soto Copper Co
Rm. 340
411- N Central
Phoenix, Ariz.

MAGMA COPPER COMPANY

MILL ASSAY CERTIFICATE

DATE 4-11-53

NO. Samples	LOCATION	CU. %	AG. OZ.	AU. OZ.	CA.O %	SI.O2 %	%MOISTURE	REMARKS
90	HM1 Core 284-289	0.25						
91	" " 289-295	0.20						
92	" " 295-300	0.20						
94	Hole M2 " 0-10'	0.25						
95	" " 10-15'	0.95						
96	" " 15-22	0.12						
97	" " 22-28	0.35						
98	" " 28-32	0.50						
99	" " 32-38	0.30						
100	" " 38-43	0.55						
101	Hole M1 Hydro 241-246	0.35						
102	" " 246-251	0.35						
103	" " 251-258	0.25						
104	" " 258-263	0.45						
105	" " 263-269	0.50						
106	" " 269-274	0.45						

M - 16

M. B. Marin
ASSAYER

De Soto Copper Co
R.M- 340
411- N- Central
Phoenix, Ariz.

MAGMA COPPER COMPANY

MILL ASSAY CERTIFICATE

DATE 4-11-57

NO.	LOCATION	CU. %	AG. OZ.	AU. OZ.	CA.O %	SI.O2 %	%MOISTURE	REMARKS
107	Hole M1 Indge 274-279	0.50						
108	" " 279-284	0.55						
109	" " 284-289	0.65						
110	" " 289-295	0.50						
111	" " 295-300	0.45						
112	Hole M-2 Core 47-51	0.15						
113	" " 51-55	0.15						
114	" " 55-61	0.30						
115	" " 61-66	0.20						
116	" " 66-72	0.40						
117	" " 72-76	0.40						
S-2	Ex Core DeSoto Mine	0.15						

Desoto 1
M-11

M. B. Cavin
ASSAYER

De Soto Mining Co
Rm - 340
411 - N. Central
Phoenix, Ariz.

Magma Copper Company

ASSAY CERTIFICATE "A"

Date 4-15-53

No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
74	Hole M-1 - Shoulder 236-241	0.55						
118	Hole M-2 Lone 77-85	0.45						
119	85-88	0.30						
120	88-97	0.40						
121	97-105	0.65						
122	105-110	0.25						
123	110-116	0.30						
124	116-121	0.32						
125	121-127	0.45						
126	127-131	0.25						
127	131-141	0.20						

M - 11

M. B. Clark
CHIEF CHEMIST

De Soto Copper Co.
Rm - 340
411 - N. Central
Phoenix, Ariz.

Magma Copper Company

ASSAY CERTIFICATE "A"

Date 4-18-57

No. Sample	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
128	M-2-Sludge - 10-15	1.15						
129	" 15-22	0.55						
130	" 22-28	0.40						
131	" 28-32	0.65						
132	" 32-37	0.60						
133	" 37-42	0.55						
134	" 42-47	0.55						
135	" 47-51	0.65						
136	" 51-56	0.45						
137	" 56-61	0.40						
138	" 61-66	0.40						
139	" 66-71	0.40						
140	" 71-76	0.50						
141	" 76-85	0.45						
142	" 85-88	0.45						
143	" 88-97	0.40						
144	" 97-105	0.20						
145	" 105-110	0.30						

M-18

M. B. Harris
CHIEF CHEMIST

De Soto Copper Co
Rm. 340
411 - N Central
Phoenix.

Magma Copper Company

ASSAY CERTIFICATE "A"

Date 4-18-57

No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
146	Hole M-2 - Sludge - 110-116	0.35						
148	" " 121-129	0.30						
149	" " 129-136	0.35						
150	" " 136-141	0.25						
152	" " 156-163	0.55						
153	" " 163-169	0.45						
154	" " 169-172	0.55						
155	" " 172-180	0.35						
156	" " 160-165	0.20						
157	" " 185-190	0.20						
158	" " 190-196	0.20						
159	" " 196-203	0.15						
160	" One - 141-145	0.20						
161	" " 145-150	0.20						
162	" " 150-156	0.55						
163	" " 156-163	0.65						
164	" " 163-169	0.30				M-18		
165	" " 169-172	0.25						

M. B. Lorie
CHIEF CHEMIST

De Soto Copper
Rm - 340
411 - N. Central
Phoenix, Ariz.

Magma Copper Company

ASSAY CERTIFICATE "A"

Date 4-18-57

Sample No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
166	Hole M-2 - Core 172 - 180	0.40						
167	180 - 185	0.30						
168	185 - 190	0.25						
169	190 - 196	0.35						
170	196 - 203	0.55						
171	203 - 210	0.15						
							M-18	

M. B. Harris
CHIEF CHEMIST

De Soto Copper Co
Rm - 340
411 - N. Central
Phoenix, Ariz

Magma Copper Company

ASSAY CERTIFICATE "A"

Date 4 - 22 - 57

Sample No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
151 A	Hole Mr Shafts 150-156	0.65						
150 A	" " 141-145	0.30						
147	" " 116-121	0.45						
151 m-2	" " 145-150	0.35						
172	" " 203-210	0.20						
173	" " 210-216	0.25						
174	" " 216-221	0.25						
175	" " 221-226	0.30						
176	" " 226-231	0.25						
177	" " 231-238	0.25						
178	" " 243-248	0.25						
179	" " 248-254	0.30						
180	" " 254-258	0.30						
181	" " 258-263	0.25						
182	" " 263-268	0.35						
183	" " 268-271	0.60						
184	" " 271-276	0.25						
185-m-2	" " 276-281	0.25						

M 18

M. B. Lewis
CHIEF CHEMIST

De Soto Copper Co
Rm - 340
411 - N Central.
Phoenix Ariz

Magma Copper Company

ASSAY CERTIFICATE "A"

Date

Sample No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
185	~~234~~	~~0.25~~						
186	Hole Mc Sludge 241 - 247	0.60						
187	247 - 297	0.25						
188	297 - 301	0.30						

M - (4)

CHIEF CHEMIST

De Soto Copper Co
Rm - 340
411 - N. Central
Phoenix, Ariz.

Magma Copper Company

ASSAY CERTIFICATE "A"

Date 4 - 22 - 57

Sample No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
54	Chip every 5' #1 cx "600" Level	0.20						
189	Hole M2 Core 210-216	0.25						
190	" " 216-221	0.15						
191	" " 221-226	0.25						
192	" " 226-231	0.35						
193	" " 231-238	0.40						
194	" " 238-243	0.40						
195	" " 243-248	0.20						
196	" " 248-254	0.25						
197	" " 254-258	0.40						
198	" " 258-263	0.20						
199	" " 263-268	0.15						
200	" " 268-271	0.20						
201	" " 271-276	0.25						
202	" " 276-281	0.20						
203	" " 281-289	0.15						
204	" " 289-297	0.15						
205	" " 297-301	0.10						

Del. 1
M - 17/18

J. E. Harris
CHIEF CHEMIST

De Soto Copper Co
Rm. 340
411 N. Central
Phoenix,

Magma Copper Company

ASSAY CERTIFICATE "A"

Date 4-24-52

No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
6-1		0.25-						
6-2		0.10						
6-3		0.25-						
6-4		0.40						
6-5		0.75-						
6-6		0.65-						
6-7		0.70						
6-8		0.20						
6-9		0.80						
6-10		0.40						
6-11		0.30						
6-12		0.50						
6-13		0.60						
6-14		0.15-						
6-15		0.10						
6-16		1.15-						
6-17		0.25-						
6-18		1.70						

De Soto

18

M. E. Thomas
CHIEF CHEMIST

De Soto Copper
Rm 340
411 - N. Central
Phoenix,

Magma Copper Company

ASSAY CERTIFICATE "A"

Date 4-24-57

No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
6-19		2.80						
6-20		1.15						
6-21		0.15						
6-22		0.10						
6-23		0.10						
6-24		0.30						
6-25		0.55						
6-26		0.75						
6-27		0.15						
6-28		1.00						
6-29		0.25						
6-30		0.10						
6-31		0.15						
6-32		0.20						
6-33		0.15						
6-34		0.20						
6-35		0.15						
6-36		0.10						

De Soto
18

M. B. Tarr
CHIEF CHEMIST

De Soto Copper
Rm. 340
411-N Central
Phoenix, Ariz.

Magma Copper Company

ASSAY CERTIFICATE "A"

Date Apr. 24, 53

No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
6-37		0.10						
6-38		0.10						
6-39		0.25						
6-40		0.24						
6-41		0.10						

DeSoto

M. B. Cerni
CHIEF CHEMIST

De Soto Copper Co.
Rm - 340
411 - N Central
Phoenix, Ariz.

Magma Copper Company

ASSAY CERTIFICATE "A"

Date 4-10-57

No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
Sample 56	Hole M1 - sludge 121-126	0.30						
57	126-131	0.22						
58	131-136	0.18						
59	136-139	0.18						
60	154-161	0.45						
61	167-172	0.25						
62	172-176	0.35						
63	176-184	0.30						
64	184-191	0.37						
65	191-197	0.45						
66	197-201	0.65						
67	201-205	0.50						
68	205-210	0.55						
69	210-218	0.75						
70	218-221	0.65						
71	221-226	0.75						
72	226-232	0.50						
73	232-236	0.50						

M-18

M. G. [illegible]
CHIEF CHEMIST

De Soto Copper Co.
Rm. 340 -
411 - N. Pontland
Phoenix, Ariz.

Magma Copper Company

ASSAY CERTIFICATE "A"

Date 5-1-57

No. Sample	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
6-49		0.10						
6-50		0.10						
6-51		0.10						
6-52		0.10						
6-53		0.10						
6-54		0.10						
6-55		0.10						
6-56		0.05-						
6-57		0.05-						
6-58		0.05-						
6-59		0.60						
6-60		2.85-						
6-61		3.60						
6-62		1.20						
6-63		0.45-						
6-64		1.45-						
6-65-		0.90						
6-66		0.40						

R
18

M. B. Kami
CHIEF CHEMIST

De. Soto Copper Co
Rm-340
411-N Central
Phoenix, Ariz.

Magma Copper Company

ASSAY CERTIFICATE "A"

Date 5-1-52

No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
6-67		1.00						
6-68		0.10						
6-69		0.10						
6-70		0.15-						
6-71		0.10						
6-72		0.10						
6-73		0.15-						
6-74		0.05-						
6-75		0.10						
6-76		0.10						
6-77		0.10						
6-78		0.15-						
6-79		0.10						
6-80		0.10						
6-81		0.10						
6-82		0.05-					D	
							16	

M. B. Kani
CHIEF CHEMIST

Magma Copper Company

ASSAY CERTIFICATE "A"

Mesota Copper Co. Date [illegible]

No.	LOCATION & REMARKS	From To	CU %	AG OZ.	AU OZ.				
206	DD Hole M-3	0.0'-10'	0.30						
207		10-14	0.20						
208		14'-18	0.15						
209		18'-27'	0.15						
210		27-32	0.20						
211		32'-40'	0.35						
212		40'-46'	0.15						
213		46'-51'	0.15						
214		51'-56'	0.20						
215		56'-62'	0.15						
216		62-66'	0.15						
217		66'-70	0.15						
218		70-74	0.20						
219		74-79	0.25						
220		79-87	0.40						
221		87-92	0.20						
222		92-100	0.30						
223		100-107	0.45						

Madero Mine

[illegible]

CHIEF CHEMIST

Magma Copper Company

ASSAY CERTIFICATE "A"

DeSoto Copper Co. Date 5-13-57

No.	LOCATION & REMARKS	From To	CU %	AG OZ.	AU OZ.				
224	DD Core M-3	107'-110'	0.45						
225		110'-115'	0.35						
226		115-120	0.30						
227		120-125'	0.10						
228		125'-130	0.35						
229		130-135	0.30						
230		135-142	0.35						
231		142-149	0.15						
232		149-154	0.20						
233		154-160	0.25						
234		160-167	0.15						
235		167-172	0.30						
236		172-176	0.30						
237		176-186	0.10						
238		186-189	0.20						
239		189-190	0.65						
#6-83	52 Channel Main Haulage		0.20						
6-84	Level		0.30						

Moderate Mine

DeSoto Mine

M. L. Klein

CHIEF CHEMIST

Magma Copper Company

ASSAY CERTIFICATE "A"

De Soto Cu. Co.

Date 5-13-'57

No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
#6-85	5' Channel Hot No	0.50						
6-86	Adit. Main x cut	0.15						
6-87		0.15						
6-88		0.25						
6-89		0.20						
6-90		0.15						
6-91		0.30						
6-92		0.75						
6-93		0.75						
6-94		0.20						
6-95		0.25						
6-96		0.15						
6-97		0.15						
6-98		0.10						
6-99		0.15						
6-100		0.10						
6-101		0.10						
6-102		0.10						

De Soto Mine

M B Harris (Chem)

CHIEF CHEMIST

Magma Copper Company

ASSAY CERTIFICATE "A"

DE SOTO CU. CO.

Date 5-13-57

No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
#6-104	5' channel Hot No Adit	0.10						
6-105	Main xcut	0.10						
6-106		0.20						
6-109		0.10						
6-127		0.15						
6-128		0.10						
6-129		0.10						
6-103		0.10						
6-107		0.10						
6-108		0.05						
6-110		0.05						
6-111		0.10						
6-112		0.10						
6-113		0.15						
6-114		0.10						
6-115		0.10						
6-116		0.05						
6-117		0.05						

De Soto Mine

M B Harris (MBH)

CHIEF CHEMIST

Magma Copper Company

ASSAY CERTIFICATE "A"

De Soto Cu. Co.

Date 5-14-'57

No.	LOCATION & REMARKS	CU %	AG OZ.	AU OZ.				
#6-118	5' Channel Hot No Adit	0.10						
6-119	Main X Cut	0.05						
6-120		0.10						
6-122	121	0.10						
6-123		0.05						
6-124		0.10						
6-125		0.10						
6-126	127 128 129	0.10						
6-130		0.05						
6-131		0.05						
6-132		0.10						
6-135	133 134	0.10						
6-136		0.10						

De Soto Mine

M B Harris

CHIEF CHEMIST

15 & 16 Roosevelt. Farmer - 271 -

207 W. Washington

2" to mile -

585 -

Westin U.S Prof 120 - 585

Elev 5800'
5800
5784
5764
5740
5705
5688
5677
5652
5640
5630
5622
5605
5600
5614
Pinal Schist
Qtz diorite
N
Scale 1" = 100'

Madero - Hole No. 1

% Core Rec.	% copper Core		Sldg.
	0.18	5	
	0.40	10	
	0.20	15	No Sludge Samples
	1.76	20	
	0.22	25	
	0.36	30	
	0.40	35	
	0.62	40	0.80
	0.22	45	0.80
	0.12	50	0.80
	0.16	55	0.55
	0.46	60	0.45
	0.60	65	0.50
	0.08	70	0.35
	0.54	75	0.25
	0.44	80	0.30
	0.44	85	0.94
	0.40	90	0.88
	0.30	95	0.46
	0.26	100	0.76
	0.29	105	No Sludge Samples
	0.20	110	
	0.44	115	0.58
		120	0.54
	0.18	125	0.30
	0.10	130	0.22
	0.16	135	0.18
	0.08	140	0.18
	0.16	145	No Sludge Samples
	0.30	150	
	0.24	155	
	0.26	160	0.45
	0.30	165	No Sludge Samples
	0.32	170	0.25
	0.25	175	0.35
	0.15	180	0.30
		185	
	0.30	190	0.37
	0.80	195	0.45
	0.40	200	0.65
	0.25	205	0.50
	0.40	210	0.55
	0.27	215	0.75
	0.25	220	0.65
	0.20	225	0.75
	0.12	230	0.50
	0.15	235	0.50
	0.10	240	0.55
	0.30	245	0.35
	0.18	250	0.35
	0.12	255	0.25
	0.30	260	0.45
	0.15	265	0.50
	0.10	270	0.45
	0.15	275	0.50
	0.15	280	0.55
	0.12	285	0.65
	0.25	290	0.50
	0.20	295	0.45
	0.20	300	

70%

Madero - Hole No.2

% Core Rec.	% copper Core		Sldg.
	>0.25	5	1.15
	0.95	10	1.15
	0.12	15	0.55
	0.35	20	0.40
	>0.50	25	0.65
	>0.30	30	0.60
	0.55	35	0.55
		40	0.55
	0.15	45	0.65
	>0.15	50	0.45
	>0.30	55	0.40
	0.20	60	0.40
	0.40	65	0.40
	>0.40	70	0.50
	0.45	75	0.45
	0.30	80	0.45
	0.40	85	0.40
		90	
	0.65	95	0.20
	>0.25	100	0.30
	0.30	105	0.35
	0.32	110	
	0.45	115	0.30
	0.25	120	0.35
	0.20	125	0.25
	0.20	130	0.
	0.20	135	
	0.55	140	
	0.65	145	0.55
	0.30	150	0.45
	>0.25	155	0.55
	0.40	160	0.35
	0.30	165	0.20
	0.25	170	0.20
	0.35	175	0.20
	0.50	180	0.15
	0.15	185	
		190	
		195	
		200	
		205	
		210	
		215	
		220	
		225	
		230	
		235	
		240	
		245	
		250	
		255	
		260	
		265	
		270	
		275	
		280	
		285	
		290	
		295	
		300	

70%

Diamond Drill Log

Property — Madera Prospect
Hole Location — Portal +500' east wall
DD Hole Number — M1
Date — March 20, 1957

Sample Depth From	to	Core Recovery	% Core Recovery	Sludge	Mineralization Cpy	cc	Py	Mo	Ox	Nia	Geology
0.0'	5.0'	4.5'	90.0%	None							Highly silicified schist having stringers of $CuCO_x$, $CuFeS_2$, FeO_x & Mica. Very little dissemination of mineralization.
5.0'	10.0'	5.0'	100.0%	None							"
10.0'	12.0'	0.8'	40.0%	None							"
12.0'	15.0'	1.3'	43.3%	None							No disseminated mineralization visable
15.0'	16.5'	0.4'	26.7%	None							Very Silicified Schist having few specks of $CuCO_x$ FeS_2, $CuFeS_2$.
16.5'	17.5'	0.8'	80.0%	None							"
17.5'	19.0'	0.6'	40.0%	None							Good $CuCO_x$ mineralization from 16.5' to 16.7' FeO_x & $CuCO_x$ stringers thru micaceous Silicified Schist
19.0'	24.0'	4.2'	89.0%	None							Very little Cu mineralization in FeO_x stained stringers
24.0'	29.0'	2.4'	48.0%	None							Good $CuFeS_2$ & FeO_x stringers in last 0.2' of core.
29.0'	34.0'	0.6'	12.0%	None							Fair $CuCO_x$ stringers in very Silicified schist Mineralization very sparse beyond 29.0'
34.0'	39.0	0.8'	16.0%	Sampled							Very few $CuCO_x$ specks in Silicified Schist.
39.0'	43.0'	1.1'	37.5%	Sampled							Very small stringers of $CuFeS_2$
43.0'	48.0	2.1'	42.0%	Sampled							"
48.0'	50.0'	0.3'	15.0%	Sampled							Little FeO_x mineralization & no Cu visable
50.0'	55.0'	0.9'	18.0%	Sampled							Two small blebs $CuFeS_2$ & few specks $CuCO_x$
55.0'	58.5'	2.9'	83.0%	Sampled							"
58.5'	62.0'	2.6'	74.5%	Sampled							Very little $CuCO_x$ staining along joints.
62.0'	66.0'	1.8'	45.0%	Sampled							Few blebs of $CuFeS_2$ in Silicified Schist.
66.0'	71.0'	1.6'	32.0%	Sampled							FeO_x stringers from 61.5' to 62.0' in almost otherwise barren silicified schist.
71.0'	76.0'	2.9'	60.0%	Sampled							One 0.03' stringer $CuCO_x$ at 62.4' in barren Silicified Schist.
76.0'	81.0	3.8'	76.0%								Very Silicified schist & somewhat micaceous
81.0'	86.0'	1.7'	35.0%								"
86.0'	90.0'	3.5'	88.0%								Red specks disseminated through very Sil Schist probably FeO_x
90.0'	95.0'	3.6'	71.0%								Very Sil.
95.0'	99.0'	4.0'	100.0%			?					"
99.0'	103.0'	3.0'	75.0%								Core gets much darker at 94.0' = biotite & hornblend Sparcely min. Increase in biotite & " " ?
103.0'	108.0'	4.5'	90.0%								Good Cpy in highly Sil biotite Schist ? & hornblende & Augite
108.0'	111.0'	2.6'	87.0%								Sparcely mineralized
111.0'	121.0'	4.5'	45.0%								Good Cpy min from 105.0' to 107.5' in highley Sil schist
121.0'	126.0'	4.4'	90.0%								Very dark Core - Slightley Sil
126.0'	131.0'	4.9'	98.0%								No min visable
131.0'	136.0'	4.9'	98.0%								Somewhat Sil Schist
136.0'	139.0'	2.5'	83.0%								Very narrow stringers Cpy & Py. Little dis.
139.0'	143.0'	3.3'	82.0%								" "
143.0'	151.0'	7.0'	88.0%								" "
151.0'	154.0'	2.0'	66.0%								"
154.0'	161.0'	3.0'	43.0%								Very Sil where min occures "
											Very little dis. Ox Cu. & $CuFeS_2$
											Very dark Core - biotite & hornblende or Augite.
											Few good stringers Cu & FeS_2
											Highley Sil. "
											Very little min.
											Light Colored Very Sil Schist
											No min to 158.5' Very min. & Sil to 161.0'.

DR Hole #1

	From	to	Rec.	% Rec	Cpy	FeS2	Ox	Remarks
No Sludge	161.0	164.5	2.6	74%	↕	↕	↕	Cpy & FeO_x; FeS_2 & $CuCo_x$ Stringers in Light Sil. Schist
	164.5	167.0	2.0	80%				"
	167.0	172.0	3.3	66%				"
	172.0	176.0	2.5	63%			↕	" Light gray Sil Schist
	176.0	178.0	1.8	90%				"
	178.0	184.0	2.4	40%				" " Very Sil Schist
	184.0	188.0	3.0	75%				" Very light Sil "
	188.0	191.0	1.0	66%			↕	" " "
	191.0	197.0	5.0	84%	↓	↓	↕	At 192.0 Numerous FeO_x Stained fractures in very light highley Sil Schist.
	197.0	201.0	2.2	52%	↕	↕	↕	Light Sil. Schist good Cpy & FeO_x Stained Stringers
	201.0	205.0	3.1	77%				" " " "
	205.0	209.0	2.2	73%	↕			Few Cpy. & FeO_x Stained fractures Light Sil Schist
	209.0	210.0	0.6	60			↑	Highly Sil Schist; Numerous Oxidized fractures
	210.0	214.0	2.4	60				" " " " "
	214.0	218.0	3.0	75	↕	↕		" " " Very Sparcely mineralized
	218.0	221.0	2.4	80				" " " " " "
	221.0	226.0	1.6	82				" " " " " "
	226.0	228.0	2.2	100			↕	" " " " " "
	228.0	232.0	3.8	95				" " " " " "
	232.0	236.0	3.7	92	↓	↓		" " " " " " 232.0 to 236.0
	236.0	241.0	4.5	90	↕	↕		fair mineralization in fractures. Highly Sil Schist; Sparcely mineralized; 1/4 Qtz. Cpy Stringers 236.0-238.0
	241.0	246.0	3.3	66				" " " ; " " ; " 241.0-241.5
	246.0	251.0	2.4	48				" " " " " ; 1/4 Qtz Str. 250.0-251.0
	251.0	253.0	1.8	90				" " " " " ; 1/4 Qtz. Str. 251.5-252.0
	253.0	258.0	5.0	100	↓	↓		" " " " " " " 254.0, 254.3, 255.0, 256.0, 258.0
	258.0	263	4.0	80	↕	↕		" " " " ; 258.3; 258.7, 261.0, Three at 262.5.
	263.0	269	4.5	77	↕	↕	↕	" " 263.0, 263.3, 263.6, 268.2
	269.0	274.0	5.0	100%				" " 270.2, 270.8, 271.3, 272.0
								" " 272.5, 273.0, 273.51
	274.0	279.0	5.0	100%	↕	↕		" " Dark & Min. - 274.6, 276.1, 276.2, 276.3
	279.0	284.0	4.5	90%	↕	↕		" " — Two at 279.7, 281.3
	284.0	289.0	4.0	80%				" Very light. - Good Min 287.5 to 289
	289.0	290.0	1.0	100%				" " " " 289.3; 289.7
	290.0	295.0	4.7	93%				" " " " Str. at 293.0; 194.0, 194.9
	295.0	300.0	4.8	95%	↓	↓		" " " " " " 295.5, 298.0, 298.1, 298.2, 298.7, 299.7, 300.0

DD Hole M2

From	To	Core Rec	% Core Rec	Cpy	FeS2	Ox	Min in Core	Remarks	1/4" Stringers
0.0	10.0	10.0	100%					Very Light gray Sil. Sch.	0.5', 1.5', 1.7', 2.2, 3.0, 9.0
10.0	15.0	1.4	28%					" " " " "	Str at 12.5
15.0	20.0	2.0	40%					" " " " "	" " 15.2, 19.7
20.0	22.0	0.8	40%					" " " " "	FeOx along several joints
22.0	24.0	1.5	75%					" " " " "	" " " "
24.0	26.0	2.0	100%					" " " " "	" "
26.0	28.0	1.7	85%					" " " " "	" " Good Sheet Mica
28.0	30.0	2.0	100%					" " " " "	" " 29.5'
30.0	32.0	2.0	100%					Light gray Sil Sch	" " 30.0, 30.3, 31.0, 31.5
32.0	33.0	1.0	100%						" " 32.5'
33.0	38.0	5.0	100%						" " 33.1, 33.5, 34.0
									34.8, 35.2, 35.8
									36.0, 37.0, 37.5
38.0	41.0	2.3	72%					Light gray Sil. Sch. Highly broken	" " 39.5 - good Stringer
41.0	43.0	1.8	90%					" " " " " "	" 42.0
43.0	45.0	1.8	90%					Dark " " " " "	" " Several CuOx Str 43-44
45.0	47.0	1.3	60%					" " " " " "	No FeOx 46.3
47.0	49.0	1.5	75%					Light " " " " "	" " 47.1
49.0	50.0	0.8	80%					" " " " "	" " 49.5, 49.9
50.0	51.0	0.75	75%					" " "	" " 50.5
51.0	52.0	1.0	100%					" " "	" " CuOx 152 to 152.5
52.0	55.0	3.0	100%					" " "	" "
55.0	60.0	5.0	100%					" " Very Sil & Micaceous	FeOx Along joints; Str at: 55.4, 55.5, 56.5, 59.7
60.0	61.0	1.0	100%					Light gray Sil Sch.	" " 61.0
61.0	63.5	1.5	60%					" " " "	" " 61.3, 61.5, 61.8
63.5	66.0	2.0	80%					" " " "	" " 65.0 65.2
66.0	69.0	2.5	83%					" " " "	" " 67.0 67.2
69.0	72.0	3.0	100%					Dark gray " " Mica	" " 69.5, 69.7, 69.8
72.0	76.0	4.0	100%					" " " " "	" " 70.0, 70.2, 73.5, 74.3

DD Hole M-2

From	To	Core Rec	% Core Rec	Cpy	FeS_2	Ox	Core Min	Remarks	1/4 Stringers at:
76	77	0.10'	10%					Light Sil. Schist	76.1; 76.5,
77	81	2.4'	60%					" " " Mica in place	77.9, 78.0, 78.1, 78.3
81.	82	0.4'	40%					" " " " " "	None.
82	85	1.0'	33%					" " " " " "	82.1
85	88	2.7'	90%					" " " Very little Mica	85.0 = Ox, 85.3, 85.5
								Last 1.0' highly broken & Ox	85.6, Last 1.0' oxide
88.	93	5.0'	100%					Med light schist, little Mica.	88.6, = Ox & Cpy, 89.8 90.2, 90.8
93.0	95.0	2.0'	66%					" " " " "	93.1, 93.2 = Ox. 93.5, 94.5 94.6 94.7
95.0	97.0	1.0'	50%					" " " " "	95.7
97.0	100.0	None	0%						
100.0	105.0	0.8'	16%					Light Sil schist, somewhat broken	FeOx along joints
105.0	107.0	1.5'	77%					Med. light Sil. Schist, mica	106.8
107.0	110.0	2.0'	66%					Light Sil schist last 1.0' highly Blk.	107.0 107.2
110.0	112.0	2.0'	100%					" " " Some Mica	110.0, 110.2, 110.7
112.0	116.0	2.5'	60%					" " " " "	112.1, 112.5 113.0
116.0	118.0	0.7'	35%					" " " " "	None visable
118.0	121.0	2.8'	93%					" " " " "	" "
121.0	123.0	1.7'	85%					" " " " "	122.0
123.0	124.0	1.0'	100%					Very light Sil Schist, little Mica	None visable
124.0	127.0	3.0'	100%					" " " " "	125.0,
127.0	131.0	3.8'	95%					" " " " "	130.0 128.0
131.0	136.	3.8'	76%					" " " highly broken	Several str. 135.0 to 136.
136.0	141.0	2.0	90%					" " " " "	" " 140.0 141.0
141.0	143.0	1.8	90%					" " " " "	few extreamly
								FeOx along fractures	Small Seams.
143.0	145.0	1.2	90.0%					Very light gray Sil Schist; mica	Stringers at: 143.2 to 143.5; 144.7
145.0	150.0	3.0	60.0%					" "	145.2, 149.8.
150.0	154.0	3.2	80.0%					" "	151.0, 152.1, 152.2
								Good Stringers 152.0 to 153.0	152.3, 152.9, 152.7. 153.0, None 153-154
154.0	156	1.5	75%					Light gray Sil schist	Str. at 155.0,
156.0	157	0.8	80%					" " " "	156.3,
157.0	161	1.5	38%					" " " " Mica	No Stringers
161.0	163	2.0	100%					" " " "	" "
163.0	164	0.9	90%					" " " "	" "
164.0	169.0	1.6	40%					Dark gray Sch. much Mica	Ox min Last 0.4"
169.0	172	3.0	100%					Med " " Mica.	Str at: 171.8 Dis Ox min. thru Core.
172	177	4.7	94.0%					" " " "	Str at 172.3, 176.
								Ox min in 173.0 to 174.0.	
177	180	2.3	77%					Light Sil. Sch. Highly frac. Mica	No Stringers
180	185	4.0	80%					" " " Mica	" "
185	189	3.2	80%					" " " "	Str 185.5, 188.0 188.4, 188.8
189.0	190	0.9	90%					" " " Mica	No Stringers

D.D Hole M-2

From	To	Core Rec.	% Core Rec.	Cpy	FeS2	Ox	Core Min	Remarks	1/4" Qtz & CuFeS2 Stringers. at:
190.0	192.0	0.3	30%					Light gray Sil Sch. Mica	No Stringers
192.0	196.0	1.0	25%					" " " " "	192.1
196.0	198.0	0.5	25%					" " " " "	196.2
198.0	200	0.9	95%					Very Light Sil. Sch. little Mica	FeOx Stain only.
200.0	203.0	0.2	15%					" " " " " "	No Stringers
203.0	205.0	0.4	20%					" " " " " "	203.1 = Small str
205.0	208.0	0.5	17%					" " " " " "	FeOx Stain along frac
208.0	210.0	None	0%						
210.0	213.0	1.2	43%					Very Light gray highly Sil. Sch.	No visable Cu. min. FeOx Stain along fractures
213.0	216.0	1.2	43%					" " " " " " Mica	" " " Strea 214.5
216.0	221.0	0.8	18%					" "	" " " 216.3.
221.0	226.0	2.0	40%					" " "	"
226.0	231.0	4.0	80%					" "	227.0
231.0	234.0	1.8	60%					" "	230.5
[illegible]	[illegible]	[illegible]	[illegible]					Mica	No FeOx 231.5, 233.8
234.0	238.0	2.7	68%					" " Mica	" "
238.0	243	3.6	72%					" "	Little FeOx 239.0, 239.1
243.0	248	5.0	100%					" "	" 247.0
248.0	251.0	1.3	43%					" "	" None
251.0	254.0	1.4	47%					" " Little Mica	" "
254.0	258.0	3.7	43%					" " "	254.2, 255.7, 255.8, 256.5
258.0	263.0	4.0	80%					" " Some "	" 259.2
263.0	268.0	2.6	50%					" " " "	" None
268.0	271.0	2.2	73%					" " " "	" None
271.0	274.0	1.2	40%					" " Little Mica	No FeOx 273.5
274.0	276.0	0.5	25%					" " " "	" one fracture
276.0	281.0	1.1	22.0%					" " " "	" None
281.0	284.0	1.4	47.0%					" " " "	" "
284.0	289.0	3.8	76.0%					" " " "	" "
289.0	292.0	0.8	36.0%					" " " "	" "
292.0	297.0	2.6	52%					" " " "	" "
297.0	301.0	2.0	50.0%					" " " "	" "

DD Hole NB

From	To	Core Rec.	% Core Rec.	Cpy	FeS_2	Ox	Min. Core	Remarks	Qtz & Cpy Str. at:
0'	5'	4.3'	86%					Dark gray Sil. Sch. Mica bands	1.0, 1.2,
5'	10'	4.1'	82%					" " " " "	7.0, 8.5, 9.6, 10.0.
10'	12'	1.3'	65%					" " " " " "	11.8
12'	14'	2.0'	100%					" " " " " "	13.7
14'	18'	2.5'	63%					" " " " " "	14.5
18'	20'	1.7'	85%					" " " " " "	18.3
20'	22'	2.0'	100%					Very light gray Sil. Sch. " "	20.1, 21.7
22'	27'	2.0'	40%				None	" " " " " "	None
27'	32'	4.4'	88%					" " " " " "	27.4, 31, 33.0 331 34.5
32'	35'	2.8'	94%					" " " " " "	FeO_x & CuO_x along frac.
35'	40'	4.7'	94%					" " " " " "	35.6, 35.7, 38.1, 40.0
40'	43'	2.7'	93%				None	" " " " " "	None
43'	46'	2.0'	66%					" " " " " "	"
46'	51'	3.2'	64%					" " " " " "	47.0
51'	56'	4.0'	80%					" " " " " "	55.9
56'	59	1.5'	38%				None	Med gray " " " "	None
59'	62'	1.1'	37%					" " " " " "	"
62'	66'	2.1'	52%					" " " " " "	
66'	70'	1.7'	43%					" " " " " "	68.1, 68.3
70'	74'	4.0'	100%					Light gray " " " "	70.3, 71.5, 71.6,
74'	79'	3.5'	70%					" " " " " "	75.0
79'	81	1.6'	80%					Very Light gray	81.0
81'	82	1.0'	100%				None	Very Light gray " " "	None
82'	87	4.0'	80%					" " " " " "	82.5, 83.0, 84.4
87'	88'	1.0'	100%					Dark gray " " " " "	86.0 86.8
88'	92'	4.0'	100%					Very light gray Sil. Sch. Little Mica	89.3, 90.4, 91.0
92'	95'	3.0'	100%					" " " " " "	92.1, 93.6, 93.8, 93.9,
95'	100'	5.0'	100%					" " " " " "	95.9, 97.0
100'	105'	4.0'	80%					" " " " " "	104.5
105'	107'	2.0'	100%					" " " " " "	105.5, 105.8
107'	108'	0.4	40%					" " " " " "	107.5
108'	110'	2.0'	100%				None	" " " " " "	None
110'	115'	5.0'	100%					Gray Sil. Sch. quartz, Some Mica	112.0, 112.4, 112.6
								Good Sulfide Min.	112.9, 114.4, 114.8
115'	120'	5.0'	100%					" " " " " "	115.8, 117.0, 117.5
								Good Sulfide Min.	117.8, 119.8
120	125'	5.0	100%				None	Very light Highly Sil. Sch, Some Mica	None
125'	130'	3.5'	70%					" " " " " " "	125.2, 127.0
130'	135'	3.5	70%				None	" " " " " " "	None
135'	138	1.0	33%					" " " " " " "	135.2
138'	142	3.0	100%					" " " " " " "	138.8
142'	144	0.4	20%				None	" " " " " " "	None
144'	147	1.2	25%				None	" " " " " " "	None
147'	149'	1.5'	75%				None	" " " " " " "	None.
149'	154'	5.0'	100%					Dark gray Sil. Sch., Much Mica	149.5
154'	160	3.0'	50%					" " " " " "	159.0
160'	162	2.0	100%					" " " " " "	160.8, 161.4, 161.5
162'	167	4.5	90%					Very Dark gray, Highly Sil. Sch., Mica	164.0

DD Hole M-3

From	To	Core Rec	% Core Rec	Cpy	FeS_2	Ox	Min in Core	Remarks	Quartz & Cpy-FeS_2 Stringers at:
167'	172'	5.0'	100%	↕	↕			Very light gray Highly Sil. Sch, Mica	168.0, 169.3, 170.0,
172'	176'	2.7'	68%					" " " " " "	172.4, 174.0, 175.8
176'	178'	1.2	60%					" " " " " "	176.1
178'	182'	1.2	30%	↓	↓			" " " " " "	178.2
182'	187'	2.0	40%				None	" " " " " "	None
187'	191'	3.5	88%	↕	↕			" " " " " "	187.1, 187.7, 188.2, 190.0
191'	196'	4.0	80%	↓	↓			" " " " " "	191.2, 192.0 192.7
								Very Good 1/4" Stringers.	193.8, 194.2

Diamond Core Drilling
Mining
Quarries
Shaft Sinking
Tunnel Driving

Boyles Bros.
DRILLING COMPANY

CONTRACTORS—ENGINEERS
General Offices
1321 South Main Street Phone 84-4401
SALT LAKE CITY 15, UTAH

Reply to:

March 9/57

COPY OF MADERO CONTRACT

Mobilization & demobilization ----------$ 200.00

		AX	BX
Drilling	0 to 200 ft	4.60	4.90
	200 to 400 ft	4.90	

Reaming if necessary all sizes 2.30 per foot

Cementing if necessary 9.10 per hour plus cost of cement

A shift rate of 70.00 per eight hour shift will be charged for moving compressor from unloading point to portal, laying air and water lines, moving equipment into tunnel and setting water tanks.

Compressor will be charged for at cost, including fuel and supplies.

We plan on collaring holes BX and drilling AX.

Thanks for calling on us, it is greatly appreciated.

Very Truly Yours

J.E.Roberts

J.E.Roberts
District Mgr. Arizona Division

1321 South Main St. SALT LAKE CITY 15, UTAH Phone HUnter 4-4401

Boyles Bros. DRILLING COMPANY

DIAMOND DRILLING CONTRACTORS ENGINEERS — GEOLOGY

FOR CUSTOMER'S USE ONLY	
REGISTER NO.	VOUCHER NO.
TERMS APPROVED	RATE APPROVED
CALCULATIONS CHECKED	
FOOTAGE CHECKED	
ADJUSTMENTS	
ACCOUNTING DISTRIBUTIONS	
AUDITED	FINAL APPROVAL

INVOICE DATE: April 30/57
ORDER NUMBER:
INVOICE NUMBER:
CONTRACT: 6-39 Miami
TERMS:
LOCATION: Madero Prospect, Miami, Arizona

DeSoto Copper Corporation
Room 340
411 North Central
Phoenix, Arizona

HOLE NO.		FROM	TO	FOOTAGE	RATE	TOTAL
Hole M1	AX	210	300	90	4.90	441.00
" M2	BX	0	10	10	4.90	49.00
	AX	10	200	190	4.60	874.00
	AX	200	301	101	4.90	494.90
Cement time				12 hrs	9.10	109.20
Cement used (lumnite)				1 sack	7.50	7.50
Hole M3	BX	0	10	10	4.90	49.00
	AX	10	196	186	4.60	855.60
Cement time				7 hrs	9.10	63.70
Cement used (celseal)				1 sack	10.50	10.50
Compressor rental				31 days	17.70	548.70
Supplies	(fuel & oil)					105.17
	(filters)					16.86
						$ 3625.13

ok
JM 5-7-57

1321 South Main St. SALT LAKE CITY 15, UTAH Phone HUnter 4-4401

Boyles Bros. DRILLING COMPANY

DIAMOND DRILLING CONTRACTORS ENGINEERS — GEOLOGY

FOR CUSTOMER'S USE ONLY	
REGISTER NO.	VOUCHER NO.
TERMS APPROVED	RATE APPROVED
CALCULATIONS CHECKED	
FOOTAGE CHECKED	
ADJUSTMENTS	
ACCOUNTING DISTRIBUTIONS	
AUDITED	FINAL APPROVAL

INVOICE DATE: March 31/57
ORDER NUMBER:
INVOICE NUMBER:
CONTRACT: 6-39 Miami
TERMS:
LOCATION: Madero Prospect Miami, Arizona

DeSoto Copper Corporation
Room 340-411 North Central
Phoenix, Arizona

HOLE NO.	FROM	TO	FOOTAGE	RATE	TOTAL
M-1 Mobilization & demobilization					200.00
Drilling BX	0	10	10	4.90	49.00
" AX	10	200	190	4.60	874.00
" AX	200	210	10	4.90	49.00
Cement time			26 hrs	9.10	236.60
Cement used (lumnite)			1 sack	7.50	7.50
Rental on compressor			19 days	17.70	336.30
Deisel fuel purchased					64.20
Unloading & setting compressor, laying Air & water lines moving equipment in tunnel & setting water tanks 6 shifts				70.00	420.00
					$ 2236.60

Rate on compressor
$531.00/mo
$17.70/day

30 30/231 210/210

Richard E. Mieritz
MINING CONSULTANT

May 13, 1957

Mr. E. G. Frawley
Room 340
411 North Central Ave.
Phoenix, Arizona

MADERO PROJECT
PROGRESS REPORT
April 16 to 30, 1957

Dear Mr. Frawley:

Herewith is the semi-monthly report covering activities of the project for the above noted period.

Activity on the project was limited to diamond drill holes M-2 and M-3. Hole M-2 was drilled at a minus 4° in a S 72° W. direction. Hole M-3 was a vertical hole at a location approximately midway between the portal and face of the adit. Hole M-2 was completed at a depth of 300 feet while hole M-3 was completed at a depth of 196 feet.

The following table indicates the footage drilled during the period.

Previous total		548 feet
Advance for period	M-2	52 feet
" " "	M-3	196 feet
Total footage to date		796 feet

DIAMOND DRILL HOLE M-2

This hole was collared at a flat minus angle in the west wall of the drift a few feet back of the adit face. The objective was to test the strength of mineralization on the west side of the mineralized fissure zone. The copper mineralization encountered in the hole is primarily associated with thin quartz stringers and compares to the results obtained in drill hole M-1.

DIAMOND DRILL HOLE M-3

This vertical hole was collared in the floor of the adit approximately midway between the portal and face of the adit, opposite the inclined interior shaft. The objective of the hole was the diorite contact which surface-wise was exposed approximately 50 feet lower in elevation than the portal with an assumed dip towards the mine workings. As evidenced on the surface, the diorite was weakly mineralized with some chalcopyrite and pyrite. The drill hole was stopped at 196 feet without encountering the diorite.

Stopping of this hole concluded exploration at the project.

The drill contractor has removed all of his equipment. All our sampling equipment has been removed and taken to my office for storage until it can be put to use on another project.

A report will be submitted to you complete with drill logs, assays, maps, etc.

Very truly yours,

R. E. Mieritz.

ccManing Cox
Gene Turley

Richard E. Mieritz
MINING CONSULTANT

April 22, 1957

Mr. E. G. Frawley
Room 340
411 North Central Ave.
Phoenix, Arizona

MADERO PROJECT
PROGRESS REPORT
April 1 to 15, 1957

Dear Mr. Frawley:

Herewith is the semi-monthly report covering activities of the project for the above noted period.

Activity on the project during the period is concerned with diamond drilling of holes M-1 and M-2.

DIAMOND DRILLING:

Drill hole M-1 was completed on April 4th at a depth of 300 feet. Drill hole M-2 was started on the 6th of the month and advanced to a depth of 248 feet by the end of the period. Hole M-2 is being drilled at a minus 4° in a S. 72° W. direction approximately at right angles to the foliation of the mineralized schist.

The following table indicates the footage drilled during the period.

Previous total - M-1		210 feet
Advance for period	M-1	90 feet
" " "	M-2	248 feet
Total footage to date		548 feet.

DIAMOND DRILL HOLE M-1

This hole was collared at a flat angle in the east wall of the drift a few feet back of the adit face. The objective was to test the strength of mineralization which was thought to exist as disseminations and as crack or fracture fillings in the schist. The copper mineralization encountered thus far is primarily associated with thin quartz stringers which tend to cut the folliation at a slight angle. Sulphides of copper and iron are minerals present. Occassionally some oxides of copper are visible.

The attached assay-corerecovery log indicates mineralization was encountered but the strength of same

does not measure up to what might be considered ore material. The arithmetic average of 58 core samples is .29% copper, that for 45 sludge samples is .50% copper and the combined core-sludge arithmetic average for the entire hole is .38% copper.

DIAMOND DRILL HOLE M-2 :

This hole is being drilled to test the strength of copper mineralization in the schist area to the west of the adit. Assay results and visual examination of the core indicate mineralization of a similar magnitude exists in this area also. Here again the strenght is is not sufficient to be considered ore material. The 35 core samples representing 210 feet of completed hole average arithmetically .35% copper while 30 sludge samples representing 203 feet of hole arithmetically average .43% copper. The combined core-sludge arithmetic average is .39% copper.

Since the material thus far encountered represents no ore material, no effort has been made to combined the core and sludge assays individually by one of the more accepted methods, such as Longyears formula. This will however be done upon completion of the project and included in the final report.

The attached assay logs indicate the tenure ofthe mineralization encountered to date in the two drill holes.

Very truly yours,

R. E. Mieritz.

cc:Manning Cox
Gene Turley

Madero - Hole No 1

% Core Rec.	% copper Core		Sldg.
	0.18	5	
	0.40	10	
	0.20	15	No Sludge Samples
	1.76	20	
	0.22	25	
	0.36	30	
	0.40	35	
	0.62	40	0.80
	0.22	45	0.80
	0.12	50	0.80
	0.16	55	0.55
	0.46	60	0.45
	0.60	65	0.50
	0.08	70	0.35
	0.54	75	0.25
	0.44	80	0.30
	0.44	85	0.94
	0.40	90	0.88
	0.30	95	0.46
	0.26	100	0.76
	0.29	105	No Sludge Samples
	0.20	110	
	0.44	115	0.58
		120	0.54
	0.18	125	0.30
	0.10	130	0.22
	0.16	135	0.18
	0.08	140	0.18
	0.16	145	No Sludge Samples
	0.30	150	
	0.24	155	
	0.26	160	0.45
	0.30	165	No Sludge Samples
	0.32	170	0.25
	0.25	175	0.35
	0.15	180	0.30
		185	
	0.30	190	0.37
	0.80	195	0.45
	0.40	200	0.65
	0.25	205	0.50
	0.40	210	0.55
	0.27	215	0.75
	0.25	220	0.65
	0.20	225	0.75
	0.12	230	0.50
	0.15	235	0.50
	0.10	240	0.55
	0.30	245	0.35
	0.18	250	0.35
	0.12	255	0.25
	0.30	260	0.45
	0.15	265	0.50
	0.10	270	0.45
	0.15	275	0.50
	0.15	280	0.55
	0.12	285	0.65
	0.25	290	0.50
	0.20	295	0.45
	0.20	300	

70%

Madero - Hole No. 2

% Core Rec.	% copper Core		% copper Sldg.
	0.25	5	~~1.15~~
	0.95	10	1.15
		15	
	0.12	20	0.55
	0.35	25	0.40
	0.50	30	0.65
	0.30	35	0.60
	0.55	40	0.55
		45	0.55
	0.15	50	0.65
	0.15	55	0.45
	0.30	60	0.40
	0.20	65	0.40
	0.40	70	0.40
	0.40	75	0.50
	0.45	80	0.45
	0.30	85	0.45
	0.40	90	0.40
		95	
	0.65	100	0.20
		105	
	0.25	110	0.30
	0.30	115	0.35
	0.32	120	
	0.45	125	0.30
		130	
	0.25	135	0.35
	0.20	140	0.25
	0.20	145	0.
	0.20	150	
	0.55	155	
	0.65	160	0.55
	0.30	165	0.45
	0.25	170	0.55
	0.40	175	0.35
		180	
	0.30	185	0.20
	0.25	190	0.20
	0.35	195	0.20
	0.50	200	0.15
	0.15	205	
		210	
		215	
		220	
		225	
		230	
		235	
		240	
		245	
		250	
		255	
		260	
		265	
		270	
		275	
		280	
		285	
		290	
		295	
		300	

.35
35/1229

43
30/1295

ave 65/2524 .39

70%

Richard E. Mieritz
MINING CONSULTANT

April 1, 1957

Mr. E. G. Frawley
Rm. 340
411 North Central Ave.
Phoenix, Arizona

MADERO PROJECT
PROGRESS REPORT
March 15 to 30, 1957

Dear Mr. Frawley:

Herewith is the semi-monthly report covering activities of the project for the above noted period.

The only activity of concern is the diamond drilling now in progress.

DIAMOND DRILLING

After a short delay, actual drilling of hole No. 1 was started on March 23, 1957. Hole No. 1 is being drilled in a N. 72° E. direction at a minus 4 degree angle at a station about 10 feet back ofthe face of the 600 foot adit. This hole is being drilled approximately at right angles to the strike foliation of the mineralized schist.

Depth of the hole at the end of the period was 210 feet.

Previous Total	0 feet	~~210~~	~~210~~ 210
Advance for period	210 feet	hole M-1	90
Total footage to date	210 feet	M-2	270 360
			870

DIAMOND DRILL HOLE No. 1

The entire advance for the period has been limited to this hole.

The hole was collared BX size and reduced to AX size at 10 feet. Core recovery varies considerably, from 100 percent to as low as 12 percent. Although I have not arithmetically averaged the recovery, an average of 50 to 55 percent is indicated on the attached assay-core recovery log.

The mineralization thus far penetrated is erratic and is primarily concentrated on fine hair line fractures and to a lesser degreee as disseminations. The hole thus far proves that mineralization does extend to some breath but its tenure is presently sub-marginal.

An arithmetic average of the core assays for the first 160 feet indicates approximately 0.4% copper content. Only a guess could be made as to the ratio of oxide to sulphide copper thus far encountered.

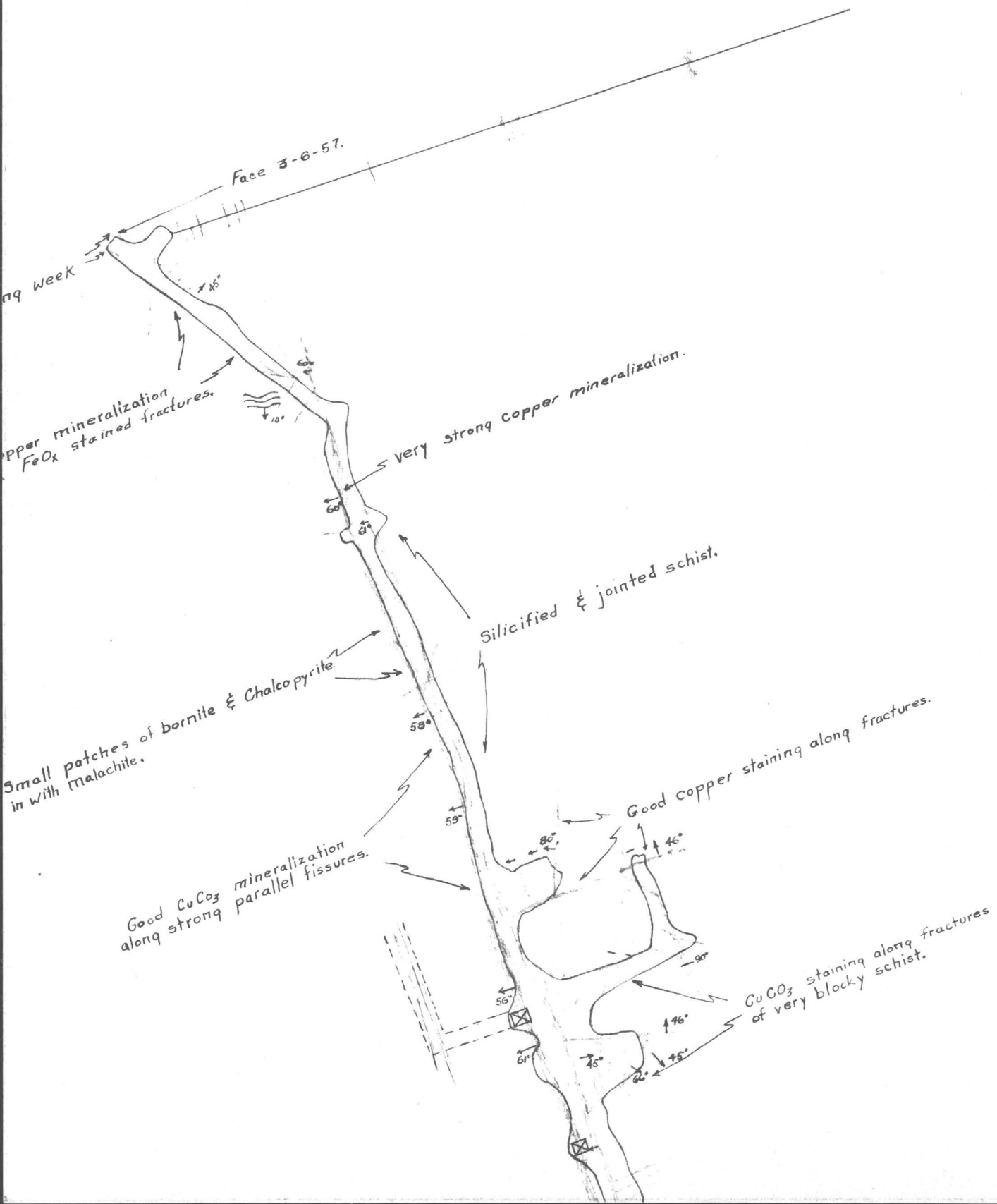
A complete analysis will be made upon completion of the hole.

The attached map and assay schedule will indicate the progress made.

Very truly yours,

R. E. Mieritz

cc:Manning Cox


Face 3-6-57.
ng week
45°
pper mineralization
FeOx stained fractures.
10°
very strong copper mineralization.
60°
Silicified & jointed schist.
Small patches of bornite & Chalcopyrite
in with Malachite.
58°
59°
Good copper staining along fractures.
80°
46°
Good CuCO3 mineralization
along strong parallel fissures.
90°
CuCO3 staining along fractures
of very blocky schist.
56°
46°
61°
45°
45°
62°

Madero - Hole No. 1

% Core Rec.	% - copper Core		Sldg.
	0.18	5	
	0.40	10	
	0.20	15	
	1.76	20	
	0.22	25	
	0.36	30	
	0.40	35	
	0.62	40	0.80
	0.22	45	0.80
	0.12	50	0.80
	0.16	55	0.55
	0.46	60	0.45
	0.60	65	0.50
	0.08	70	0.35
	0.54	75	0.25
	0.44	80	0.30
	0.44	85	0.94
	0.40	90	0.88
	0.30	95	0.46
	0.26	100	0.76
	0.29	105	
	0.20	110	
	0.44	115	0.58
		120	0.54
	0.18	125	
	0.10	130	
	0.16	135	
	0.08	140	
	0.16	145	
	0.30	150	
	0.24	155	
	0.26	160	
		165	
		170	
		175	
		180	
		185	
		190	
		195	
		200	
		205	
		210	
		215	
		220	
		225	
		230	
		235	
		240	
		245	
		250	
		255	
		260	
		265	
		270	
		275	
		280	
		285	
		290	
		295	
		300	

70%

Richard E. Mieritz
MINING CONSULTANT

March 28, 1957

Mr. Lawerence D. Sheldon
Box 1685 Hackney Ave.
Globe, Arizona

Dear Larry:

As a remeinder please send in your time card on the morning of the 30th and also on the morning of the 14th each month so we will recáve it in short order so we can return to you the check for your time.

Also I would like you to call me collect at my home phone onthe nite of the 31 of this month to advise me the depth of the hole at the end of night shift on the 30th. I will need this for my report. My home phone is Crestwood 4-6950. Call collect between 8:00 and 9:00 pm. I will also need this information on the 16th of each month and the end of each month.

One other ### thing, the assayer complained about the amount of grease on the core and in the sludge. The drillers like to use grease in their drilling. Would you please advise them that I have asked you to tell them to eliminate the grease. The use of grease causes havoc with the assaying.

If at anytime you need us urgently, call me at home or at the office. You might give us a telephone number at which we may be able to reach you or leave word for you to call us.

Sincerely yours,

R. E. Mieritz

at Tucson, Arizona
March 21, 1957

Memorandum for R. E. Mieritiz:
Subject: Madero Exploration

For the purpose of a record I wish to set down the things we discussed in connection with Madero Exploration.

1- Claims- Ellis was to stake the north open ground in the name of Turley for protection to this deal. If he objects to staking them in Turleys name, stake them in yours and assign to De Soto Copper.

2- Drilling- I think the two west holes have somewhat better chance than the east holes but think one east and one west should first be drilled. Sludge must be caught but can be discraded where core recovery in terms of five or ten foot runs is above say 75%. I think that composites on Moly, gold and silver for say each 50 foot section will suffice and total copper in not over ten foot runs. There is no need to prepare a graphic core log such as you have previously done in churn drilling. Be sure that in splitting the core the man uses a little judgement to rougly split the visible mineralizaion. I understand you plan to save one half the core in marked and sealed boxes. The other half may be bucked down thru a pulversizer and then re split for assaying and checks. The assayer should be instructed to save all rejects for later metallurgical work.

3- Mapping - Mr. Puttuck ought to get a compass- tape survey of the area immediately over the tunnel to tie in the mineralized outcrops , especially along the old Miami road and the Maimi churn drill hol.e He ought to extend this coverage to include the area where he has noted mineralization in the Madero Diorite. Either you or I ought to discuss this project with Nels Petersen of the U. S. G. S. at Globe. With Frawleys and Ellis permission we ought to offer the drill results to him, not as a matter of trading but of cementing good relations for future information.

Unless you disagree with with these plans, in which case please talk it over with me, I will expect you to carry them out.

Sincerely,

Manning W. Cox , for
WISSER AND COX

CC: EGFRAWLEY

STURTEVANT MILL COMPANY

PARK AND CLAYTON STREETS
DORCHESTER, BOSTON 22, MASS.
CABLE ADDRESS "EMERYSTONE" BOSTON

ACCEPTANCES, PAYMENTS AND SETTLEMENTS MADE ONLY AT BOSTON OFFICE

AIR MAIL March 18, 1957

Mr. R.E.Mieritz
307 East Indian School Road
Phoenix, Arizona

Dear Sir:

We thank you for your telegram of March 18, covering parts for Jaw Crusher.

#0233

The Serial Number you referred to is for a 2 x 6 Jaw Crusher furnished in 1908 but you also stated it is a 2 x 4 machine and therefore we are at a loss to know what machine you have.

We are enclosing drawings 1006 of the 2 x 4 Crusher and Drawing 83 for the 2 x 6 Crusher from which you can properly identify your machine and also the parts you require to repair your Crusher.

Very truly yours,

STURTEVANT MILL COMPANY

D E Morrison

D.E.Morrison - Order Dept.

DEM G

Drawings 1006
83

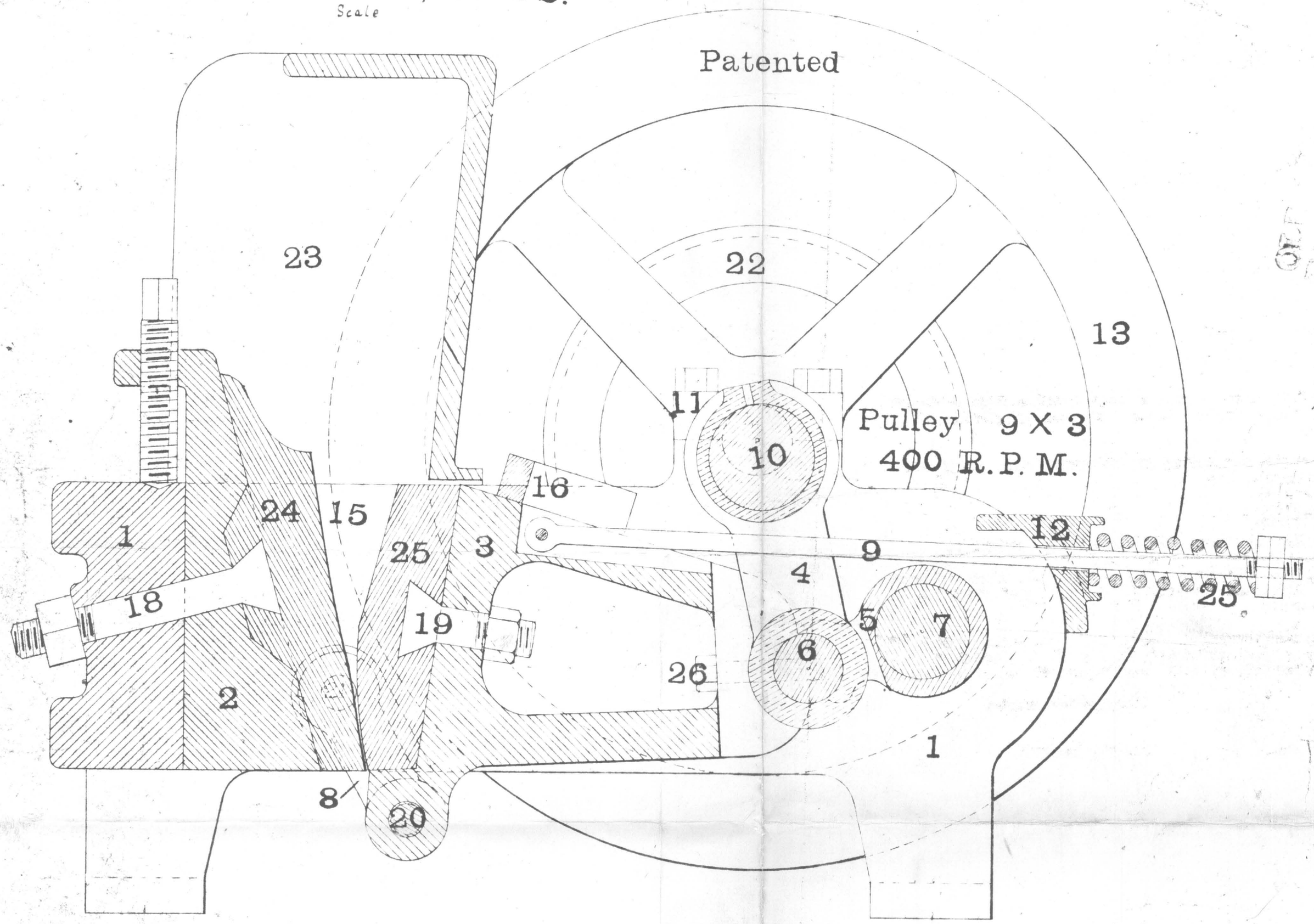
LABORATORY CRUSHER

Mfrd. by

STURTEVANT MILL Co.

BOSTON, MASS.

Scale



List of numbered parts of 2"X4" Crusher.

1	Frame	10	Eccentric Shaft	19	Swing Jaw Bolt
2	Wedge	11	Bearing Cap	20	Lower Link Pin
3	Swing Jaw	12	Spring Bar	21	✠ Upper Link Pin
4	Connecting Rod	13	Fly Wheel	22	Pulley
5	Toggle	14	✠ Fly Wheel Key	23	Hopper
6	Toggle Pin	15	Shield	24	Fixed Jaw Plate
7	Connecting Rod Pin	16	Spring Rod Shield	25	Swing Jaw Plate
8	Link	17	✠ Fly Wheel Handle	26	Swing Jaw Toggle Bolt
9	Spring Rod	18	Fixed Jaw Bolt	27	Spring

✠ Parts not shown in the Drawing

Drawing No. 1006

Richard E. Mieritz
MINING CONSULTANT

March 18, 1957

Mr. E. G. Frawley
Room 340
411 North Central Ave.
Phoenix, Arizona

MADERO PROJECT
PROGRESS REPORT
March 1 to 15,1957

Dear Mr. Frawley:

Herewith is a semi-monthly progress report covering activities of the project for the period March 1 to 15, 1957.

GENERAL:

Since acquisition of the property we have done much towards getting the project under way. Preliminary work such as geologic mapping, sample equipment procurement and map preparation have been accomplished.

A representative of Boyles Bros. drilling company visited the property in order to provide us a firm bid on a drilling rate per foot and any other costs necessary for them to complete the work of drilling the required holes.

GEOLOGIC MAPPING:

The 600 foot adit has been brunton-tape surveyed and mapped geologically. A map has been prepared of same.

A geologic mapping of the surface is being continued as time permits.

DIAMOND DRILLING:

The drill crews moved into the property on Thursday of this past week and started to drill the west hole at a small minus angle. The direction of this hole is S. 72° W. and is about 10 to 15 feet from the face of the adit.

The sampling proceedure used here will approximate that which has been outlined for the De Soto work as described in my March 10, 1957 report on the De Soto Exploration.

Very truly yours,

cc: Manning Cox

R. E. Mieritz

Richard E. Mieritz
MINING CONSULTANT

March 10, 1957

Mr. E. G. Frawley
Rm 340
411 North Central Ave.
Phoenix, Arizona

Madera Prospect
Gila County, Arizona

Dear Mr. Frawley:

Since you have approved early exploration ofthe Madero Prospect, the wheels have been turning in that direction.

Boyles Bros. Drilling Company was contacted for their drilling prices on the basis of their furnishing the necessary drilling equipment etc, plus the required air power, air and water lines and obtaining the water and bringing to the mine, or in other words, the complete job.

The attached letter from Mr. J. Roberts of Boyles Bros. is self explanatory. I am sure you will feel as I that these prices and conditions are extremely satisfactory. As a result I have advised Mr. Roberts to proceed as soon as possible.

Mr. Roberts advised me this date that he will start to mobilize on Tuesday, March 12. Two days will be required to move in and set up, thus, drilling will commence on Thursday of this week.

Arrangements will be made with Magma Copper Assay Office to assay our samples for total copper. The price will be one dollar per sample. Results of samples brought in in the morning will be out the same afternoon. Control will therefore be very good.

My assistant will be "on the ground" to supervise the operation, prepare the core etc. Some temporary help may be required.

I will prepare some core boxes to be used on the project since there is not ample time to have some carpenter prepare same. We shall only need two or three for this project. I have also ordered 1000 cardboard core boxes for use on this project and also on the De Soto and Blue Bell.

The pickup truck was obtained and my assistant will be using same on the Madero Project. Both he and I are, we believe, easy on vehicles and not in the habit of mistreating same, particularly the property of someone else.

You will be advised of the progress made at the project by a semi-monthly progress report, the first of which will be for the period to March 15th.

Sincerely yours,

cc:ManningCox

R. E. Mieritz

Richard E. Mieritz
MINING CONSULTANT

February 22, 1957

De Soto Copper Corp.
Rm 340
411 Notth Central Ave.
Phoenix, Arizona

RECOMMENDED EXPLORATION
MADERA PROPERTY
GILA COUNTY, ARIZ.

Dear Mr. Frawley:

The following is my recommended exploration program for the Madera Property. It has been designed to primarily maintain a low expenditure, to obtain the maximum information on which to justify an indicated reserve and grade and to permit step phasing inthe event early results are negative to our present thoughts.

Phase 1

Repair road, minimum cat rental	$ 300.00
Air, Water supply, Compressor, pipe, 2" air 1" water	max. $ 2500.00
Diamond drill-600 foot min. AX @ $8.00/ft	$ 4800.00
Sampling, max. @ 50¢/ft	$ 300.00
Supervision and Expenses	$ 1000.00
Total Phase 1	$ 8900.00

Phase 2

Diamond drill-600 ft. AX @ $8.00/ft	$ 4800.00
Sampling, max. @ 50¢/ft.	$ 300.00
Supervision and expenses	$ 1000.00
Total Phase 1 and 2	$15600.00

Phase 3

Diamond drill-400 ft. AX @ $8.00/ft.	$ 3200.00
Sampling, max.@ 50¢/ft.	$ 200.00
Supervision and expenses	$ 650.00
Total Phase 1 to 3	$19050.00
Say	$20000.00

Phase one would include drilling two holes about 500 feet in from the portal, one crosscutting the schistosity to the right and one to the left. If the suspected mineralization did not come up to expectancy, the program could be abandoned at this point.

If phase one gave fine results, phase two should be completed by drilling two holes in each direction from the drift about 250 feet in from the portal. Similarly if this phase falls off, it is doubtful that phase three should be completed. Phase three should be completed if phase two is successful.

An expanded program can be more fully evaluated upon completion of the previous three successful phases.

I recommend the above program be put into operation as soon as time permits.

Very truly yours,

cc R. E. Mieritz

Richard E. Mieritz
MINING CONSULTANT

February 22, 1957

De Soto Copper Corp.
Rm 340
411 North Central Ave.
Phoenix, Arizona

Madera Property
Gila County, Arizona

Dear Mr. Frawley:

Accompanied by Messrs. Turley and Ellis, I visited the Madera Property in Gila County, Arizona. The short examination was completed on February 16, 1957.

The property is located about 7 airline miles southwest of Miami and about the same distance northeast of Ray and in an area of considerable mineralization. The country rock is primarily the Pinal schist with extrusive granitic igneous rocks to the east.

It is my opinion the property should be optioned if a satisfactory deal is possible. With a minimum exploration program and expense, a low grade (.8 to 1.0%) disseminated ? copper reserve of considerable magnitude could be inferred, possibly indicated.

The property itself is developed by a 600 foot adit, a 40 foot cross-cut, a 65 foot interior shaft plus some stoping on a well mineralized fissure.

The examination revealed the possibility of disseminated copper within the schist zone. Although the drift parallels the schistosity, the previous sampling of the adit on the right wall indicates the presence of copper mineralization at a remarkable consistant level gradewise. The crosscut to the east also maintains such mineralization. Whether this mineralization will crosscut the schist to any great extent must be determined by some drilling.

It is my thought that four well spaced drill holes from the drift, two to the east and two to the west would either justify additional drilling or kill the project with a minimum expenditure. These flat angle holes should be drilled approximately

250 feet and 500 feet from the portal of the adit. These holes should approximate a 300 foot total depth. A minus 45° angle hole should also be drilled approximately 300 feet from the portal and in an easterly direction as a crosscutting and depth intersecting objective. This hole could assume a 400 foot depth.

The entire project should not exceed a $20,000 expenditure including drill costs, sampling and assaying, supervision and expenses and necessary equipment rental for air and water. A small amount of road work might be necessary. A spring of border line capacity could possibly supply the required demand for drilling, is located a hundred feet or so below the portal of the adit.

Mr. Manning Cox had previously examined the property and thought well of it as I do. Two samples were assayed for copper. Sample M-1 is a scoop sample from the dump and M-2 consisted of small hand samples or specimens of the"deadest" rock from the adit. The results are as follows:

M-1 --- o.54%
M-2 --- 0.06%

The copper content of the samples and the material in the adit is predominantly sulphides. The main fissure itself does carry some oxide copper.

This type prospect could be turned quite easily if the tonnage and grade would uphold itself.

Very truly yours,

R. E. Mieritz

cc