CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
416 W. Congress St., Suite 100
Tucson, Arizona 85701
520-770-3500
http://www.azgs.az.gov
inquiries@azgs.az.gov

The following file is part of the

James Doyle Sell Mining Collection

ACCESS STATEMENT

These digitized collections are accessible for purposes of education and research. We have indicated what we know about copyright and rights of privacy, publicity, or trademark. Due to the nature of archival collections, we are not always able to identify this information. We are eager to hear from any rights owners, so that we may obtain accurate information. Upon request, we will remove material from public view while we address a rights issue.

CONSTRAINTS STATEMENT

The Arizona Geological Survey does not claim to control all rights for all materials in its collection. These rights include, but are not limited to: copyright, privacy rights, and cultural protection rights. The User hereby assumes all responsibility for obtaining any rights to use the material in excess of "fair use."

The Survey makes no intellectual property claims to the products created by individual authors in the manuscript collections, except when the author deeded those rights to the Survey or when those authors were employed by the State of Arizona and created intellectual products as a function of their official duties. The Survey does maintain property rights to the physical and digital representations of the works.

QUALITY STATEMENT

The Arizona Geological Survey is not responsible for the accuracy of the records, information, or opinions that may be contained in the files. The Survey collects, catalogs, and archives data on mineral properties regardless of its views of the veracity or accuracy of those data.

Fig 17

Approximate limits of zone of mineralization and alteration.

Fine grained, dense sericitized pyritic monzonite

5396.0

NO. 1 ADIT

Crest

MR

limit of 0.7% primary copper under gossan 1951

Highest Point on Four Metals Mtn.

SW COR. PRES. GRANT

Fresh Monzonite

Numerous quartz lined vugs

5834.0

MR

MR

Crest of Ridge

very approximate extent of 200' thick partially enriched layer discovered by Noranda-Iso, 1963.

Fresh Monzonite

MR

Trail

NE COR. PRES. JAMES K. POLK

NO. 2 ADIT

6260.6

MR

Inclusions dark fine grained diorite in qtz monzonite

SEC. A

NO. 3 ADIT

5086.6

"Waste" dump

"Ore" Dump

Jeep Road

additions by JHC 1982

N

EXPLANATION

Brecciated Monzonite outcrops

Altered Monzonite outcrops - Essentially sericite-clay. Limonite derivatives as follows:

Less cupriferous pyrite

More cupriferous pyrite

Approximate limits of zone of mineralization and alteration

Steep shears containing thin seams of limonite.

MR Mantle rock

TO ACCOMPANY Report
DATED June 8, 1951
BY J. H. Courtright

Geologic Plan Map

FOUR METALS DEPOSIT

Santa Cruz County, Arizona

AMERICAN SMELTING AND REFINING CO.

Plane table survey by W. K. C. Nourse
Elevations Adits Nos. 2 & 3 from R. Lenon
Composite of Adit levels from maps by Roos and Tovote, 1917.
Geology by J. H. Courtright.

SCALE 1" = 200'

MAY 1951 MAP NO. 931

ATTACHMENT G

STRIKE OF SECTION N 19° E

SOUTH

NORTH END CENTER - ZACHARY TAYLOR

TO ACCOMPANY Report
DATED June 8, 1951
BY J. H. Courtright

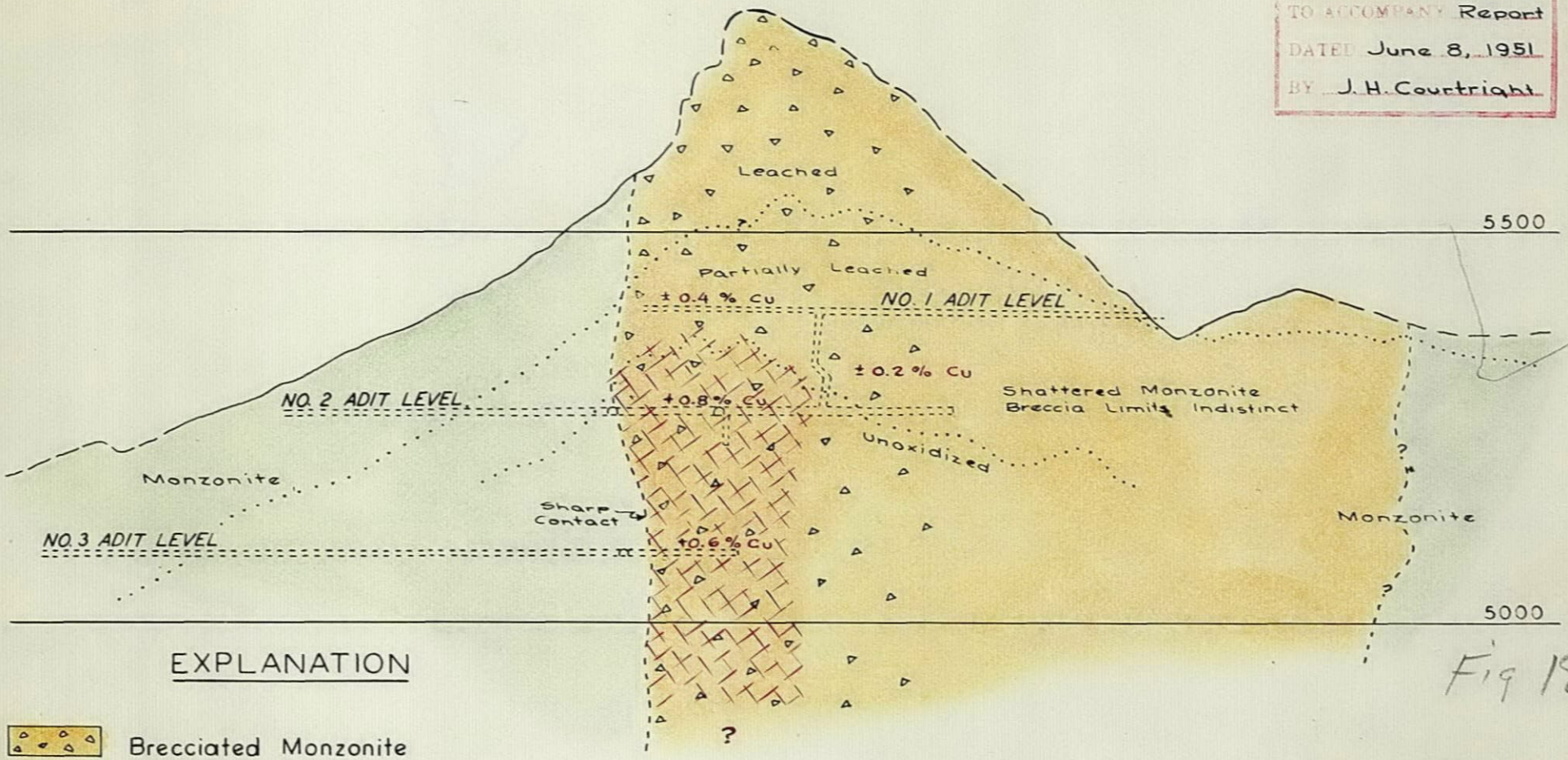


Fig 18

EXPLANATION

- Brecciated Monzonite
- Zone of Alteration and Disseminated Sulphide Mineralization
- Relatively Fresh Monzonite
- Extent of plus 0.6 % Cu (present essentially as primary chalcopyrite)

Red figures indicate approximate average copper content

SECTION A-A'

Looking Westerly

FOUR METALS MINE

Santa Cruz County, Arizona

AMERICAN SMELTING AND REFINING CO.

SCALE 1" = 200'

J. H. COURTRIGHT MAY 1950

MAP NO. 932

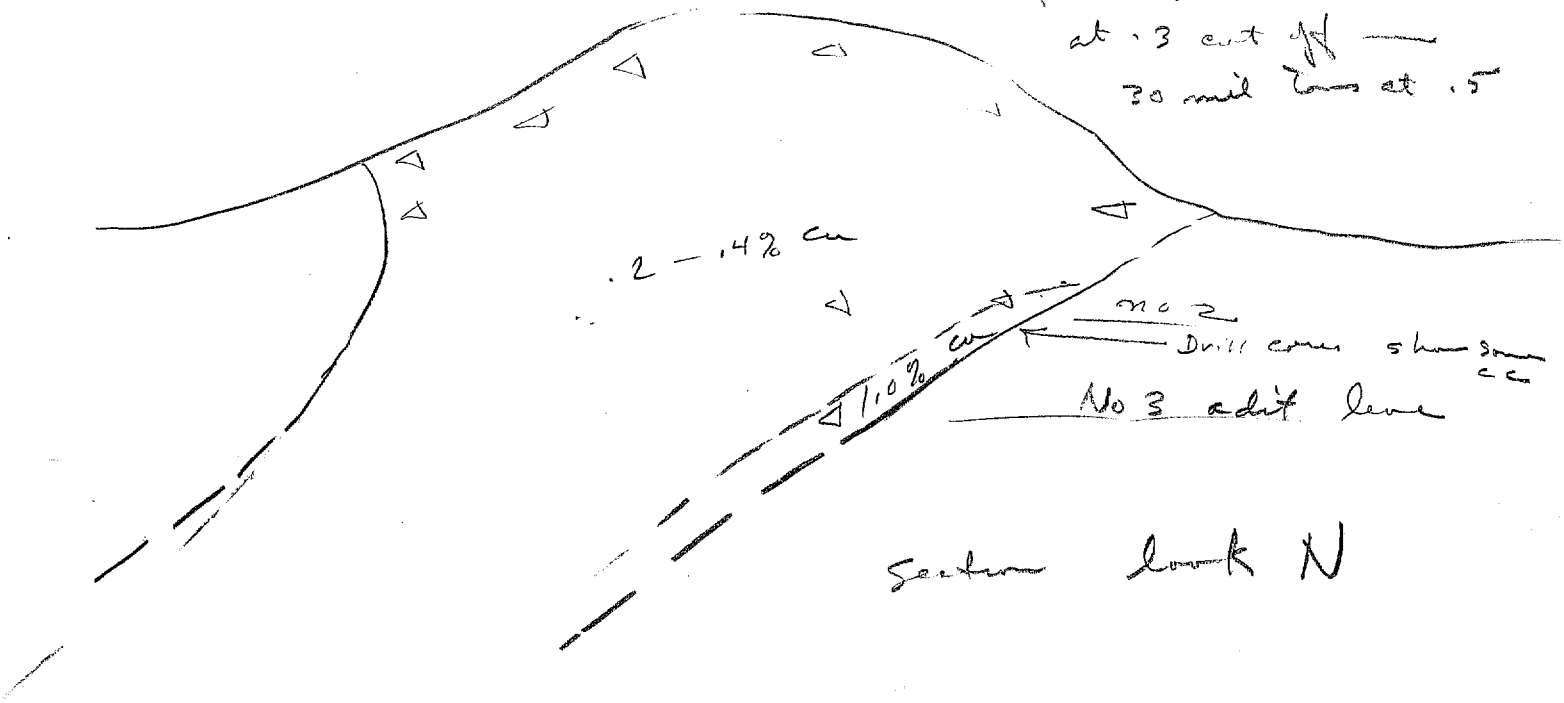
ATTACHMENT E

Four Metals

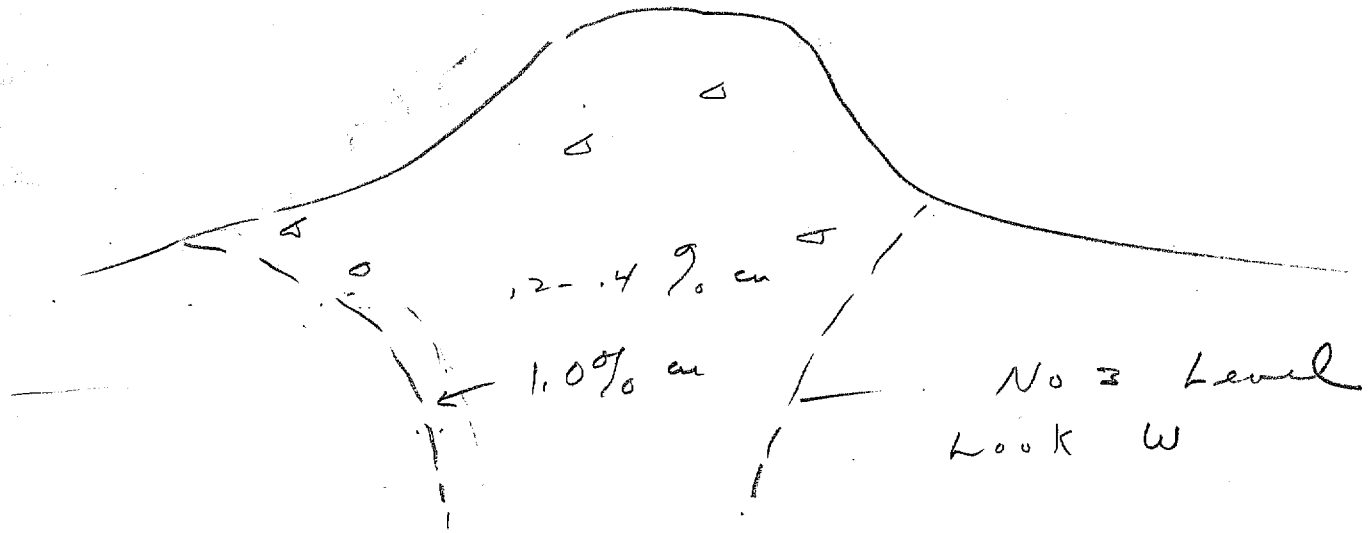
Wi[illegible] Range —

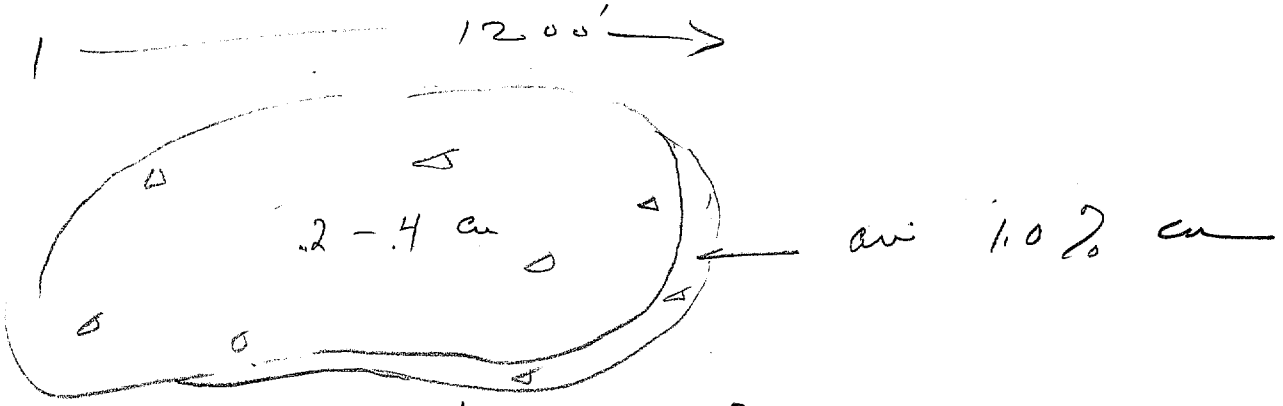
at .3 cut off —

30 mil tons at .5



Section look N





No 3 Level plan

July 24 '54

Toy Chief — Co. —

Jack — ?

says: Duval Sulphur drilled 12000 ft — mainly 1000' holes — some underground — at Four Corners

core recov high — av 30'-40' per shift

Mr. Hardie
Aa-19.18.6F

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

March 4, 1954

MEMORANDUM FOR MR. KENYON RICHARD

FOUR METALS MINE EXPLORATION
Duval Sulphur and Potash Corp.
Patagonia Mts., Santa Cruz County,
Arizona

The following information was volunteered by Mr. Don Klippinger 3/2/54. Mr. Klippinger is a mining engineer who has recently been transferred to Nogales from Duval's metallurgical department at Carlsbad, New Mexico. Klippinger is doing library research at the U. of A. in Tucson in connection with exploration that Duval is currently conducting in southwestern Arizona.

"Four diamond drill holes (BX-EX) totaling 3000 feet have been drilled since October, 1953. One hole was bottomed at 1500 feet in fresh monzonite. Drilling is being done in the footwall of an east-west striking fault that is exposed in mine workings. This fault dips northerly at 45 degrees. At least one flat parallel fault has been recognized in the hanging wall in the old mine workings. It is thought that this 'fault zone' controls brecciation and mineralization. At the present time, the fourth (?) hole is being drilled underground in the hanging wall and at a slightly steeper dip than the northerly dipping flat fault zone".

Mr. Klippinger states that "the breccia pipes referred to (by Schrader?) are actually misinterpretations of fault breccia easily observed." This is not in agreement with Courtright's detailed study.

Duval has optioned "30 or 40 claims" from Coronado Mines, Inc. and plans to drill at least 6000 feet of diamond drill hole.

Some of the diamond drill core (AX size) from holes 1, 2 and 4 were examined. Klippinger was not specific about location of holes but one sample already described was in fresh monzonite at 1500 feet. One other core sample showed silicified porphyry (monzonite?) with fresh pyrite at depths of 50 to 700 feet. One hand specimen showed molybdenite enclosed by chalcopyrite.

None of the core was strongly altered except the two silicified samples.

All drilling to date has been at angles of about 45 degrees.

Mr. Klippinger stated that they (Duval) are interested in a copper uranium prospect near Sells, Arizona.

BSH:ar

Byron S. Hardie

cc: TASnedden

J. H. Courtright

Aa-19.16.6a

June 8, 1951

FOUR METALS MINE
Patagonia District
Santa Cruz County, Ariz.

CONTENTS

	Page
Introduction	1
Summary of Conclusions and Recommendations	1
Name of Property	2
Location	2
Adjoining and Other Nearby Properties	2
Claims and Area	2
Ownership and Titles	2
Price and Terms	2
History	2
Production	3
Facilities and Equipment	3
Development	3
Geology:	
General	3
Local	3
Sampling:	
Past	4
Present	5
Tonnage and Grade Estimates	6
Conclusions and Recommendations	7

ATTACHMENTS

		Scale
a.	State Index Map	
b.	County Index Map	1" = 2 Mi.
c.	Claim Map	1" = 1000'
d.	Photographs	
e.	Areal Geologic Map	1" = 1000'
f.	Section	1" = 200'
g.	Geologic plan of Four Metals deposit (shows extent of drift levels)	1" = 200'
h.	Adit No. 2, Assays and Geology	1" = 50'
i.	Adit No. 3, " " "	1" = 50'

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

June 8, 1951

Mr. L. Kenneth Wilson, Chief Geologist
Southwestern Mining Division
Tucson Office

FOUR METALS MINE - Cu
Patagonia District
Santa Cruz County, Ariz.

Dear Sir:

Herewith is my report on the Four Metals deposit. The mapping, sampling and other field work, started in September, 1950 and completed in March, 1951, occupied a total of three weeks' time.

The property has been considered by the Company on several occasions in the past, and a number of written opinions are on file, both optimistic and pessimistic in respect to potentialities, but none are supported by sample results and geologic maps. In 1917 Roos and Tovote estimated a possible 20 million tons of plus 1.0% copper ore; in 1947 James Pollock noted that the deposit appeared to be a breccia pipe and as such deserved further study; in 1948 C. A. Basor concluded that the property should be dropped from further consideration.

In view of the apparent need here for more conclusive data, a re-examination was considered advisable, as explained in your Memorandum of August 16, 1950, under the heading of Coronado Mines, and in Mr. F. V. Richard's Memorandum of May 18, 1950, under the heading of Patagonia Area.

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

The deposit represents a partially leached, but unenriched, disseminated copper occurrence, in a pipe-like zone of brecciated monzonite. The copper is present as primary chalcopyrite; minor amounts of silver and molybdenum are associated.

The results of recent sampling indicate the existence of 1,000,000 tons containing an average of 0.7% Cu, within a vertical distance of 360 feet. Assuming horizontal projections of reasonable extent and a vertical range of 1,000 feet, the existence of 6,000,000 tons of plus 0.6% Cu is considered possible.

A larger area of the breccia, extending through the same vertical range, is estimated to contain a possible 16,000,000 tons of plus 0.45 Cu.

These values in the tonnages to which they apply are regarded as submarginal, except in cases where they occur adjacent to a low-cost open pit operation. At some later date the deposit might become of interest in the event of a substantial increase in the demand for metals. For the present, however, no further action on the property is recommended.

Mr. L. Kenneth Wilson

NAME OF PROPERTY

Present: Four Metals Mine
Former: Red Mountain Mine, Kino and Red Cone
Current Company: Coronado Mines, Inc.

LOCATION

The property is located in Santa Cruz County near Section 28 in unsurveyed T. 23 S., R. 16 E. From Nogales the distance by car in an easterly direction over fair roads is 15 miles. (See Attachment B). There is a jeep road from the Canyon bottom to Adit No. 3, and trails to adits numbered 1 and 2.

ADJOINING AND OTHER NEARBY PROPERTIES

There are no adjoining or close-by properties worthy of note. The Buena Vista and Golden Rose are small vein-type deposits lying southwest and westerly. The Mowry and Duquesne mines are in limestone some distance east. (See Attachment B). The Trench and Flux Mines owned by the Company are situated some 5 miles northerly, airline.

Other breccia occurrences, including the BK prospect recently discovered southeast of the Three R, are now being investigated by the Company.

CLAIMS AND AREA

The Four Metals property is covered by 32 unpatented claims. (See Attachment C). These are part of a total of 163 contiguous, unpatented claims held by Coronado Mines, Inc.

OWNERSHIP AND TITLES

In 1941 the Kino Copper Company turned over its holdings which included the above-mentioned 32 claims as well as other groups such as the Buena Vista and Golden Rose, to Coronado Mines, Inc. The latter is incorporated under the laws of New Jersey and is capitalized for 3,000,000 shares at $1.00 par. Milton Leon, President, is reported to be the principal stockholder.

PRICE AND TERMS

As stated in your File Memorandum of August 16, 1950, Mr. Leon appeared unwilling to offer anything specific as to terms on which the property might be available, but gave verbal assurance of exclusive examination privileges. It was quite obvious during our discussions that he has a highly inflated opinion of the potential value of the deposit.

HISTORY

1867 - J. R. Browne referred to property as the "Guajalote Lode" in Mineral Resources of the States and Territories, page 449.

1903 - Four Metals Company organized. Drove 3500 feet of drifts. Sent 100 samples to El Paso; none assayed over 1.00% Cu. Later reorganized as Red Cone Mining Company.

1913 - Reorganized as Red Mountain Mining Company.

1915 (?) - Lower south adit (No. 3) started.

Mr. L. Kenneth Wilson

1928 - Continued development.

1929 - Four (?) diamond drill holes put down by a local group which included Paul Billingsby and a Mr. Jensen.

1941 - Coronado Mines, Inc. acquired property.

1950 - Coronado engaged in reopening of adits and survey work.

PRODUCTION

None, either past or present.

FACILITIES AND EQUIPMENT

None worthy of mention.

DEVELOPMENT

The extent of the three main adits and one connecting raise, totaling some 4300 feet, is shown on accompanying maps. Except for two small caved areas noted on the 50-scale plan (Attachment H) the workings are open, essentially dry and in fair condition.

GEOLOGY

General

The deposit is situated on the west slope of the Patagonia Mountains, at about 5,500 feet elevation. It is in quartz monzonite, a Cretaceous granitic rock which occurs as a batholitic mass, extending northwesterly from Cananea, Mexico, to the Twin Buttes area lying southwest of Tucson. The granitic rocks pass beneath extensive deposits of loosely consolidated gravels in the Santa Cruz Valley about four miles west of the mine, and about one mile to the east they intrude Cretaceous sedimentaries, chiefly sandstones.

Local

The deposit, composed essentially of iron and copper sulphides, occurs in a breccia pipe and in the shattered monzonite of its periphery. The more intensely brecciated portion forms a horseshoe-shaped mass (Attachment E) which outcrops prominently along the crest and south slopes of Four Metals Mountain. The reddish-brown color tones of the outcrops and talus slopes contrast sharply with the dull gray color of the unaltered monzonite surrounding the deposit. (See color photograph, Attachment D).

The breccia is quite similar in appearance to many of the copper-bearing pipes occurring elsewhere in the Southwest. As exposed on the surface and in the adits, the fragments are mostly angular, very few being rounded. They are composed entirely of monzonite and a darker dioritic appearing rock. The latter occurs occasionally as large inclusions in the monzonite — apparently these represent partially digested masses of an earlier intrusive. The breccia fragments range in size from less than an inch to eight feet but are commonly around two or three inches in diamater. The margins of the breccia pipe are not readily discernible on the surface, due to the shattered zone existing around the borders.

Sulphide mineralization, essentially as pyrite with minor chalcopyrite, occurs mainly as vug-fillings between fragments. These masses range up to six inches in diamater. Lesser amounts occur as discrete grains in the fragments themselves.

Mr. L. Kenneth Wilson

Chlorite, sericite and other silicates (?) are localized in the brecciated "core" of the mineralized zone. Chalcopyrite deposition appears to have been confined principally to the breccia. The shattered monzonite contains relatively little introduced material, other than pyrite; it usually contains clay alteration and is rather soft in contrast to the more resistant breccia which outcrops prominently. However, there are some narrow bands of sericite in the "argillic" zone; these are all associated with narrow seams of pyrite-chalcopyrite mineralization.

Other than a few minor patches of mineralization, shown on Attachment E, the surrounding country rock is barren.

Minor amounts of silver, molybdenum and lead are associated with the primary copper mineralization.

Rather thorough oxidation and leaching of the sulphides extends some 200 feet below the mountain top (see section, Attachment F). The zone of partial leaching continues to a depth of around 400 feet. Minor amounts of chalcocite occur in the No. 1 adit; below, in the No. 2 and No. 3 adits none was observed.

On the surface occasional vugs of limonite after chalcocite occur in the breccia outcrops. Otherwise, there is little or no evidence of copper — either carbonate, silicate or oxide.

The absence of appreciable enrichment in a disseminated type deposit containing over 0.5% primary copper is quite unusual. Oxidation and leaching has penetrated the Four Metals Mountain from 200 to 400 feet below the top, but only very minor amounts of secondary chalcocite were deposited in the uppermost sulphides; and practically none below. It is considered possible, but highly improbable that the primary copper-bearing zone cut by the No. 2 and No. 3 adits did <u>not</u> originally extend above the present surface elevation. More likely, certain features, both chemical and physical, caused the greater part of the dissolved copper to be widely dispersed — rather than concentrated in the form of chalcocite immediately below the base of oxidation.

<u>SAMPLING</u>

<u>Past</u>

Results of sampling reportedly done by J. L. Shepard in 1927 are detailed and summarized on a 20-scale map loaned to us by Milton Leon. There is no date nor identification of source on this map. It was obviously prepared for promotional purposes, as were the various reports, also loaned by Mr. Leon. A summary of results from the above-mentioned map are given below:

	Average
<u>Adit No. 3</u> 66 samples at 10-foot intervals	1.99% Cu
<u>Adit No. 2</u> 88 samples at 10-foot intervals	2.07% Cu
<u>Adit No. 1</u> 19 samples at 40-foot intervals	.50% Cu

Over-all average gold-silver value, $1.00 per ton.

Mr. L. Kenneth Wilson:

The results of diamond drilling done in the late twenties are not available. According to your Memorandum of September 7, 1950, Anaconda cut 70 channel samples in the No. 3 Adit. These ran up to 1.47% Cu and averaged .41% Cu, with negligible gold, silver and molybdenum.

As noted under "History", 100 samples were shipped to El Paso in 1903. None were reported to run over 1.00% copper.

Present

The level maps (Attachments H and I) show the assay results of samples taken under my supervision. In order to obtain clean surfaces, free of water soluble copper, 10-inch holes were drilled and blasted wherever necessary on the No. 2 level. A sample weighing from 10 to 15 pounds was then cut by moil from an area of about two square feet on the wall of the drift. This procedure was followed in the No. 3 Adit, except for the blasting which was considered unnecessary in the absence of copper sulphate effluorescence on the walls.

No samples were taken in the No. 1 Adit, due to the presence of considerable limonite and the general low tenor apparent. Milton Leon's map showed an average of about .40% copper. Judging from the results he obtained from the adits below, this figure is probably somewhat high. A summary of recent sampling, including those from dumps, follows: (Assays by Jacobs, Tucson.)

No. 2 Adit

46 samples — arithmetical average — .57% Cu. (One sample — 5.40% Cu — cut to 1.00% in above average).

Composite of 23 samples in selected area (Attachment H):

Au	Ag	Cu	Pb	Mo	Fe	S	Ins.
Tr.	.12	.04	.15	.04	7.64	4.17	77.7

Qualitative spectrographic analysis of above composite: (Smith-Emery Company, Los Angeles):

Major constituents	-	Silicon	
Intermediate "	-	Al, Fe, K, Mg	
Minor "	-	Sodium	0.5%
		Calcium	0.5%
		Titanium	0.5%
		Copper	0.5%
		Manganese	0.5%
		Barium	0.1%
		Lead	.01%
		Strontium	.01%
		Boron	.005%
		Vanadium	.005%
		Gallium	.005%
		Molybdenum	.005%
		Nickel	.001%
		Chromium	.001%
		Cobalt	Trace

Mr. L. Kenneth Wilson

Quantitative Chemical Determinations (Smith-Emery)

Titanium Oxide (TiO_2)	0.80%
Gallium (Ga)	0.002%

No. 3 Adit

39 samples - arithmetical average — .47% Cu.

Composite of 23 samples: (See Attachment I).

Au	Ag	Cu%	Mo%	Fe%	S%	SiO_2%
Tr.	0.4	0.62	0.04	6.7	3.47	68.4

No. 3 Adit "Ore" Dump

Sample No.	Cu%	
2885	1.51	) From relatively small portion of
6	.82	) dump nearest to portal
7	.25	) From slopes of dump -
8	.37	taken from
9	.45	3' x 3' excavations

The first two samples above are representative of a relatively small portion of the dump and correspond to the better values first cut by the adit. The last three, averaging 0.36% Cu, represent the major portion of the dump material.

No. 2 Adit "Ore" Dump — grab samples

No.	Au	Ag	Cu%
4417	Tr.	.5	.08
4418	Tr.	.6	.42

No. 1 Adit - grab sample of dump

No.	Au	Ag	Cu%
4420	Tr.	.4	.09

Field sheets of the three levels with sample numbers and locations, assay certificates, etc., have been placed in the local files.

TONNAGE AND GRADE ESTIMATES

No portion of the deposit is considered as "ore"; however, the copper content indicated by sample results from existing development is here summarized:

No. 2 Adit Level

$$\frac{\text{Horizontal}}{200' \times 200'} \times \frac{\text{Vertical}}{180'} = 600{,}000 \text{ tons at } 0.8\% \text{ Cu.}$$

No. 3 Adit Level

$$\frac{\text{Horizontal}}{100 \times 300} \times \frac{\text{Vertical}}{180} = 450{,}000 \text{ tons at } 0.6\% \text{ Cu.}$$

In round figures the above amounts to a total of 1,000,000 tons at 0.7% copper.

Mr. L. Kenneth Wilson

Judging from surface exposures, less than 50% of the horizontal extent of the breccia pipe has been penetrated by the various adits. Assuming a possible vertical extent of 1,000 feet (900 feet below the No. 2 Adit), and a horizontal extent of twice that considered in the above, the deposit might contain 6,000,000 tons of plus 0.6% Cu.

Outside of this higher grade "core" the copper content appears to be extremely variable, except for the north side where the drifts show uniformly low values (0.2% or less). Since the "ore" dumps are to some extent diluted with this relatively low grade material from the north side, their values cannot be considered representative of that part of the mineralized zone showing higher copper values. It is considered that the average grade of the entire area of brecciation which appears stronger in copper, comprising some 200,000 square feet (see 200-scale plan, Attachment G), is probably above 0.45% Cu. Assuming a vertical range of 1,000 feet (below the No. 1 Adit), the total volume would amount to 16,000,000 tons.

CONCLUSIONS AND RECOMMENDATIONS

The Four Metals deposit, containing primary copper, silver and molybdenum as the principal metals of interest, is regarded as a mineralized breccia pipe. As such, the vertical range of mineralization could be considerably greater than the horizontal extent. However, the copper content, as determined by samples from existing development, is insufficient to consider any portion of the deposit workable under present conditions.

Better copper mineralization is localized around the base of the central portion of the horseshoe-shaped breccia mass. Here, there are a possible 6,000,000 tons of plus 0.6% Cu, assuming a vertical range of 1,000 feet. Under conditions ideal for cave mining this portion might be considered commercial; however, the "nose" of unbrecciated monzonite on the south contact is heavy ground, requiring timber support, while the mineralized breccia is exceptionally firm and tough. Excessive dilution would very likely be encountered in any attempt to cave-mine the latter. This also applies to the larger volume of lower grade — 16,000,000 tons at .45% Cu — considered in the foregoing as possible over a vertical range of 1,000 feet.

Concluding, at some time in the future, a reasonable possibility of developing such tonnages of low tenor may warrant expenditures for exploration. For the present, no action on the property is recommended.

Yours very truly,

J. H. Countright

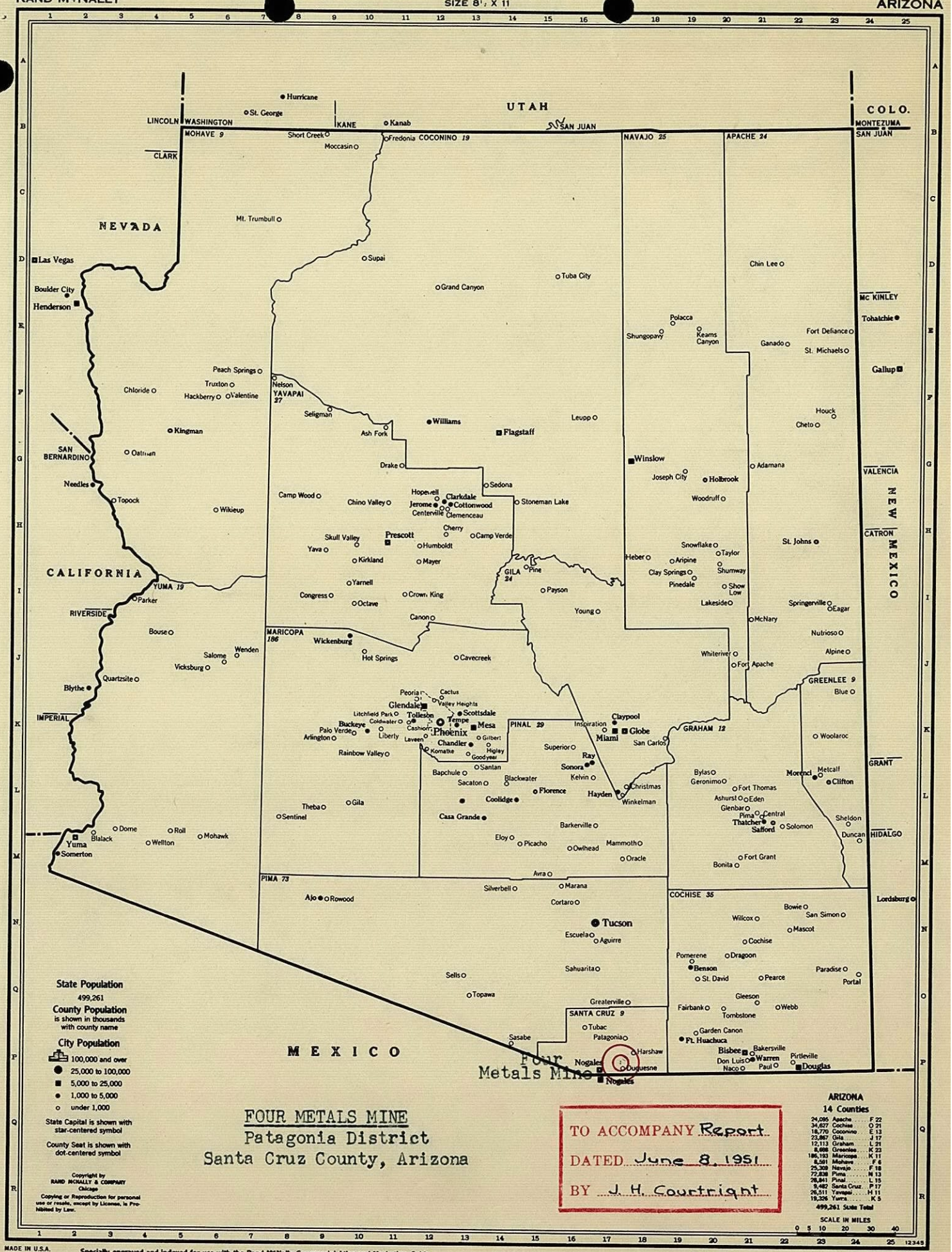
J. H. COUNTRIGHT

JHC:ar

RAND McNALLY

CITY-COUNTY STATE MAP
SIZE 8½ X 11

ARIZONA



FOUR METALS MINE
Patagonia District
Santa Cruz County, Arizona

TO ACCOMPANY Report
DATED June 8, 1951
BY J. H. Courtright

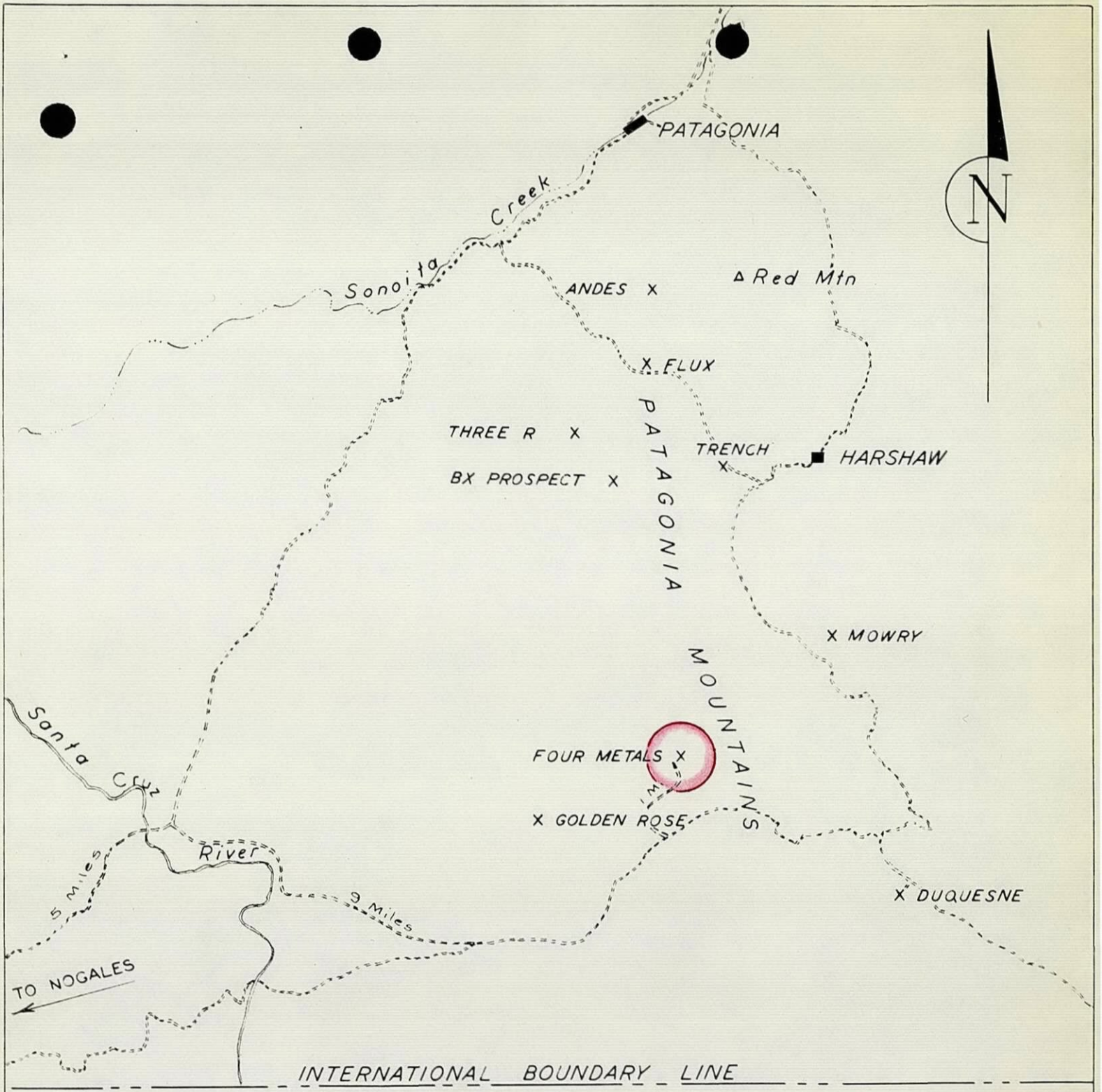
MADE IN U.S.A.

Specially engraved and indexed for use with the Rand McNally Commercial Atlas and Marketing Guide.

This Map is also available in size 17 X 22

CL 02

ATTACHMENT A



TO ACCOMPANY Report
DATED June 8, 1951
BY J. H. Courtright

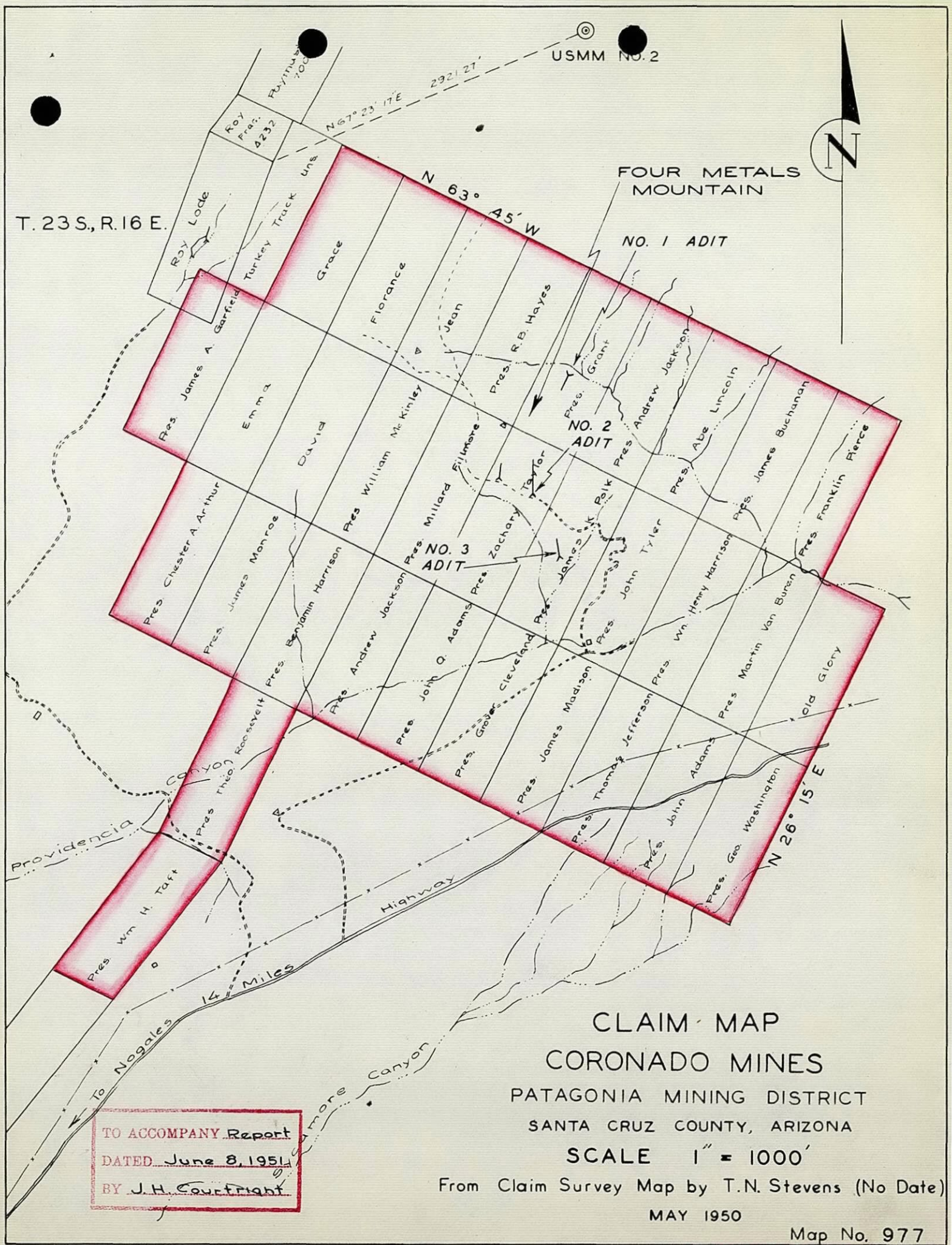
LOCATION MAP

PATAGONIA MOUNTAINS

SANTA CRUZ COUNTY, ARIZONA

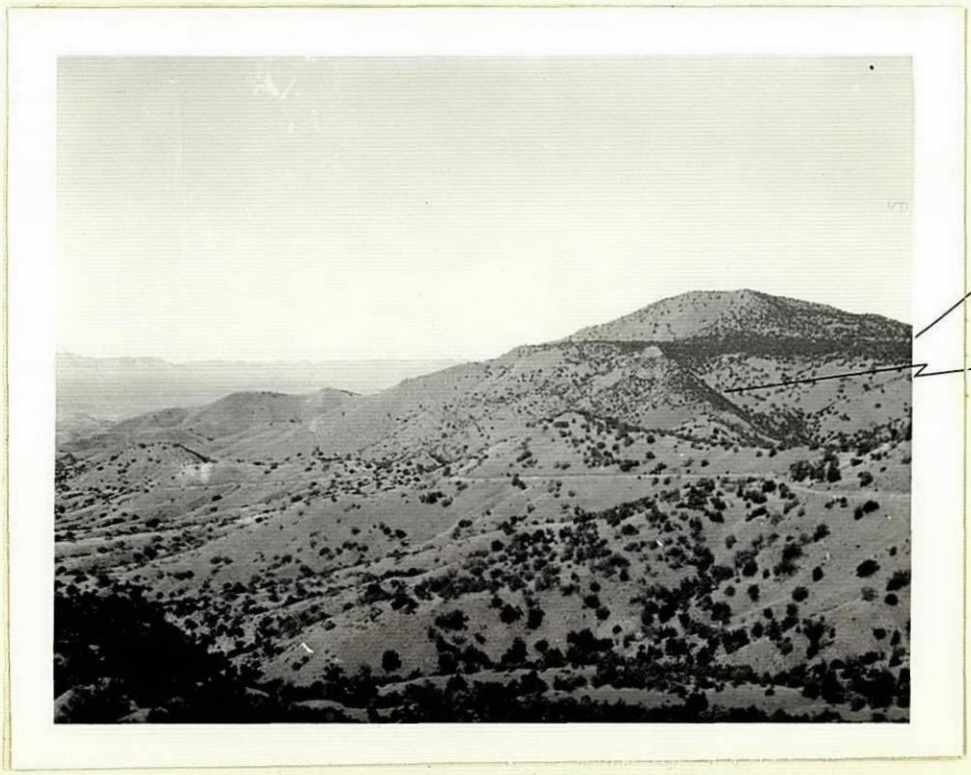
SCALE 1 INCH = 2 MILES

AFTER U.S.G.S. TOPOGRAPHIC MAP - DATED 1914



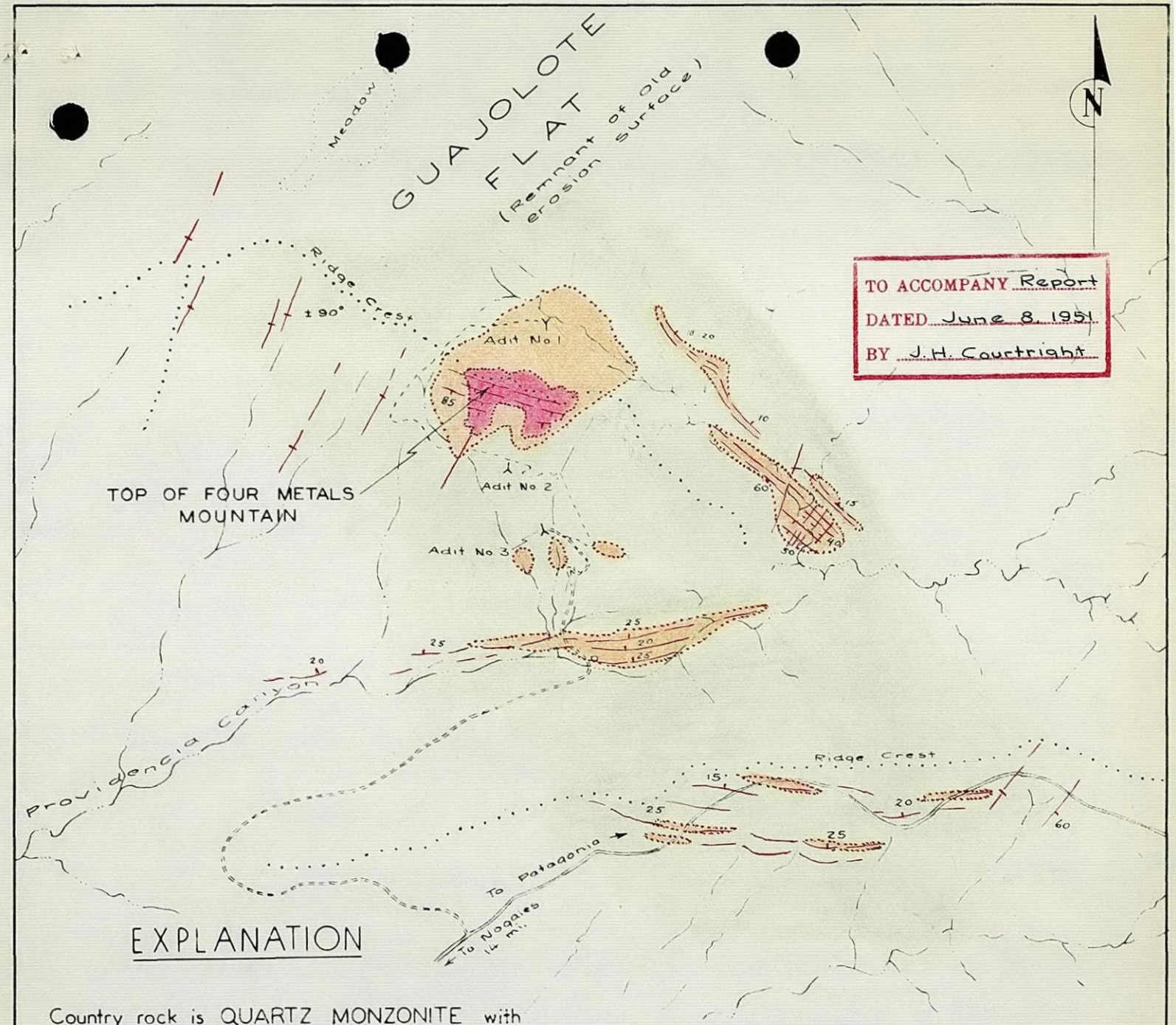
CLAIM MAP
CORONADO MINES
PATAGONIA MINING DISTRICT
SANTA CRUZ COUNTY, ARIZONA
SCALE 1" = 1000'
From Claim Survey Map by T.N. Stevens (No Date)
MAY 1950
Map No. 977

Four Metals Mountain - Looking Northwesterly



Looking Northwesterly
Santa Cruz Valley in background

ATTACHMENT D



TO ACCOMPANY Report
DATED June 8, 1951
BY J. H. Courtright

EXPLANATION

Country rock is QUARTZ MONZONITE with a few partially digested blobs of diorite.

Area of prominent outcrops of breccia. Represents zone of strongest quartz-sericite and copper mineralization.

Extent of disseminated sulphide mineralization — essentially pyritic. Characterized by argillic type alteration in weakly brecciated or shattered rock.

Fresh or slightly altered monzonite

Mineralized shears – widely spaced seams of pyrite-chalcopyrite marked by thin quartz-sericite zones, leached near surface.

Areal Geologic Map
FOUR METALS DEPOSIT
and Vicinity

Santa Cruz County, Arizona

AMERICAN SMELTING AND REFINING CO.

Drainage pattern from aerial photograph mosaic

Breccia pipe and outline of mineralization reduced from 200 scale map No. 931

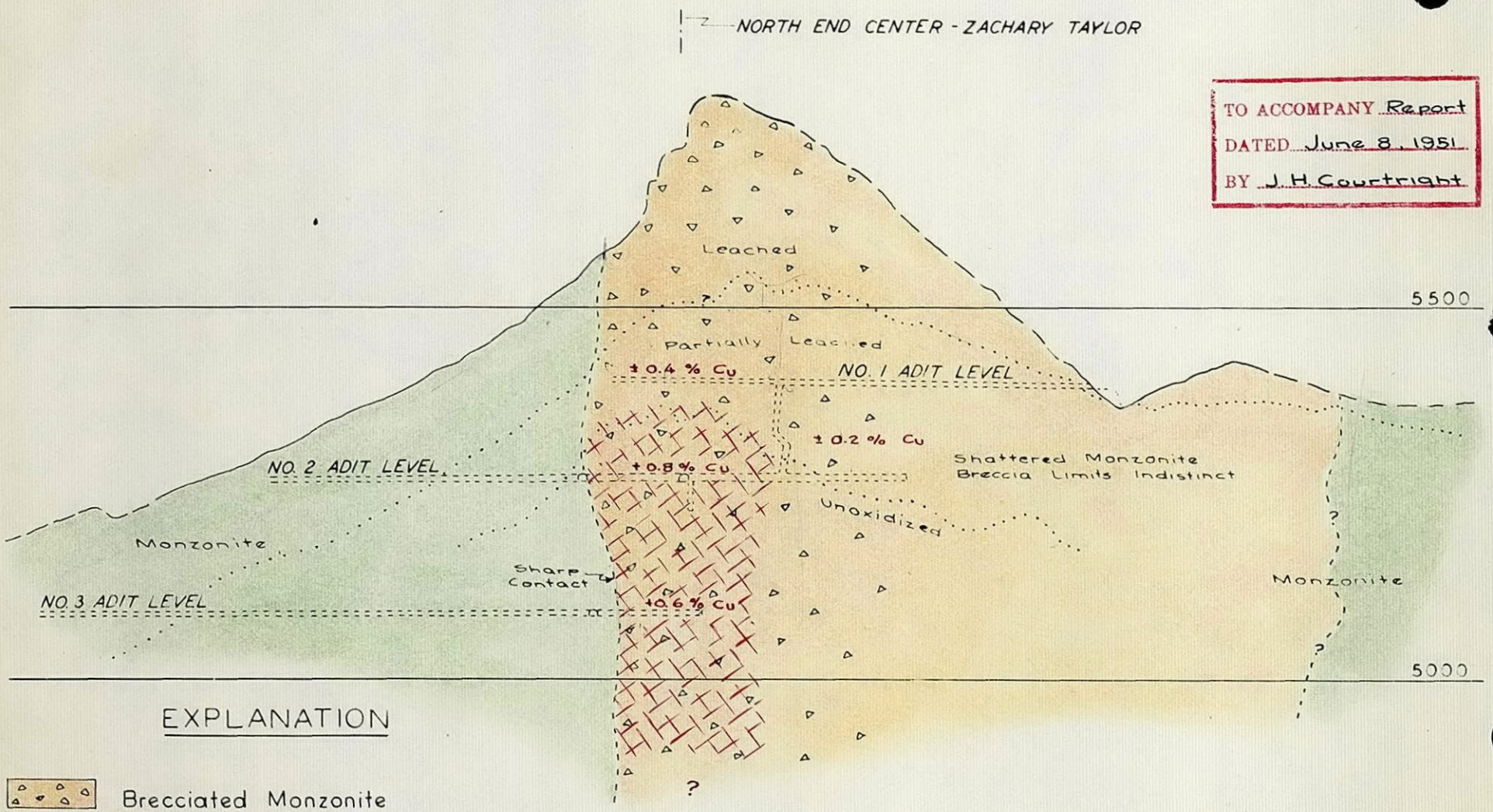
SCALE 1" = 1000'

J. H. COURTRIGHT

MAY , 1950

Map No. 930

ATTACHMENT E



EXPLANATION

- Brecciated Monzonite
- Zone of Alteration and Disseminated Sulphide Mineralization
- Relatively Fresh Monzonite
- Extent of plus 0.6 % Cu (present essentially as primary chalcopyrite)

Red figures indicate approximate average copper content

SECTION A-A'

Looking Westerly

FOUR METALS MINE

Santa Cruz County, Arizona

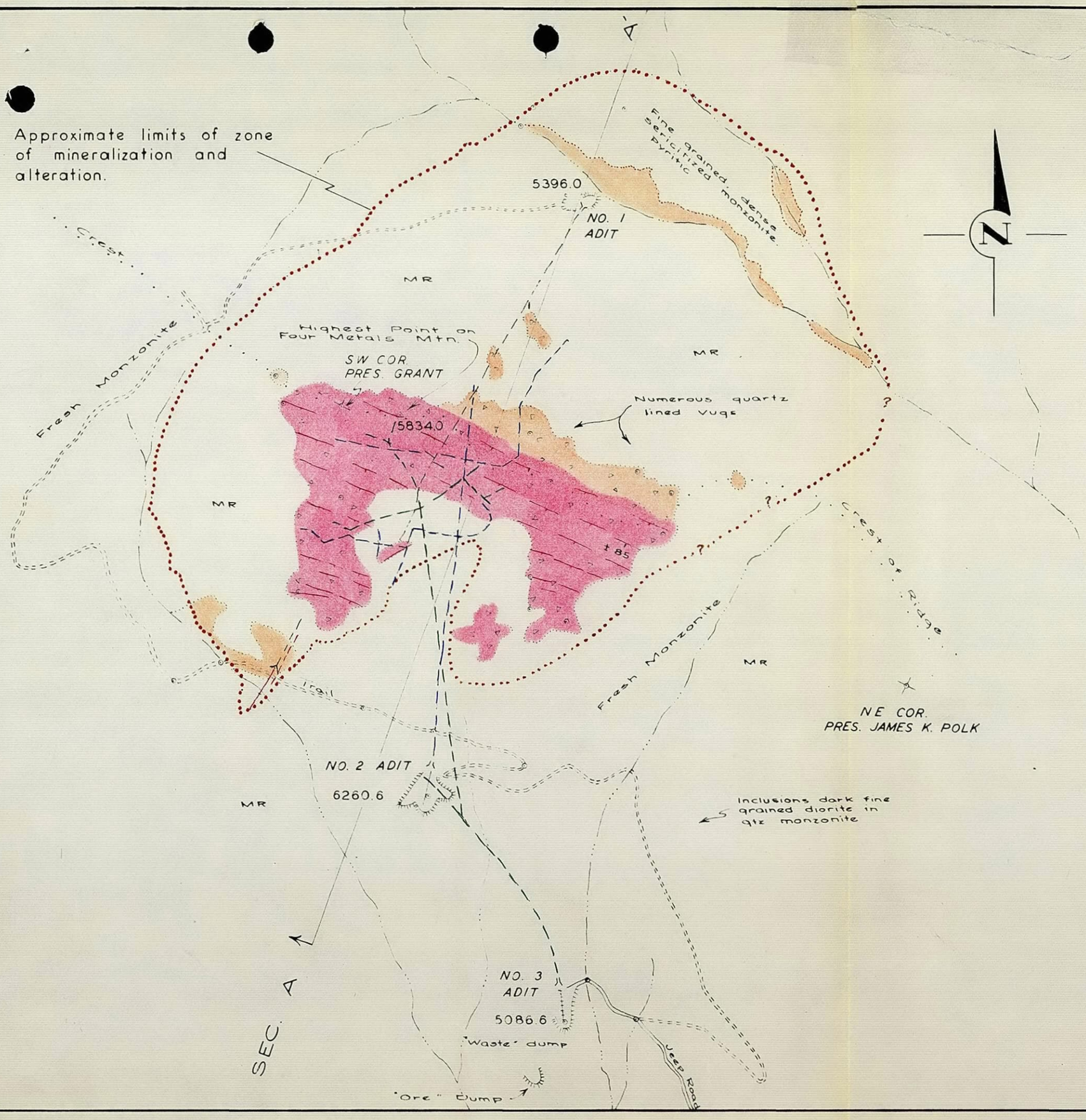
AMERICAN SMELTING AND REFINING CO.

SCALE 1" = 200'

J.H. COURTRIGHT

MAY 1950

MAP NO. 932



EXPLANATION

Brecciated Monzonite outcrops

Altered Monzonite outcrops - Essentially sericite-clay. Limonite derivatives as follows:

Less cupriferous pyrite

More cupriferous pyrite

Approximate limits of zone of mineralization and alteration

Steep shears containing thin seams of limonite.

MR — Mantle rock

TO ACCOMPANY Report
DATED June 8, 1951
BY J.H. Courtright

Geologic Plan Map

FOUR METALS DEPOSIT

Santa Cruz County, Arizona

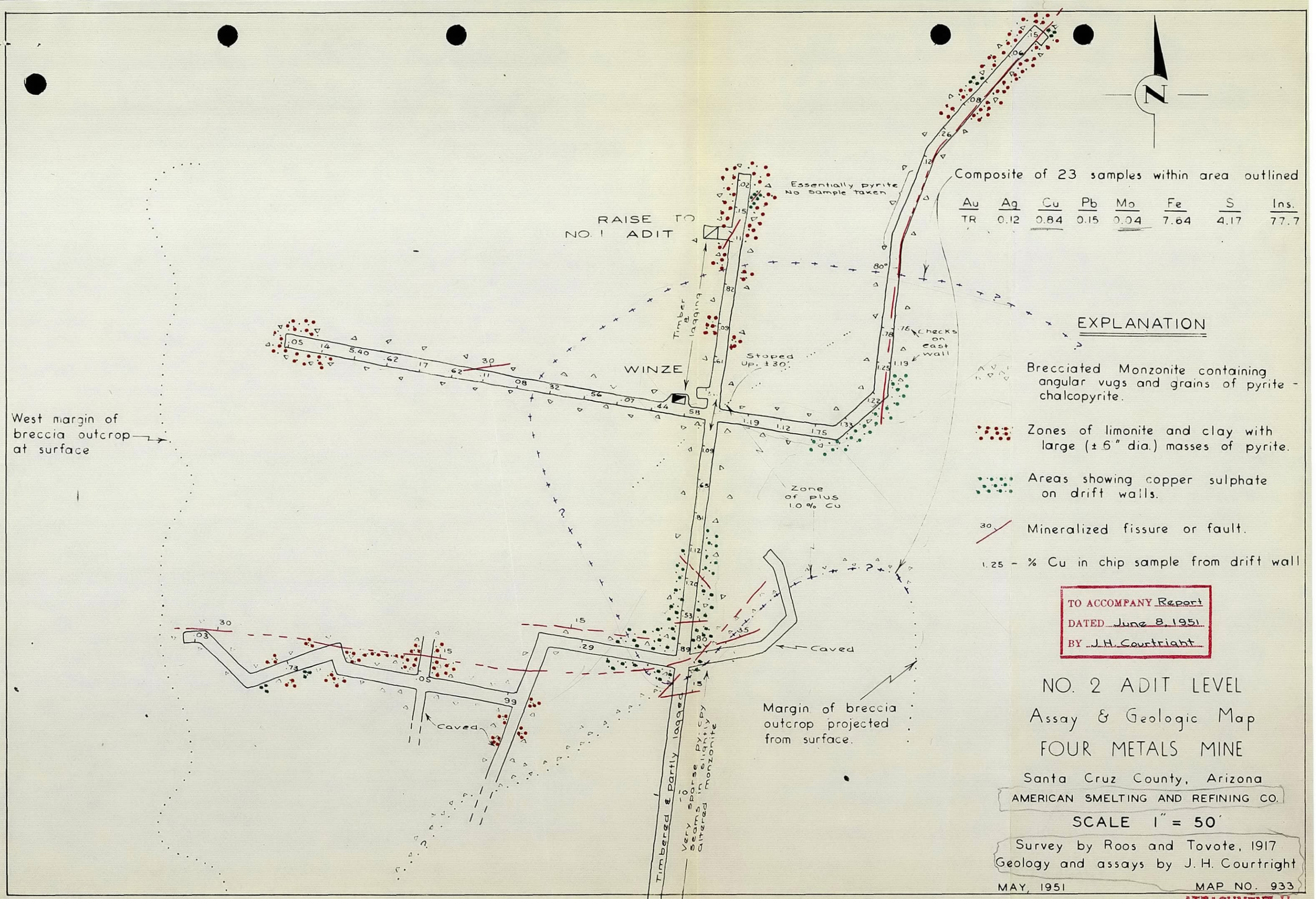
AMERICAN SMELTING AND REFINING CO.

Plane table survey by W. K. C. Nourse
Elevations Adits Nos. 2 & 3 from R. Lenon
Composite of Adit levels from maps by Roos and Tovote, 1917.
Geology by J. H. Courtright.

SCALE 1" = 200'

MAY 1951 MAP NO. 931

ATTACHMENT G



Composite of 23 samples within area outlined

Au	Ag	Cu	Pb	Mo	Fe	S	Ins.
TR	0.12	0.84	0.15	0.04	7.64	4.17	77.7

EXPLANATION

Brecciated Monzonite containing angular vugs and grains of pyrite - chalcopyrite.

Zones of limonite and clay with large (± 6" dia.) masses of pyrite.

Areas showing copper sulphate on drift walls.

30 Mineralized fissure or fault.

1.25 - % Cu in chip sample from drift wall

TO ACCOMPANY Report
DATED June 8, 1951
BY J.H. Courtright

NO. 2 ADIT LEVEL
Assay & Geologic Map
FOUR METALS MINE

Santa Cruz County, Arizona

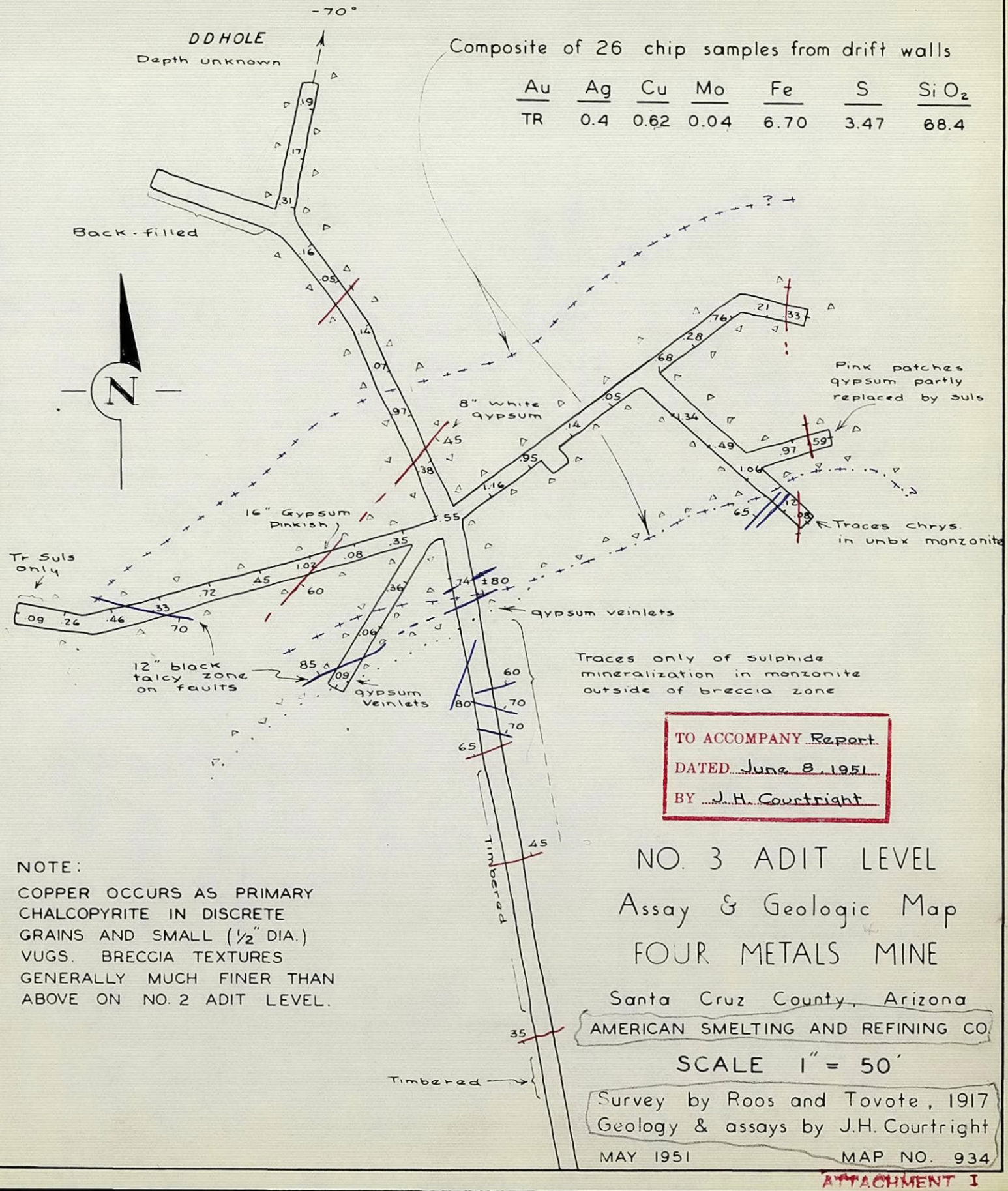
AMERICAN SMELTING AND REFINING CO.

SCALE 1" = 50'

Survey by Roos and Tovote, 1917
Geology and assays by J. H. Courtright

MAY, 1951 MAP NO. 933

ATTACHMENT H



ATTACHMENT I

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

September 7, 1950

FILE MEMORANDUM

FOUR METALS MINE
Patagonia District
Santa Cruz County, Ariz.

I discussed the subject property with Mr. Vin Perry while in Salt Lake September 1st.

He advised that the diamond drilling of the late twenties was done by Paul Billingsley and a local syndicate headed by a Mr. Jensen and that none of the Anaconda people or their subsidiaries had been able to obtain any information on the results. He volunteered that subsequently Anaconda examined and sampled the property and dropped it as "too low grade".

Of seventy samples cut by their Mr. Beckwith in the Lowermost Tunnel, only three exceeded 1% copper (the highest being 1.47%), and all of which averaged 0.41% Cu. Samples were channeled at 5-foot intervals and, according to Mr. Perry, showed "negligible gold, silver and molybdenum".

LKW:ar

L. KENNETH WILSON

cc: JHCourtright

~~Aa-19.16.6E~~

AUG 16 1950

Mr. Courtright L.K.W.

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

August 16, 1950

FILE MEMORANDUM

CORONADO MINES, INC.
Four Metals Copper
Patagonia District
Santa Cruz County, Ariz.

The Coronado Company has expanded its holdings since our last consideration of this ground, now owns 163 unpatented and contiguous claims divided into five groups: The Red Mountain Copper or old Four Metals Mine, the Buena Vista (Cu), Golden Rose (Au), Washington (W, Mo) and Bennett (Cu). These are grouped approximately five miles air-line south of our Trench Unit.

The Red Mountain deposit, not to be confused with "Red Mountain" east of the Flux Mine, is described in Mr. C. A. Rasor's report of examination May 8, 1948. (This Coronado Company has no relation to the Coronado Zinc Company owned by the Mudd Interests of Los Angeles).

Courtright and I spent the larger part of yesterday with Mr. Milton Leon, principal of the Company who flew here from Tulsa to present his records. Previously, while considering copper possibilities in this general area last May, Courtright suggested that the property be reconsidered and past exploration and development be investigated more fully. Mr. Leon's visit yesterday, therefore, was in answer to our request for any informative data he would wish to send us, and he has now left with us copies of four reports and several maps which show workings, property, and assays by former operators. No logs are available on four or five diamond drill holes drilled by Anaconda in the twenties.

Mr. Courtright will handle this study while in the meantime the Coronado people continue their present work with five men reopening a critical adit — a cave has blocked entry into the lower tunnel where assays indicate a pipe-like mass of from 1 to 2% copper ore. At this elevation the areal distribution of values on old maps suggests to me about 8,000 tons of possible ore per foot of depth. Assuming that Mr. Leon's reports will not change Mr. Courtright's impression that there might be something of interest here for a large-tonnage, low-grade-copper operation, this lower tunnel as well as the others should be examined, check-sampled and geologically mapped.

If the Four Metals or Red Mountain deposit warrants a formal option after this further investigation, then all of the adjoining properties owned by Coronado, listed and shown on the attached Index Map, should be studied in detail to determine if they are to be included or excluded in the option then to be considered.

Mr. Leon appeared unprepared to discuss a firm outline of prospective terms but he did acquiesce to a verbal assurance of exclusive examination privileges until such time as a better expression of terms can be arrived at. I would judge that he will be reasonable as to the length of "free" time I made clear would be necessary for any period of exploration and his Company will not ask for "option payments", he states. However, I am dubious about his implications that Coronado will propose some form of stock exchange in lieu of dollars.

Aa-19.16.6E
August 16, 1950

File Memorandum

In view of the present formal status above described, this property will hereafter appear on our formal lists of properties reported for New York (through Salt Lake) as under consideration.

LKW:ar

L. KENNETH WILSON

enc: Location Map

cc: LHHart
WRLandwehr
FVRichard

ROOS & TOVOTE
Consulting Mining Engineers.

Tucson, Arizona, July 1917.

RED MOUNTAIN COPPER COMPANY

A stock company, capitalized at 5,000,000 shares about 3,000,000 of which are issued, owns the Fou r Metals Mine in the Patagonia Mining District, Santa Cruz County, Arizona. The property comprises 100 claims, all unpatented but a number of which has been surveyed for patent. It is situated about fifteen miles by wagon road in ENE direction from Nogales, Arizona. The road to the property is fair to good and of easy grade. The camp is located at an elevation of less than 5,000 ft., while the top of the mountain in which the mine is opened rises to an altitude of 5,850 ft. The climate is good, neither extremely hot nor extremely cold. Vegetation is scarce and of semidesert character. The water is shallow in this section of the country and usually found within a few feet of the surface, but seems to occur in small disconnected basins. It is liable to be rather mineralic, but good drinking water is found in a number of springs. Outside of scattered development and assessment work on the different claims, most of the work has been concentrated in the Four Metals Mine. Here three main tunnel levels have been driven.

Tunnel Nevel No.1 at the approximate elevation of 5,480' between 600 and 700 ft. of workings.
Tunnel Level No. 2 approximate elevation 5,360'-close to 2,000' of workings.
Tunnel Level No. 3 approximate elevation 5,175'-close to 1,750' of workings.

A total of over 4,000' of tunnel work over a vertical range of 300' or nearly 700 ft. figuring from the top of the mountain. Tunnel No.1 and Tunnel No.2 are connected by a winze, otherwise there is very little vertical work. A winze from Tunnel No. 2, supposed to be about 40' deep, is full of water.

Red Mountain, in which the Four Metals Mine is located, is a prominent landmark. A steep, rugged mountain of bright red color, jutting out from the high mesa, called Guajolote Flats, on which other mines, especially the famous Old Mowry Mine, are located. It rises abruptly to nearly 1,000 ft. above Providencia Canyon, in which the camp is located. The country rock is quartz-monzonite, a rock of granitic texture and mesozoic age into which have been intruded two plugs of rhyolite. The rhyolithe is in all probability the cause and the source of the mineralization. It caused a fracturing and brecciation of the monzonite and introduced metallic and non-metallic solutions, which invaded the monzonite along cracks and fissures and re-cemented the brecciation. The minerals, which were deposited are: Orthoclase, quartz, nephelite, zeolithes, principally stilbite, a very dark green mica, probably neither biotite nor chlorite, pyrite, chalcopyrite and sparingly galena, sphalerite and molybdenite. An abnormal development and probably partly secondary, are irregular dikes made up of a clayey material, compose all together from minite flakes of a silvery mica, probably zinnwaldite in part, and perfect cubes of pyrite. Secondary also is a very heavy development of sulphates, which tends to obscure the surface of the exposed rocks. There are apparently two periods of pyritization, the older pyrite is crushed and fractured and shows distorted crystal planes. The younger is fresh and unfractured. The chalcopyrite was introduced rather late, probably about contemporaneous with the later pyrite. It is very pure chemically and occurs as well in impregnations and seam as in fairly solid bunches. All the pyrite with the possible exception of the secondary cube-pyrite, is cupriferous. The mineralized area contains accessory values in gold, which are claimed to average better than 50¢ per ton.

The mineralized zone or ore body has been proven 300 ft. long by 250 ft. wide in the lowest tunnel, without showing signs of terminating in all but one direction. In tunnel,No. 2, it is exposed for more than 600 ft.

in length and over 300 ft. in width, but not uniformly mineralized. Tunnel No. 1 adds several hundred feet more to the probable length and to dudge from surface indications, the total striking length will ultimately be over 2,000 ft. with a possible width of from 300 ft. to 1200 ft. The grade of the ore is very low. As average for Tunnel No. 2 is claimed 1.65% Cu. for Tunnel No.3 only 1.00%. This latter, I believe, to be too low and it certainly could be raised by eliminating too low grade blocks. Groove sampling is a very doubtful way for determining the grade of ore in a deposit of this kind, where the rock is extremely tough and hard and the metallic mineralization very irregular. There are several thousand tons of ore on the dump, which would afford a far more reliable way of ascertaining the average grade than any hand sampling possibly could. With an established grade of 1.25% Cu. average and the accessory values in gold I would consider the property workable, especially because steam shovel operation appears to be within the range of possibility, It is decidedly worth further testing, if feasable rather by drilling than by further underground work. Still there remains a chance for an economic tunnel site about 250 ft. below tunnel No. 3.

The lowest possible estimate for probable ore at present is 1,000,000 tons, the highest 5,000,000 tons. The ultimate possible tonnage is absolutely beyond estimate, as the horizontal as well as the veritcal possibilities are practically unlimited. My idea is that a tonnage of 20,000,000 tons could be very easily established by drilling.

The deposit is of the "Rhyolithic" porphyry type, very similar to the porphyry coppers, except that the ore is strictly primary and not confined to any definite horizon. In fact I consider the possibility of higher grade with increasing depth extremely favorable, if a possible slight secondary enrichment at the bottom of the oxidized horizon is eliminated from comparison. Nacozari is the only similar mine that I know in the Southwest. Here of course the grade is much higher. Since the Four Metals is prospected only

for a very limited part of its possible extent, the chances are good that higher grade ore will be found, which would help to raise the ultimate average grade. The ore should be splendidly adapted to concentration by flotation on account of its character as straight primary sulphide. A very high extraction as well as a high ratio of concentration should be easily feasable. In short the property inspite of its low grade has many features which should decidedly encourage further investigation.

Yours truly,

(Signed) W. TOVOTE.

C o p y.