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04/11/89

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: GLADSTONE MINE GROUP

ALTERNATE NAMES:

INDEPENDENCE
THESSALIA
EUREKA
ARIZONA
RAY
ATHENS

SANTA CRUZ COUNTY MILS NUMBER: 5

LOCATION: TOWNSHIP 23 S RANGE 16 E SECTION 30 QUARTER W2
LATITUDE: N 31DEG 23MIN 53SEC LONGITUDE: W 110DEG 45MIN 03SEC
TOPO MAP NAME: CUMERO CANYON - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:

COPPER
SILVER
GOLD
LEAD
ZINC

BIBLIOGRAPHY:

ADMMR GLADSTONE MINE GROUP FILE
USBM FIELD NOTES
LENON'S MAP, SANTA CRUZ CO. - RBT LENON 1962
AZBM, 1927-29, HIST. MNG IN AZ, P. 313
AZBM BULL 191, "INDEX OF MNG PROP. IN SANTA
CRUZ CO.", P 80
USGS BULL 582, P. 316

COMBIOR USA, INC. NO. 27387

ROCK: Date: 3/13/92

SOIL: State: AZ

SED.: County: Banta Cruz

Project: 304 - 4 metals

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
S _____ W _____

Quad: _____ Scale _____

RX: Dump/Tailings Outcrop/Float Fresh/Weathered

Outcrop Location: _____

_____ NO. _____

Sample Description: _____ Rock Type: GMP

Rock Mod: _____ Mineral: _____

Oxides: Lin Alteration: sil, ser, chl

Structure: bx Spl. Width: 20

became along with plan
↑
↑ (sub-AW)

↓ CS, ↑ ser, ↓ chl

Px stringer w/ wc: chalcite (white) (MATRIX)

Fe oxides → hematite

Cpx (rare)

Px disseminated in clast.

Clasts

↳ ser ← feldspar

(clean) (comp. sil) mineral

White pyrite rims associated with w/ malenite

dissolved w/ ligand, < 4 hard

COMBIOR USA, INC. NO. 27388

ROCK: Date: 3/4/92
SOIL: State: AZ
SED.: County: Santa Cruz
Project: 303-4 metal

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
S W

Quad: _____ Scale _____

RX: Dump/Tailings Outcrop Float Fresh/Weathered

Outcrop Location: _____

_____ NO. _____

Sample Description: _____ Rock Type: Q MPC?

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: _____

Same as prev.
last 10' ~~to~~ 30'
larger (boulder size)
~~1m~~ ↑ clast supported
↑ chl out w/ see (Phy. alt)

COMBIOR USA, INC. NO. 27389

ROCK: Date: 3/14/92
 SOIL: State: Az
 SED.: County: Santa Cruz
 Project: 204 - A metals

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
 S _____ W

Quad: _____ Scale _____

RX: Dump/Tailings Outcrop Fresh/
 Float Weathered

Outcrop Location: _____

_____ NO. _____

Sample Description: _____ Rock Type: QMP(?)

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: _____

*mostly
 chert*

2 boxes
1 Py in matrix along left/W
chert
Crystalline Chalcocite
to Cpy

CAMBIOR USA, INC. NO. 27390

ROCK: Date: 3/4/92

SOIL: State: Az

SED.: County: Santa Cruz

Project: 3024 - 4 meters

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
S W

Quad: _____ Scale _____

RX: Dump/Tailings ~~Outcrop~~ Float Fresh/Weathered

Outcrop Location: _____

_____ NO. _____

Sample Description: _____ Rock Type: _____

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: _____

1 matrix support w/ Py
Diverse Py, Py dominated in last
Co Oxides rare
Trs CPY

COMBIOR USA, INC. NO. 27391

ROCK: Date: 3/19/92
SOIL: State: Az
SED.: County: Santa Cruz
Project: 304 - 4 Metals

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
S W

Quad: _____ Scale _____

RX: Dump/Tailings Outcrop/Float Fresh/Weathered

Outcrop Location: _____

_____ NO. _____

Sample Description: _____ Rock Type: _____

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: _____

↓ Py
Vuggy gtz (subhedral)
dk - mod Ag
larger clast sizes
CO₂
white clay-like mineral.

COMBIOR USA, INC. NO. 27392

ROCK: Date: 3/14/92
SOIL: State: Az
SED.: County: Santa Cruz
Project: ~~304~~ 4 metals

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
S W

Quad: _____ Scale _____

RX: Dump/Tailings Outcrop Float Fresh/Weathered

Outcrop Location: _____

_____ NO. _____

Sample Description: _____ Rock Type: _____

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: _____

↓ last size

Same as prev

↑ in white powdery mineral

Chalcoacite present with white powdery mineral.

Py arsenate

8) matrix
& ~~tailings~~

CAMBIOR USA, INC. NO. 27393

ROCK: Date: 3/17/92
SOIL: State: Az
SED.: County: Santa Cruz
Project: 309-4 metals

DRILL HOLE NO. _____ FROM _____ TO _____
Loc.: T _____ N; R _____ E; _____ 1/4; S _____
S _____ W _____
Quad: _____ Scale _____

RX: Dump/Tailings Outcrop/Float Fresh/Weathered

Outcrop Location: _____
_____ NO. _____

Sample Description: _____ Rock Type: _____

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: _____

Same as prev., ↓ chlc w/ chert
Vuggy Qtz (rare)
Py pseudomorphs
↑ chalcocite w/ white precip.
Select areas Hematite
crystalline chalcocite

These along a series of pits dipping
toward postcard.

CAMBIOR USA, INC. NO. 27394

ROCK: Date: 3/19/92SOIL: State: AZSED.: County: Santa CruzProject: 303 - 4 Pitfalls

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
S W

Quad: _____ Scale _____

RX:

Dump/
TailingsOutcrop
FloatFresh/
Weathered

Outcrop Location: _____

NO. _____

Sample Description: _____ Rock Type: _____

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: _____

Semi crs 27393gtz assoc w matrixPx (Anni - euhedral) ↑Chalcoite w/ white precip. last bandyHem oxides

COMBIOR USA, INC. NO. 27395

ROCK:

Date: 3/14/92

SOIL:

State: AZ

SED.:

County: Santa Cruz

Project: 304 - 4 Metals

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
S W

Quad: _____ Scale _____

RX:

Dump/
Tailings

Outcrop/
Float

Fresh/
Weathered

Outcrop Location: _____

_____ NO. _____

Sample Description: _____ Rock Type: _____

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: _____

Same as prev.

Qtz (?)

↑ cov

to Qpy

Chert size (x cable size)

COMBIOR USA, INC. NO. 27396

ROCK: Date: 3/14/92

SOIL: State: AZ

SED.: County: Santa Cruz

Project: 309-4 metal

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
S W

Quad: _____ Scale _____

RX: Dump/Tailings Outcrop/Float Fresh/Weathered

Outcrop Location: _____

_____ NO. _____

Sample Description: _____ Rock Type: _____

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: _____

Same as prev

↑ dust size

↑ ni Py

Hem pods

0cp

CAMBIOR USA, INC. NO. 27397

ROCK: Date: 3/14/92
SOIL: State: AZ
SED.: County: Santa Cruz
Project: 304 4 Metals

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
S W

Quad: _____ Scale _____

RX: Dump/Tailings Outcrop Fresh/Weathered
Float

Outcrop Location: _____
_____ NO. _____

Sample Description: _____ Rock Type: _____

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: _____

Same as prev.
↑ Py content
↑ Cobs
↑ white precip.
Asbestos
Hexammine rods

CAMBIOR USA, INC. NO. 27398

ROCK: Date: 3/14/92
SOIL: State: AZ
SED.: County: Santa Cruz
Project: 304-4 Pitfalls

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
S W

Quad: _____ Scale _____

RX: Dump/Tailings Outcrop Fresh/Weathered
Float

Outcrop Location: _____

_____ NO. _____

Sample Description: _____ Rock Type: _____

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: Si

Structure: _____ Spl. Width: _____

Same as 27396
COx in vugs w/ Hem pods
qtz in (subhedral) assoc w/
white precip, Py in COx (matrix)
Chalcanite along frag. boundaries
Py also occurs as stringer in NS.

COMBIOR USA, INC. NO. 27399

ROCK: Date: 3/19/92
 SOIL: State: AZ
 SED.: County: Santa Cruz
 Project: 303-4 metal

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
 S _____ W _____

Quad: _____ Scale _____

RX: Dump/Tailings Outcrop/Float Fresh/Weathered

Outcrop Location: _____

_____ NO. _____

Sample Description: _____ Rock Type: _____

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: _____

Similar to 27356

↑ pyrite

↑ chalcocite ore w/ white precip?

Py

Massive pods

h. Azurite

CAMBIOR USA, INC. NO. 27400

ROCK: Date: 3/14/92

SOIL: State: AZ

SED.: County: Santa Cruz

Project: 304 - 4 metals

DRILL HOLE NO. _____ FROM _____ TO _____

Loc: T _____ N; R _____ E; _____ 1/4; S _____
S W

Quad: _____ Scale _____

RX: Dump/Tailings Outcrop/Float Fresh/Weathered

Outcrop Location: cloned sample 20'
in 5260 level NO. _____

Sample Description: _____ Rock Type: G.D.

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: Ser, S1

Structure: _____ Spl. Width: _____

CoDs, Chalcocite & Chalcocyanide
approx. (?) (white yellow precip)
white bot. occurs as precip
metals (?) glob → Silver ^{bricks color} streaks
Py disseminated throughout: vml
P1
Permissive. ser
select system areas
Sta. Lm/Hm (permissible) minerals

(Bist)

COMBIOR USA, INC. NO. 27401

ROCK: Date: 3/15/92
 SOIL: State: Az
 SED.: County: Santa Cruz
 Project: 304-4 metals

DRILL HOLE NO. _____ FROM _____ TO _____
 Loc.: T _____ N; R _____ E; _____ 1/4; S _____
 Quad: _____ W _____ Scale _____

RX: Dump/Tailings Outcrop/Float Fresh/Weathered

Outcrop Location: _____
 _____ NO. _____

Sample Description: _____ Rock Type: GD B

Rock Mod: D (?) Mineral: _____

Oxides: Lim Alteration: chd, Ser, wls, Sil

Structure: bx (?) Spl. Width: 20'

Perhaps chert supported bx
 Permissibly St Sil & siliceous
 sm via grey halon
 Disseminated ~~of~~ sulfides
 by stringers
 Sto Lim exposed areas: ✓
 Az \rightarrow chalcophite(?) chalc. Chrysocolla
white bot. precip.
 Select areas of chd ~~at~~

COMBIOR USA, INC. NO. 27402

ROCK: Date: 3/13/52
 SOIL: State: Az
 SED.: County: Santa Cruz
 Project: 304-4 Metals

DRILL HOLE NO. _____ FROM _____ TO _____
 Loc.: T _____ N; R _____ E; _____ 1/4; S _____
 S W
 Quad: _____ Scale _____

RX: Dump/Tailings Outcrop/Float Fresh/Weathered

Outcrop Location: _____
 _____ NO. _____

Sample Description: _____ Rock Type: SAME as spec
 Rock Mod: _____ Mineral: _____
 Oxides: _____ Alteration: _____
 Structure: _____ Spl. Width: _____

↓ See, & sil, & ble
 1/2 in mineral
 Chalcantite, Chrysocolla
 ↑ in Azurite, ~~Malachite~~, CuOx, white bot
 gypsum.
 Chalcocite "pods"
 Select area of almost pure 1/2 in

CAMBIOR USA, INC. NO. 27403

ROCK: Date: 3/13/92
 SOIL: State: Az
 SED.: County: Santa Cruz
 Project: 264-1A 100

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
 S _____ W _____

Quad: _____ Scale _____

RX: Dump/Tailings Outcrop/Float Fresh/Weathered

Outcrop Location: _____

_____ NO. _____

Sample Description: _____ Rock Type: same as prev

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: 20

Serpentine ^{dry} @ large strand

↑ Py subhedral < 15um

↑ Py oxidation ^{dry} mapped strand

↑ chlorite

↓ Chalcocite & Chrysocolla

↓ Azurite malachite

↑ ^{dry} phyllic ^{phyllic} ~~propylitic~~ ^{phyllic}

select frag v2 d11

gd seems to alt to a black soil

a few small bix.

lim along pit in

COMBIOR USA, INC. NO. 27404

ROCK: Date: 3/15/92

SOIL: State: AZ

SED.: County: Santa Cruz

Project: 3034 - 4 mts

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
S _____ W _____

Quad: _____ Scale _____

RX: Dump/Tailings Outcrop Float Fresh/Weathered

Outcrop Location: _____

_____ NO. _____

Sample Description: _____ Rock Type: gd bx

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: 20

↓ ~~last size~~ ~~Handwritten description~~
mostly pebble size - calc.

Sample shows ser/ccl w/ small bris (LAs)
white sugary precip common along
in last boundaries

border size
a possible mafic ~~is~~ is present

Rock shows py druse; desiminicled

bcw → mst ch

C/MBIOR USA, INC. NO. 27405

ROCK: Date: 3/13/92
SOIL: State: Az
SED: County: Santa Cruz
Project: 304 4 M²

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
S W

Quad: _____ Scale _____

RX: Dump/
Tailings Outcrop/
Float Fresh/
Weathered

Outcrop Location: _____

_____ NO. _____

Sample Description: _____ Rock Type: _____

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: _____

Same as prev.
occasional boulder size gal pieces
siliceous white precip occasional
has a bitter salty taste.

Py VN

COOx

Low amount of sulfide

C/MBIOR USA, INC. NO. 27406

ROCK: Date: 3/14/92

SOIL: State: AZ

SED.: County: Santa Cruz

Project: 30A-4A's

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
S W

Quad: _____ Scale _____

RX: Dump/Tailings Outcrop/Float Fresh/Weathered

Outcrop Location: _____

_____ NO. _____

Sample Description: _____ Rock Type: _____

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: _____

Semilocks prev.

↑ on

↑ sulfide primarily Py VN

↑

COMBIOR USA, INC. NO. 27407

ROCK: Date: 3/15/82

SOIL: State: WV

SED.: County: Putnam County

Project: 304 - A.M.D.

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
S _____ W _____

Quad: _____ Scale _____

RX: Dump/Tailings Outcrop/Float Fresh/Weathered

Outcrop Location: _____

_____ NO. _____

Sample Description: _____ Rock Type: _____

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: _____

3 brownish pin - medium grained

G.P. sugary texture

most

bio → chl l m

sh. ser

Sulfidation ^{common} stringers; disseminated.

mainly Py w/ some Gpy

Sil(?)

Sugary white precip common

along cleat boundaries, w/ 1/2 flt.

Siderite spines in red chert "pseudos"

*COOX
rare
fracture
post-epate
L in mass
w/ outflow
ox*

COMBIOR USA, INC. NO. 27408

ROCK: Date: 3/13/92
 SOIL: State: 12
 SED.: County: Santa Cruz
 Project: 30A 4M/2

DRILL HOLE NO. _____ FROM _____ TO _____

Loc.: T _____ N; R _____ E; _____ 1/4; S _____
 S W

Quad: _____ Scale _____

RX: Dump/Tailings Outcrop/Float Fresh/Weathered

Outcrop Location: _____

_____ NO. _____

Sample Description: _____ Rock Type: _____

Rock Mod: _____ Mineral: _____

Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: _____

Some on pres.
Occasional ~~stained~~ ^{conspicuous} - grained clast
apparent ↓ Coy
↑ pyroxen fibers
↑ Crn, ~~some~~ fine Hem.
White → white-yellowish tint → white-greenish tint
bot precip hardness < 3.

CAMBIOR USA, INC. NO. 27409

ROCK: Date: 3/15/82
 SOIL: State: AZ
 SED.: County: Santa Cruz
 Project: 304 - 4 M.S.

DRILL HOLE NO. _____ FROM _____ TO _____
 Loc.: T _____ N; R _____ E; _____ ¼; S _____
 S W
 Quad: _____ Scale _____

RX: Dump/Tailings Outcrop/Float Fresh/Weathered

Outcrop Location: _____
 _____ NO. _____

Sample Description: _____ Rock Type: _____
 Rock Mod: _____ Mineral: _____
 Oxides: _____ Alteration: _____
 Structure: _____ Spl. Width: _____

Similar to prev.
talc (?) ~~the mineral~~ assoc. w/ major
chert N41°E
↑ Py → euhedral cube ↑ 8mm
greenish white bot. precip
↳ ½ cm py in
Cu Ox

cut

↖ Star Lm/cree pod in footwall of flt
Star Py's indication of host rx
Azurite in Hanging wall (?)

COMBIOR USA, INC. NO. 27410

ROCK: Date: 3/15/52
 SOIL: State: Az
 SED.: County: Santa Cruz
 Project: 309 - AMO

DRILL HOLE NO. _____ FROM _____ TO _____
 Loc.: T _____ N; R _____ E; _____ 1/4; S _____
 S _____ W _____
 Quad: _____ Scale _____

RX: Dump/Tailings Outcrop/Float Fresh/Weathered

Outcrop Location: _____
 _____ NO. _____

Sample Description: _____ Rock Type: _____
 Rock Mod: _____ Mineral: _____
 Oxides: _____ Alteration: _____

Structure: _____ Spl. Width: _____

*assist
w/ alt
lower zone?*

(caption of alt dia.)
 Two ~~green~~ zone
 The upper zone is chalcocite
 similar to 407
 ↑ gypsum, ↓ Py (sulf. de), ↓ Lin
 Rox shows a greyish ^(orange) olive green (clay) alt
 as defined 407
 ↓ orange green clay alt.

Lower zone
 Upper zone as 407
 Lower

CAMBIOR USA, INC. NO. 27411

ROCK: Date: 3/13/92
SOIL: State: 42
SED.: County: DeWitt County
Project: 303A - 4 miles

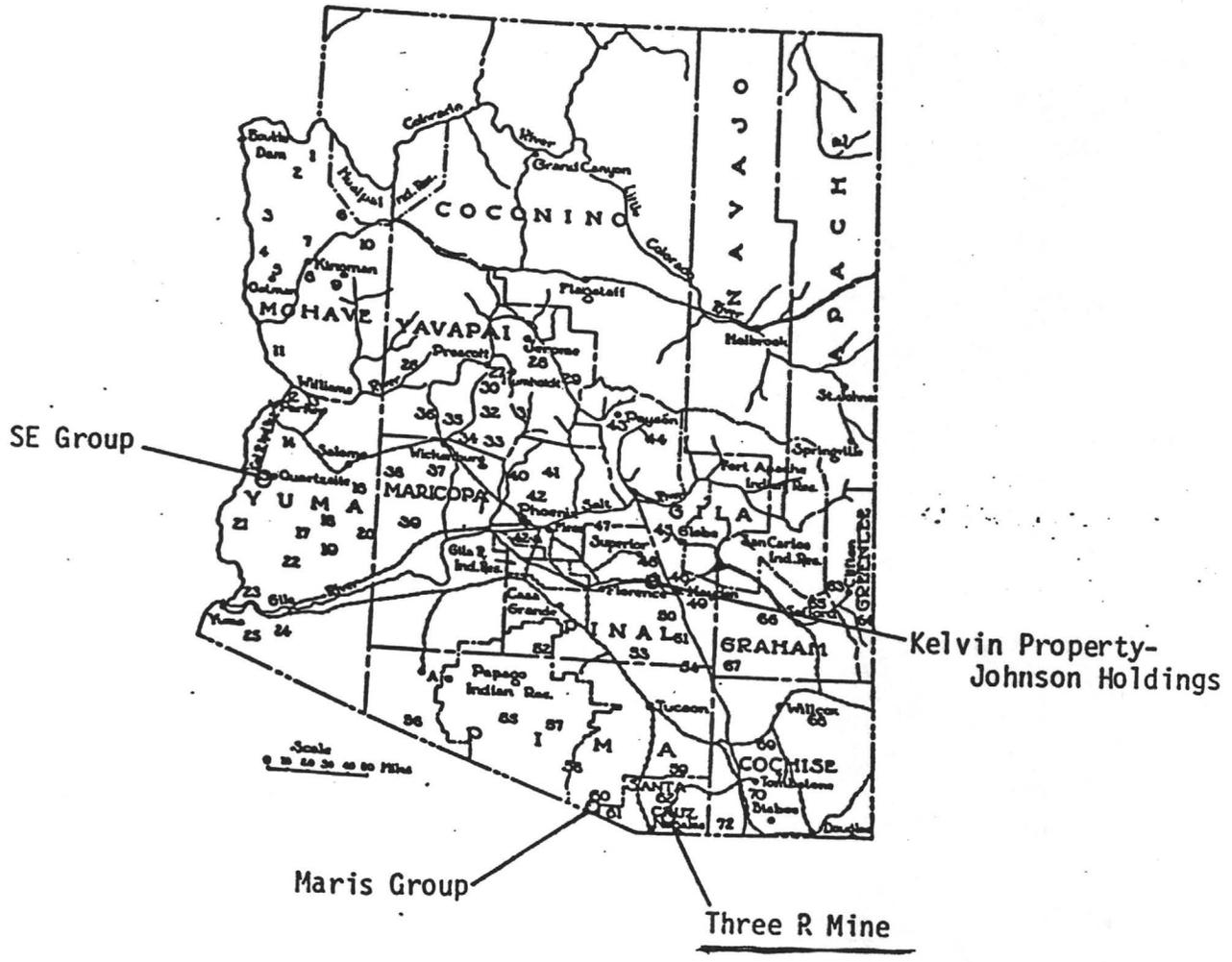
DRILL HOLE NO. _____ FROM _____ TO _____
Loc.: T _____ N; R _____ E; _____ 1/4; S _____
S W
Quad: _____ Scale _____

RX: Dump/Tailings Outcrop/Float Fresh/Weathered

Outcrop Location: _____
_____ NO. _____

Sample Description: _____ Rock Type: _____
Rock Mod: _____ Mineral: _____
Oxides: _____ Alteration: fill
Structure: _____ Spl. Width: _____

Some in prev. lower rx
Sugary white precip
lim present in box voids



Wombat (?)

LOCATION MAP OF ARIZONA PROPERTIES

THREE R MINE DATA OUTLINE

LOCATION

Palmetto-Harshaw Mining District, T 22 & 23 S,
R 15 & 16 E, Santa Cruz County, Arizona.

PROPERTY

21 patented and 11 unpatented claims in a solid,
contiguous block. Approx. 4800' to 6000'
elevation in rugged terrain.

OWNERSHIP

Owned by two family groups, one represented by
Thomas L. Hall of Tucson and the other by Jack
C. Pierce of Prescott.

HISTORY

See USGS Bulletin 582 by Frank C. Schrader (1915).
Updates in Pierce memos attached.

GEOLOGY AND PRODUCTION

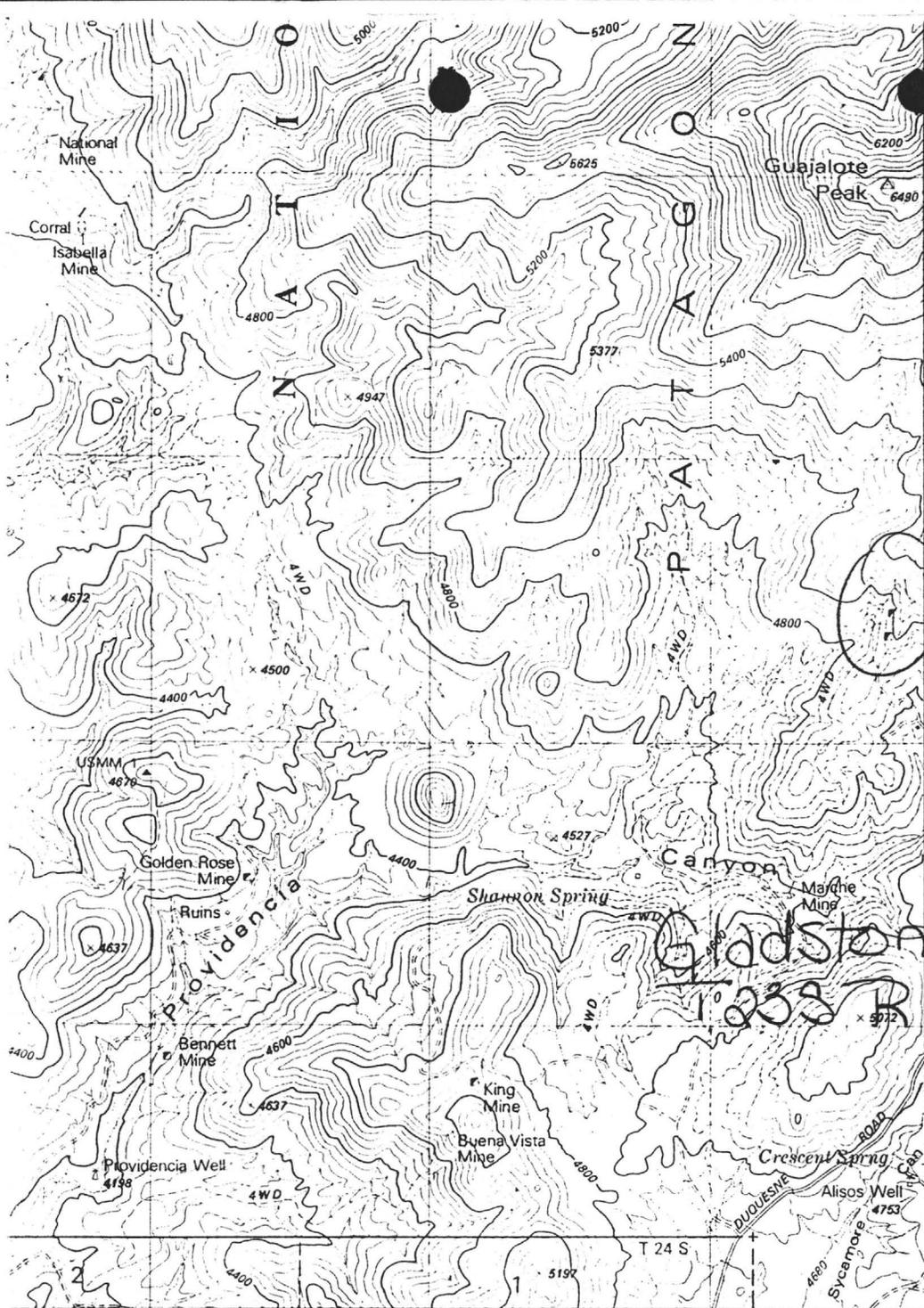
USGS Bulletin 582 1915
ABM Bulletin No. 140 1936
ABM Bulletin No. 191 1975

EXPLORATION

UofA Master Thesis 1963 Paul A. Handverger
Magma Copper Company 1920 10 holes--data
available.
Consolidated Coppermines 1951-53 5 holes
no data in hand
Anaconda-Asarco drilling 1963-81 Brief data
attached. Additional data available.

IN-PLACE LEACHING

Proposal summary 1979 Mention in Pierce memos.

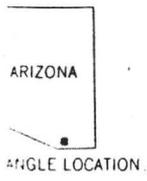


Gladstone Mine Group
 T 23S R 16E Sec. 30 W2

521 522 INTERIOR—GEOLOGICAL SURVEY RESTON, VIRGINIA—1981 523000mE 31°22'30" 110°45'

ROAD CLASSIFICATION

- Primary highway, hard surface
- Secondary highway, hard surface
- Light-duty road, hard or improved surface
- Unimproved road
- Interstate Route
- U. S. Route
- State Route



CUMERO CANYON, ARIZ.

NE/4 NOGALES 15' QUADRANGLE
 N3122.5—W11045/7.5

From
 WIDE WORLD OF MAPS, INC.
 ARIZ. MAP SHOP & GALLERY
 Phoenix, Arizona

1981

DMA 3846 IV NE—SERIES V898

(DUQUESNE)
 3846 / SW

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

VERBAL INFORMATION SUMMARY

1. Information from: Madeline Minchin

Company:

Address: 1118 W. Coronado Road

Phoenix, Arizona 85007

2. Phone: 252-0317

3. Mine:

4. ADMMR Mine File: GLADSTONE MINE GROUP

5. County: Santa Cruz, MILS #5

6. Summary of information received, comments, etc.:

Mrs. Minchin was in to discuss a lease agreement on her patented Arizona and Athens claims in W1/2 Sec. 30, T23S R16E with International Dorado Resources (c), 802-625 Howe Street, Suite 820, Vancouver, BC V6C 2T6. International Dorado proposes to lease the patents from her for 10 years at \$5,000 annual minimum royalty with a 5% net smelter after the \$5,000. Carl Wuest (c) Dekon Corp. (c) is handling the negotiations for International Dorado. He was found actively doing exploration work on the property by the owner without a lease or permission. A copy of the "Memorandum of Mining Lease Agreement" was provided for our file. She had previously had the property leased to Four Corners Resources (c) who she reported to now be defunct. Before that it was leased to Phelps Dodge Corporation.

Date: December 27, 1988

Ken A. Phillips, Chief Engineer

GLADSTONE MINE

SANTA CRUZ COUNTY

Noble & Rucknick, John Stone, geologist, 6919 Mesa Grande, Tucson. An exploration project for client (old Gladstone Mine owner) J. W. Forsythe. 4 holes 200'-500'.

Note GWI 11/16/65

MEMORANDUM OF MINING LEASE AGREEMENT

Under the terms of that certain MINING LEASE AGREEMENT dated effective as of the _____ day of _____, 1988, by and between MADELINE MINCHIN, a widow designated as "OWNER" and INTERNATIONAL DORADO RESOURCES, Ltd., designated as "LESSEE"; OWNER has leased and let to LESSEE the following described real property:

The Arizona and Athens patented lode mining claims of United States Mineral Survey 4526, situated in Section 30, T. 23 S., R. 16 E., G. & S.R.M. (unsurveyed), Santa Cruz County, Arizona, all as more particularly described in the United States Patent No. 02-63-0156, a copy of which is of record in the office of the Recorder of Santa Cruz County, Arizona and the description in which Patent is by this reference incorporated herein and made a part hereof;

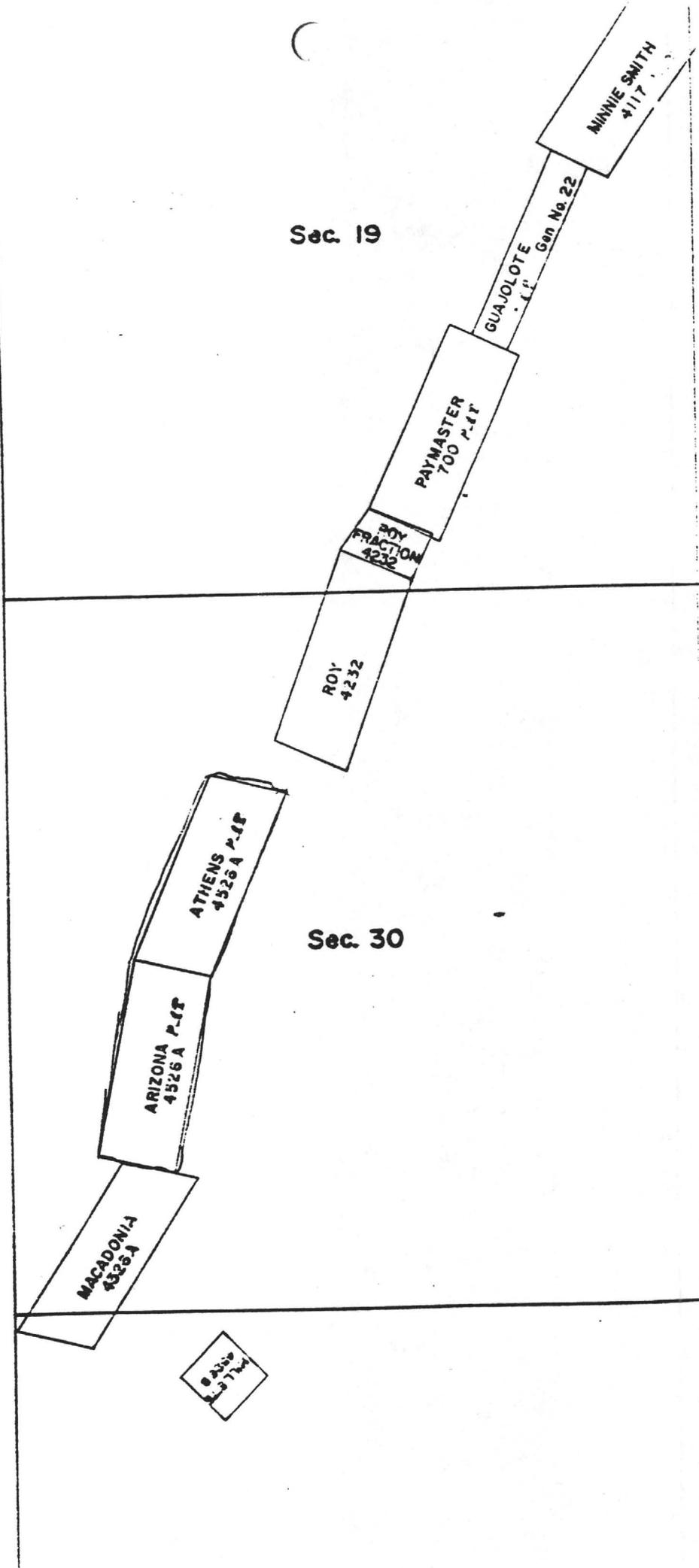
(which patented lode mining claims are hereinafter referred to as the "Leased Premises;") pursuant to which LESSEE shall have the exclusive right to explore, develop, remove and sell "Leased Substances" from the Leased Premises.

Unless sooner terminated the term of this Agreement shall be for a period of ten (10) years from the effective date herof, with the right to renew this Agreement for an additional period of ten (10) years.

Right of First Refusal. If, at any time during the term hereof, OWNER intends to sell, assign, transfer or convey the interest retained in the Leased Premises under this Agreement, OWNER shall deliver to LESSEE at least thirty (30) days' prior written notice, describing all of the terms of the proposed sale, assignment, transfer, or conveyance. LESSEE shall have the exclusive right during the above thirty (30) day period, at its election, to purchase the interest described in said notice, for a sum of money equal in value to the consideration which would be received by OWNER under the terms set forth in the written notice. If LESSEE elects to purchase the interest described in the notice, LESSEE shall so notify OWNER within the thirty (30) day period. OWNER shall have the right during the next succeeding thirty (30) day period to sell, assign, transfer or convey the interest as described in said notice, but all subject to this Agreement. Upon expiration of the above-described second thirty (30) day period, any subsequent sale, assignment, transfer or conveyance of any of OWNER's retained interest in the Leased Premises shall be subject to LESSEE's foregoing right of first refusal, all upon the terms and conditions set forth above.

IN WITNESS WHEREOF, this MINING LEASE AGREEMENT has been executed as of the date first above written.

From
BLM Mining District
Sheet # 725
SW 1/4, T. 23S., R. 16E



* GENERAL REFERENCES

- REFERENCE 1 F1 <USBM - ARGMT ()DUCTION DATA, GLADSTONE - PROTO MINE GROUP>
- REFERENCE 2 F2 <ADMR FILE DATA, GLADSTONE (PROTO, INDEPENDENCE) MINE>
- REFERENCE 3 F3 <USBM - FILE DATA, CLUSTER #22, GLADSTONE MINE GROUP>
- REFERENCE 4 F4 <ARGMT CLIPPINGS FILE DATA, GLADSTONE MINE>

L110 < W.W. TODD, F.O. BOSTWICK, TODD AND BOSTWICK, HUGO MILLER, HANNA MINING CO. (1966), INDEPENDENT MINING AND MILLING CO., MICHELS, PROTO BROTHERS, R.C. BLABON; PROTO AND GLADSTONE PROPERTIES WERE MERGED IN 1930, FORMING TOTAL OF 10 UNPATENTED CLAIMS >

M110 < BODIES ALSO LOCATED ON PROPERTY. 2 OF THE 3 ORE BODIES ARE 160 FT DEEP, 110 FT WIDE AND AVERAGE 20 INCHES THICK OF 12% Cu. GLADSTONE AND PROTO MINE GROUPS COVER CENTRAL 16000 FT OF 5-MILE LONG FISSURE SYSTEM, WITH KNOWN EXTENT FROM BUENA VISTA GROUP ON SOUTH TO MORNING GLORY MINE ON NORTH >

- K5 < DEPOSITS FORM LENTICULAR SHOOTS WITHIN VEIN >
- N15 < IN FISSURES, JOINTS, SHEETING PLANES, AND OTHER FRACTURES IN QUARTZ MONZONITE AND DIORITE >
- N16 < DEPOSITS, DOWNTHROW TO E >
- N70 < VEIN SYSTEM; MINERALIZATION OCCURRED MAINLY IN DIORITE >
- N75 < AND CRUSHED >
- N80 < INTRUSION OF PORPHYRITIC GRANDDIORITE >
- N85 < TEST GRANDDIORITE; ABOVE DESCRIBES GLADSTONE MINE >
- D10 < PRODUCTION DATA INCLUDED IN GLADSTONE - PROTO MINE GROUP >

- F5 < SCHRADER, F.C., 1915, USGS BULL. 582, p. 316 >
- F6 < SIMONS, FRANK'S, 1974 GEOLOGIC MAP AND SECTIONS OF THE NOGALES AND LOCHIEL, QUADRANGLES SANTA CRUZ COUNTY, ARIZONA; USGS MAP I-762 (1:48000) >
- F7 < KEITH, STANTON B., 1975 INDEX OF MINING PROPERTIES IN SANTA CRUZ COUNTY, ARIZONA; ARIZONA BUREAU OF MINES BULLETIN 191, p. 80 >
- F8 < ARGMT FILES, STANTON B. KEITH >
- F9 < TENNEY, JAMES B., 1927-1929, HISTORY OF MINING IN ARIZONA; ARIZONA BUREAU OF MINES, p. 313 >

U.S. CRIB-SITE FORM

RECORD IDENTIFICATION

RECORD NUMBER B10 < 92103 > RECORD TYPE B20 < X.I.M. > DEPOSIT NUMBER B40 < >

REPORT DATE G1 < 92103 > INFORMATION SOURCE B30 < 1.2 > FILE LINK IDENT. B50 < USBM-0040230198 >

REPORTER (SUPERVISOR) G2 < LARABA PETER (CALDER, SUSAN) >

REPORTER AFFILIATION G4 < ARGMT > SITE NAME A10 < GLADSTONE MINE GROUP >

SYNONYMS A11 < INDEPENDENCE, THESSALIA, EUREKA, ARIZONA CLAIM, RAY, GLADSTONE - PROTO GROUP, PROTO MINE >

LOCATION

MINING DISTRICT/AREA A30 < PATAGONIA DISTRICT > STATE A80 < A.Z. > COUNTRY A40 < U.S. >

COUNTY A60 < SANTA CRUZ >

TOPOGRAPHIC PROV A63 < 1.2.V. >

RAINAGE AREA A62 < 1.S.O.S.O.3.O.1.V. LOWER COLORADO > LAND STATUS A64 < 4.1.V. (1979) >

QUADRANGLE NAME A90 < NOGALES, ARIZ. (1958) > QUADRANGLE SCALE A100 < 62500 >

COND QUAD NAME A92 < LOCHIEL (1958) > SECOND QUAD SCALE A91 < 62500 >

ELEVATION A107 < 5350 FEET >

ITM ACCURACY GEODETIC

ORTHING A120 < 3473559 > ACCURATE ACC (circle) ESTIMATED EST < > LATITUDE A70 < 31-23-53N >

ASTING A130 < 523688 > LONGITUDE A80 < 110-45-03W >

ZONE NUMBER A110 < 12 >

ADASTRAL OWNERSHIP(S) A77 < 0235... > RANGE(S) A78 < 016E... >

SECTION(S) A79 < 30 >

SECTION FRACTION(S) A76 < C OF W 1/2 >

MERIDIAN(S) A81 < GILA AND SALT RIVER >

POSITION FROM NEAREST PROMINENT LOCALITY A82 < 6 MILES EAST OF NOGALES INTERNATIONAL AIRPORT >

LOCATION COMMENTS A83 < 4.0 MILES NW OF WASHINGTON CAMP; NORTH SIDE OF PROVIDENCIA CANYON 1.0 MILE WEST OF FOUR METALS MINE; GROUP OF 3 PROSPECTS LOCATED ON USGS MAP; PROTO MINE LOCATED LESS THAN 1/4 MILE TO NE OF GLADSTONE MINE >

ESSENTIAL INFORMATION ESSENTIAL SOMETIMES OR HIGHLY RECOMMENDED

COMMODITY INFORMATION

COMMODITIES PRESENT C10 Cu, Ag, Pb, Zn, Fe
 ORE MINERALS C30 GALENA, SPHALERITE, CHALCOPYRITE
 COMMODITY SUBTYPES C41
 GEN. ANALYTICAL DATA C43 ORE VALUES AVERAGED 2% Cu, 3 OZ./TON Ag, 0.1 OZ./TON Au, MINOR Pb
 COM. INFO. COMMENTS C60

* SIGNIFICANCE

MAJOR PRODUCTS MAJOR Cu, Ag, Au
 MINOR PRODUCTS MINOR Pb, Zn
 POTENTIAL PRODUCTS POTEN
 OCCURRENCES OCCUR

NON-PRODUCER
 MAIN COMMODITIES PRESENT C11
 MINOR COMMODITIES PRESENT C12
 OCCURRENCES OCCUR

* PRODUCTION

PRODUCTION (circle) PRODUCTION SIZE MED LGE (circle one)
 NON-PRODUCER PRODUCTION UND NO (circle one)

* STATUS

EXPLORATION OR DEVELOPMENT

PRODUCER STATUS AND ACTIVITY A30 4
 NON-PRODUCER STATUS AND ACTIVITY A30 4

DISCOVERER L20 ANTONE PROTO; GLADSTONE
 YEAR OF DISCOVERY L10 1888 NATURE OF DISCOVERY L30 B YEAR OF FIRST PRODUCTION L40 1916 YEAR OF LAST PRODUCTION L45 1951
 PRESENT/LAST OWNER A12 J.W. FORBETH (1966)
 PRESENT/LAST OPERATOR A13 HANNA MINING CO. (1966)
 EXPL./DEV. COMMENTS L110 UNPATENTED CLAIMS; OWNERS AND OPERATORS INCLUDED SMITH AND FULTON (1926-1950), RAYMOND AND SULLIVAN, HOLLAND AND DRISCOLL, TODD AND J.N. MOON,

DESCRIPTION OF DEPOSIT

DEPOSIT TYPE(S) C40 VEIN/SHEAR ZONE
 DEPOSIT FORM/SHAPE M10 TABULAR
 DEPTH TO TOP M20 UNITS M21 MAXIMUM LENGTH M40 5 UNITS M41 MILES
 DEPTH TO BOTTOM M30 160 UNITS M31 FT MAXIMUM WIDTH M50 3 UNITS M51 FT
 DEPOSIT SIZE M15 SMALL M16 MEDIUM M16 LARGE (circle one) MAXIMUM THICKNESS M60 UNITS M61
 STRIKE M70 N-S DIP M80
 DIRECTION OF PLUNGE M100 PLUNGE M90
 DEP. DESC. COMMENTS M110 IRREGULAR VEIN-LIKE MINERALIZATION OF CHALCOPYRITE AND OXIDIZED COPPER MINERALS; AVERAGE VEIN WIDTH RANGES FROM 1-18 INCHES; 3 CONTINUOUS ORE

DESCRIPTION OF WORKINGS

Workings are: SURFACE M120 UNDERGROUND M130 BOTH M140 (circle one)
 DEPTH BELOW SURFACE M160 UNITS M161
 LENGTH OF WORKINGS M170 300 UNITS M171 FT
 OVERALL LENGTH M190 UNITS M191
 OVERALL WIDTH M200 UNITS M201
 OVERALL AREA M210 UNITS M211
 DEC. OF WORK. COM. M220 1 TUNNEL INTO THE MOUNTAIN, ABOUT 300 FT LONG, ONE WINZE, NEAR END OF TUNNEL, 100 FT DEEP.

GEOLOGY

* AGE OF HOST ROCK(S) K1 TERT. 58 ± 5 m.y. (SIMONS, FS, 1974)
 * HOST ROCK TYPE(S) K1A BIOTITE-HORNBLENDE GRANODIORITE
 * AGE OF IGNEOUS ROCK(S) K2 TERT. 58 ± 5 m.y. (SIMONS, FS, 1974)
 * IGNEOUS ROCK TYPE(S) K2A EQUIGRANULAR AND PORPHYRITIC GRANODIORITE, DIORITE, APLITE DIKES
 * AGE OF MINERALIZATION K3 TERT.
 * PERT. MINERALS (NOT ORE) K4 QUARTZ; IRON STAINING
 * ORE CONTROL/LOCUS K5 N-S TRENDING QUARTZ VEIN WITH SEVERAL SUBSIDIARY VEINS IN GRANODIORITE; ORE DEPOSITS OCCUR IN FORM OF SUBORDINATE VEINS, LENSES, STRINGERS, AND SEAMS
 * TECTONIC SETTING N15 GUAYULOTE FAULT BLOCK; NW-TRENDING, INFERRED GUAYULOTE FAULT LIES TO E OF
 * SIGNIFICANT LOCAL STRUCTURE N70 DIORITE FORMS FOOTWALL AND QUARTZ MONZONITE FORMS HANGING-WALL OF
 * SIGNIFICANT ALTERATION N75 STRONG POTASSIC ALTERATION; GRANODIORITE IS HIGHLY SHATTERED, SHEETED,
 * PROCESS OF CONC./ENRICH. N80 OXIDATION AT NEAR SURFACE; MINERALIZATION ACCOMPANIED OR FOLLOWED
 * FORMATION AGE N30
 * FORMATION NAME N30A
 * SECOND FM AGE N35
 * SECOND-FM NAME N35A
 * IGNEOUS UNIT AGE N50
 * IGNEOUS UNIT NAME N50A
 * SECOND IG. UNIT AGE N55
 * SECOND IG. UNIT NAME N55A
 * GEOLOGY COMMENTS N85 ON ARIZONA CLAIM, SPOTTY PYROMETASOMATIC BASE METAL MINERALIZATION OCCURRED ALONG CONTACT OF A NARROW IRREGULAR BAND OF PENN.-PERM. NACO LIMESTONE AND

GENERAL COMMENTS

GENERAL COMMENTS GEN SEE ALSO: PROTO MINE GROUP

NAME: Gladstone gp (Eureka, Arizona)

COUNTY Santa Cruz

[W.W. Todd]

T 255 R 16E SEC. N cen. 31 (Protracted)

DISTRICT: Patagonia

Mineralization: Cu, Ag, Au ep. black Cu ox

Geology: _____

Type Operation: Shaft

Production: Over 2,000 tons, ave. 9.1 ft, 302 ft/T, 8% Cu, minor Pb

References: ASM

Year	Production (Tons)	Grade (%)	Value (\$)	Other (\$)	Total (\$)	Notes
Prior	10	1	100		5600	
1915	42	1	117		21432	
1916	215	36.5	1199		51490	
1917	36	1	112		18541	
1918	28	1	112		4930	
1919	57	86.2	126		9775	
1920	98	86.2	507		20960	
1921	32	86.2	134		12880	
1922	17	86.2	42		3550	
1923	59	86.2	200		18182	
1924	23	86.2	55		8673	
1925	100	1.1	29		2981	
1926	7	1.1	32		10000	
1927	47	1.0	140		2943	
1928	125	1.0	300		6679	
1929	100	1.0	300		20000	
1930	6	1.0	34		10000	
1931	115	2.0	402		905	
1932	115	2.0	374		18930	
1933	97	4.0	380		16164	
1934	141	1.0	36		3155	
1935	252	2.0	474		1222	
1936	101	2.0	171		26154	
1937	45	1.0	57		12476	
1938	4	1.0	13		2721	
1939	29	2.0	113		1030	
1940	1918	150	5994		2151	
1941	58	4.0	200		2721	
1942	42	15.4	108		1030	
1943	2018	1.08	6302		2151	
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X NAME: GLADSTONE MINE
 (1926) includes Independence-Thessalia - Eureka (Proto Grp)
 T. 23S R 16E SEC. 30, quarter(?)

COUNTY: Santa Cruz
 [J.W. Forsythe] [Hugo Miller]
 DISTRICT: Patagonia

Mineralization: Cu, Pb, Zn, Ag, Au
 sulfide ore w/ siliceous gangue.

Geology:

Type Operation: Shaft & adit w/ U.G. workings shaft, tunnel

Production: 215 (1916), 28 (1917), 98 (1920), 23 (1923), 10 (1924), 6 (1936)
 7 (1942), 41 (1943), 252 (1944)

References: ABM

Year	Tons	oz Au	oz Ag	lbs Cu	lbs Pb	lbs Zn
1916	215	36.5	1197	51,490		
1917	28			4,986	13,014	
1920	98		507	20,968		
1923	23		55	8,073		
1924	10	.1	29	2,981		
1936	6		34	905		

Forsythe
H. Miller
Trevino
Petro
Gladstone
Miller
Gladstone

NAME OF MINE: PROTO
OWNER:

COUNTY: Santa Cruz
DISTRICT:
METALS: Cu

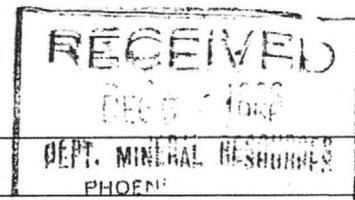
OPERATOR AND ADDRESS		MINE STATUS	
Date: 6/46	W.W. Todd & H. Bostwick, Box 1812, Nogales	Date: 6/46	Shipping

WEST, LEE (OWNER)

MINE - PROTO MINE - 2 miles west of the Patagonia highway,
15 miles northeast of Nogales.

See classification USGS Bull. 582, p. 316

ARIZONA DEPARTMENT OF MINERAL RESOURCES
Mineral Building, Fairgrounds
Phoenix, Arizona



1. Information from: Mrs. Hugo Miller
Address: Box 257 Nogales, Arizona
2. Mine: GLADSTONE also known as Independence 3. No. of Claims - Patented _____
Unpatented 8 reported
4. Location: 15½ miles east of Nogales in Sycamore Canyon area.
prob. 31
5. Sec. unsurveyed T_p 23S Range 16E 6. Mining District Palmetto ?
7. Owner: Mr. & Mrs. J. W. Forsythe, 920 Forsythe Road, Carnegie, Pa.
8. Address: _____
9. Operating Co.: Leased to Hanna Mining Co.
10. Address: 112 So. Van Buren, Tucson.
11. President: _____ 12. Gen. Mgr.: _____
13. Principal Metals: _____ 14. No. Employed: _____
15. Mill, Type & Capacity: _____
16. Present Operations: (a) Down (b) Assessment work (c) Exploration
(d) Production (e) Rate _____ tpd.
17. New Work Planned: _____
In 1965 The Hanna Mining Co. built drill roads and ~~###~~ drilled 4 DD holes.
According to Mrs. Miller they still have have the lease.
18. Misc. Notes: Mrs. Miller states that her husband mined the highest grade
copper ore of his career from this property in the late twenties.
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Date: 11/30/66

G. W. Irvin
(Signature)

G. W. Irvin
(Field Engineer)

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

~~FIELD ENGINEERS REPORT~~

NEWS ITEM

Mine Gladstone Mine

Date Jan. 9, 1952

District Patagonia Mining Dist., Santa Cruz Co.

Engineer Axel L. Johnson

Subject: News Item --- Source of Information--- J. W. Forsythe, Owner

Location 15 1/2 miles east of Nogales, on the road to Washington Camp. It is about 3 1/2 miles west of Washington Camp.

Number of Claims 8 unpatented claims.

Owners Mr. and Mrs. J. W. Forsythe, 920 Forsythe Road, Carnegie, Pa.

Operators None. Operators having assessment work done.

Metals Found Copper and Silver.

Men Employed None, except for a assessment work.

Production Rate None.

Ore Values Copper 10 % to 15 %. Silver about 2 oz.

Geology and Mineralization Found in a vein, ranging in width from 0 to 18 inches.

Old Workings One tunnel into the mountain, about 300 ft. long.
One winze, near end of tunnel---100 ft. deep. (Vein is reported to be 3 ft. wide at bottom of winze)

Past Production Considerable past production by former leasers. Mine was last worked in 1946 and 1947. Later the lease was cancelled, and the mine has remained idle.

Proposed Plans Owners would like to sell or lease the property. Sale price is placed at \$40,000. Will lease with option to buy at \$40,000, with 10% royalty, the royalty to apply on the purchase price. Owners wish to have \$500 down, or else a minimum monthly royalty, or a specified amount of work to be done per month.

Remarks Owners, Mr. and Mrs. Forsythe, live in Carnegie, Pa. They are here for a couple of months only to see that the assessment work is done.

STATUS OF DORMANT MINES

MINE NAME: Gladstone Mines
 LOCATION: Patagonia Mining District, Santa Cruz County
 OWNER AND/OR LEASEE: WALTER W. TODD, Owner and Leasee
 ADDRESS: P.O. Box 1812 - Nogales, Ariz.
 APPROXIMATE PRODUCTION (Year of 1945): Copper - 2-50 ton cars - 12611 - copper
1944 - 4-50 ton cars copper ore - 24362 lbs copper
 COPPER _____ Lbs. LEAD _____ Lbs.
 ZINC _____ Lbs. (OTHER) Silver 5 to 6 oz

CHECK THE CHIEF CAUSE OF YOUR DISCONTINUED PRODUCTION:

- (A) Easily available ore worked out.
- (B) Increased costs, but have quantity similar to past grade of ore.
- (C) Too close a margin to develop more ore.
- (D) Two of us worked mine, I injured my knee so discontinued, My knee is OK now.

If you have ore ready to mine please give your estimate of the amount of metal (name each metal) that you could produce in one year (after allowing 60 days to get started) if there were premiums above present market prices. Name amount with a low premium, and amount at a high premium; such as:

Copper at 22½¢ plus 5¢ premium..... 1,000,000 Lbs.
 Copper at 22½¢ plus 10¢ premium..... 1,500,000 Lbs.

Two people could take out 4-50 ton cars same as above about 24000 lbs copper should have a 5% premium above 22½¢ and small amount of cash to start.

If you do not have ore ready to mine please discuss the following:

- (A) Do you think a reasonable development program would produce a justified tonnage of commercial ore at above mine?
In 1945 - Made application for Government loan. This was approved, but could not close on account of conditions that would not interfere now, if this loan was completed it would increase above estimate - Mr. Rafter, Geologist of Phoenix had charge.
- (B) With a premium price (guaranteed for one year) could you carry out such a development program yourself? What premium?

Yes - would have to mine 27½¢ for copper. Price of silver etc. - this is what I received in 1943 & 44-45

(C) If you could not do this yourself, would a quick drilling program by some government agency (at government expense) be sufficient?

(D) Or would you prefer a loan plan similar to the arrangements during World War II?

_____ *yes.* _____

How about a combination plan in two stages such as follows?

Stage 1: Government engineers review project and, if a little drilling appears to be justified and a preliminary key to the situation, such drilling program to be agreed upon by owner and government engineer, paid for by the government, but let by contract.

Stage 2: If results of drilling (or without drilling) justify underground development and/or production equipment, same to be obtainable via a mortgage loan on property.

Please discuss the above: *I can start mining with a small advance say \$500⁰⁰ - but if I could close the loan applied for in 1945 through the Phoenix Office it would enable me to mine a known body of good ore.*

SUGGESTIONS:

I suggest that you contact the Phoenix Office, believe they have all necessary information

DATE Aug 6 - 1950.

SIGNATURE Walter W. Todd
P.O. Box 1812 - Nogales, Ariz

NAME OF LINE: \ GLADSTONE

COUNTY: S. CRUZ

OPERATOR AND ADDRESS:

LINE STATUS

DISTRICT:
METALS: \ CU

DATE: 5/1/44

W.W. Todd, Box 1812, Nogales 5/1/44

DATE:

Shipping

7-27-43

R.F.C. loan reported
by local ROC office -
Must have been handled
direct -

llb

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

OWNERS MINE REPORT

Date July 1, 1943

Mine Gladstone Copper

District Patagonia, Santa Cruz County Location 14 miles northeast of Nogales on Washington Camp road.

Former name Same

Owner W. W. Todd & C. C. Hoffman Address Hoffman, Box 1812, Nogales, Ariz.

Operator Same Address

President Gen. Mgr.

Mine Supt. Mill Supt.

Principal Metals copper Men Employed 5

Production Rate Mill: Type & Cap.

Power: Amt. & Type

Operations: Present We are stopping ore in two places.

Operations Planned We are planning to sink winze 50 feet and come up under another large ore body.

Number Claims, Title, etc. 5 unpatented.

Description: Topog. & Geog. Very rugged.

Mine Workings: Amt. & Condition We have a cross-cut tunnel 600 feet long, 190 feet below the surface at location monument, then we have a winze down 90 feet with a drift 100 feet long under two ore chutes.

Geology & Mineralization

The country rock is monzonite and the vein structure is very good outcropping with wide quartz veins three miles long.

Ore: Positive & Probable, Ore Dumps, Tailings

We have at least 50 carloads of ore on dumps that will average 3% copper and we have 3 ore bodies in sight that will run 2000 tons. These three ore bodies are continuous; two of them are 160 feet deep and 110 feet on the cross section and will average 20" thick of 12% copper. The other ore chute goes down - we do not know how far until we sink the winze down.

Mine, Mill Equipment & Flow Sheet

We have a compressor, a Studebaker power plant, jackhammer, stoper, air hoist, drill steel - everything for an operating mine.

Road Conditions, Route

Good road right to the mine and a good house to live in.

Water Supply

Limited; the mine makes just about enough water to work it.

Brief History

This mine was located Jan. 15, 1890 and was always worked by hand until we took it over three years ago, but there have been hundreds of carloads of ore shipped.

Special Problems, Reports Filed

We have sent all of our reports and maps to the R.F.C. as we have had a \$5,000 development loan O.K.'d by them.

Remarks

If property for sale: Price, terms and address to negotiate.

The whole property is worth \$50,000 and it will take \$10,000 cash toward a 1/2 interest in property.

Signed.....Walter W. Todd, Chas. C. Hoffman.....
Box 1812, Nogales, Arizona

Use additional sheets if necessary.

SURVEY OF OPERATING MINES

By: George A. Ballam

DEPT. MINERAL RESOURCES

RECEIVED

JUN 15 1942

PHOENIX,

ARIZONA

GLADSTONE MINE

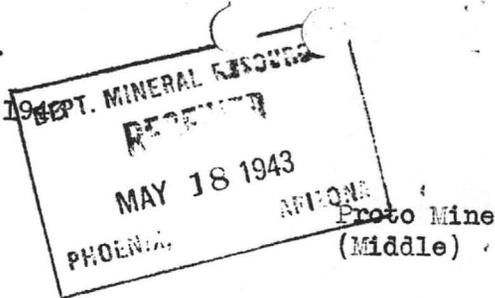
June 10, 1942

This property is situated about 15 miles NE Nogales in the Patagonia Mining District, on a southern spur of the Santa Rita Mts. The owner is Walter W. Todd. There is a tunnel 200' with a 100' winze. The owner claims he can ship 10% copper ore of which some 7 cars have already been shipped.

He desired to make application for a "B" Development loan, and the necessary information to make such application was furnished. Three men are working.

George A. Ballam

May 15, 1943



MEMORANDUM

To: Director, Dept Mineral Resources
From: George A. Ballam

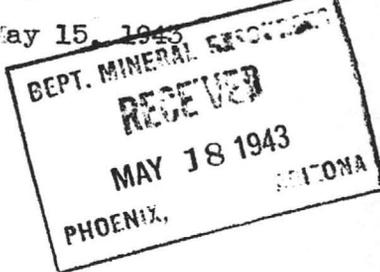
Mr. Brown and I visited this property accompanied by one Bill Smoot who has a lease on the adjoining Upper Proto.

The middle portion of the property is held under lease by Chas. C. Hoffman and one Todd of Nogales. These men have been working during the past year and have about a car of high-grade (10% and better) copper ore ready to ship. They are mining in a 100 ft. winze off the tunnel level and have drifted about 30 ft. coming up on ore. It was examined by RFC (Rasur) for a loan, but apparently not enough ore showing to warrant larger development loan. In view of the showing already made, and possibility of a couple of cars readily obtainable, it might well qualify for a small operating capital loan. Hoffman is very determined and is taking the matter up with Sen. Hayden and others. Has been promised a re-examination. If he needs assistance in making application for the ~~revised~~ amended loan will help him.

This property is owned by the Forsythe estate, and is sometimes known as the Gladstone.

George A. Ballam

May 15, 1943



MEMORANDUM

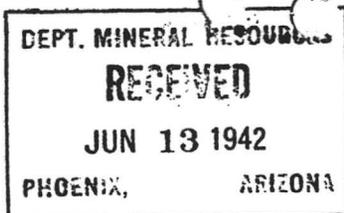
Proto Mine
(Upper)

To: Director, Dept. Mineral Resources
From: George A. Ballam

Bill Smoot of Tucson has a newly-executed lease from Will Patty, owner of the claims known as the Upper Proto. Some work was done by Lee West and Higgins during the past year. They went in from a tunnel on a parallel vein to that of the middle Proto of Todd and Hoffman. About 200 ft. from the portal a x-cut had been driven diagonally to intersect the main vein referred to. Apparently contact had been made without showing ore. I examined the Hoffman tunnel but beyond where he is working it is badly caved and blocked off, consequently it is impossible to get in to see where the x-cut intersected. That tunnel is also inaccessible. There is no record of ore having been found there. However, I advised Smoot to contact West and Higgins before submitting application for an accessibility loan, and try to learn what they found.

The property has a record of shipments of considerable high-grade ore, but has not been worked for many years and it may be that a great deal of preliminary work would be necessary to open it up again. The outcrop is definite enough along the area in question, but it appears to be one of those in and out things in the monzonite and altered granite. Rasur, I believe, said it was a condition of small lenses of ore. There are numerous tunnels, open-cuts and shafts over the entire Proto property, and it might be difficult now to find out where earlier production was had.

George A. Ballam



June 11, 1942

RP

MEMORANDUM

PROTO MINE
(Patagonia District)

To: Director, Dept. Mineral Resources
From: George A. Ballam

This mine is situated on a southern spur of the Santa Rita Mts., about two miles west of the Patagonia highway, 15 miles northeast of Nogales. It is owned by Lee West, Box 1113, Nogales.

This is a copper property with a small record of 35 cars shipment. Mr. West has shipped 5 cars during the past year, and desires to open up more ore. He claims to be able to produce copper ore running about 10%.

He desires to make application for a "B" loan. Assistance in making application was rendered. At present he is employing no men.

George A. Ballam

C//MBIOR

February 5, 1993

Fred Warnares
JAMES ASKEW ASSOCIATES
5600 S. Quebec Street, Suite 312-A
Englewood, CO 80111

RE: 4-Metals Property

Dear Fred:

Enclosed are the files we have for the 4-Metals property. Feel free to copy what you want and please return the file to either Howard or myself.

best of luck with your endeavors.

Sincerely,

CAMBIOR EXPLORATION USA, INC.



Randy Moore
Senior Geologist

RM:lat
Encl.

Cambior Exploration USA, Inc.

230 South Rock Blvd., Suite #23, Reno, Nevada 89502-2345, USA, Telephone 702-856-5189, Fax 702-856-4549

CAMBIOR USA, INC.

MEMORANDUM

To: Randy Moore

From: Howard Harlan *HH*

Date: June 8, 1992

Subject: FOUR METALS COPPER PROPERTY EVALUATION
SANTA CRUZ COUNTY, ARIZONA

SUMMARY

The Four Metals project does not meet the minimum economic criteria, even without a purchase price. It is a fairly small project with minimal potential to expand beyond 20 to 25 million tons of ore. Four Metals does not appear to be a project for Cambior to pursue.

EVALUATION

The Four Metals project is owned by Manzanita Hills, Inc. There is an underlying three percent NSR royalty on the project. The project consists of copper mineralization as oxides and chalcocite, which have been tested by sampling old underground workings and drilling from the surface and underground. The base case (summary attached, Case 1) consisted of 15 million tons of ore grading 0.635 percent copper, mineable at a stripping ratio of 1.3:1, waste to ore. No recovery data exist, so it was assumed that recovery of the copper oxide would average 85 percent; recovery of the chalcocite 75 percent, and the average for the property would be 80 percent. An eight-year life was chosen, and capital and operating costs were estimated accordingly. Total capital was estimated for the life of the property at \$27.1 million, and operating costs were estimated at \$5.63 per ton of ore. Results for Case 1 showed that after taxes, the present value was a negative \$1.9 million and the IRR was 12.4 percent. The average annual cash flow of \$2,736,000 failed to meet the \$3 million criteria. Likewise, the IRR of 12.4 percent was below the 15 percent minimum. These figures were without the price of a buy-in, and therefore, there is little room for improvement.

The second case evaluated was 20 million tons of 0.55 percent copper, mineable at a stripping ratio of 1.5:1, waste to ore, over an eight-year life. As in the previous case, 80 percent recovery was assumed and a 3 percent NSR burdened the property. Total capital was estimated for the life of the mine at \$30.8 million and operating costs were \$5.23 per ton of ore. Results of the evaluation showed that the IRR was 9.7 percent, the PV15 was a negative \$4.7 million,

Four Metals
June 8, 1992
Page Two

and the average annual cash flows were \$2,554,000. Even though the reserve had grown in this case over Case 1, the grade was lower and the stripping ratio was higher, and these factors contributed to more negative results than were achieved in Case 1.

RECOMMENDATION

It is recommended that this project not be pursued for acquisition by Cambior.

Attachment

cc: Alex Bissett
Jock McGregor
Gary Parkison

FOUR METALS, ARIZONA

Case 1

Tons:	15 M
Grade:	0.635% Cu
Strip Ratio:	1.3:1
Life:	8 years
Recovery:	80%
NSR:	3%
Purchase Price:	\$0

Costs

	<u>Capital (\$M)</u>	<u>Oper</u>
Mine	5.8	\$1.00/t mtl
Process	9.5	\$0.30/lb Cu
Infra/Admin	2.0	<u>\$ 0.75 M/yr</u>
Pad	2.5	
Start-up	1.0	
Pre-strip	<u>2.0</u>	
Subtotal	22.8	\$ 5.63/t ore
Sustaining	2.8	
Explor	1.0	
Feas	<u>0.5</u>	
Grand Total	27.1	

Production Rate: 1,875 k tpy ore; 5,400 tpd
3,750 k tpy all materials

Evaluation Results (100% project, no buy-in):

	<u>Pre-tax</u>	<u>After-tax</u>
PV15 (\$000)	(\$1,139)	(\$1,957)
IRR (%)	13.6	12.4
Aug Annual C.F. (\$000)	3,252	(2,736)

Case 2

Tons: 20 M
Grade: 0.55% Cu
Strip Ratio: 1.5:1
Life: 8 years
Recovery: 80%
NSR: 3%
Purchase Price: \$0

Costs

	<u>Capital (\$M)</u>	<u>Oper</u>
Mine	7.5	\$0.95/t mtl
Process	11.0	\$0.30/lb Cu
Infra/Admin	2.0	<u>\$ 0.75 M/yr</u>
Pad	3.0	
Start-up	1.0	
Pre-strip	<u>2.0</u>	
Subtotal	26.5	\$ 5.23/t ore
Sustaining	2.8	
Explor	1.0	
Feas	<u>0.5</u>	
Grand Total	30.8	

Production Rate: 2,500 k tpy ore; 7,100 tpd
5,000 k tpy all materials

Evaluation Results (100% project, no buy-in):

	<u>Pre-tax</u>	<u>After-tax</u>
PV15 (\$000)	(\$4,907)	(\$4,706)
IRR (%)	10.0	9.7
Aug Annual C.F. (\$000)	2,895	2,554

(702) 849-9084 - number disconnect,
Mike Bentley no listing in information

CAMBIOR USA, INC.

TO: Howard Harlan
FROM: Randy Moore
DATE: May 12, 1992
SUBJECT: Four Metals Copper Property, Santa Cruz County, Arizona

Our office has taken a preliminary look at the Four Metals property within southern Arizona and have concluded that it is something that needs the input of your group. I have discussed this copper occurrence with Gary, and he may be able to provide you with some added insight.

Mineralization at Four Metals is hosted within a breccia pipe with well-defined boundaries. The property was drilled by a variety of companies over the past 50 years, almost all of which were looking for a deep porphyry system.

Manzanita Hills Inc. controls the property at the current time and has done a reasonable job at digging up most of the old information. They have used underground sampling, surface drill hole, and underground drill hole information to develop a reserve. Mike Bentley has all the data on disc and has produced reserve numbers using Medsystem software from Mintec.

Our office has done a limited amount of underground sampling in order to verify the accuracy of some of the numbers which were used in the reserve calculations. Cambior results confirmed those from the old records.

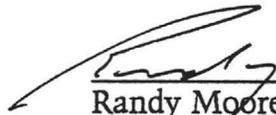
The one big unknown is metallurgy. Nowhere in the old reports is there a mention of the mineralogy. Within the drifts, copper occurs as oxides and chalcocite. To what depth this extends is not known. Pyrite is present on all levels of the old workings but chalcopyrite has not been seen to date.

The reserve numbers generated by Mike Bentley are as follows;

CUT OFF:	.268% Cu	.441% Cu
TONS:	15 MT	10.3 MT
GRADE:	.635% Cu	.735% Cu
STRIP:	1.3/1	1.4/1

There is the potential to expand these reserves to around 20 to 25 MT at a grade above .5% Cu with an approximate 1.5/1 strip. It is unlikely that this property could expand beyond this size as there is no mineralization within the walls of the breccia pipe.

I have sent a set of cross sections to Gary and I am enclosing a report completed by Manzanita Hills. If you need additional information please let me know. The data is available on disc which can be obtained if necessary.



Randy Moore
Senior Geologist

RM:lat

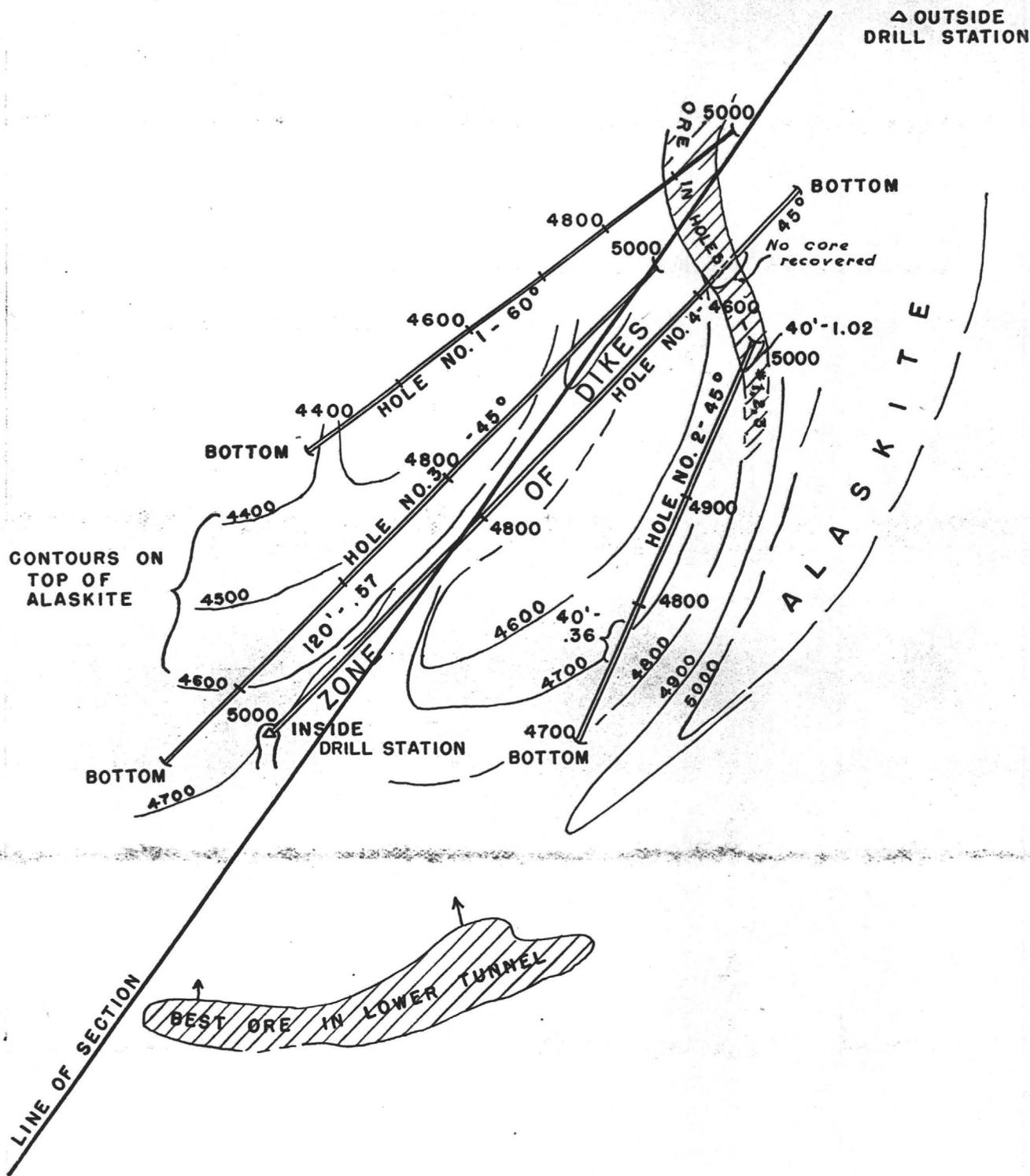


FIGURE 3
 GEOLOGIC ELEMENTS
 OF THE
 FOUR METALS

SCALE 1" = 100'

DEVELOPMENTS BELOW 5000 FT.
 COPY OF MAP BY PAUL BILLINGSLEY

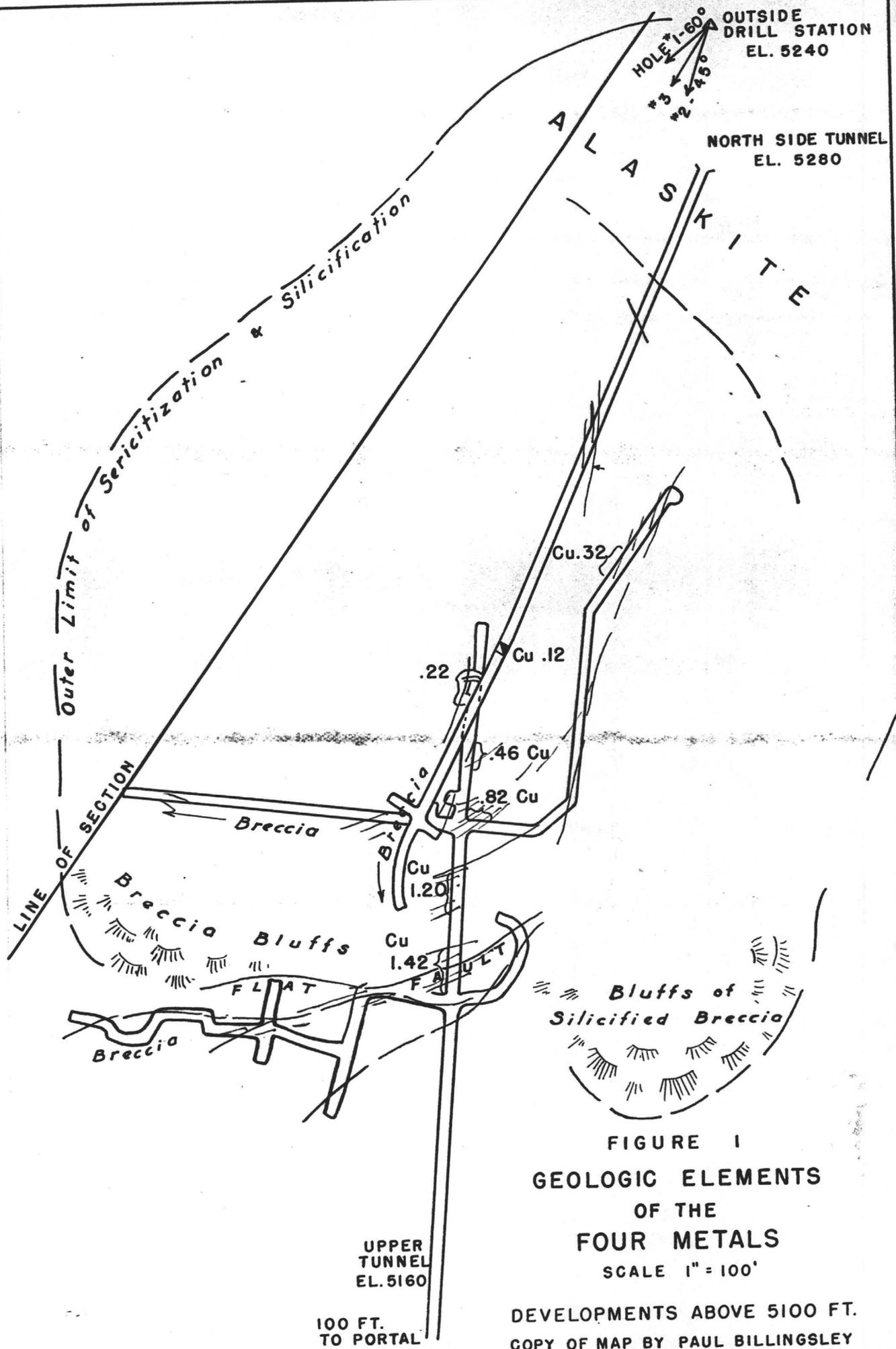


FIGURE 1
GEOLOGIC ELEMENTS
OF THE
FOUR METALS

SCALE 1" = 100'

DEVELOPMENTS ABOVE 5100 FT.
COPY OF MAP BY PAUL BILLINGSLEY

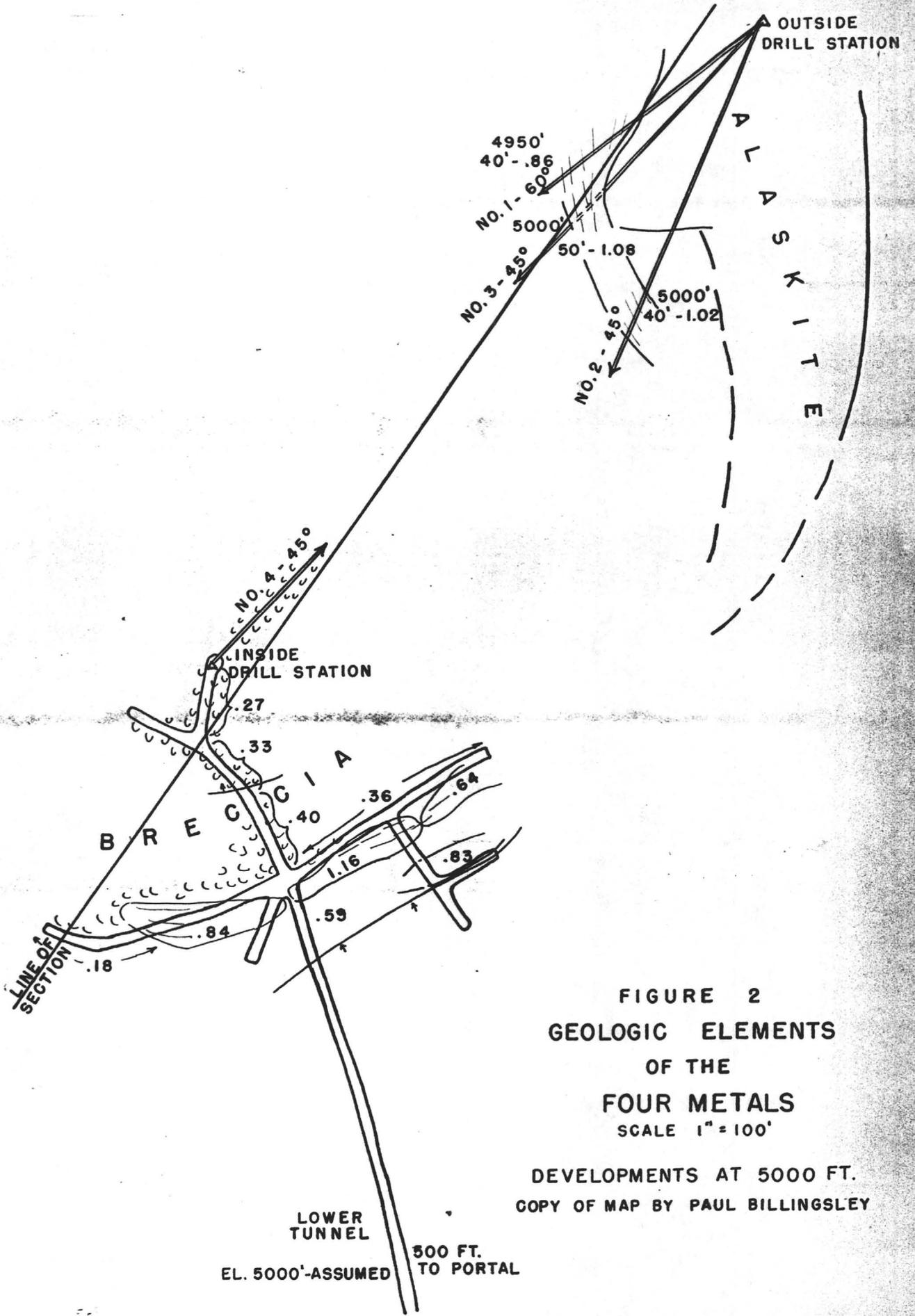


FIGURE 2
 GEOLOGIC ELEMENTS
 OF THE
 FOUR METALS
 SCALE 1" = 100'

DEVELOPMENTS AT 5000 FT.
 COPY OF MAP BY PAUL BILLINGSLEY

LOWER TUNNEL
 EL. 5000'-ASSUMED 500 FT. TO PORTAL

FOUR METALS MINE

SANTA CRUZ

Jo. S. Dreshsler, Jr., geologist, Noranda Exploration, 260 N. First Avenue, P.O. Box 50326, Tucson, Arizona, 85705, (602) 623-2505, was in to study files on properties in Santa Cruz County. Noranda presently owns the Four Metals Mine and a number of adjacent claims in Santa Cruz County.
KAP WR 10/22/74

MG/WR 3/7/79 - Visited the Four-Metals Mine, no apparent activity. The road into property is in fairly good condition. 4/18/79 a.p.

MG/WR 11/21/79 - Mr. Robert Crist of ASARCO reports that ASARCO has an "agreement" with Noranda Mines Ltd. concerning the Ventura and Four Metals properties in Santa Cruz Co. Noranda is the owner of these properties.

MG WR 3/12/82: The Four Metals (Red Hill) mine in Santa Cruz County is within the Faro claim group. This claim group and the adjoining MM claim group is owned by the Sharon Steel Corp., Thomas Road, Hubbard, Ohio 44425, phone (216) 448-4011. Sharon Steel bought out UV Industries Inc.

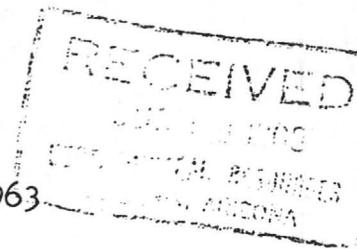
CJH WR 1/25/85: James C. Jones, Certified Geologist, 720 N. Mann Ave., Tucson, Az. 85710, phone 298-3576. Researched mine file on Four Metals mine, Santa Cruz County. Held by Noranda who apparently has not filed assessment work for four years.

MG WR 7/12/85: The Four Metals mine (Santa Cruz Co) is now covered by the Precious Metals claim group owned by the Dore Mining & Milling Co., W. 601 1st Avenue, #507, Spokane, Washington 99204.

VICTOR 4-9413

C. PHILIP JENNEY
CONSULTING GEOLOGIST
372 LAKESHORE HY. WEST
OAKVILLE, ONTARIO

June 6, 1963



Mr. Frank P. Knight, Director,
Dept. of Mineral Resources,
State of Arizona,
Mineral Building, Fairgrounds,
Phoenix, Arizona

Re: Report of Mr. Axel L. Johnson,
Four Metals Property, Santa
Cruz County

Dear Sir:

This will acknowledge your letter of May 27, 1963, enclosing a copy of the above report, dated May 8, 1963, and a blank Mine Owner's Report.

Mr. Johnson's report is substantially correct and I am returning a copy, herewith, with a few minor corrections for your records. With this report on hand, it seems unnecessary to fill out the Mine Owner's Report which covers the same information.

The property has been examined and sampled on many occasions during the past 15 years by a number of the large American companies and by some Canadian companies. While some of their geologists and engineers estimated the presence of certain tonnages and grades of copper, our geologists have been able to examine only the 5,400 level and, cannot therefore, make any estimates at this time.

Since the date of Mr. Johnson's report, we have decided to abandon the work on the 5,090 level and to re-open the 5,260 foot level for examination, sampling, and a possible drilling program.

As our program progresses, we will be glad to cooperate with you by keeping you informed of results. However, as the property is not for sale, we may request that you keep confidential certain information supplied in the future.

Thank you for your interest and assistance in our project.

Yours very truly,


C. P. Jenney
Consulting Geologist for
West Range Company

CPJ/ja
cc: Dr. Peter Price

KING PROSPECT.

The King prospect is half a mile northeast of the Buena Vista mine and about a quarter of a mile south of Providencia Canyon. It is opened mainly by a 40-foot shaft and a drift. The drift was not enterable but to judge from the size of the dump must be extensive.

The deposits apparently occur in a 10-inch iron-stained, banded quartz vein which dips 70° SE. in coarse quartz monzonite and which as seen in the shaft carries pyrite, chalcopyrite, and bornite, with some malachite and azurite, extending to a depth of 15 feet below the surface. About 5 tons of copper ore containing principally these minerals lies on the dump.

MARCHÉ PROSPECT.

The Marché prospect is in Providencia Canyon, one-eighth of a mile northeast of the King prospect and 1½ miles east of the Golden Rose camp, at an elevation of about 4,550 feet. It is opened by two tunnel drifts driven in opposite directions on different sides of the gulch, of which the southerly one is 90 feet in length. It is on a 2-foot quartz vein which dips 35° SE. in quartz monzonite. The vein is composed mainly of iron-stained quartz and crushed rock or gouge and contains some malachite and azurite. No sulphides were noted.

GLADSTONE PROSPECT.

The Gladstone prospect is on the north side of Providencia Canyon about half a mile northeast of the Marché prospect, at an elevation of about 4,700 feet. The property comprises a group of claims. It is opened by a shaft near the center of the group and is said to have shipped a number of tons of ore, containing mainly chalcopyrite and black copper sulphide, that averaged 28 per cent in copper.

PROTO MINE.

On leaving the foothill or Gross belt just described and ascending the slope which rises eastward to Guajolote Flat, the observer encounters a different set of fissures and veins which strike more nearly north, almost at right angles to the course of the veins in the Gross belt. In the quartz monzonite ridge, followed by the trail leading from the Gladstone prospect northward up to Guajolote Flat, there are distributed through a distance of 1¼ miles in a vertical range of 1,000 feet half a dozen or more mines and prospects, including the Proto mine, located just west of the trail at about the 5,000-foot contour. This mine is opened by a series of tunnels and shafts. It is on a 2½ to 5 foot vein which dips 80° E. into the mountain, with a dike or intrusive mass of diorite forming the footwall and the quartz

monzonite country rock the hanging wall. The vein at the surface is highly iron-stained. The principal ore mineral is chalcopyrite. One of the shafts, which is 100 feet or more deep, contains water. Openings of considerable extent, seen across the broad head of the canyon to the north but not visited, seem to be on this same vein.

FOUR METALS MINE.

Location.—The Four Metals mine is a mile east of the Proto mine, in the head of Providencia Canyon on its north side, on the south edge of Guajolote Flat, at an elevation of about 5,400 feet. It is 3 miles northwest of Washington and 2½ miles southwest of Mowry. The camp, which is a village of about 100 Mexican laborers and a few whites, is three-fourths of a mile to the north, on Guajolote Flat, at an elevation of 5,800 feet. Two good wagon roads connect the camp with the stage road 2 miles distant on the east, one at a point half a mile south and the other at a point a mile northwest of Mowry, and by the latter road Patagonia, on the railroad, is 16 miles distant. Nogales is 13 miles west of the mine, and the Washington-Nogales wagon road is half a mile away.

History and production.—The deposit, known as the Guajolote lode, was discovered by pioneers in the sixties or before, but not developed for some time. Browne¹ states:

The Guajolote lode, 4 miles west of the Mowry mines, is a lode varying from 1 to 6 feet in width on the surface. At the bottom of a shaft of 60 feet there is a vein of metal 3 feet wide. The ore is chiefly sulphurets of silver and there are traces of gold.

Later the property was owned by George Gross, from whom it was bought about 1904 by the present owner, the Four Metals Mining Co. of Arizona, with headquarters at Mowry, Ariz., and Blandinsville, Ill. In the following year this company opened it with over 2,000 feet of work.²

In 1906 a shipment of ore containing copper, gold, and silver was made,³ and beginning in 1907 more extensive development work was done, including the driving of the Red Hill 712-foot lower crosscut tunnel, cutting the vein, and the taking out of considerable low-grade ore, of which several thousand tons now lies on the dump. During the winter of 1908-9 80 men were employed at the mine. Since that time some work has been carried on intermittently by two small forces of men. The property comprises a group of 35 claims.

Developments and equipment.—The mine is developed by about 3,000 feet of work, consisting mainly of crosscut tunnels, two of

¹Browne, J. R., Mineral resources of the States and Territories west of the Rocky Mountains, 1867, p. 449, 1868.

²Heikes, V. C., U. S. Geol. Survey Mineral Resources, 1905, p. 156, 1906.

³Idem, 1906, p. 171, 1907.

which, connected by an upraise, extend north and south for more than 1,200 feet through the hill, as shown in figure 41.

The company buildings accommodate 20 men, and the camp contains Mexican buildings sufficient for about 150 persons. Water for domestic use and for stock is supplied by a 20-foot well, and much of the oak timber on the flat is suitable for mine use.

Topography and geology.—The mine is in a small hill, known as Four Metals Hill (fig. 41), surmounting a steep ridge which descends from the Guajolote Flat 1,000 feet southeastward into the head of Providencia Canyon in the horizontal distance of three-

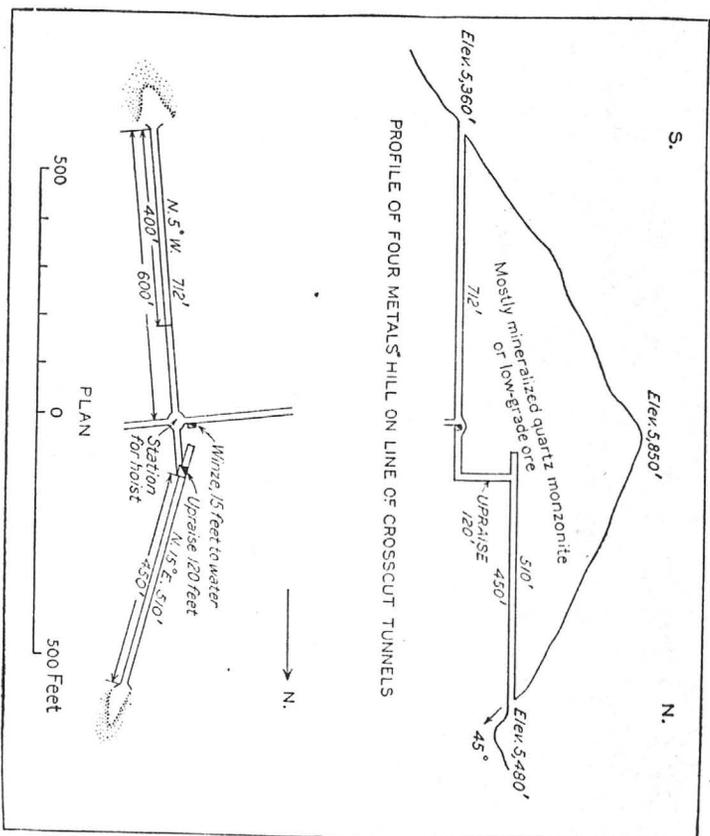
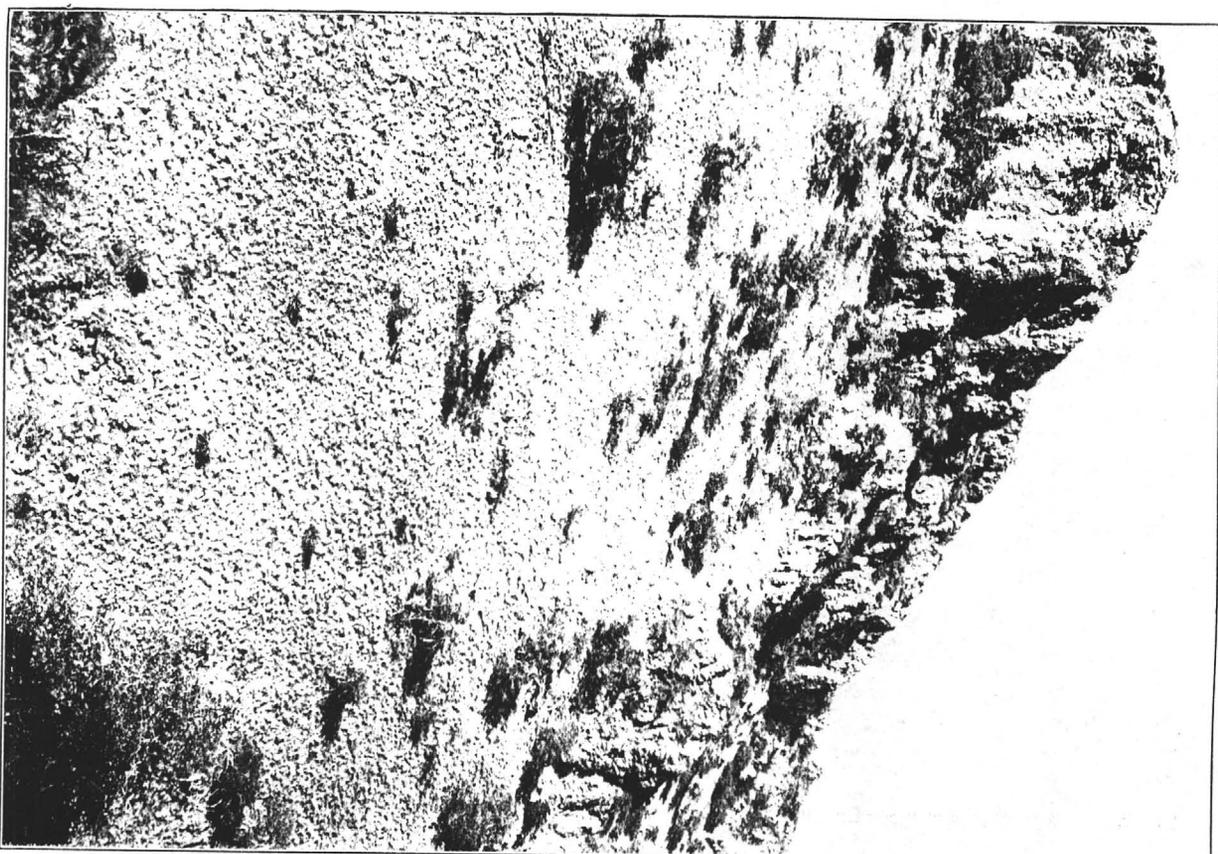


FIGURE 41.—Profile and plan of Four Metals mine.

fourths of a mile. On the northeast the hill and the ridge are separated from the mountain mass by a tributary gulch about 300 feet deep; on the south the surface from the top of the hill declines steeply 950 feet into the canyon in a horizontal distance of a third of a mile, or at an angle of about 27°. The hill is slightly oblong parallel with the ridge, with a basal or shorter diameter of about 1,200 feet, as shown in figure 41.

The deposit occurs in a stocklike body of the younger quartz monzonite or "porphyry," which forms Four Metals Hill and intrudes the older quartz monzonite. The intrusive quartz monzonite is the usual reddish-gray granitoid rock described on page 64. It



CROPPINGS OF COPPER DEPOSITS OF FOUR METALS MINE.
In mineralized shear zone in quartz monzonite. Looking northeast.

is granular and medium grained and is composed mainly of oligoclase and orthoclase in about equal amounts, with considerable biotite, magnetite, some hornblende, and quartz. It is intruded in the south fault zone of the Guajolote block, where it, together with some of the adjoining older quartz monzonite, has since been profoundly sheeted, shattered, crushed, and mineralized. As shown in Plate XXIII, it is sliced by a dominant east-west vertical sheeting about parallel with the fault scarp. Underground it is shattered and traversed by fissures, seams, and fractures trending in almost every direction, and these are largely filled by pyrite and chalcopyrite to such an extent that the rock mass as a whole forms a sort of breccia cemented by the iron content. It is stained a brilliant red on the weathered surface.

In the south or lower tunnel water and soft ground requiring heavy timbering were encountered at a kind of contact dipping to the north at 400 feet in from the mouth, beyond which to the face the intrusive rock is practically all very low-grade ore. Water stands near the top of the 15-foot winze sunk from this level.

Ore deposits.—The deposits are copper-bearing ores, occurring in the mineralized intrusive quartz monzonite. The ore minerals are principally chalcopyrite, with some secondary chalcocite and considerable pyrite, most of which is probably cupriferous. The deposits occur in the form of subordinate veins, lenses, stringers, and seams in the fissures, joints, sheeting planes, and other fractures in the rock, and also to a large extent as metamorphic replacement deposits in the body of the rock itself, notably in the walls of the fissures and fractures, where solid bodies or pockets of relatively pure metallic minerals are of common occurrence. The principal gangue mineral besides the altered rock and pyrite is quartz, which, however, is only sparingly present. The entire hill, 1,200 feet or more in width and 2,000 feet in length, is more or less mineralized and contains a large amount of low-grade ore, as shown by the crosscut tunnels indicated in figure 41. The mineralization extends through a known vertical range of nearly 400 feet, from the crop-pings at the top of the hill, shown in figure 41 and Plate XXIII, to and below the deepest workings or winzes sunk from the lower tunnel, where the geologic conditions show it continuing downward without diminution. From the intrusive nature of the containing rock and the profoundness of the disturbance it is inferred that the additional downward extent is considerable, probably several hundred feet below the present lower workings.

The entire volume of the hill, however, is not of workable grade, for, as seen in the forepart of the main tunnels, the mineralization is in places sporadic. The best showings are contained in a central belt or zone about 500 feet in width, extending from a point about

300 feet in from the mouth of the south or lower tunnel to a point somewhat north of the upraise in the north or upper tunnel. From the south edge of this belt, as shown in the lower tunnel, the mineralization is practically continuous for 300 feet to the station room, where a winze is sunk, and also the portion of the zone lying in and near the upraise 100 feet to the north. The drifts extend north and south on a more concentrated portion of the zone, called a vein.

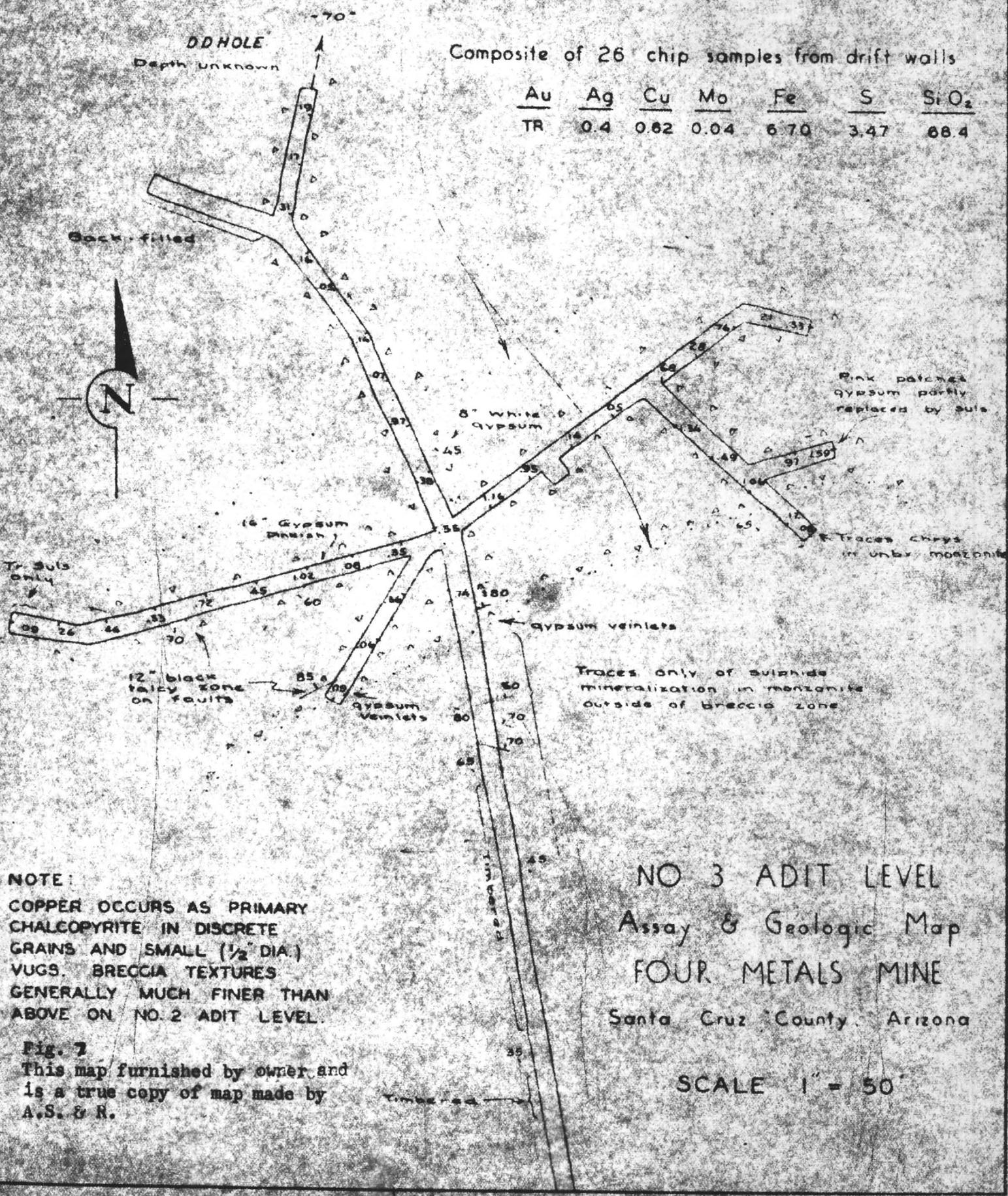
From the conditions in the forepart of the tunnels it is inferred that the metallic contents are probably somewhat leached in the upper part of the hill, but not to any great extent, for the sulphides appear prominently in the croppings at the top of the hill.

The value of the ore lies solely in copper, which occurs principally in the chalcopyrite, to a small extent in the secondary chalcocite, and seemingly to some though probably less extent in the cupriferos pyrite. The chalcopyrite and pyrite occur mostly in the massive and finely crystalline form, but a little is coarsely crystalline, with crystals measuring as much as 0.7 inch on the edge of the cube. The ore contains also a little gold, lead, and silver, but not in workable quantity. A little magnetite is also present, but may be derived principally from the quartz monzonite.

Though the deposits occur in the quartz monzonite, their ore minerals are not primary in this rock as are apparently those in the quartz monzonite near the Bennett mine, already described. They were formed by infiltrating mineral-bearing solutions after the shattering of the quartz monzonite by the uplift of the Guajolote fault block. That meteoric waters have played an important part, at least in the concentration of the veinlike portions of the deposits contained in the fissures and fractures, there is no doubt, but the evidence of metasomatic replacement afforded, for instance, by bands or lenses of ore several inches in width and a number of feet in extent, wholly or in part replacing the hard wall rock, seems to indicate that hydrothermal solutions were probably a factor in the origin of some of the deposits. These solutions may have been associated with the intrusive quartz monzonite magma, or with later intrusions of granite porphyry or rhyolite. Rhyolite intrudes the quartz monzonite at a point half a mile north of the mine. Some of the altered rock seen in the forepart of the north tunnel was provisionally recorded in the field notes as granite porphyry, but it received no further examination.

WINIFRED MINE.

The Winifred mine is 1½ miles east of the Four Metals mine, 2 miles northwest of Washington, and 3½ miles south-southwest of Mowry, in the head of a small canyon at the southwest head of Mowry Wash, at an elevation of about 6,000 feet. It is connected by wagon road with the Guajolote road, a mile distant on the north.



Composite of 26 chip samples from drift walls

Au	Ag	Cu	Mo	Fe	S	SiO ₂
TR	0.4	0.62	0.04	6.70	3.47	68.4

NOTE:
 COPPER OCCURS AS PRIMARY
 CHALCOPYRITE IN DISCRETE
 GRAINS AND SMALL (1/2" DIA.)
 VUGS. BRECCIA TEXTURES
 GENERALLY MUCH FINER THAN
 ABOVE ON NO. 2 ADIT LEVEL.

Fig. 7
 This map furnished by owner and
 is a true copy of map made by
 A.S. & R.

NO 3 ADIT LEVEL
 Assay & Geologic Map
 FOUR METALS MINE
 Santa Cruz County, Arizona

SCALE 1" = 50'

FOUR METALS MINE

SANTA CRUZ COUNTY



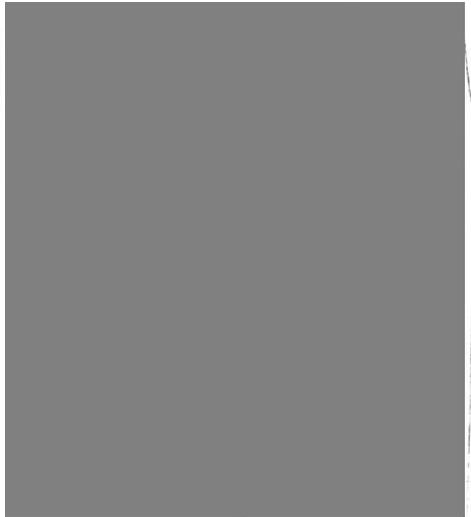
Taken from MINING WORLD May 1963/



Mines. mmp 8/1964

per Mining World 8/1963

MINING WORLD 7/1963



Aug. 1964
E&MJ—Volume 165, No. 8

Metal Mining & Processing 7/1964

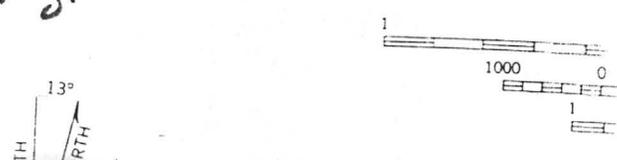


Payson. PAY DIRT for December 23, 1974



Map prepared by the Army Map Service
 Edited and published by the Geological Survey
 Control by USGS, USC&GS, and USCE
 Topography from aerial photographs by stereoplanigraph methods
 Aerial photographs taken 1946. Field check 1948
 Edited by the Geological Survey 1958
 Conic projection, 1927 North American datum

Harshaw, G. 7.5



STATE OF ARIZONA
DEPARTMENT OF MINERAL RESOURCES
MINERAL BUILDING, FAIRGROUNDS
PHOENIX 7, ARIZONA



June 11, 1963

Mr. C. Philip Jenney
Consulting Geologist for West Range Co.
372 Lakeshore Hy. West
Oakville, Ontario, Canada

Dear Mr. Jenney:

Thank you for your letter of June 6th regarding and the accompanying photocopy of your corrected report of Axel Johnson on the Four Metals property. We will not put the report in our open files.

Your information is gratefully received and any request for its being kept confidential will be respected.

Sincerely yours,

FRANK P. KNIGHT,
Director.

FK:p

C
O
P
Y

COMMODITY INFORMATION

*COMMODITIES PRESENT C10 <W, M, O, V, Y, Z, AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM, AN, AO, AP, AQ, AR, AS, AT, AU, AV, AW, AX, AY, AZ, BA, BB, BC, BD, BE, BF, BG, BH, BI, BJ, BK, BL, BM, BN, BO, BP, BQ, BR, BS, BT, BU, BV, BW, BX, BY, BZ, CA, CB, CC, CD, CE, CF, CG, CH, CI, CJ, CK, CL, CM, CN, CO, CP, CQ, CR, CS, CT, CU, CV, CW, CX, CY, CZ, DA, DB, DC, DD, DE, DF, DG, DH, DI, DJ, DK, DL, DM, DN, DO, DP, DQ, DR, DS, DT, DU, DV, DW, DX, DY, DZ, EA, EB, EC, ED, EE, EF, EG, EH, EI, EJ, EK, EL, EM, EN, EO, EP, EQ, ER, ES, ET, EU, EV, EW, EX, EY, EZ, FA, FB, FC, FD, FE, FF, FG, FH, FI, FJ, FK, FL, FM, FN, FO, FP, FQ, FR, FS, FT, FU, FV, FW, FX, FY, FZ, GA, GB, GC, GD, GE, GF, GG, GH, GI, GJ, GK, GL, GM, GN, GO, GP, GQ, GR, GS, GT, GU, GV, GW, GX, GY, GZ, HA, HB, HC, HD, HE, HF, HG, HH, HI, HJ, HK, HL, HM, HN, HO, HP, HQ, HR, HS, HT, HU, HV, HW, HX, HY, HZ, IA, IB, IC, ID, IE, IF, IG, IH, II, IJ, IK, IL, IM, IN, IO, IP, IQ, IR, IS, IT, IU, IV, IW, IX, IY, IZ, JA, JB, JC, JD, JE, 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SV, SW, SX, SY, SZ, TA, TB, TC, TD, TE, TF, TG, TH, TI, TJ, TK, TL, TM, TN, TO, TP, TQ, TR, TS, TT, TU, TV, TW, TX, TY, TZ, UA, UB, UC, UD, UE, UF, UG, UH, UI, UJ, UK, UL, UM, UN, UO, UP, UQ, UR, US, UT, UY, UZ, VA, VB, VC, VD, VE, VF, VG, VH, VI, VJ, VK, VL, VM, VN, VO, VP, VQ, VR, VS, VT, VU, VV, VW, VX, VY, VZ, WA, WB, WC, WD, WE, WF, WG, WH, WI, WJ, WK, WL, WM, WN, WO, WP, WQ, WR, WS, WT, WU, WV, WW, WX, WY, WZ, XA, XB, XC, XD, XE, XF, XG, XH, XI, XJ, XK, XL, XM, XN, XO, XP, XQ, XR, XS, XT, XU, XV, XW, XX, XY, XZ, YA, YB, YC, YD, YE, YF, YG, YH, YI, YJ, YK, YL, YM, YN, YO, YP, YQ, YR, YS, YT, YU, YV, YW, YX, YY, YZ, ZA, ZB, ZC, ZD, ZE, ZF, ZG, ZH, ZI, ZJ, ZK, ZL, ZM, ZN, ZO, ZP, ZQ, ZR, ZS, ZT, ZU, ZV, ZW, ZX, ZY, ZZ, AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM, AN, AO, AP, AQ, AR, AS, AT, AU, AV, AW, AX, AY, AZ, BA, BB, BC, BD, BE, BF, BG, BH, BI, BJ, BK, BL, BM, BN, BO, BP, BQ, BR, BS, BT, BU, BV, BW, BX, BY, BZ, CA, CB, CC, CD, CE, CF, CG, CH, CI, CJ, CK, CL, CM, CN, CO, 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MF, MG, MH, MI, MJ, MK, ML, MM, MN, MO, MP, MQ, MR, MS, MT, MU, MV, MW, MX, MY, MZ, NA, NB, NC, ND, NE, NF, NG, NH, NI, NJ, NK, NL, NM, NN, NO, NP, NQ, NR, NS, NT, NU, NV, NW, NX, NY, NZ, OA, OB, OC, OD, OE, OF, OG, OH, OI, OJ, OK, OL, OM, ON, OO, OP, OQ, OR, OS, OT, OU, OV, OW, OX, OY, OZ, PA, PB, PC, PD, PE, PF, PG, PH, PI, PJ, PK, PL, PM, PN, PO, PP, PQ, PR, PS, PT, PU, PV, PW, PX, PY, PZ, QA, QB, QC, QD, QE, QF, QG, QH, QI, QJ, QK, QL, QM, QN, QO, QP, QQ, QR, QS, QT, QU, QV, QW, QX, QY, QZ, RA, RB, RC, RD, RE, RF, RG, RH, RI, RJ, RK, RL, RM, RN, RO, RP, RQ, RR, RS, RT, RU, RV, RW, RX, RY, RZ, SA, SB, SC, SD, SE, SF, SG, SH, SI, SJ, SK, SL, SM, SN, SO, SP, SQ, SR, SS, ST, SU, SV, SW, SX, SY, SZ, TA, TB, TC, TD, TE, TF, TG, TH, TI, TJ, TK, TL, TM, TN, TO, TP, TQ, TR, TS, TT, TU, TV, TW, TX, TY, TZ, UA, UB, UC, UD, UE, UF, UG, UH, UI, UJ, UK, UL, UM, UN, UO, UP, UQ, UR, US, UT, UY, UZ, VA, VB, VC, VD, VE, VF, VG, VH, VI, VJ, VK, VL, VM, VN, VO, VP, VQ, VR, VS, VT, VU, VV, VW, VX, VY, 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SIGNIFICANCE

MAJOR PRODUCTS MAJOR < > PRODUCER
 MINOR PRODUCTS MINOR < > PRODUCER
 POTENTIAL PRODUCTS POTEN < > PRODUCER
 OCCURRENCES OCCUR < > PRODUCER

NON-PRODUCER
 MAIN COMMODITIES PRESENT C11 <W, M, O, V, Y, Z, AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM, AN, AO, AP, AQ, AR, AS, AT, AU, AV, AW, AX, AY, AZ, BA, BB, BC, BD, BE, BF, BG, BH, BI, BJ, BK, BL, BM, BN, BO, BP, BQ, BR, BS, BT, BU, BV, BW, BX, BY, BZ, CA, CB, CC, CD, CE, CF, CG, CH, CI, CJ, CK, CL, CM, CN, CO, CP, CQ, CR, CS, CT, CU, CV, CW, CX, CY, CZ, DA, DB, DC, DD, DE, DF, DG, DH, DI, DJ, DK, DL, DM, DN, DO, DP, DQ, DR, DS, DT, DU, DV, DW, DX, DY, DZ, EA, EB, EC, ED, EE, EF, EG, EH, EI, EJ, EK, EL, EM, EN, EO, EP, EQ, ER, ES, ET, EU, EV, EW, EX, EY, EZ, FA, FB, FC, FD, FE, FF, FG, FH, FI, FJ, FK, FL, FM, FN, FO, FP, FQ, FR, FS, FT, FU, FV, FW, FX, FY, FZ, GA, GB, GC, GD, GE, GF, GG, GH, GI, GJ, GK, GL, GM, GN, GO, GP, GQ, GR, GS, GT, GU, GV, GW, GX, GY, GZ, HA, HB, HC, HD, HE, HF, HG, HH, HI, HJ, HK, HL, HM, HN, HO, HP, HQ, HR, HS, HT, HU, HV, HW, HX, HY, HZ, IA, IB, IC, ID, IE, IF, IG, IH, II, IJ, IK, IL, IM, IN, IO, IP, IQ, IR, IS, IT, IU, IV, IW, IX, IY, IZ, JA, JB, JC, JD, JE, JF, JG, JH, JI, JJ, JK, JL, JM, JN, JO, JP, JQ, JR, JS, JT, JU, JV, JW, JX, JY, JZ, KA, KB, KC, KD, KE, KF, KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ, LA, LB, LC, LD, LE, LF, LG, LH, LI, LJ, LK, LL, LM, LN, LO, LP, LQ, LR, LS, LT, LU, LV, LW, LX, LY, LZ, MA, MB, MC, MD, ME, MF, MG, MH, MI, MJ, MK, ML, MM, MN, MO, MP, MQ, MR, MS, MT, MU, MV, MW, MX, MY, MZ, NA, NB, NC, ND, NE, NF, NG, NH, NI, NJ, NK, NL, NM, NN, NO, NP, NQ, NR, NS, NT, NU, NV, NW, NX, NY, NZ, OA, OB, OC, OD, OE, OF, OG, OH, OI, OJ, OK, OL, OM, ON, OO, OP, OQ, OR, OS, OT, OU, OV, OW, OX, OY, OZ, PA, PB, PC, PD, PE, PF, PG, PH, PI, PJ, PK, PL, PM, PN, PO, PP, PQ, PR, PS, PT, PU, PV, PW, PX, PY, PZ, QA, QB, QC, QD, QE, QF, QG, QH, QI, QJ, QK, QL, QM, QN, QO, QP, QQ, QR, QS, QT, QU, QV, QW, QX, QY, QZ, RA, RB, RC, RD, RE, RF, RG, RH, RI, RJ, RK, RL, RM, RN, RO, RP, RQ, RR, RS, RT, RU, RV, RW, RX, RY, RZ, SA, SB, SC, SD, SE, SF, SG, SH, SI, SJ, SK, SL, SM, SN, SO, SP, SQ, SR, SS, ST, SU, SV, SW, SX, SY, SZ, TA, TB, TC, TD, TE, TF, TG, TH, TI, TJ, TK, TL, TM, TN, TO, TP, TQ, TR, TS, TT, TU, TV, TW, TX, TY, TZ, UA, UB, UC, UD, UE, UF, UG, UH, UI, UJ, UK, UL, UM, UN, UO, UP, UQ, UR, US, UT, UY, UZ, VA, VB, VC, VD, VE, VF, VG, VH, VI, VJ, VK, VL, VM, VN, VO, VP, VQ, VR, VS, VT, VU, VV, VW, VX, VY, VZ, WA, WB, WC, WD, WE, WF, WG, WH, WI, WJ, WK, WL, WM, WN, WO, WP, WQ, WR, WS, WT, WU, WV, WW, WX, WY, WZ, XA, XB, XC, XD, XE, XF, XG, XH, XI, XJ, XK, XL, XM, XN, XO, XP, XQ, XR, XS, XT, XU, XV, XW, XX, XY, XZ, YA, YB, YC, YD, YE, YF, YG, YH, YI, YJ, YK, YL, YM, YN, YO, YP, YQ, YR, YS, YT, YU, YV, YW, YX, YY, YZ, ZA, ZB, ZC, ZD, ZE, ZF, ZG, ZH, ZI, ZJ, ZK, ZL, ZM, ZN, ZO, ZP, ZQ, ZR, ZS, ZT, ZU, ZV, ZW, ZX, ZY, ZZ

*PRODUCTION

PRODUCTION YES (circle) PRODUCTION SIZE SML MED LGE (circle one) PRODUCER

NON-PRODUCER
 PRODUCTION UNP NO (circle one)

*STATUS

EXPLORATION OR DEVELOPMENT

PRODUCER
 STATUS AND ACTIVITY A20 < >

NON-PRODUCER
 STATUS AND ACTIVITY A20 <2>

DISCOVERER L20 < >
 YEAR OF DISCOVERY L10 < > NATURE OF DISCOVERY L30 < > YEAR OF FIRST PRODUCTION L40 < > YEAR OF LAST PRODUCTION L45 < >
 PRESENT/LAST OWNER A12 <KIND COPPER CO. (1960)>
 PRESENT/LAST OPERATOR A13 < >
 EXPL./DEV.COMMENTS L110 <NO DEVELOPMENT OR PRODUCTION DATA>

DESCRIPTION OF DEPOSIT

DEPOSIT TYPE(S) C40 <STOCKWORK>
 DEPOSIT FORM/SHAPE A110 <PIPE; IRREGULAR MASSES>
 DEPTH TO TOP A230 < > UNITS A21 < >
 DEPTH TO BOTTOM A230 < > UNITS A21 < >
 DEPOSIT SIZE A115 <SMALL> A116 <MEDIUM> A118 <LARGE> (circle one)
 STRIKE A170 < >
 DIRECTION OF PLUNGE A1100 < > DIP A890 < >
 EXPL. DESC. COMMENTS A1180 <STOCK OR PIPE OF PORPHYRY ABOUT 1200 FT IN DIAMETER; ASSOCIATED SERICITE ALTERATION ZONE DIPS 20-25 N>

DESCRIPTION OF WORKINGS

Workings are: SURFACE A120 UNDERGROUND A130 BOTH A140 (circle one)
 DEPTH BELOW SURFACE A1160 < > UNITS A161 < >
 LENGTH OF WORKINGS A1170 < > UNITS A171 < >
 DESC. OF WORK. COM. A1220 <TYPE AND EXTENT OF WORKINGS ARE UNKNOWN>

GEOLOGY

*AGE OF HOST ROCK(S) K1 <TERT. v. 58 ± 5 m.y. (SIMONS F.S. 1974)>
 *HOST ROCK TYPE(S) K1A <BIOTITE-HORNBLENDE GRANODIORITE>
 *AGE OF IGNEOUS ROCK(S) K2 <TERT. v. 58 ± 5 m.y. (SIMONS F.S. 1974)>
 *IGNEOUS ROCK TYPE(S) K2A <PORPHYRITIC GRANODIORITE, DIORITE, PLITE DIKES>
 *AGE OF MINERALIZATION K3 <TERT. v. >
 *PERT. MINERALS (NOT ORE) K4 <SERICITE>
 *ORE CONTROL/LOCUS K5 <STOCK OR PIPE OF ACID PORPHYRY INTRUDING GRANODIORITE; SERICITE ZONE ABOUT 5 FT>
 *MAJ. REG. TRENDS/STRUCT. N15 <E-W AND NE TRENDING QUARTZ VEINS AND ASSOCIATED BANDS OF CRUSHED MINERALIZED>
 *TECTONIC SETTING N16 <GUAYTOLOTE FAULT BLOCK; DOWNTHROW TO E>
 *SIGNIFICANT LOCAL STRUCT. N17 <NEAR NW-TRENDING INFERRED GUAYTOLOTE FAULT; FAULT SHEAR ZONE IS 200 FT WIDE>
 *SIGNIFICANT ALTERATION N17S <INTENSE SERICITIC ALTERATION; GRANODIORITE IS HIGHLY SHATTERED, SHEETED, AND>
 *PROCESS OF CONC./ENRICH. N80 <SURFACE OXIDATION; OXIDIZED MOLYBDENUM COMPOUNDS ARE ABUNDANT IN MINERALIZED AREA>
 *FORMATION AGE N30 < >
 *FORMATION NAME N30A < >
 SECOND FM AGE N35 < >
 SECOND FM NAME N35A < >
 *IGNEOUS UNIT AGE N50 < >
 *IGNEOUS UNIT NAME N50A < >
 SECOND IG. UNIT AGE N55 < >
 SECOND IG. UNIT NAME N55A < >
 GEOLOGY COMMENTS N85 <IRREGULAR PARTICLES AND MASSES OF TUNGSTEN REACH SEVERAL INCHES IN DIAMETER>

GENERAL COMMENTS

GENERAL COMMENTS GEN < >

* GENERAL REFERENCES

- REFERENCE 1 F1 < DALE V.B. STEWART, A. AND W.A. MCKINNEY 1960, TUNGSTEN POSITS OF COCHISE, PIMA, AND SANTA CRUZ COUNTIES, ARIZONA: U.S. BUREAU OF MINES REPORT OF INVESTIGATIONS 5650 p. 122 >
- REFERENCE 2 F2 < SIMONS FRANK S. 1974, GEOLOGIC MAP AND SECTIONS OF THE NOGALES AND LOCHIEL QUADRANGLE, SANTA CRUZ COUNTY, ARIZONA: USGS MAP I-762 (1:48000) >
- REFERENCE 3 F3 < SCHRADER, F.C., 1915, USGS BULL. 582 (GENERAL REFERENCE) >
- REFERENCE 4 F4 < >

K5 < WIDE CONTAINS IRREGULAR PARTICLES AND MASSES OF BROWNISH TUNGSTEN MATERIAL OF UNKNOWN IDENTITY; TUNGSTEN MINERALS ALSO FOUND IN ADJACENT WALL ROCK >

N5 < ROCK IN FAULT FISSURES CUTTING DIORITE AND QUARTZ MONZONITE >

N75 < CRUSHED >

119

U.S. CRIB-SITE FORM

RECORD IDENTIFICATION

RECORD NUMBER 810 < > RECORD TYPE 820 < X, 1, M > DEPOSIT NUMBER 840 < >

REPORT DATE 81 < 82, 04 > INFORMATION SOURCE 830 < 12 > FILE LINK IDENT. 850 < >

REPORTER (SUPERVISOR) 82 < CALDER SUSAN R. > (last, first, middle initial) (last, first, middle initial)

REPORTER AFFILIATION 86 < ABGMT > SITE NAME 10 < RED MOUNTAIN CLAIMS >

SYNONYMS 811 < RED HILL CLAIMS, FOOT METALS, GUAJOLOTE LOPE, E. 22 OF CALDER PROPERTY CHS. >

MINING DISTRICT/AREA A30 < PATAGONIA DISTRICT >

COUNTY A60 < SANTA CRUZ > STATE A50 < A.Z. > COUNTRY A40 < U.S. >

PHYSIOGRAPHIC PROV A63 < 1.2, 1. >

DRAINAGE AREA A62 < 1.5, 0.5, 0.3, 0.1, V. LOWER COLORADO >

QUADRANGLE NAME A90 < LOCHIEL > LAND STATUS A64 < 4.1, 1.1, 1.1, 1.9, 7.9, 1. >

SECOND QUAD NAME A92 < HARSHAW > QUADRANGLE SCALE A100 < 625, 00. >

ELEVATION A107 < 5, 350, 1. FT. > SECOND QUAD SCALE A91 < 24, 00. 0. >

UTM NORTHING A120 < 34, 74, 00. 0. > ACCURACY ESTIMATED (EST) USED USBM RT 5650, p. 122. GEODETIC LATITUDE A70 < > N. LONGITUDE A80 < > W.

CADASTRAL TOWNSHIP(S) A77 < 0235. > RANGE(S) A78 < 01. 6. E. >

SECTION(S) A79 < 28 > SECTION FRACTION(S) A76 < SW, 28; SE, 29 >

MERIDIAN(S) A81 < GILA AND SALT RIVER >

POSITION FROM NEAREST PROMINENT LOCALITY A82 < 4.5 MILES SW OF HARSHAW >

LOCATION COMMENTS A83 < CLAIMS LOCATED ON SE SIDE OF GUAJOLOTE FLAT; 1.0 MILE SE OF GUAJOLOTE MINE >

* ESSENTIAL INFORMATION
+ ESSENTIAL SOMETIMES OR HIGHLY RECOMMENDED

09/26/88

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: FOUR METALS

ALTERNATE NAMES:

GUAJOLOTE LODE
PHOENIX CLAIMS
HILLSIDE CLAIMS
RED HILL

SANTA CRUZ COUNTY MILS NUMBER: 119

LOCATION: TOWNSHIP 23 S RANGE 16 E SECTION 29 QUARTER W2
LATITUDE: N 31DEG 23MIN 53SEC LONGITUDE: W 110DEG 43MIN 54SEC
TOPO MAP NAME: HARSHAW - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:

COPPER
SILVER
GOLD
LEAD
ZINC
MOLYBDENUM
TUNGSTEN

BIBLIOGRAPHY:

AZBM BULL. 191, P. 80
ADMMR FOUR METALS FILE
ADMMR "U" FILE, SANTA CRUZ CU65
USBM BULL. 582, P. 317-320
USBM RI 5650, P. 122
USGS MAP I-762

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine Four Metals Mine

Date March 4, 1965

District Palmetto District, Santa Cruz Co.

Engineer Axel L. Johnson

Subject: Field Engineers Report. Information from William Lundby and Boyce Cook.

References: Report of Nov. 5, 1964 and previous reports.

Present Mining Activity: Diamond drilling on the surface on contract to Metler Bros. Drilling Co. One diamond drill working two shifts. No underground drilling at present.

Review of Recent Operations: Since last report of Nov. 5, 1964, all the underground drilling on the 5090 ft. level of the mine has been completed.

THE FOUR METALS MINE

45 holes totaling 19,169' ; 3,000,000 tons of .82 Cu.

GI ~~###~~ 9/16/66

Active Mine List	April 1967	- Expl.	- C.P. Jenny, Mgr. West Range Co., 400 Golf View Drive, Rte. #6, Tucson.
"	"	"	Oct. 1967 - Expl.
"	"	"	April 1968 - Expl. - E. E. Jones, Proj. Supervisor, Kerr-McGee Oil Industries, Inc., 1637 E. 18th St., Tucson
"	"	"	April 1969 - Expl. - " " " " " " "
"	"	"	October 1970 - Expl. - " " " " " " "

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Four Metals Mine Date November 5, 1964
District Palmetto District, Santa Cruz Co. Engineer Axel L. Johnson
Subject: Mine Visit. Information from Art Robinson, Mine Foreman

Reference: Report of September 2, 1964.

Present Mining Activity: Diamond drilling underground on contract to Metler Brothers Drilling Co. One diamond drill now working two shifts. Also cutting drill stations on the 5090 ft. level for the additional drill holes. 10 men are employed on both operations.

Review of Operations: 38 holes have been drilled to date. The 39th hole is now being drilled. From 3 to 5 holes are drilled at different angles from each drill station. All of the holes except 3 have been flat plus or minus 3 degrees and have been from 350 to 500 ft. deep. The 3 exceptions were: 1 vertical, 1 at 45 degrees, and 1 at 35 degrees.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Four Metals Mine

Date Sept. 2, 1964

District Palmetto District, Santa Cruz Co.

Engineer Axel L. Johnson

Subject: Mine Visit. Information from Art Robinson, Mine Foreman

References Report of May 7, 1964, and previous reports.

Present Mining Activity Diamond drilling underground on contract to Metler Bros. Drilling Co. 3 diamond drill rigs now working, 2 of these are working 2 shifts, and the other one is working one shift. 12 men are employed on the diamond drilling operations -- 7 on days and 5 on nights. In addition, 2 men are working for West Range.

Review of Operations

- (1) The adit, described in the May 7, 1964, was continued to a length of 900 ft., where it intersected the old adit, and old workings.
- (2) 17 drill stations were cut from the sides of the new adit for diamond drilling operations.
- (3) Diamond drilling was started from these drill stations on the 5090 ft. level the latter part of June. 14 drill holes have been drilled to date.

Proposed Plans

About 14 more drill stations will be cut on the 5090 ft. level for additional diamond drilling.

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Four Metals Mine

Date May 7, 1964

District Palmetto District, Santa Cruz Co.

Engineer Axel L. Johnson

Subject: Mine Visit. Information from Art Robinson.

References: Report of March 5, 1964 and previous reports.

Present Mining Activity:

- (1) Diamond drilling from surface on contract by Metler Bros. with 1 drill operating.
- (2) Driving an adit on the 5090 ft. level on contract by Metler Bros.

A total of 17 men are employed - 2 men working on the drill rig, 13 men driving the adit, and 2 men working for West Range.

Review of Operations:

- (1) Underground diamond drilling was suspended some time ago, and now only one diamond drill is working, and that one is drilling from the surface, day shift only.
- (2) The adit on the 5090 ft. level, described in the Mar. 5, 1964 report is being continued, and this is now in a distance of 833 ft. from the portal. 13 men are employed in this work, working on 3 shifts. 2 Gardner Denver air leg drilling machines with Atlas Copco steel are used. The number of holes per round varies from 21 to 34, depending on the ground. 40% Ammonium Gelatin dynamite is used. A mucking machine is used for loading the mine cars, which are trammed out and dumped on the mine dump.

Proposed Plans:

- (1) To extend the adit to a length of about 900 ft. where it will intersect the old adit. At the point of intersection, the new adit will be at a 12 ft. lower elevation than the old one.
- (2) Drive crosscuts from the new adit.
- (3) Make drill hole stations on this level for future diamond drill holes.

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine 'Four Metals Mine Date January 9, 1964
District Palmetto District, Santa Cruz Co. Engineer Axel L. Johnson
Subject: Field Engineers Report. Information from Art Robinson & Personal visit.

References: Reports of Nov. 6, 1963, Sept. 5, 1963 & May 8, 1963.

Location: See report of May 8, 1963.

Owners & Operators: 'West Range Co., subsidiary of Norando Mines
Four Metals Division
'C.P. Jenney, Manager
'Art Robinson, Mine Foreman

Number of Claims: See report of May 8, 1963.

Principal Minerals: Copper

Present Mining Activity:

- (1) Drilling on 5260 ft. level on contract by Metler Bros.
- (2) Driving new adit on 5090 ft. level, on contract by Metler Bros.

Past History & Production: See report of May 8, 1963.

Old Mine Workings: See report of May 8, 1963.

Review of Recent Operations: The following work is now being done:

- (1) On the 5260 ft. level 1 diamond drill now working 2 shifts, and one diamond drill working 1 shift, both drilling horizontal holes. The 15th hole is now being drilled on the 5260 ft. level.
- (2) On the 5090 ft. level (lower level) a new adit is now being driven (started Jan. 7, 1964). The old portal is now being repaired. From the old portal, the adit will be driven straight, and not following the old adit, which has several bends and turns in it. The adit will be 6' x 8' inside, and will be driven a distance of 870 ft.

A mucking machine and 20# rails will be used.
Cross cuts and raises to follow.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Four Metals Mine Date November 6, 1963
District Palmetto District, Santa Cruz Co. Engineer Axel L. Johnson
Subject: Field Engineers Report. Information from Art Robinson & Personal visit.

References: Reports of Sept. 5 and May 8, 1963.

Present Mining Activity: Making drill stations and diamond drilling underground on contract to Metler Bros. Drilling Co. Art Robinson, Mine Foreman Metler Bros.

C.P. Jenney, Mgr., West Range Co.

2 drill rigs working two shifts, with 12 men working on the drill rigs.
Building change room and office, with 3 men working.

Review of Recent Operations: Since Sept. 5, 1963, the date of my last report, the following work has been done:

- (1) Continuation of diamond drilling underground on the 5260 ft. level. One rig was used until this week when a second rig was moved in and started to operate. Both are large C.P. air drills. Mr. Robinson reports that the 7th hole is now being drilled, with several more planned.
- (2) Making drill stations on the 5260 ft. level for additional drilling.
- (3) Minor repairs on the 5260 ft. level.
- (4) Building change room and office at the mine site.

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Four Metals Mine (also called 'Red Mountain')
District Palmetto District, Santa Cruz Co.
Date Sept. 5, 1963
Engineer Axel L. Johnson
Subject: Field Engineers Report. Information from Art Robinson & Personal visit.

References Report of May 8, 1963

Present Mining Activity Making drill stations and diamond drilling underground on contract to Metler Bros. Drilling Co. Art Robinson, Mine Foreman. Stan Williams, Engineer in charge of operations for West Range Co.

7 men are working one shift---- 4 of these are making drill stations, and 3 are working on the drill rigs.

Review of Recent Operations Since May 8, 1963, the date of my last report, the following work has been done at the mine:

(1) Repairing and retimbering an additional 235 ft. on the 5090 ft. level (bot. level) from May 8 to June 1.

(2) Repairing and retimbering of 600 ft. of adit and 670 ft. of cross cuts on the 5260 ft. level, and laying track, pipe, and water lines, June 1 to date.

(3) Made 3 drill stations on the 5260 ft. level. 3 to 4 diamond drill holes will be drilled from each of these stations.

(4) Now diamond drilling and making additional drill stations. A C. P. diamond drill rig is being used. Horizontal holes are being drilled --- some 250 ft. long, some 300 ft. long, and others 350 ft. long. Cores are N, B and Ax.

Mineralization Some minerals are found in spots, and is usually found in narrow veins from 1 to 4 inches wide. Minerals are chalcopyrite, a few specks of bornite, and a little molybdenite.

Proposed Plans Operators plan on drilling at least 10 horizontal drill holes, possibly more. In addition to the horizontal, shallow holes, they expect to drill a few deep angle holes up to 1,000 ft. deep.

Operators also expect to repair the 5400 ft. level for an escape route and for ventilation, and may also drive a 400 ft. crosscut to the west on the 5260 ft. level.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

6

Mine Four Metals Mine (also called Red Mountain) Date May 8, 1963
District Palmetto District, Santa Cruz Co. Engineer Axel L. Johnson

Subject: Field Engineers Report. Information from Art Robinson & personal visit.
(19,20,29,30,32 - workings in 29) *additions as per C.P. Jenney 6-6-63*

Location: Approximately Sec. 30, T. 23 S., R. 16 E. To reach property drive 5 miles north from Nogales on Hwy 82, turn right (east) and drive east for 9.3 miles on Nogales-Washington Camp road. Turn left (north) and drive north for 1.3 miles to the mine.

Owners & Operators: West Range Co., subsidiary of Noranda Mines
C. P. Jenney, Manager, Catalina Foothills Lodge
5250 N. Oracle Road, Tucson, Ariz.
Stan Williams, Engineer in charge of operations
Art Robinson, Mine Foreman

(31)

Number of Claims: 30 unpatented claims *as per C.P. Jenney 6-6-63* other 30
1 claim purchased from Manuel Herredia (covers part of same area as
Other 29 claims located by the company.
30 " " 1 claim staked April 8, 1963

Principal Minerals: Copper

Present Mining Activity: Repairing adit on S side of Red Mountain - 3 men working.

Past History & Production: (1) The Four Metals group of claims (30 claims) was formerly a part of Coronado Mines, owned by Coronado Mines, Inc., and consisting of 10 mines with 163 unpatented claims. (See report of Coronado Mines under date of Dec. 3, 1953.) Prior to about 1942, these holdings were known as Kino Copper Company.

(2) In 1953, Duval Sulphur & Potash Co. put down several diamond drill holes on the Four Metals group of claims, at that time called "Red Mountain." (See report of Coronado Mines under date of Feb. 3, 1954.)

There is no record of any past production.

Old Mine Workings: (1) 1 tunnel on the 5360 ft. level (S side of Red Mountain) ¹⁸⁵ ~~163~~ ft. long
(2) 1 tunnel on the 5400 ft. level (N side of Red Mountain) 600 ft. long
(3) 1 adit on the 5260 ft. level (S side of Red Mountain) 750 ft. long with about 400 ft. of cross cuts.
(4) 1 adit on the 5090 ft. level (S side of Red Mountain) 1187 ft. long, referred to as "bottom level." This is now being repaired.
(5) 1 raise, about 140 ft. high, connecting the 5260 ft. level and the 5400 ft. level.

Much of the above old workings are caved in and in need of repair.

Review of Recent Operations: Operators started work on this property about April 1st. Since that time, about 224 ft. of the bottom adit, (5090 ft. or bottom level) has been cleaned out, repaired and retimbered. A contract has been let to Metzler Bros. Drilling Co. for underground diamond drilling, which work will start as soon as enough of the adit has been repaired.

Proposed Plans: (1) Underground diamond drilling by Metzler Bros.
(2) Geologic mapping and sampling on the bottom level.

Other Work in the Area: Metzler Bros. Drilling Co. drilled 2 diamond drill holes on contract for West Range Co. in March and April. These holes were put down NW of the Golden Rose and Buena Vista, approximately in Sections 33 & 36, T. 23 S., R. 15 E.
1 & 26

MINNESOTA MINE (FILE)

8/84

SANTA CRUZ COUNTY
PATAGONIA DISTRICT
T23S R16E Sec. 31

MILS Santa Cruz Index #164A

USGS Bull. 582, p. 316

AKA: Marche Mine

Nogales, AZ 7.5 map (included in file)

COMMODITY INFORMATION

COMMODITIES PRESENT C10 < K.U. MAG. >
 ORE MINERALS C30 < MALACHITE, IRITE >
 COMMODITY SUBTYPES C41 < >
 GEN. ANALYTICAL DATA C43 < >
 COM. INFO. COMMENTS C50 < NO SULPHIDES NOTED >

* SIGNIFICANCE

PRODUCER		NON-PRODUCER	
MAJOR PRODUCTS MAJOR < K.U. >	MINOR PRODUCTS MINOR < MAG. >	MAIN COMMODITIES PRESENT C11 < >	MINOR COMMODITIES PRESENT C12 < >
POTENTIAL PRODUCTS POTEN < >	OCCURRANCES OCCUR < >	OCCURRANCES OCCUR < >	

* PRODUCTION

PRODUCER		NON-PRODUCER	
PRODUCTION (YES) (circle) < YES >	PRODUCTION SIZE < SMALL > MED LGE (circle one)	PRODUCTION UND NO (circle one)	

* STATUS

PRODUCER		NON-PRODUCER	
EXPLORATION OR DEVELOPMENT		EXPLORATION OR DEVELOPMENT	
STATUS AND ACTIVITY A20 < (4) >		STATUS AND ACTIVITY A20 < () >	

DISCOVERER L20 < >
 YEAR OF DISCOVERY L10 < > NATURE OF DISCOVERY L30 < (B) > YEAR OF FIRST PRODUCTION L40 < 1952 > YEAR OF LAST PRODUCTION L45 < 1953 >
 PRESENT/LAST OWNER A12 < >
 PRESENT/LAST OPERATOR A13 < W.W. TODD AND JOE BOSTWICK (1952-53) >
 EXPL./DEV.COMMENTS L110 < DEVELOPMENT BEGAN AS EARLY AS 1900 >

DESCRIPTION OF DEPOSIT

DEPOSIT TYPE(S) C40 < VEIN / SHEAR ZONE >
 DEPOSIT FORM/SHAPE M10 < TABULAR, IRREGULAR >
 DEPTH TO TOP M20 < > UNITS M21 < > MAXIMUM LENGTH M40 < > UNITS M41 < >
 DEPTH TO BOTTOM M30 < > UNITS M31 < > MAXIMUM WIDTH M50 < 2 > UNITS M51 < FT >
 DEPOSIT SIZE M15 < SMALL > M15 < MEDIUM > M15 < LARGE > (circle one) MAXIMUM THICKNESS M60 < > UNITS M61 < >
 STRIKE M70 < NE-SW > DIP M80 < 35 SE >
 DIRECTION OF PLUNGE M100 < > PLUNGE M90 < >
 DEP. DESC. COMMENTS M110 < >

DESCRIPTION OF WORKINGS

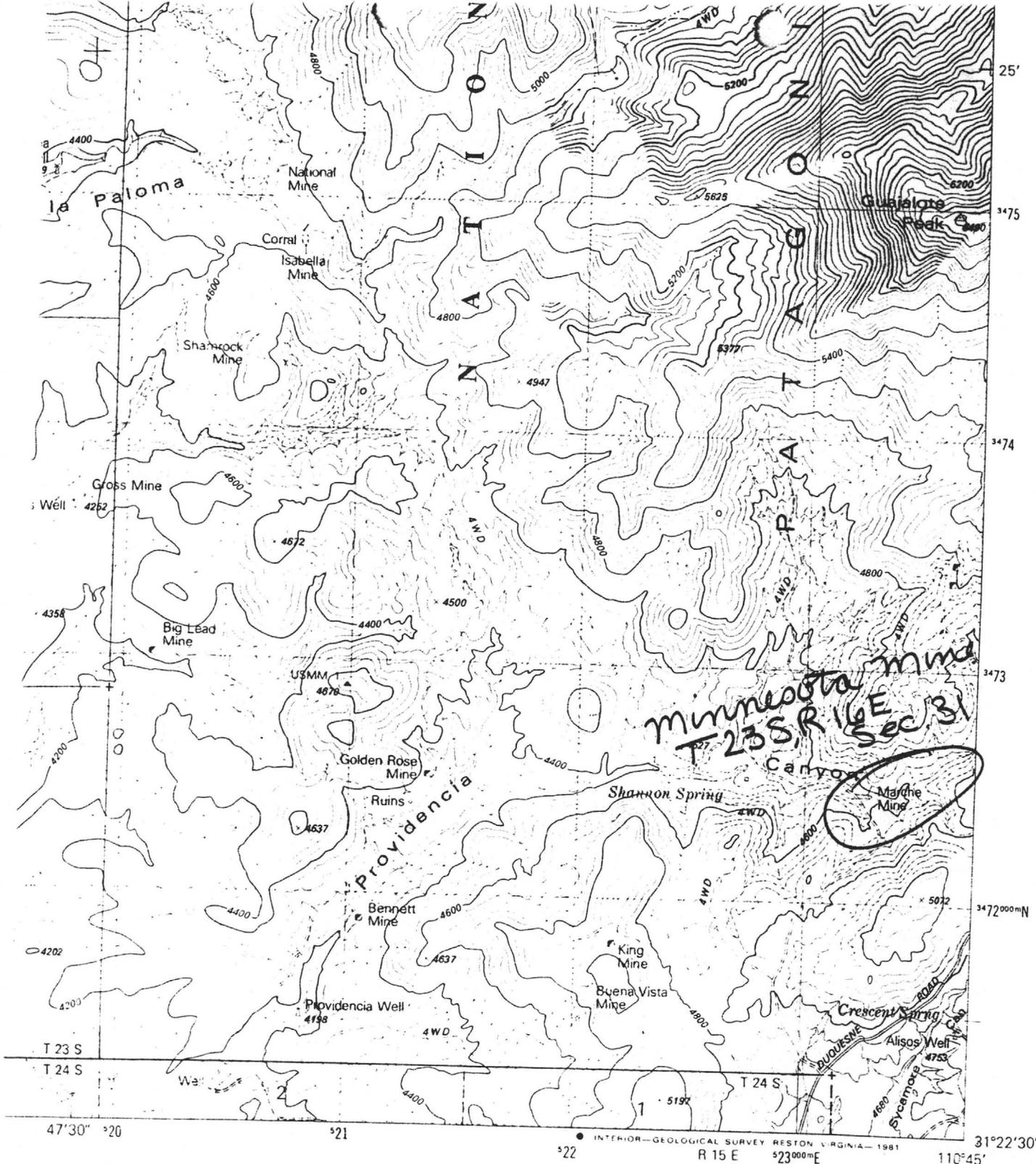
Workings are: SURFACE M120 UNDERGROUND < (M130) > BOTH M140 (circle one)
 DEPTH BELOW SURFACE M160 < > UNITS M161 < > OVERALL LENGTH M190 < > UNITS M191 < >
 LENGTH OF WORKINGS M170 < 90 > UNITS M171 < FT > OVERALL WIDTH M200 < > UNITS M201 < >
 DESC. OF WORK. COM. M220 < TWO TUNNEL DRIFTS DRIVEN IN OPPOSITE DIRECTIONS ON DIFFERENT SIDES OF THE GULCH. THE SOUTHERLY TUNNEL IS 90 FEET IN LENGTH. > OVERALL AREA M210 < > UNITS M211 < >

GEOLOGY

* AGE OF HOST ROCK(S) K1 < TERT. >
 * HOST ROCK TYPE(S) K1A < QUARTZ MONZONITE >
 * AGE OF IGNEOUS ROCK(S) K2 < TERT. > 58 ± 5 m.y. (SIMONS, ES, 1974)
 * IGNEOUS ROCK TYPE(S) K2A < BIOTITE-HORNBLENDE GRANODIORITE >
 * AGE OF MINERALIZATION K3 < TERT. >
 * PERT. MINERALS (NOT ORE) K4 < IRON-STAINED QUARTZ >
 * ORE CONTROL/LOCUS K5 < NE-TRENDING QUARTZ VEIN CUTTING QUARTZ MONZONITE >
 * MAJ. REG. TRENDS/STRUCT. N5 < DEPOSITS OCCUR IN FORM OF SUBORDINATE VEINS, LENSES, STRINGERS AND SEAMS >
 * TECTONIC SETTING N15 < GUATELOTE FAULT BLOCK - NW-TRENDING, INFERRED GUATELOTE FAULT LIES TO E. >
 * SIGNIFICANT LOCAL STRUCT. N70 < >
 * SIGNIFICANT ALTERATION N75 < STRONG POTASSIC ALTERATION. GRANODIORITE IS HIGHLY SHATTERED SHEETED >
 * PROCESS OF CONC./ENRICH. N80 < OXIDATION AT NEAR SURFACE; MINERALIZATION ACCOMPANIED OR FOLLOWED >
 * FORMATION AGE N30 < >
 * FORMATION NAME N30A < >
 * SECOND FM AGE N35 < >
 * SECOND FM NAME N35A < >
 * IGNEOUS UNIT AGE N50 < >
 * IGNEOUS UNIT NAME N50A < >
 * SECOND IG. UNIT AGE N55 < >
 * SECOND IG. UNIT NAME N55A < >
 * GEOLOGY COMMENTS N85 < >

GENERAL COMMENTS

GENERAL COMMENTS GEN < >



Nogales, AZ 7.5



- ROAD CLASSIFICATION**
- Primary highway, hard surface
 - Secondary highway, hard surface
 - Light-duty road, hard or improved surface
 - Unimproved road
 - Interstate Route
 - U. S. Route
 - State Route

CUMERO CANYON, ARIZ.

NE/4 NOGALES 15' QUADRANGLE
N3122.5-W11045/7.5

1981

DMA 3846 IV NE-SERIES V898

(DUQUESNE)
3846 I SW

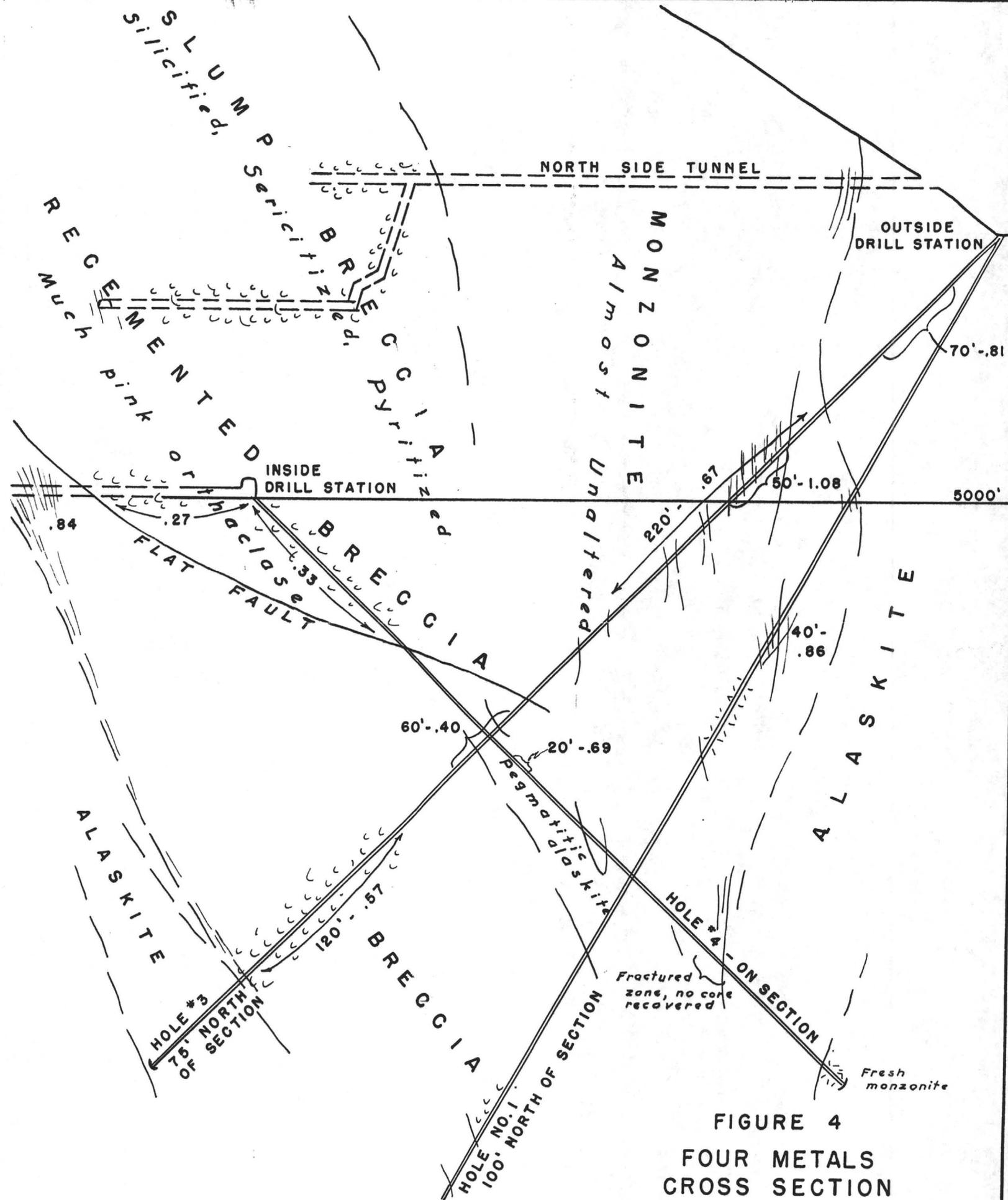
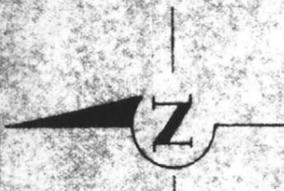


FIGURE 4
 FOUR METALS
 CROSS SECTION

COPY OF MAP BY PAUL BILLINGSLEY



Composite of 23 samples within area outlined

	Au	Ag	Cu	Pb	Mn	Fe	S	Ins.
TR	0.12	0.64	0.16	0.04	7.64	4.17	77.7	

EXPLANATION

- Brecciated Monzonite containing angular vugs and grains of pyrite - chalcocopyrite
- Zones of limonite and clay with large (± 6" dia.) masses of pyrite
- Areas showing copper sulphate on drift walls
- ▬ Mineralized fissure or fault
- 25 - % Cu in chip sample from drift wall

NO. 2 ADIT LEVEL
 Assay & Geologic Map
FOUR METALS MINE
 Santa Cruz County, Arizona

SCALE 1" = 50'

Fig. 5
 This map furnished by ORMET CO.
 It is a true copy of map made by
 A.S. & R.

