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

The following file is part of the

James Doyle Sell Mining Collection

ACCESS STATEMENT

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

CONSTRAINTS STATEMENT

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

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

QUALITY STATEMENT

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

300' - 600' overburden — average 460'

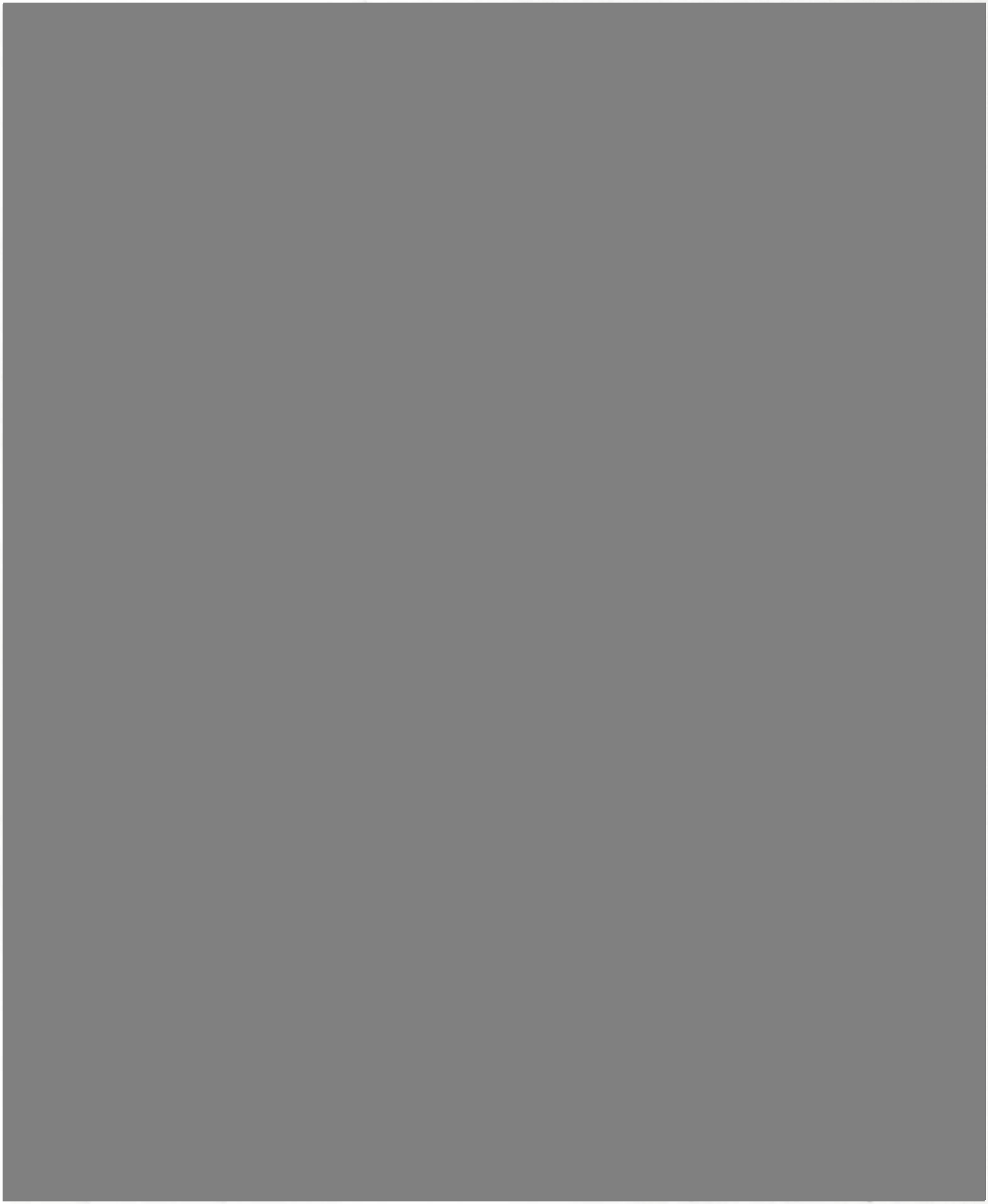
Oxidation — ± 200' — much deeper along structures

900' shaft — 15000' develop on 2400 elev. level.

L/O in bedrock (after mining starts?) 1:1

Final pit: 1 x 1½ miles, 1800' deep.

Reprinted from
E/MJ April 1967



AIME Sub Section 6-2-76

Anamax
Twin Buttes

Gordon Rossiter —

Agitation Leach

Hydro-metallurgical — electrowinning — ← to increase Cu in sol.
Solvent extraction — organic compounds —
grind: 15% plus 65 mesh —
90% recovery of acid soluble copper
Design: 10,000 tpd — 100 tons Cu/day — now 7000/day

200 lbs H_2SO_4 per ton ore — or #0 lbs/lb. Cu

5 hr leach — 13% solids.
Cathode starting sheets —
Thickener decrease ~~solids to 5~~ water
to 42% → tails —

RBC: (form 10k) capital 90 mil (including ~~32~~ 40 mils for power plant

San X — 13 million cap (~~incl mine~~ plant only)

J. H. C.

JAN 12 1965

January 12, 1965

Mr. F. C. Stevens, Development Manager
MacArthur Development Company
c/o Mount Isa Mines Ltd., Box 9
Mount Isa, Queensland, Australia

Dear Mr. Stevens:

In reply to your letter of December 22, 1964, to Mr. Nelson with reference to the Twin Buttes operation of the Anaconda Company, I am sorry to advise that we cannot provide the detailed information requested.

Anaconda is planning an open pit operation at Twin Buttes with the removal of 500-800 feet of alluvial material covering the ore body. The ore body may be wholly mined by open pit methods. They have not reached the point of selecting equipment, however, we understand the pit equipment will be 12-15 yard shovels and 65-85 ton trucks, depending on their experience with such equipment at other properties.

No typical plans or sections of the ore body are available and they probably will not be available at a future date. Such information is seldom distributed.

Yours very truly,

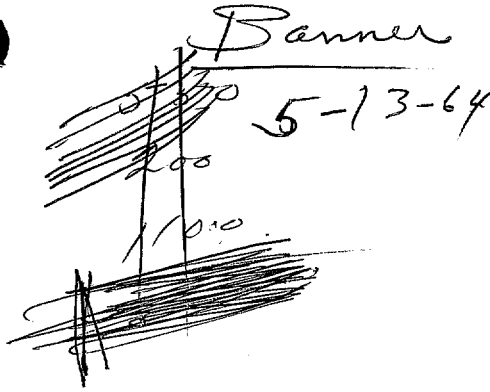
ORIGINAL SIGNED BY
T. A. SNEDDEN

T. A. Sneddon
General Manager

TAS:lc

cc: CENelson
CPPollock
JHCourtright

Banner has received 3½ million
of which 1 mil is loan
will receive 1¾ mil annually
starting in Jan 1965 —
all this advance royalties
during further drilling



will construct mill 17-000 minimum cap
net profits to be divided equally

Banner Stockholders — Tintic Standard
Rico Argentine
Hoyle family
John M Wallace
L L Travis — Dallas Pres
David Built Iliff - Houston

3½ mil will pay ½ dividend,
repay all loans and provide working capital!

WESTERN MINING DEPARTMENT
Salt Lake City, Utah

January 29, 1953

Mr. C. P. Pollock, Assistant to Vice President
American Smelting and Refining Company
120 Broadway
New York 5, New York

ARIZONA, PIMA COUNTY
BANNER MINING COMPANY
MINERAL HILL MINE

Dear Sir:

Mr. T. A. Snedden's letter and Mr. J. H. Courtright's memorandum of January 12 on the Mineral Hill are attached.

Mr. Courtright has reviewed Banner Mining Company ore reserve estimates, which show:

	Tons	Ag	Cu	MoS2	WO3
Measured	78,000				
Indicated	295,000				
Inferred	125,000				
	498,000	.78	2.63	.05	.05

According to Mr. Snedden this estimate checks closely with old reports in our files.

Mr. Snedden's estimate on outcome indicates an operating loss of 3.63/Ton on 2.5% Cu grade and 24.5 cent copper price. (Provision for royalties and recouping expenditures to date and a possibly recovery of a minor amount of molybdenum and tungsten are not included.) At 32 cent copper which the Banner people hope to negotiate from the government a $0.38 loss is estimated.

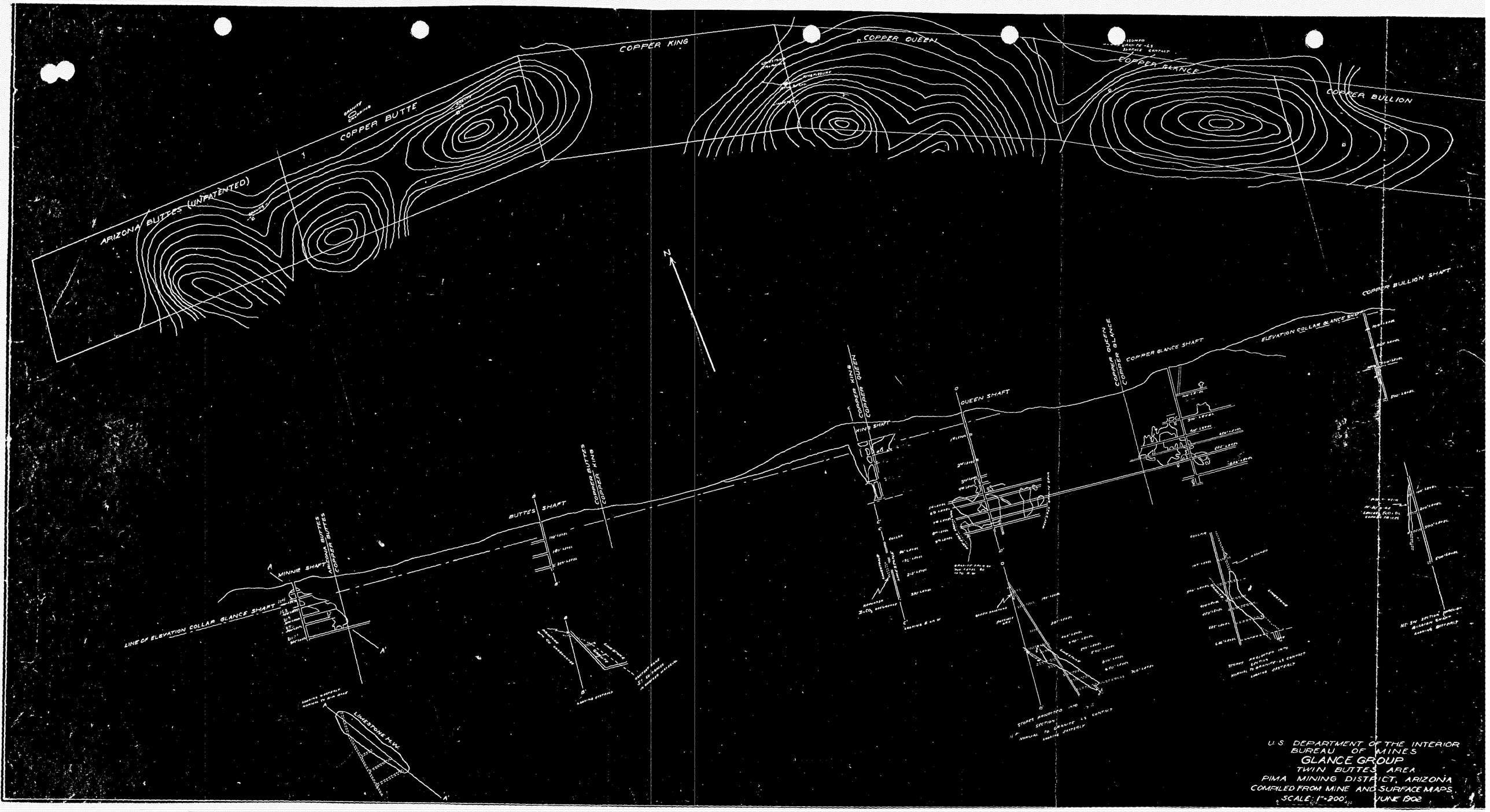
Obviously the present reserves are not of interest, however, as Mr. Courtright and Mr. Lacy report, there is a chance that the Pima ore body may extend into the eastern part of the Mineral Hill property.

Yours very truly,

ORIGINAL SIGNED BY
D. J. POPE

D. J. POPE

Encl. (2)
cc: WHLandwehr
TASnedden
LKWilson
RJLacy
JHCourtright



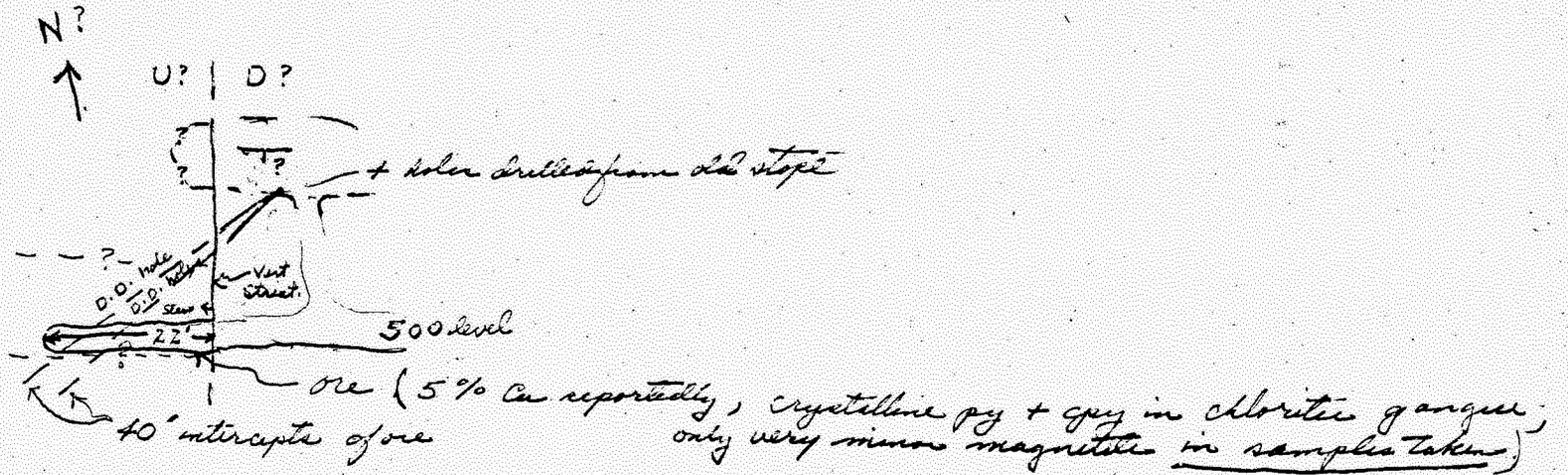
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
GLANCE GROUP
TWIN BUTTES AREA
PIMA MINING DISTRICT, ARIZONA
COMPILED FROM MINE AND SURFACE MAPS.
SCALE 1"=200' JUNE 1902

KGP

Copper Glance - Copper Queen

Glance - Vert shaft. 500 level of Glance connects with the old "700" level of Queen.

1820' apart on surface.
700' vert penetration in Queen.
9000' of igneous - sediment contact, along north edge of 6 claims.
ore shoot found at about 400 level

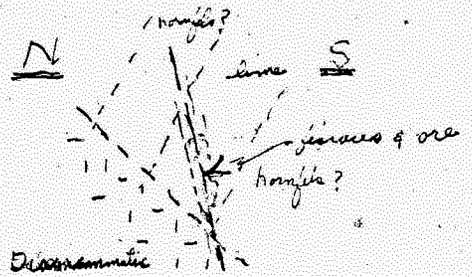


Surface outcrops: Carboniferous? Shaly members now hornfels, some losing membre recrystallized. Some tabular masses of garnet. No outcrop of ore shoots. Original shaft on Glance shows "mean Cu stain," "sulphide limonite". Igneous contact roughly E-W, dip 45° (?) S. Sediments dip steeply north into intrusive contact.

Glance 500 level.

Some sooty chalcocite & "sponge" copper, probably due to original oxidation-enrichment process rather than post-mining oxidation.

Fissures trending E-W, parallel to intrusive contact, dipping approx 70° S helped to localize sulphide deposition. Cross-cutting fissures observed in several places carrying qtz-py. ore has py, cpy, garnet, some magnetite, qtz.



PLAN MAP
COPPER QUEEN MINE
TWIN BUTTES, ARIZ.

SCALE 20' = 20'

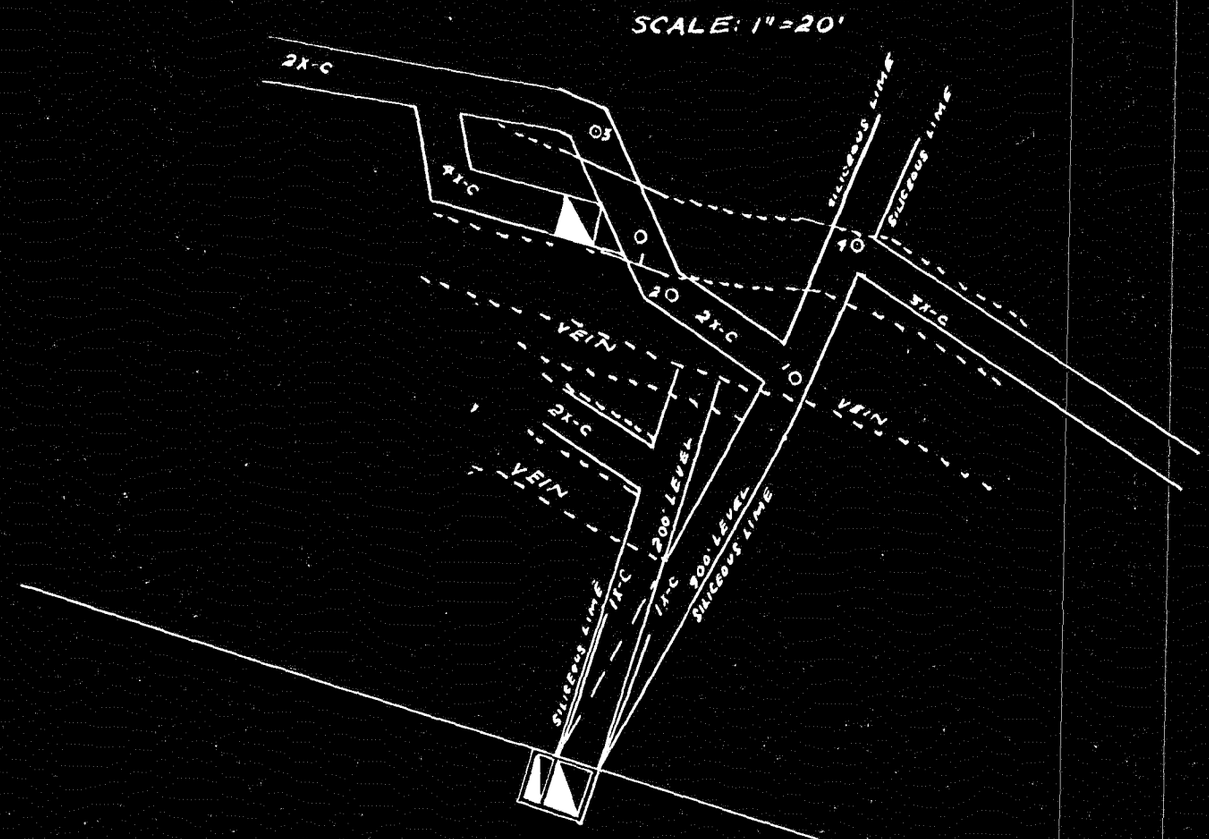
Legend

1st Level
2nd "
3rd "
4th "
5th "
6th "
7th "
Shaft
Raise
Raise (connected)
Winze
8th Level
9th "

PLAN OF THE BULLION SHAFT

N

SCALE: 1"=20'

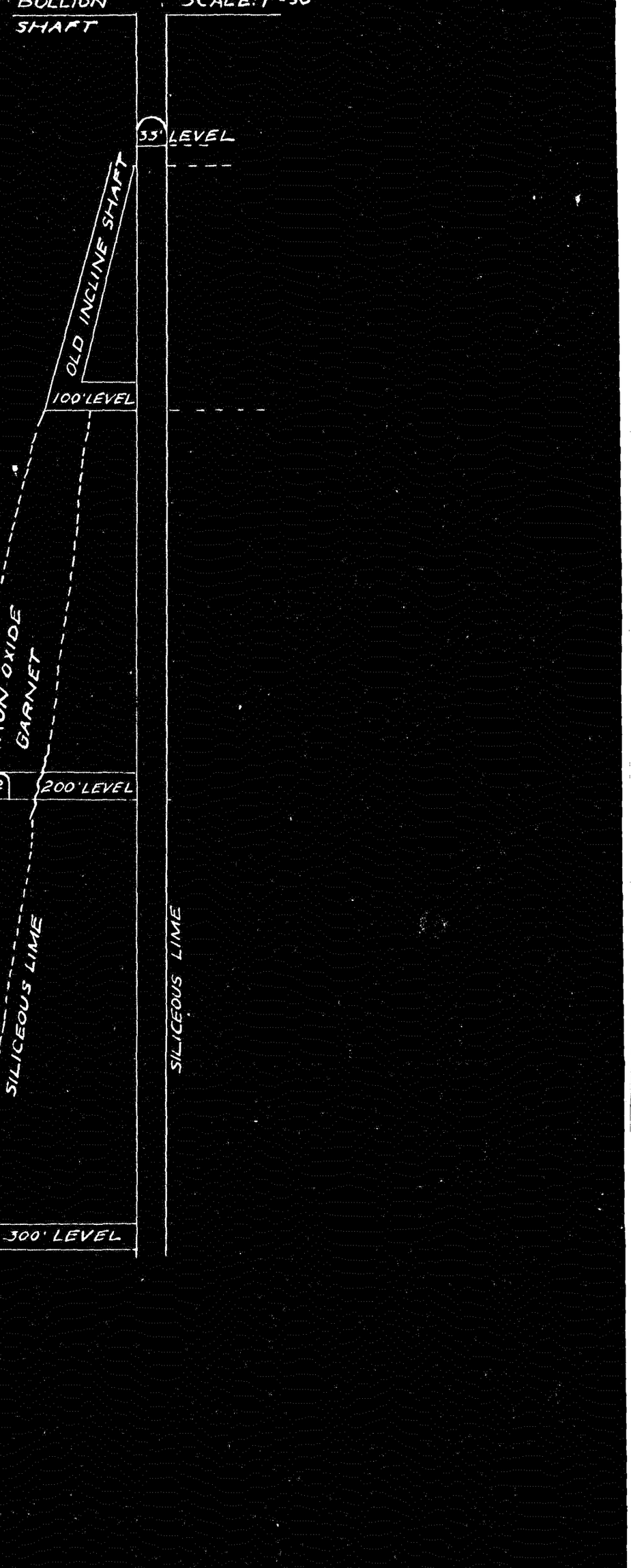


PLAN AND CROSS-SECTION
OF THE
BULLION SHAFT
MIDLAND COPPER CO.
TWIN BUTTES, ARIZONA

CROSS SECTION

NE ⟷ SW

SCALE: 1" = 30'



2 Re.

A LENSOIDAL RHYOLITE NEAR TWIN BUTTES, ARIZONA

by

Richard J. Lutton

Pectinate (or axiolitic) structure is remarkably well-developed in a volcanic rock at the southeast end of the Sierrita Mountains, Pima County, Arizona. The host rock, a lensoidal rhyolite, is one unit of a series of sedimentary and volcanic formations. In the immediate area about 1000 feet of the Cretaceous (?) column can be subdivided into six members (Figure 1). Only the upper two are of concern here.

Petrography

The lensoidal rhyolite and an underlying black welded tuff have a gradational contact and may be considered broadly to be textural facies of one unit.

Black welded tuff* The welded tuff is dark gray to black and glassy or greasy-lustered. Distorted dark fragments averaging an inch in diameter and having white rims are common. Microscopically it is crystalline but plane polarized light reveals a densely matted structure resulting from welding of what were probably once viscous shreds of melt.

A specimen from the core of the anticline at the west (Figure 2) carries fragments of devitrified glass, tuff, and part disaggregated sandstone. In addition it contains angular fragments of quartz and feldspar. The groundmass is presumed to be mostly quartz and feldspar.

* The term welded tuff is used here as a structural term with no genetic connotation.

The only other phases are opaque trichites and margarites which probably account for the dark color of the hand specimens.

Lensoidal rhyolite The lensoidal rhyolite is gray, tan, white, pink, or purple and porcelaneous in texture. It is always hard and little affected by weathering. Some rock lacks foliation but nevertheless contains the peculiar wreathed inclusions that elsewhere are streaked out to extreme lengths. Sub-angular feldspar and quartz crystals and lithic fragments are not uncommon.

In thin section the microcrystalline groundmass is sharply bounded from the lenses. It contains one or two percent of magnetite and the rest is quartz and feldspar partly altered to clay. Locally, the welded structure is recognizable but usually the granular, microcystalline assemblage has obliterated it. Some of the groundmass is highly foliated and optically oriented.

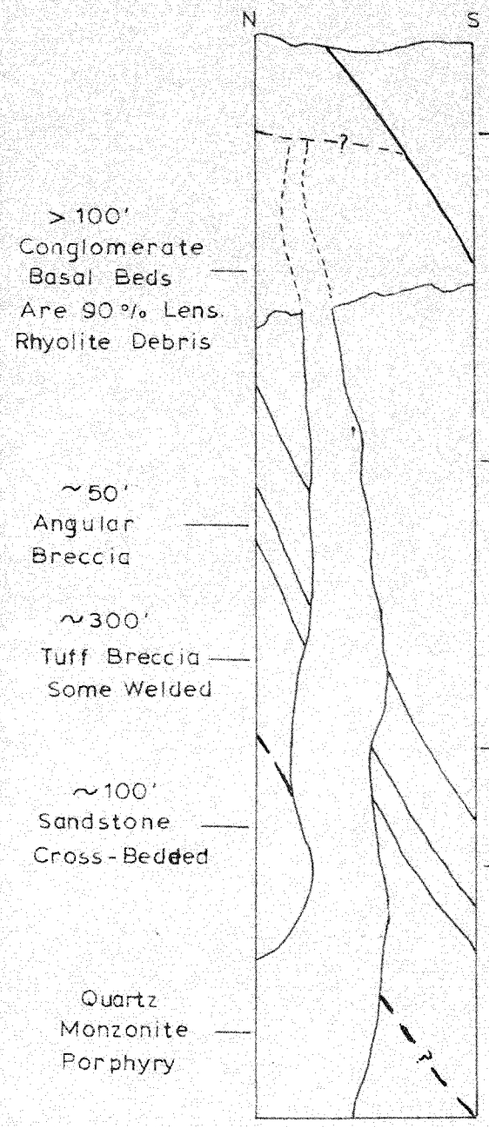
The typical lens averages about one half inch in the intermediate dimension and major-minor dimensional ratios vary from 1:1 to over 50:1. Lineation is not common. Although some lenses with feldspar laths as large as 2 mm long reveal the internal structure, one usually must rely on the microscope for examination.

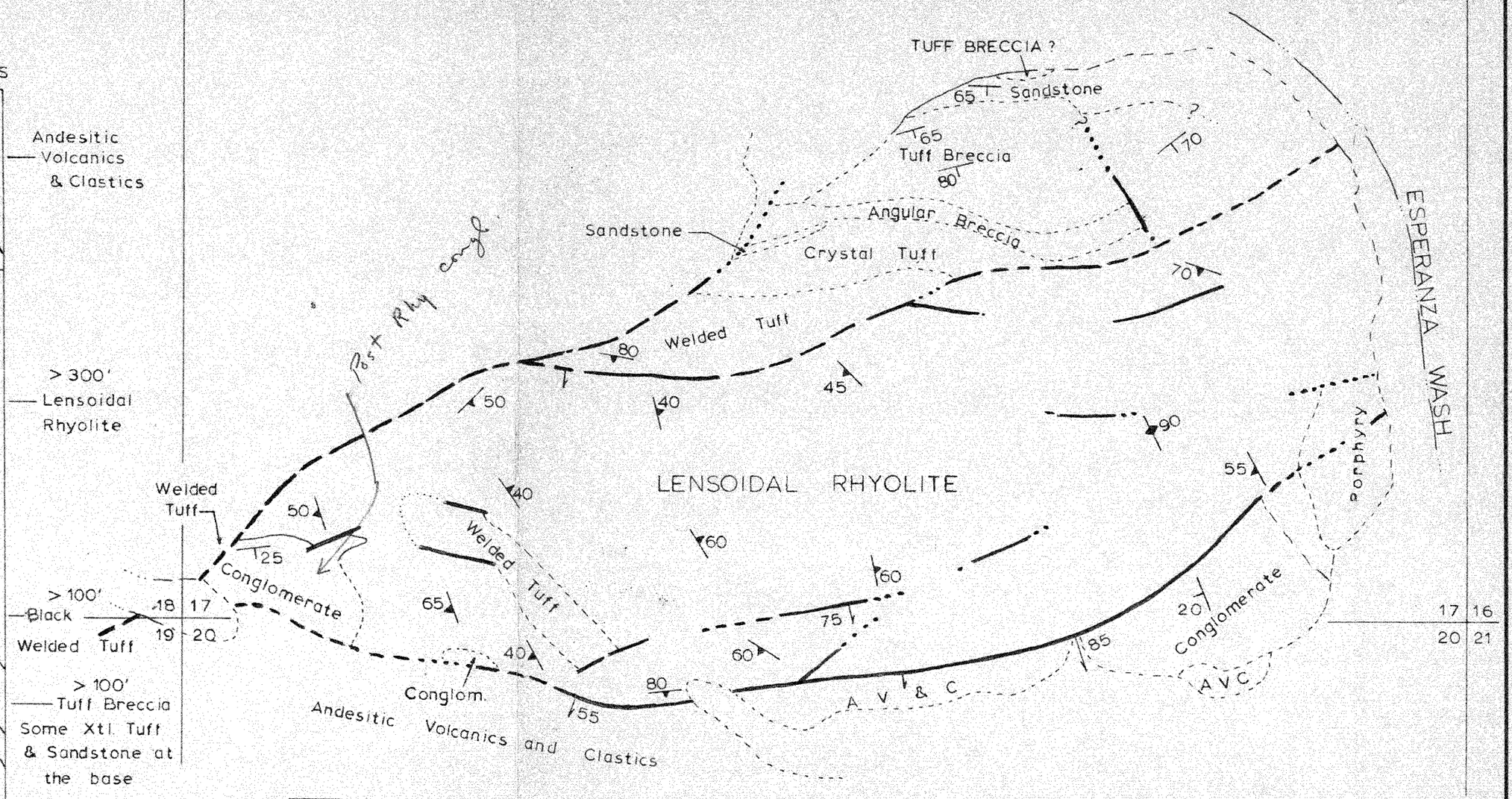
Under the microscope the structure is seen to be a zonal arrangement of a polycrystalline quartz center surrounded by a border of euhedral orthoclase projecting inward from a feathery crystalline zone at the edge of the lens. Where plagioclase is present, it is as subhedral crystals along with perthitic orthoclase isolated in the quartz center. Locally spherulites of orthoclase with well-developed crystals at the periphery are present in the core. Elsewhere in the large lenses the entire field of the miscroscope can be filled with an assemblage that resembles a fine-grained granite; the differences being that the plagioclase is never zoned and there are no mafic minerals except for rare magnetite grains.

Quantitative measurements were made on unstained and stained thin sections and with reflected light on stained slab surfaces. Slabs were stained by a procedure modified from one developed by Bazeley and Jestes (personal communication). HF was applied directly to the slab but allowed to remain only 15 seconds. Sodium cobaltinitrite solution was left on the etched surface about three minutes. Results on thin sections were disappointing. Fortunately the slabs can quickly be reground and stained again until an even degree of staining is obtained. The results in table 1 are considered reliable. They show that lenses occupy from one third to one quarter of the rock. These data must be qualified by the possibility that in selecting specimens in the field, I picked lensoidal samples and thus overweighted the importance of the lenses. Lenses are very high in orthoclase, moderately high in quartz, and low in plagioclase (obligoclase). The perthitic nature of the orthoclase suggests that more plagioclase may remain "hidden" as a submicroscopic exsolute in the orthoclase. The composition, then, is probably rhyolitic and it is considered to represent the whole rock.

Relic banding that is identifiable as that of collapsed pumice is noted in some axiolites. The transformation of such plastic fragments must have occurred at high viscosity and may even have been more properly, devitrification.

I wish to thank John R. Cooper and John W. Anthony for critically reviewing my conclusions and also the Duval Sulphur and Potash Company for permission towork on some of their claims.





DUVAL SULPHUR & POTASH COMPANY

COPPER DIVISION — TUCSON, ARIZONA

App'd by	Scale 1" = 500'	Date
App'd by	Drawn by	Drawing No.
App'd by	Ch'k'd by	