CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
3550 N. Central Ave, 2nd floor
Phoenix, AZ, 85012
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

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3-13-16 Mr. Kinnison

INTER-OFFICE MEMORANDUM

TO J. J. Durek
AT Oakland, California

DATE April 27, 1971

FROM J. E. Kinnison
AT Tucson, Arizona

COPIES TO File
Blue

SUBJECT Squaw Peak Copper Prospect, Yavapai County, Arizona

The subject property is held by Phillips Petroleum Corporation, who has done considerable drilling on it. The initial contact was made by the vice-president of Phillips Petroleum, who called Wallace McGregor, following which T. F. O'Neill relayed to me the information that the property was available for a joint venture, and that indicated reserves were 30-million tons which graded 0.46% copper and 0.05% Mo, with recoverable tungsten values. Robert Forest, Manager of the Western Region, Minerals Division, contacted me and I met with him on the property April 6, 1971, for a brief one-day examination.

The property is of no further interest to Kaiser Exploration and Mining Company. Mr. Forest has made a very crude calculation--probably representing a maximum tonnage--within the area of better copper mineralization, and has arrived at an estimated 30 million tons which will grade 0.36% copper, and 0.022% MoS_2, using a cut-off of 0.28% copper. Tungsten occurs as sheelite and grades about 0.03% Wo_3, and is not believed to be recoverable. In order to raise the grade to, say 0.45% or 0.5% Cu, the tonnage would be greatly reduced. The tenor of the deposit then, is less than originally reported to our people in Oakland, and the deposit is clearly not commercial. The area of better copper has been fairly well delineated by eight holes, of which four have intersected better copper grades, and were in turn surrounded by very lean copper mineralization. There appears to be no chance for any major extensions either laterally or in depth.

Although I advised Mr. Forest in the field at the end of the examination that I did not foresee any interest by our company in the Squaw Peak deposit, I also told him that since it had been initially brought to our attention through Oakland, that I would relay my findings for a final decision. Therefore, if you concur in my conclusion regarding this property, I will so advise Mr. Forest.

The deposit is somewhat unusual, and I believe that we can profit from the data gained by the examination. Briefly stated, the deposit is situated south of Camp Verde, near a southeasterly extension--or parallel structure--of the Verde Fault. The host rocks are characteristic of the pre-Cambrian granites of the Bradshaw Mountains, and there are no "Laramide-appearing" porphyries or other rocks. The regional setting of the deposit suggests that it is near the edge, but within, the stable plateau province as it existed during the Laramide, and which did not receive Laramide porphyry copper mineralization. Presumably the mineralization is pre-Cambrian. Sulphides

occur principally on hairline fractures, and consist of pyrite over a fairly wide area, with a restricted zone about 1200' long and perhaps 400' - 600' wide, in which the dominant sulphide is chalcopyrite. The total sulphide content rarely exceeds 1.5%. The zone of better copper mineralization--0.3% to 0.6% copper--trends almost northerly, whereas the fractures which appear to localize mineralization strike slightly across this zone--about N 30° W. This to me suggests tension fractures developed in a zone of north-trending shear stress. Another controlling feature appears to be a rock contact within the pre-Cambrian granitoid units, either separate intrusives or else a metamorphic or alteration feature. The better values lie above the contact between a quartz diorite and a complex of granite and quartz monzonite--all coarse-grained varieties, however. This contact, and the better copper zone, dips about 20° to 30° south as known by drilling, but the westerly component of dip may be much steeper. I have placed a few sketch maps and drill-log abstract notes in the Tucson files for future reference, but I have not attempted to compile a formal list of illustrations to forward to Oakland. Forest indicated that he was under instructions not to release copies of their data unless we expressed a positive and definite interest in the property. This I could not do in good faith, and therefore I have only such notes as I copied in the field, but these are quite adequate for the purpose of evaluation.

Of final passing interest, the capping over this sulphide body is very unimpressive. A strongly anomalous copper and molybdenum geochemical soil zone was found by Phillips' exploration work over the area which was shown by drilling to contain the better copper values. However, there is virtually no green copper staining, even though the rock is reactive, with fresh feldspar, biotite and chlorite. However, copper <u>is</u> retained in this capping*, and must be in the form of rather nondescript dark-brown copper oxides. I was able to identify a few grains of typical "copper pitch"--but I believe most of the copper is finely dispersed and virtually unrecognizeable in the field. Such limonite as is present is a rather "muddy" mixture containing transported iron from the breakdown of ferromagnesium minerals, and rotting vegetation roots. I believe the data gained from this examination will serve to caution us to remain alert for similar conditions elsewhere in the pre-Cambrian belt in Yavapai County, as the deposit represents significant sulphide mineralization, and is <u>not</u> the typical massive sulphide type which I have always mentally associated with pre-Cambrian deposits in that region.

*Geochem rock samples over the pyritic margin contain:

<u>Sample</u>	<u>Cu</u>	<u>Mo</u>
2082	.12%	15 ppm
2083	.10%	50 ppm

JEK/bl

Field Notes
Ap 6 1971
JEK

Squaw Peak Copper
Phillips Petroleum

History - related by Bob ~~Force~~ Forest
Manager of Western Region
Minerals Division
Phillips Petroleum Company
Reno Nevada

Prospecting in 1870's.
during WW II, small (25 Tpd) mill put in, haulage adit driven under upper levels. Operated on 2 levels — very small production, however, a 1000 tons or so. tried to mine pods of coarse Moly bearing ore in a qtz vein.

Callahan — Underground drill holes in '64.

Phillips — First exam in 1963
option in 1967

Drilled 18 or so holes, 13 essentially outlining the better Cu-Mo. This area corresponds to a pronounced Cu-Mo soil anomaly. Longyear drilling contractor. Good (+ 90%) core recovery.

Option — 10 years

payments due		
	71	20,000
	72	20,000
	74	"
	75	"
	76	"

in 1976 Upset price $1 Mill —, $250,000 increments over 4 years.

ORE RESERVE COLUMNS USED
BY FORREST of PHILLIPS PET.

To arrive @ 30 M.I tons of .36 Cu and .022 MoS_2

Used .28% Cu cutoff grade.

DDH 1:	0-250'	.49 % Cu	.029 % MoS_2
6:	0-365	.36 % Cu	.023 % MoS_2
7:	0-255	.28 % Cu	.028 % MoS_2
9:	50-725	.432 Cu	.021 % MoS_2

A few short intercepts in outlying holes, plus a polygon around No 3, Not listed above, are included in Forrest's 30 M.I ton reserve -

WO_3 about .03% — No indication that it is recoverable. Occurs as scheelite.

Assay averages listed are not math. — Are visual average estimates based on scanning assays.

SQUAW PEAK
Field Notes 4/6/71
JEK

DDH No 1 El 4338' 859' TD

0-200' Not at Property - stored in Reno or Prescott

@ 350' Qtz diorite Fine py and cpy in qtz repl. veinlets. Looks "Fresh".

@ 520 Do. But w/ pink orthoclase flooding rock. (logged as a mixed Q-M and gr. -Phillips Ref. terms)

General range of Assays:

0 - 160 plus .5% Cu (not over .6 Ave, but some higher individual assays)

160-185 ± .4% Cu

185-580 < .4 % Cu

580 - 859 < .1 %

DDH No 3 Elev 4564 incl -62° N67°E
600' TD

@ 40' . Oxidized. Tr Cu silicate. WK brown hm films

200-208' Trace hm. Sulph occurs in mafics as tiny grains and with silic repl. blebs.

~~40~~ 50-470' ± .5 % Cu rather uniform and not extending much either above or below these limits. — Ave, prob about .4 or a little under.

SQUAW PEAK

DDH No. 6 El. 4472' 862 TD

100-105' granitic (Qtz-Diorite - Phillips) .2% Cu. Cpy with some py. Best cpy on silica blebs.

115-120' Qtz-Monz (Phillips). Granitic rock with pink orthoclase + clots of mafics. - Alteration feature probably rather than rock type change from 100-105 above. shown by Phillips as dike area. St. cpy on qtz veinlets and with the mafic clots. Some discrete sulphide grains. .8% Cu

0-30' plus .5% Cu oxid.
-150' .3-.8% Cu Mostly ± .45%
150-550' < .4% showing decrease to: 550'.
550-862 < .1%

DDH No 7. El. 4403. 500' TD

No JEK log. Phillips log in mixed Qtz Monz and granite complex from collar to TD.

0-58 Ave < .4% Cu oxid.

58-265 ± .35% Cu

265-500' .05-.3% Cu. - generally < .2%.

SQUAW PEAK

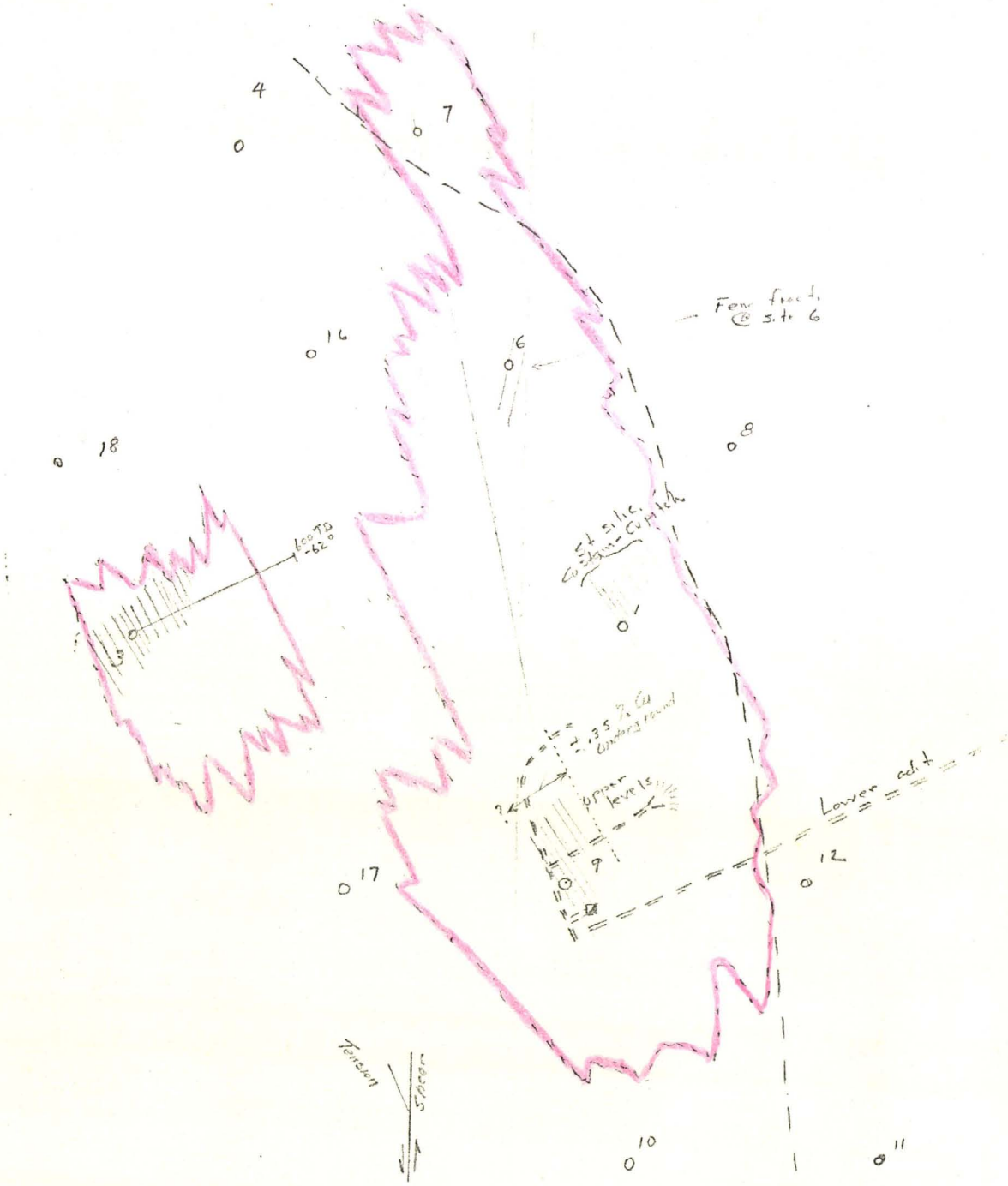
DDH No 9 4385' Elev. 822 TD

175-205 Granite (a-Dior, Phillips). Mafics chloritized. Some sericite, much clay. Cpy as tiny specs — generally favor repl. of mafics or silica veinlets. These are not the thin typical veinlets with sharp walls such as common with Mo-Qtz veinlets in the por. Cu deposits, but are short, 1/32-1/16" silic. "zones" — with irregular replacement walls. Also there are a few discrete cpy grains. Py content very low. Assay range .2-.3 Cu, with total sulphides not over 1-1½% by weight.

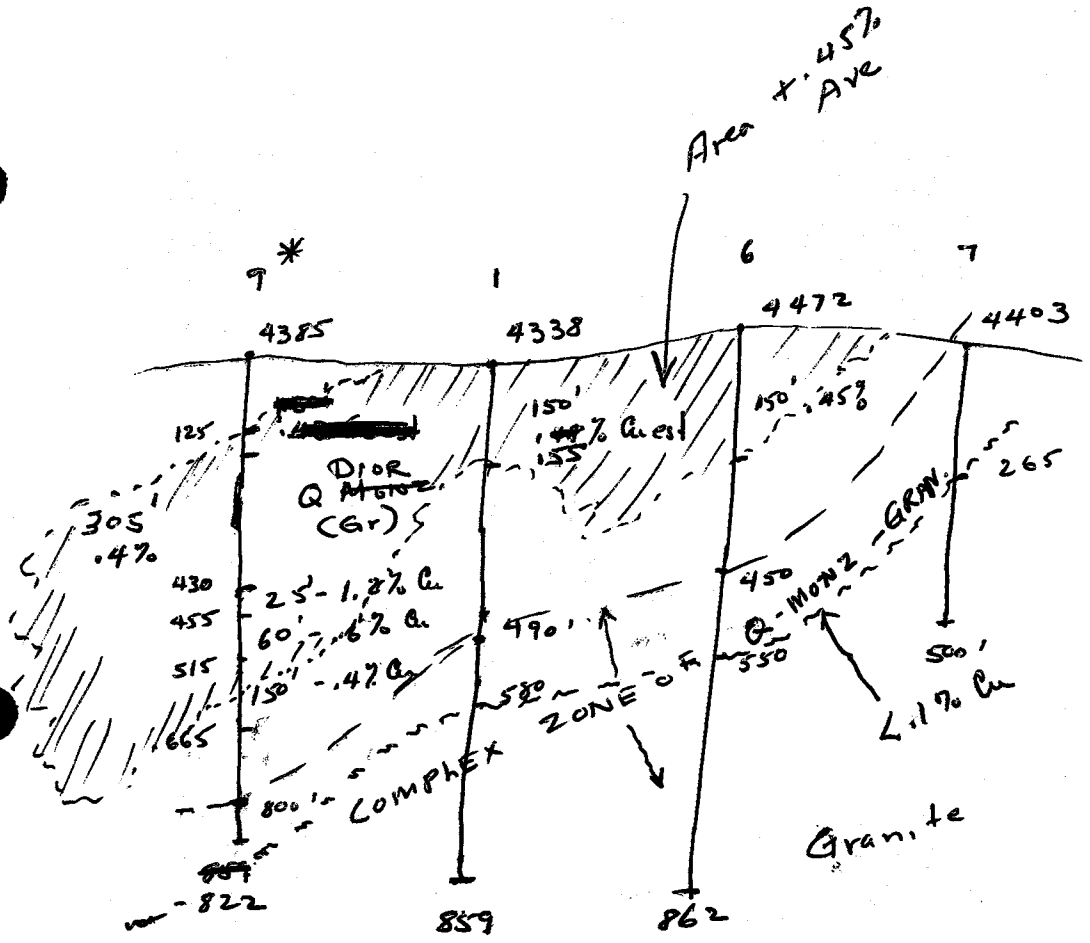
445-450' Granitic — chlorite st. Cpy in silica repl. veinlets as above. Fresh looking Biotite — possibly secondary after Hbl (this inter. by Forrest of Phillips Pet.) + 1% Cu.

785-790 Fresh looking Granitic. Py diss in mafics and in qtz repl. veins — similar to upper parts of hole only cpy is nil — Total sulph 1½% as py mostly.

125-430 Assay range wide — mostly .3-.5% Cu
430-455 plus 1% Cu
455-515 plus .5% Cu, Ave.
515-665 .3-.5% Cu
665-822 < .2% Cu



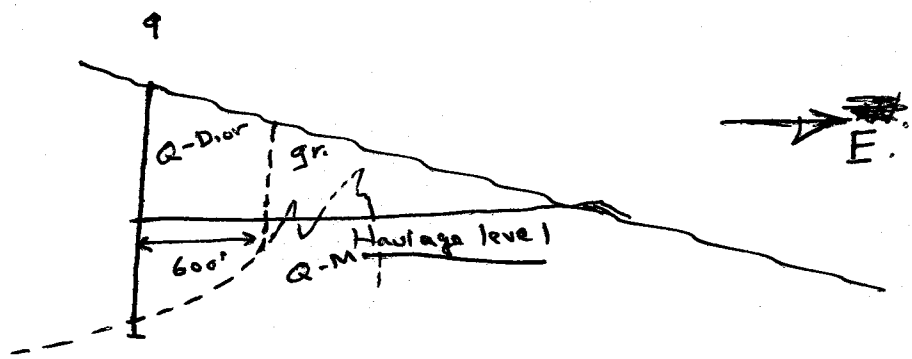
Interpreted possible relation to shear direction

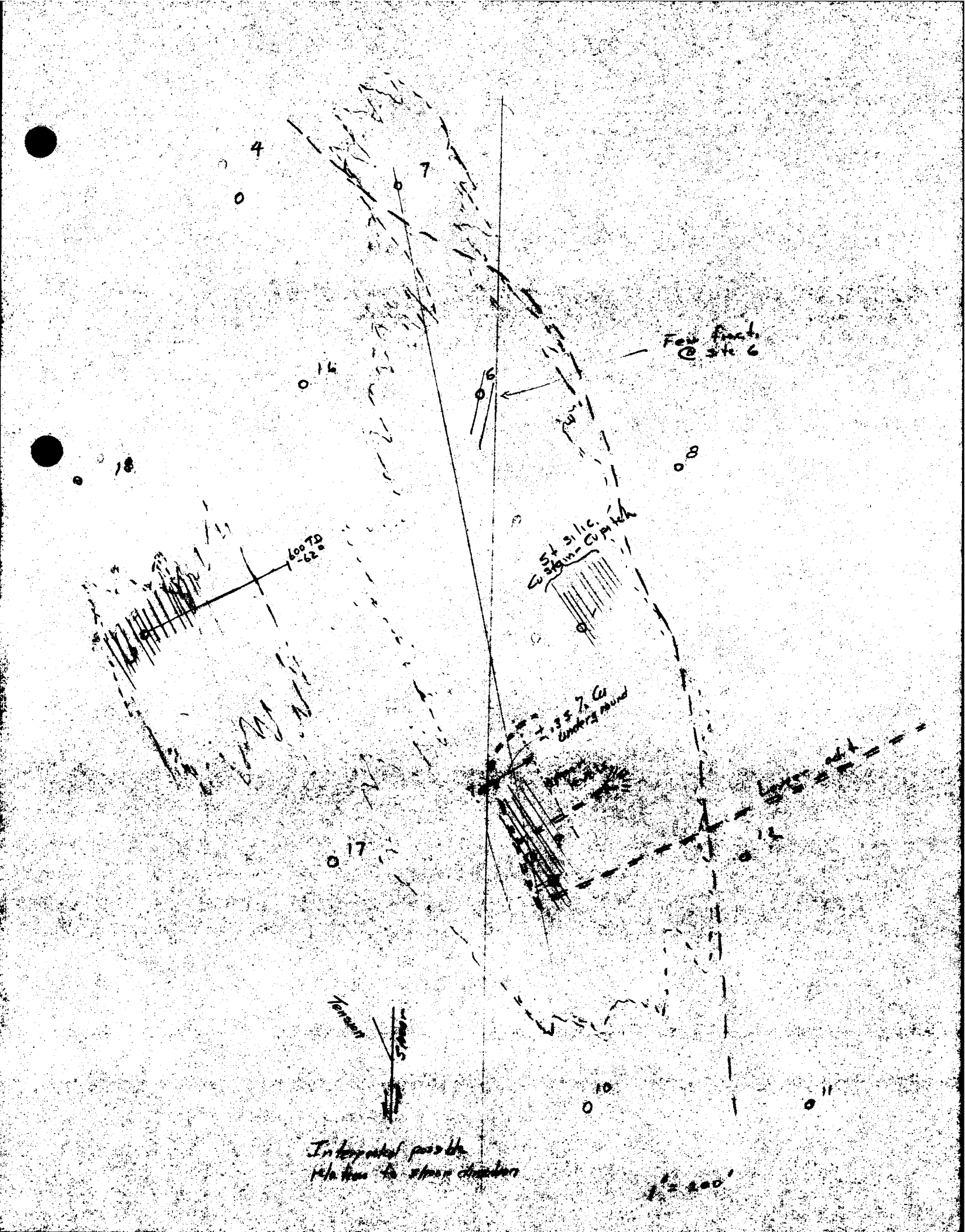


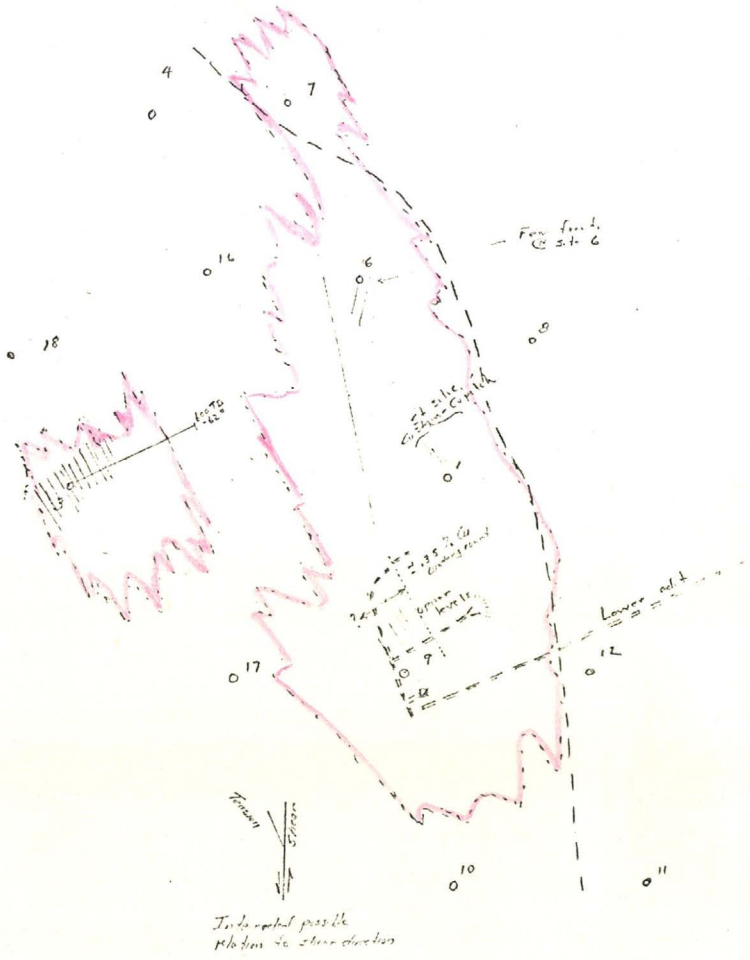
— X — SEC —

sketch — by eye
Vertical & Horiz equal scale.

* includes upper & lower "Case" of ± .4% surrounding higher grade center.




4
7
16
6
Few fract. @ site 6
18
8
600 TD -62°
St silic. Cu stain - Cu pitch
± .35 % Cu underground
17
12
Tension
Shear
10
11
Interpreted possible relative to shear direction
1" = 200'


4
7
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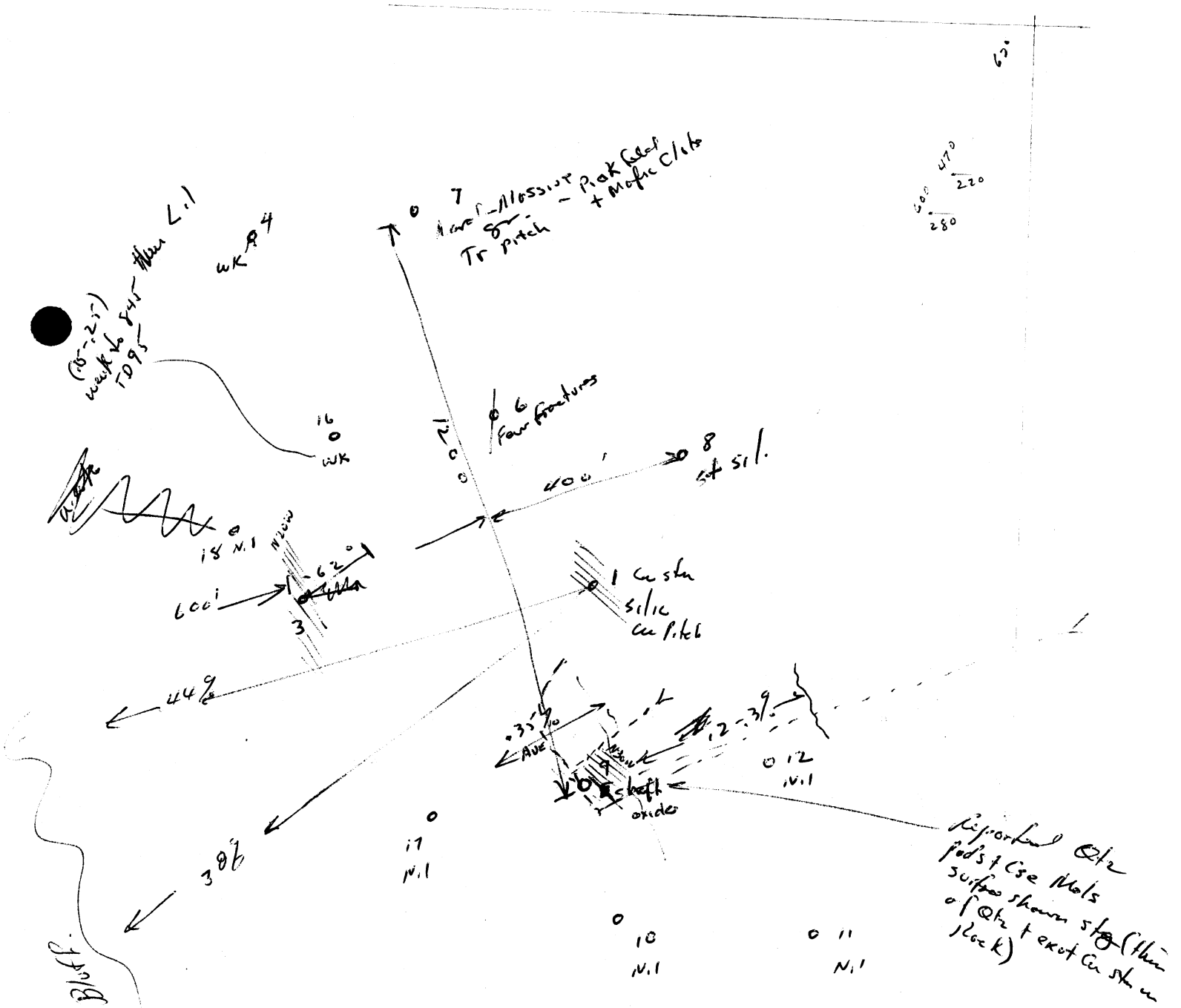
Lower adit
Tension
Shear
Interpreted possible
relation to shear direction

Sketch of hole

Ap 6



Squaw Peak Mine

Phillips Petroleum — Reno 702-786-2273
801-364-8454 Salt Lake

8 holes "interesting" .36% Cu - .022% MoS_2
30 Mill and. .28% Cu cutoff

Pre-Є - Qtz diorite - dissem cpy in fract.

800' wide 1000-1200 ft long —
along Verde — FW —
No enrichment —

begins at surface to 1000' deepest ~~in~~
better Mineralization stops in depth

8 miles south of ~~to~~ Camp Verde
Squaw Peak

Tues 30th at Camp Verde. Mon nite.
Ft. Verde Motel — Tues AM.

Bob Forest — Manager of Western Region
Minerals Div
Phillips Petroleum

check next week at
Salt Lake address for
definite time schedule.

J. E. K.
MAR 18 1971

Apache Airlines Tuc to Prescott
7^{25} a - 9^{00} a
5^{35} p - 6^{55} p

more exam up to the Tues 6th of April

702 358-2762 Reno

3-13-16

HAWLEY & HAWLEY
ASSAYERS AND CHEMISTS, INC.
1700 W. GRANT RD. • BOX 50106 • 622-4836
TUCSON, ARIZONA 85703

BRANCHES
DOUGLAS, ARIZONA
HAYDEN, ARIZONA
EL PASO, TEXAS
ST. LOUIS, MO.

IDENTIFICATION	GOLD OPT	SILVER OPT	LEAD %	COPPER %	ZINC %	MO. %	IRON %		
J. E. K.									

APR 26 1971

RECEIVED
APR 26 1971
TUCSON
KAISER EXPLORATION & MINING CO.

INVOICE COPY

CC:
ADD:
CITY:
DD:
CITY:

REMARKS:

ANALYSIS CERT. BY

PREPARATION $
ANALYSIS $

ACC:

DATE SPL. RECEIVED

DATE COMPL

$

HH3A

V.P. Phillips called McGregor —
Bob Forrest
Phillips Petroleum
Reno →

Porph Cu in Ariz
30 M.T @ .46 Cu
.05 Mo
Recov WO3 —

J. E. K.
MAR 18 1971

Telephone from R. O'Neil