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*JEK*  
BLACK MOUNTAIN COPPER PROSPECT  
MOHAVE COUNTY, ARIZONA

Reports by  
J. E. Kinnison and G. L. Richardson

3-8-15 BLACK MOUNTAIN COPPER PROSPECT  
Mohave Co., Arizona  
Reports by JEK and GLR

JEK

INTER-OFFICE MEMORANDUM

TO (NAME, LOCATION, ZIP)

▶ J. J. Durek  
Oakland, California

DATE

▶ May 16, 1973

FROM (NAME, LOCATION, ZIP)

▶ John E. Kinnison *JK*  
Tucson, Arizona

COPIES TO

▶ File  
Blue  
G. L. Richardson  
P. S. Strobel

SUBJECT

▶ BLACK MOUNTAIN COPPER PROSPECT, MOHAVE COUNTY, ARIZONA

This will transmit Mr. Richardson's report on the subject porphyry copper prospect in which he provides a description of the property and suggests possibilities for additional exploration. At my request, however, he has refrained from commenting on the probability of an extension of mineralization northerly, and this memo will review this probability, including impressions gained on the day which you and I, accompanied by Mssrs. Richardson and Strobel, spent on the ground last fall.

This probability was determined to be poor, following our field examination last fall, and no further work was conducted.

Mr. Richardson has synthesized rather voluminous data from previous drilling and geological work done by other companies on this property, and he and Mr. Strobel initially visited the ground guided by Mr. Downey, the owner. Mr. Strobel conducted reconnaissance field mapping and evaluation of capping, and geochemical sampling. These men are to be commended for their concise work.

As originally outlined in my earliest comments on the property, there seemed a possibility that the mineralized zone would extend northerly beneath volcanic cover. This area had been tested by a few drill holes by Bear Creek, and drill data suggested that the thickness of chalcocite increased in this direction, although the grade remained very low.

Kaiser's field examination determined that there are no possibilities for lateral extension of the mineralized zone beneath post-mineral cover, other than to the north and to the east. Quintana, who has done the most recent drilling on the property, has thoroughly tested the possible easterly extension, with negative results. Therefore, the only possibility of extension beneath cover is northerly from the vicinity of Bear Creek and Cerro drill holes. The work by Richardson and Strobel indicates that the exposed area of pervasive mineralization has been sufficiently tested by drilling, and that no further exploration possibilities exist. I concur in this interpretation.

J. J. Durek  
May 16, 1973  
Page 2

When you and I were in the field, we visited principally the northern part of the mineralized zone, particularly in the vicinity of the old Cerro and Bear Creek drill holes. The rather strong mineralization evident in the leached capping near the southern edge of volcanic cover appears largely to be controlled by east to northeast striking fissure zones--particularly evident near Cerro's holes 15 and 16 and Bear Creek's 7 and 9. Mr. Strobel's reconnaissance in this northern area, which we verified in the field, indicates that the limits of pervasive alteration are "closed" on the north side in the southwest quarter of Section 3. The strong structural control of better mineralization along the south edge of volcanic cover conforms in strike to that northern boundary of pervasive mineralization, and it seems likely that the limit as mapped on the surface will project westerly beneath volcanics and therefore severely limit any major extension of the mineralized area. If this interpretation is correct, the area drilled by Cerro and Bear Creek will be very near the north edge of pervasive alteration, and must represent an isolated fissure zone rather than a lead to a major extension of mineralization northerly beneath volcanics.

The volcanic thickness is unknown at this time, but general suggestion from field work done and from Bear Creek drilling is that mineralized bedrock will be too deep for adequate penetration by IP. Lacking a geophysical approach, drilling would be our only recourse. Without concrete evidence or suggestion that indeed a northwesterly extension is likely, the risk was deemed to be too high to warrant the cost of such drilling, and we therefore verbally agreed to terminate Kaiser's interest in the property. Mr. Downey was so advised late last fall, and the accompanying report and maps were delayed since there was no urgency in their presentation.

This prospect displays strong pervasive alteration but somewhat erratic sulphide distribution. Except for its smaller size, it is generally typical of the "average" porphyry copper deposit. Extremely attractive molybdenum and copper surface anomalies are present, but drilling results show the sulphides to be almost entirely pyrite and that the surface anomalies represent the sulphide grade. With the exception of Mineral Park, the deposits in Mohave County and adjacent areas in Nevada and California seem to be pyritic, and the work done on this property provides us with an interesting and ample documentation of this feature. Perhaps it is significant that this deposit lacks the widespread evidence of a major mineral district, such as exists at Mineral Park where lead, zinc, and silver veins exist in considerable quantity peripherally to the porphyry copper deposit. Crescent Peak, near Searchlight, also is a prime example

J. J. Durek  
May 16, 1973  
Page 3

of a strongly altered zone with very high surface geochem anomalies, but which has been sufficiently drilled to indicate its pyritic nature. Data on this deposit (also owned by Downey) is in our files under the name "Dinah Copper," Crescent Mining District, Clark County, Nevada.

/fn  
Enclosures

## INTER-OFFICE MEMORANDUM

TO	J. J. Durek	DATE	May 1, 1973
AT	Oakland, California	FROM	George Richardson
		AT	Tucson, Arizona
COPIES TO	File	SUBJECT	BLACK MOUNTAIN COPPER
	Blue		PROSPECT, MOHAVE COUNTY, ARIZONA
	<u>J. E. Kinnison</u>		

## INTRODUCTION

The Black Mountain prospect, located 50 miles north of Kingman, was brought to our attention by Mr. Harry Downey on behalf of the D. & G. Mining Company. Mr. Strobel and I visited the property in the company of Mr. Downey on August 24th and 25th, 1972. Our initial reaction was one of optimism, due to the strong and intense serictic alteration over more than a square mile. Three areas within the prospect contain meager limonite after chalcocite, but the majority of the limonite appeared to be derived from pyrite.

## HISTORY

According to Downey, the Black Mountain prospect was initially spotted by Bear Creek as a color anomaly from reconnaissance flights.

The prospect has been extensively mapped, sampled, and drilled by six mining and exploration companies: New Jersey Zinc Company, Bear Creek Mining Company, American Onyx Mines, Cerro Corporation, Geochemical Surveys, Inc., and Quintana Minerals Corporation. Drilling has been done semi-continuously since 1965.

## SUMMARY AND CONCLUSIONS

The prospect is a zone of pervasive alteration and mineralization which comprises slightly more than a square mile, and which is shown by drilling to contain spotty, very low-grade copper values (0.15%Cu), and about .025% Mo. From the data compiled by us, it appears that three principal zones of more intense mineralization are present. (See Attachment B). Two of these, which trend east-northeast, have been thoroughly explored. The third zone is overlain on its northwest edge by Tertiary basalts. A distinct trend for this zone is not apparent, but copper values increase toward the edge of the volcanics. Bear Creek drill holes in this area, by themselves, have not closed off a mineralized extension to the northwest--if one exists.

## GENERAL GEOLOGY

The area consists of a pre-Cambrian granite-gneiss complex, intruded by a younger--possibly Laramide-quartz monzonite porphyry

in the form of small stocks and dikes. The youngest intrusives are andesites, possibly mid-Tertiary, which strike generally north. The latest igneous stage is represented by andesite and basalt flows, which overlap the altered zone on the northwest.

The most prominent structural feature is a series of steep, post-mineral normal faults which strike northwest. A few faults strike northeast, crossing the strong northwest set, but very little displacement is apparent along them.

#### MINERALIZATION AND ALTERATION

The following generalizations are based in part on data assimilated from that gathered by the staffs of companies which explored the deposit.

I have synthesized these earlier data on the enclosed geologic and drill-hole summary map (Attachment A). Preliminary mapping and geochemical sampling was done by Paul Strobel during the week of September 6, 1972. Attachment B shows the approximate limits of alteration in the vicinity of the prospect, as determined by Mr. Strobel, and also the areas where at least a small amount of limonite after chalcocite was observed. The rock geochemical data for copper and molybdenum (Attachments C, D and E) are based only on our work. All rock samples gathered for geochemical analysis were reviewed in Tucson by John Kinnison to help evaluate the intensity and type of alteration/mineralization as mapped in the field.

I have shown on the graphic drill hole summaries (Attachment A) the probable division between leached capping, chalcocite zone, and primary sulphides. These breakdowns are based on both descriptive logs and assay data. I have used the designation "mixed zone" where the descriptive logs indicate a mixture of oxides and sulphides. The mixed zones may represent old, perched chalcocite zones which have been subsequently leached. A weak chalcocite blanket appears to be present along the west and northwest margins of the prospect area. The interpretation of chalcocite in BCMC-8 is problematic. The Bear Creek graphic log of this hole may indicate an amphibolite dike just below the Tertiary volcanics. The difficulty lies in the zerox reproduction of an original log, which has caused colors and stippling to blend on the copy. The possible amphibolite coincides with slightly increased copper content. The difficulty arises as to whether to consider this copper as chalcocite, or hypogene copper concentrated along a basic dike. No written description log of this hole is available. According to Downey, this is a chalcocite zone, but he is drawing on memory of a brief inspection of the core from some years ago. Both the core and original logs have been lost.

One basic question arises from the sulphur assays on the Bear Creek summary logs as compiled by Geochemical Surveys. These logs suggest that two to three percent of sulphur--presumably representing sulphides--is present in what is designated "leached cap." It is thus questionable whether we are dealing with a true chalcocite "blanket" at all, or enrichment by chalcocite only along veinlets or joints which have penetrated below the apparent surface of complete oxidation as interpreted from the sulphur assays.

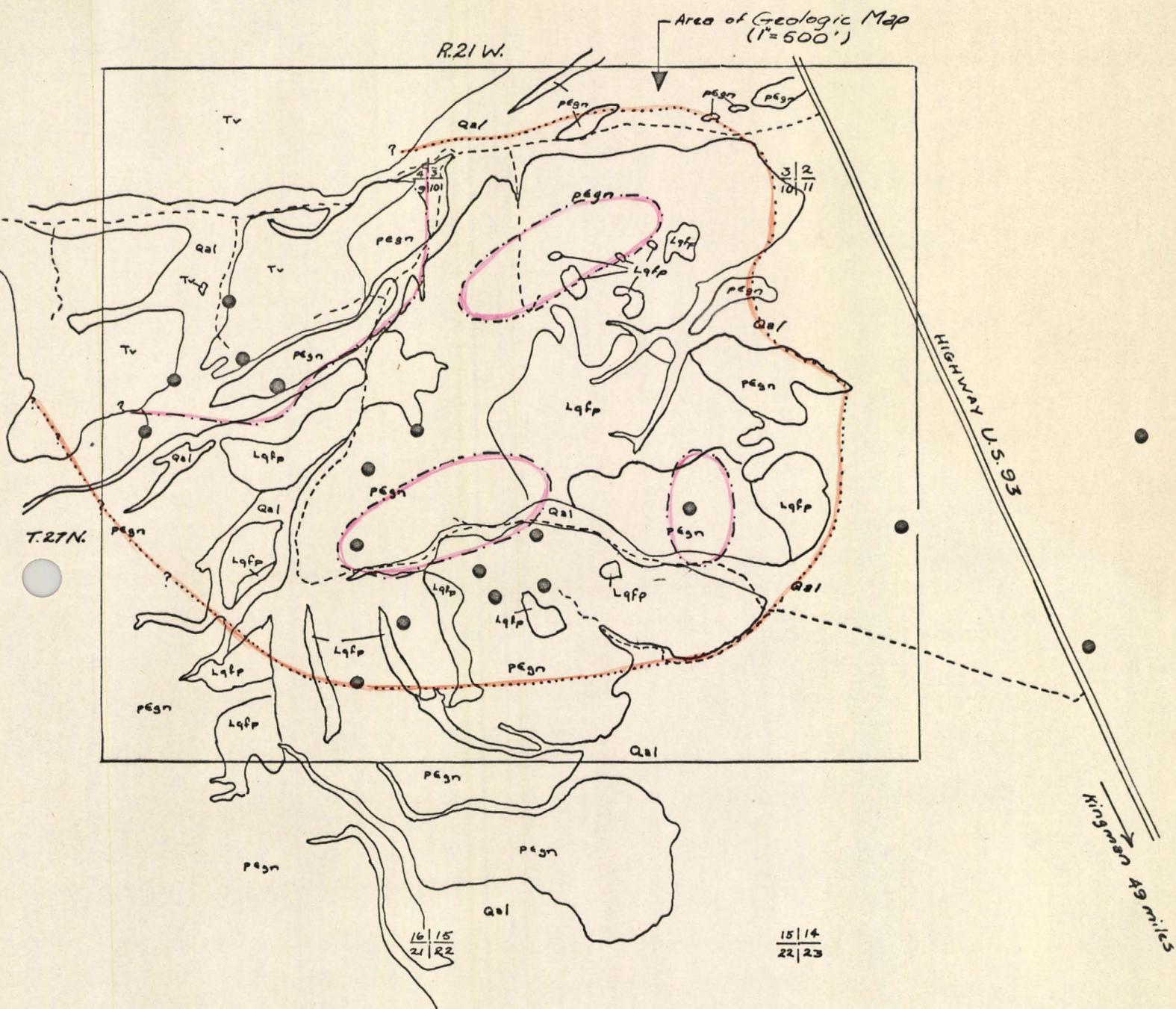
#### POSSIBILITIES FOR ADDITIONAL EXPLORATION

The Black Mountain zone of alteration/mineralization is technically "open" only to the north. All other lateral directions are delimited by outcrops, or by drilling (easterly). The alteration zone can be further appraised in a northerly direction by the following work:

1. A prediction of the maximum depth of volcanic cover perhaps could be made by additional geologic study of the volcanic section exposed to the northwest.
2. I. P. traverses can be run over the basalt cover to the northwest of the prospect.
3. Additional alteration mapping along the Tertiary basalts/pre-Cambrian contact to the northwest might yield evidence of a trend of mineralization which could be projected under the basalt cover.
4. A drill hole located about 2,000 feet north of BCMC-8 would adequately determine whether or not alteration extends northwest beneath basalt, and whether improved grades of chalcocite and primary sulphides are there present.

ATTACHMENT B

ATTACHMENT B  
 TO ACCOMPANY Report  
 TO J. J. Durak  
 BY Kinnison & Richardson  
 DATE 5/16/73



EXPLANATION

- |   |                                    |
|---|------------------------------------|
| <span style="border: 1px solid black; padding: 2px;">Qal</span> Younger alluvium          | ● Drillholes                       |
| <span style="border: 1px solid black; padding: 2px;">Tv</span> Volcanics                  | --- Limits of pervasive alteration |
| <span style="border: 1px solid black; padding: 2px;">Lqfp</span> Quartz Baldspar porphyry | — Limonite after ce                |
| <span style="border: 1px solid black; padding: 2px;">psgn</span> Gneiss                   |                                    |

Scale: 1"=2000'

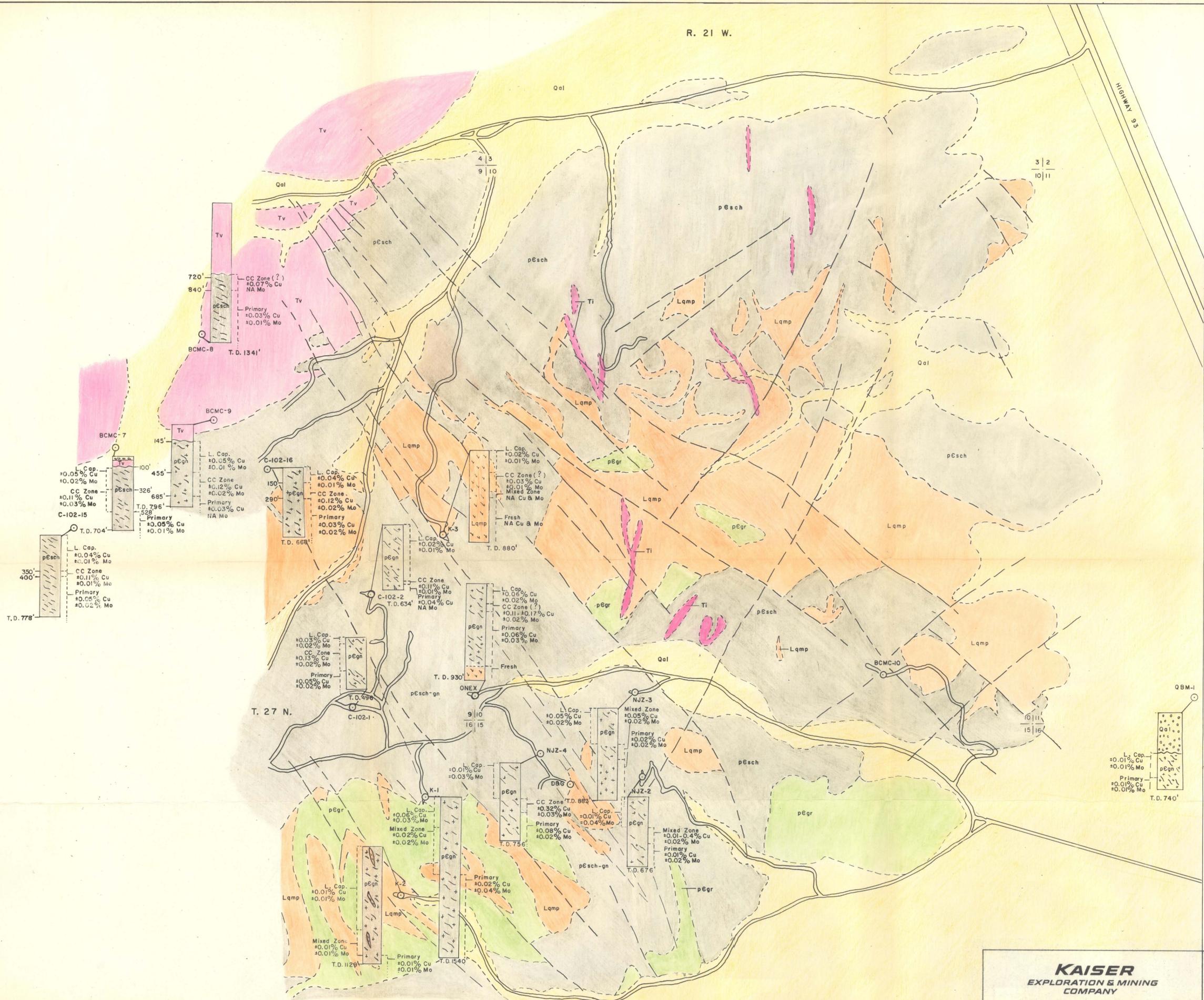
R. 21 W.

HIGHWAY 93

EXPLANATION

- |             |       |   |
|-------------|-------|---|
| QUATERNARY  | Qal   | Alluvium  |
| TERTIARY    | Tv    | Younger volcanic flows, principally basalt  |
| LARAMIDE    | Ti    | Younger volcanic intrusives, principally andesite   |
|             | Lqmp  | Quartz monzonite porphyry, including quartz porphyry and aplite phases  |
| PRECAMBRIAN | pCgr  | Granite, medium to coarse grained, including some pegmatite   |
|             | pCsch | Metamorphic complex, principally schist but including gneiss, quartz segregations, and granite where gneissic fabric is visible |

- 70 --- Fault (dashed where covered)
- 45 --- Contact (dashed where covered)

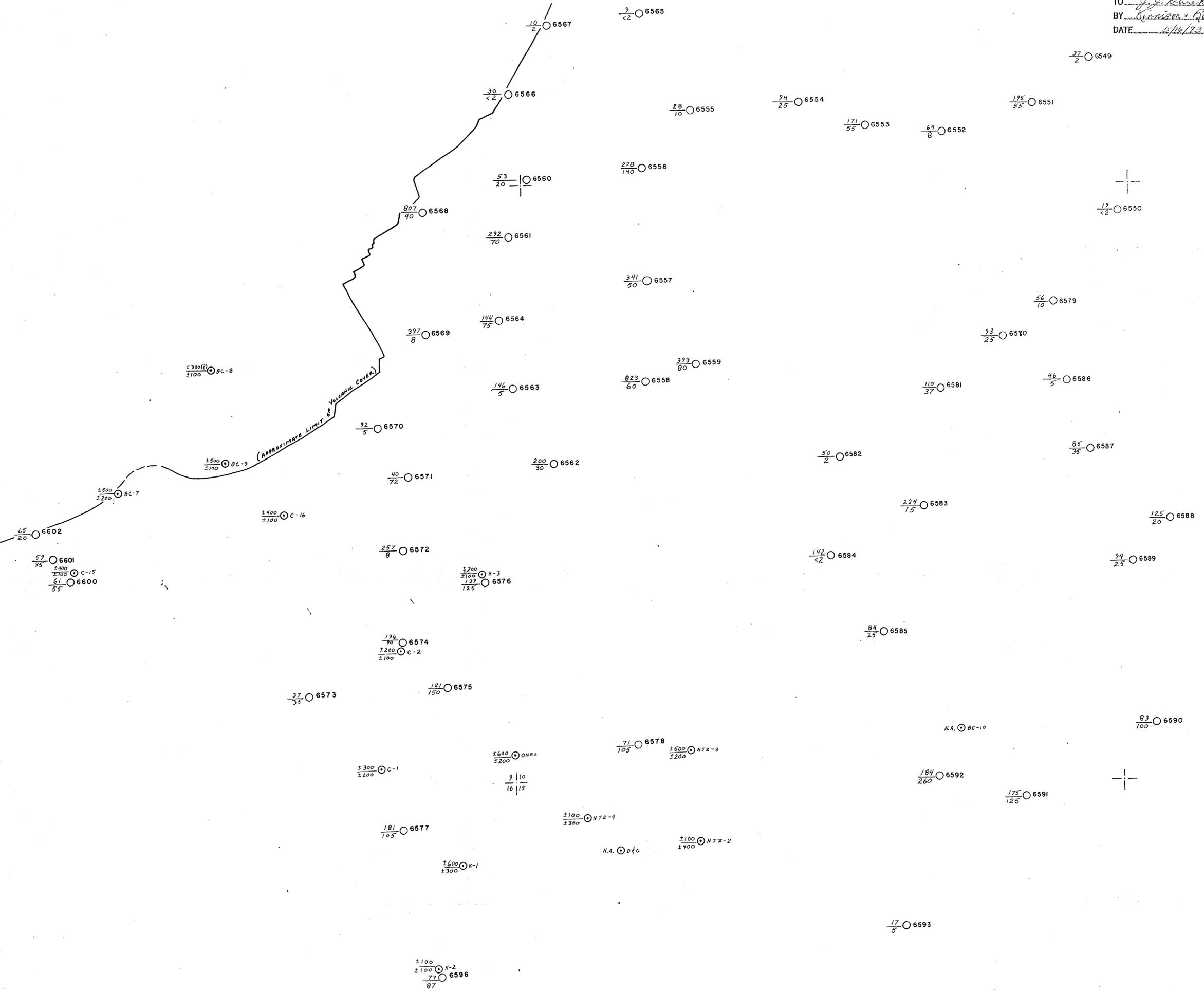


**KAISER**  
 EXPLORATION & MINING  
 COMPANY  
 TUCSON, ARIZONA

**BLACK MTN. PROSPECT**  
 MOHAVE COUNTY, ARIZONA

Geologic Map and Drill Hole Summaries

ATTACHMENT C  
 TO ACCOMPANY Reports  
 TO J.G. Durak  
 BY Kenison & Richardson  
 DATE 12/16/73



$\frac{Cu}{Mo}$  ppm  $\odot$  Sample No.

$\odot$  DRILL HOLE  
 Cu-Mo data is from drill-log summaries  
 interpreted as upper-most or leach-cap  
 internal assay results.

<b>KAISER</b> EXPLORATION & MINING COMPANY TUCSON, ARIZONA	<b>BLACK MTN. PROSPECT</b> MOHAVE COUNTY, ARIZONA <b>GEOCHEMICAL RESULTS</b>
	SCALE: 1" = 500'      BY: P. S.      DATE: 9/28/72      REVISED TO:      DWG. NO.

ATTACHMENT 5  
TO ACCOMPANY Report  
TO J. J. Duvak  
BY Simmons & Richardson  
DATE 5/16/73



PARTS PER MILLION

<b>KAISER</b> EXPLORATION & MINING COMPANY  TUCSON, ARIZONA	<b>BLACK MTN. PROSPECT</b> MOHAVE COUNTY, ARIZONA
	Preliminary Mo Geochemical Contours and Trends SCALE: 1" = 500'    DATE: 9/28/72 BY: P.S.    REVISED TO:    DWG. NO.

ATTACHMENT D  
TO ACCOMPANY Reports  
TO J.J. Duvick  
BY Kaiser + Richardson  
DATE 5/16/73



PARTS PER MILLION

<b>KAISER</b> EXPLORATION & MINING COMPANY TUCSON, ARIZONA	<b>BLACK MTN. PROSPECT</b> MOHAVE COUNTY, ARIZONA
	Preliminary Cu Geochemical Contours and Trends
SCALE: 1" = 500'	DATE: 9/28/72 BY: P.S. REVISOR TO: DWG. NO.