

BSW 1 (M₂)

SPECIMEN # BSW1 - 314
LOCALITY Buckingham
FIELD NAME MVY
DDH # BSW 1, 314 ft.
DATE _____

PETROGRAPHIC ANALYSIS

William M. Oriel

Quick Log for alteration only

MEGASCOPIC DESCRIPTION

MVY

MICROSCOPIC DESCRIPTION

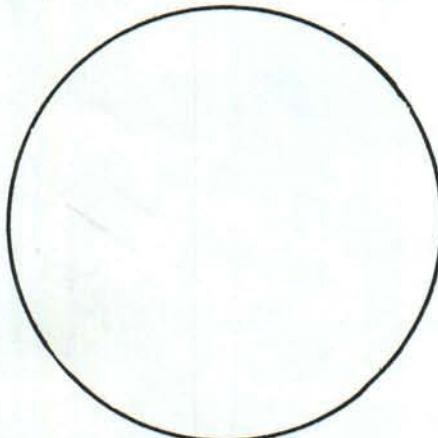
Rock Type - Essentials and accessories

Alteration

Qtz-Serrite-clay + gchl - pervasive mod strong

Mineralization

Structure



SPECIMEN # BSCW 1-517
LOCALITY Buckskin
FIELD NAME FBhp
DDH # BSCW 1, 517 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

FBhp Fine grained dott habb porphyry

MICROSCOPIC DESCRIPTION

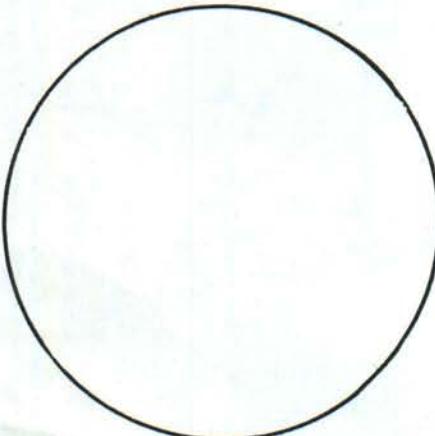
Rock Type - Essentials and accessories

Alteration

chlorite-serrite-calcite - some clay (brown).
chl/calc after mafics - 80-90% altered
serrite after outer rows of zoned plagi. 10-20%
possible silicification of g.m. - at least recrystallization

Mineralization

Structure



SPECIMEN # BSWI - 660
LOCALITY Bachsham
FIELD NAME F&hp
DDH # BSWI, 660 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

F&hp

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

Alteration

Biot - chl - cal + ser

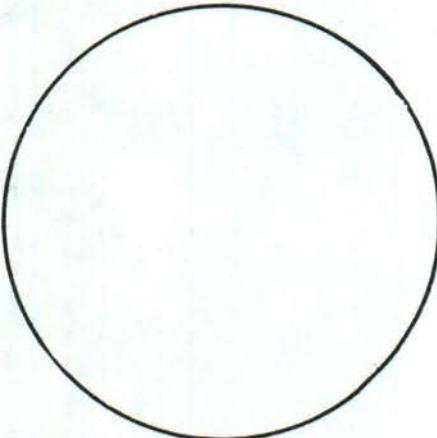
Biot stable - minor replacement of hb. Tones of sericitic

hb + parts fgm chloritized cal n gm

play only ≤ 10% hb to ser.

Mineralization

Structure



SPECIMEN # BSWI 684
LOCALITY Buckhorn
FIELD NAME ? FBhp
DDH # _____, _____ ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

? ?

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

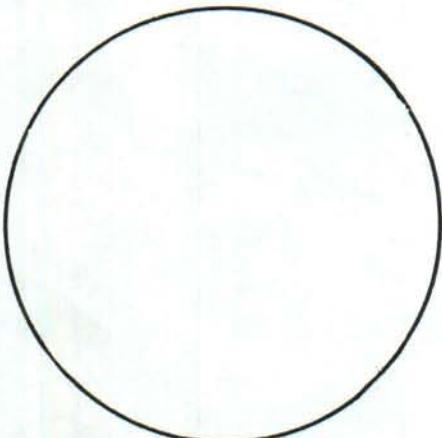
FBhp

Alteration

reverse Qtz-feldite (clay) - strong
cut by Qtz veinlet which is cut by calcite veinlet

Mineralization

Structure



SPECIMEN # BSW 1 - 705
LOCALITY Musk
FIELD NAME Mvu
DDH # BSW 1, 705 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

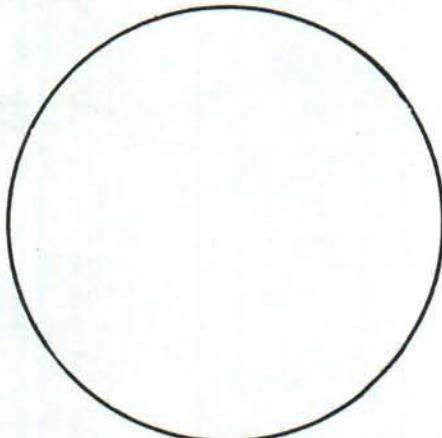
Some rutile

Alteration

← Silica - Sericite - clay - pervasive moderate
Chlorite - epidote - moderate

Mineralization

Structure



SPECIMEN # BSWP - 820
LOCALITY Fish Creek
FIELD NAME _____
DDH # BSW 1, 820 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

Frshy

MICROSCOPIC DESCRIPTION

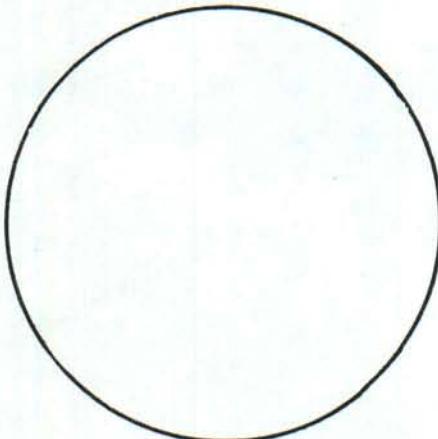
Rock Type - Essentials and accessories

Alteration

Sec. Root - calcite - chloride - mixed.
overprinted on dolomitic gm.

Mineralization

Structure



SPECIMEN # BSW1 - 85G
LOCALITY Foreskm
FIELD NAME MVFPA ?
DDH # BSW1, 85G ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

MVFPA ?

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

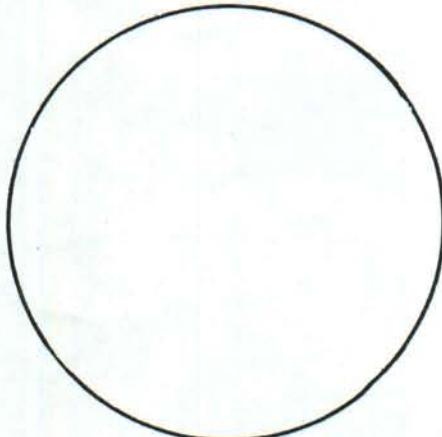
MVVA = foliated - no texture left.

Alteration

Extrem re complet $\phi_{1/2}$ sericite alt
some fg calcite and chlorite clusters

Mineralization

Structure



SPECIMEN # DSW 1 - 946
LOCALITY Buckhorn
FIELD NAME MVFPA
DDH # _____, _____ ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

Fine porphyritic andesite

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

Alteration

Secondary brookite + chlorite - pervasive in gm -
plagiophenites not affected but 10% ±

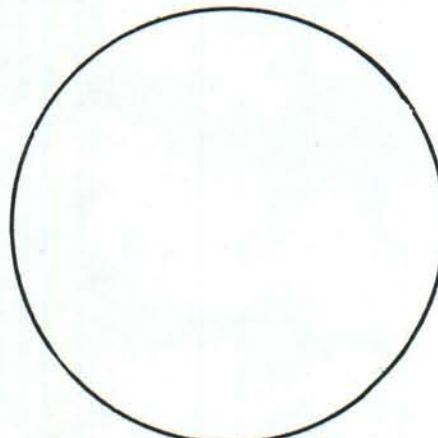
Mineralization

3-4% opaque - nearly all surrounded by brookite.

Structure

Qtz-chlorite vein cuts rock - probably later
than host.

Late calcite vein cuts Qtz-chlorite vein.



SPECIMEN # BSW1 - 981
LOCALITY Buchanan
FIELD NAME MVB?
DDH # BSW1, 981 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

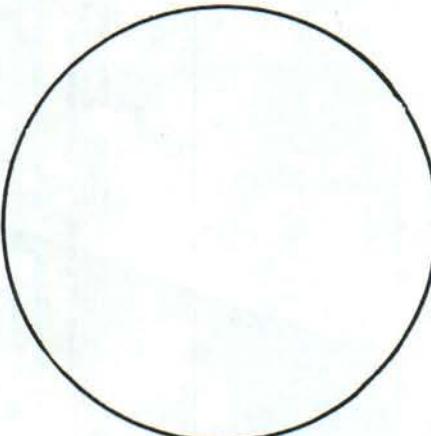
Alteration

Stray Qtz-serrite - some ^{10%} chaly & cal veins.

Mineralization

6-7% dispy

Structure



SPECIMEN # BSW 1 - 1139
LOCALITY _____
FIELD NAME _____
DDH # _____, _____ ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

MICROSCOPIC DESCRIPTION

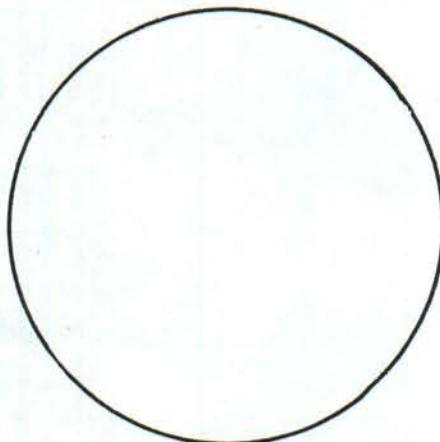
Rock Type - Essentials and accessories

Alteration

Strong nov. Q-S - some clay (?) Tr of chl

Mineralization

Structure



SPECIMEN # ASW1-1805
LOCALITY BHSK
FIELD NAME Mv FPA
DDH # _____, _____ ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

Mv FPA

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

Fire amygdalite and/or tuff

glass shards - recrystallized

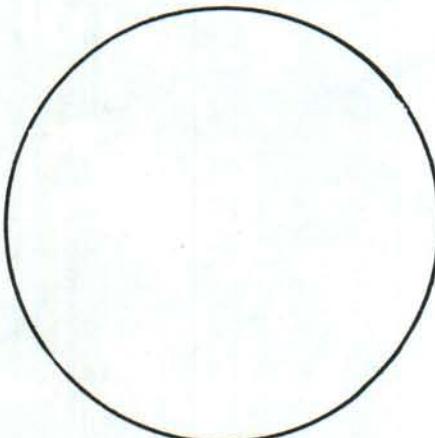
Alteration

Wk - Mod sericitic (20%) 5% chl and cal
plg relatively unaffected

Some apparent recrystallized glass shards

Mineralization

Structure



Bsu 7 Mone

SPECIMEN # BSW7-464
LOCALITY /
FIELD NAME MVB
DDH # BSW7, 464 ft.
DATE

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

Mvb volume bxa - from drill log by wmo.

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

completely recrystallized quartz in this thin section

Alteration

sulfification - complete - pervasive 95% vtg

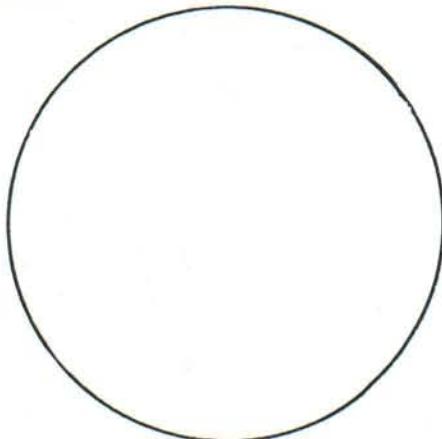
sericitic - some clusters - probably after relic plagioclase fragments

Mineralization

> 8-10% pyrite possibly 12%

Structure

some foliation - apparent,



SPECIMEN # BSW7-530
LOCALITY Bucks Km
FIELD NAME MVB?
DDH # BSW7, 530 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

Mvh? volcano bxa (from drill log-mvo)

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

Alteration

ferrofe-silica %
75-25

some small rounded blebs - very high relief very low relief - Corundum?

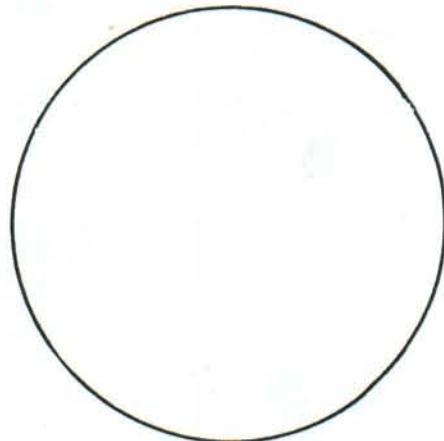
or rounded spherules - low relief

brot??? some elongate ^{iron} pleochroic mineral - moderate high relif, /EXTN, granular texture - no sharp boundaries,
possibly secondary brot but doesn't quite fit -

Mineralization

py - d:3 - 7-10%

Structure



SPECIMEN # BSW7 - 578
LOCALITY Buckskin, Nev.
FIELD NAME MVB?
DDH # BSW7, 578 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

MVB (volcanic rocks)

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

Alteration

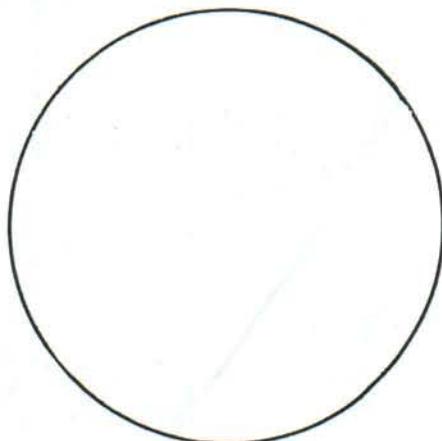
Serpentine - silica (40-40) - complete pervasive alt - some recrystallized ph. phen?

Traces of Rutile - partially grains partially elongate needle like stbs - sometimes

Mineralization

pyrite 5-6% diss - py both cubical & tabular.

Structure



SPECIMEN # BSW7-610
LOCALITY Buckhorn New
FIELD NAME _____
DDH # BSW7, 610 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

MVB?

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

F

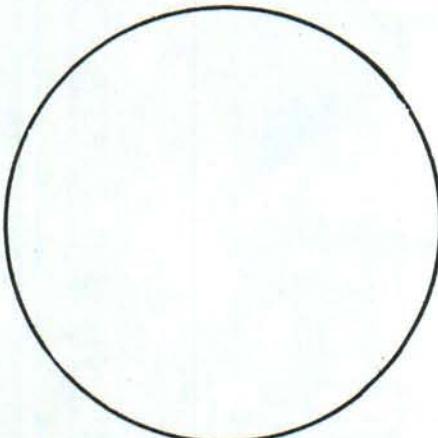
Alteration

Extreme silification vtg 97%
Subhedral zircon 2-3%

Mineralization

Essentially No opaques

Structure



SPECIMEN # BSW7 - 720
LOCALITY Buckchana
FIELD NAME MVB
DDH # BSW7, 720 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

MVB

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

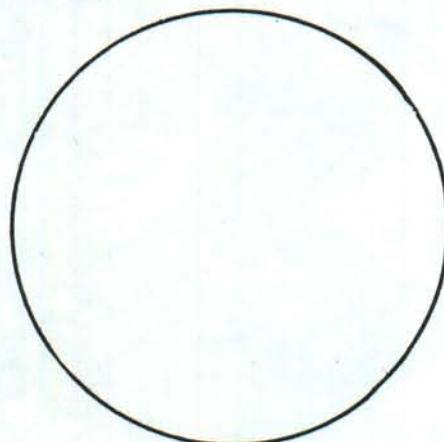
Alteration

silica - ferrite - calcite chlorite ^{7/11} trof. brt
Very strong silification & ferritization - possibly some clay (auth) margin
late qtz / chlorite / calcite veins - secondary brt on
margins of one veinlet
chlorite common also in + along veins
~~gypsum~~ in w calcite veinlet

Mineralization

Structure

very late veinlets of calcite - gyp + (brt?)



SPECIMEN # BSW7-814
LOCALITY Buckskin
FIELD NAME F&hp
DDH # _____, _____ ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

F&hp Biot-hnk porphyry - few grained (old) BIP "dilute morphology"

Note - in high Cu zone

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

Zoned & tourmaline play

possibly zircon? or corundum - small rounded b/fns

Alteration

Sericite - Biotite - Chlorite - Late chlorite - cal-gly-py veinlets
some clay cut pervasive and vein - ser + not clay alt.
zoned play only 10-15% altered - K-spar totally replaced

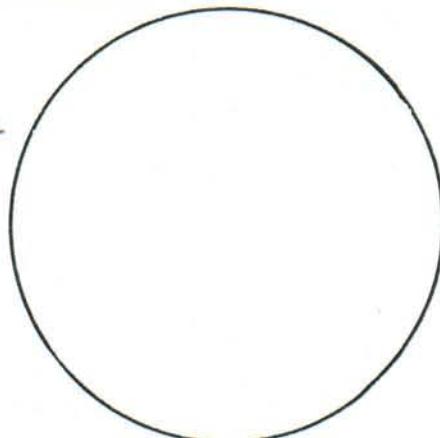
Mineralization

py - diss - definite preference for late chlorite veinlets

Late chlorite

Structure

chlorite-quartz - calcite-pyritic veinlet
cutting other alt. (Tourmaline?)
clearly cuts veinlet of biot-ph(fels)-ser + clay?



SPECIMEN # BSW7-827
LOCALITY Buckskin
FIELD NAME Fishp
DDH # BSW7, 827 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

Fishp Fine grained Biot-(hornb)-porphyry

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

General - Biot & feldspars
Some zircon or sphene

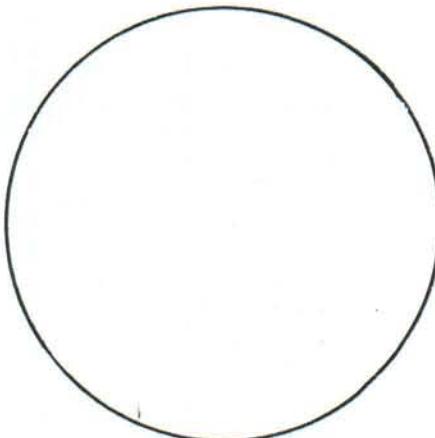
Alteration

Biotite-sericitic (both brown & some green biot.) + pervasive chlorite (weak)
late Qtz-calc-pyrite veinlets appear to cut earlier ser-biot alt
chl may be replacing biot.?

Mineralization

Structure

Late Qtz-calcite ^{opague} pyrite veinlets - 2-3 inch
check w/ PL for if cpy is away chl
rather than the prot.
1/4" Qtz-calc-py vein cuts rock - no halo zones.



SPECIMEN # BSW 7-865
LOCALITY Kucklum
FIELD NAME Mvb + AH mixed
DDH # BSW 7, 865 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

Mvb + hornblende, andesite - mixed.

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

Alteration

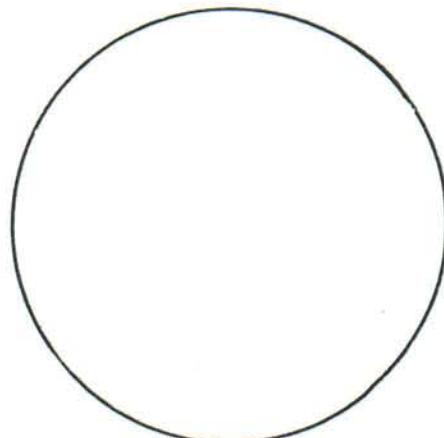
chlorite (?) &/or py - v. lowbrow - LF-micaceous - light green v. weak places.
zircon &/or rutile in chlorite
moderate sericitic

Mineralization

dsr & vein py - some occur w/ chl(?)
limonitic in clusters

Structure

Late gfy-cal vein w/ chlorite
Gfy vein cut by late chl veinlets.



SPECIMEN # BSW7-1132
LOCALITY Buckskin
FIELD NAME MVB
DDH # BSW7, 1132 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

MVB

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

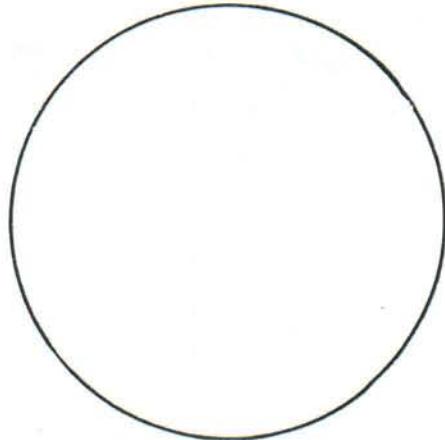
Alteration

Qtz - Ferrite

some siderite? & some chlorite - poor late

Mineralization

Structure



SPECIMEN # BSW7 - 1474
LOCALITY Buchstein
FIELD NAME FPA
DDH # 7, 1884 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

Fine Porphyritic andesite (margoc.)

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

Alteration

- Sericitic - silica - mod to strong - reverse + halo sphen
gm mostly altered plagiophen 10-50%
see biot.

strong see biot on one end of slide - may or may not be related
to sphen.

Mineralization

py - diss + vein

Structure

vem - silica-sericitic ± biot - dat possibly
not related directly to py - vem



SPECIMEN # BSW7 1662
LOCALITY Buckskin
FIELD NAME F8hp (B1P)
DDH # 7, 1662 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

F8hp

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

Play

Bro + 5%

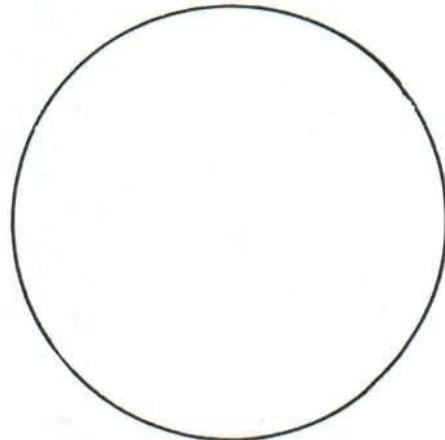
hnb < 1%

quartz - epidote - sphene
Alteration

weak chloritization of mafics - incomplete alt of brot
50% or better alt of hnb

Mineralization

Structure



BSW9
8cmc

SPECIMEN # BSW 9-170
LOCALITY Buckskin - west
FIELD NAME Fbhp
DDH # BSW 9, 170 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

Fbhp Fine boat hb-porphry

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

Plg + fextn 16° in forming - symmetrod - na rock - 0 to 30% aet
≤ 1% 1/2 mm rounded gty phenos
hb - partially replaced by chlorite + minor calcite. ~60% aet
Rust 100% aet to chl + cal
granular gm of qtz + fsp
sphene - cubeddy

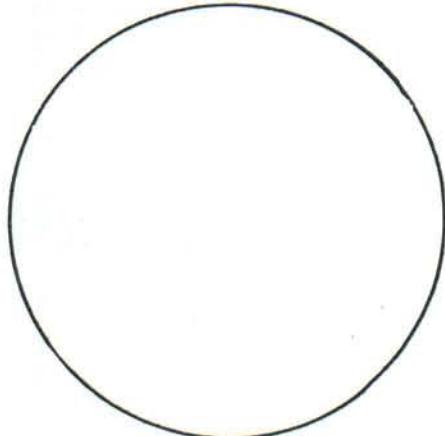
Alteration

chl-calc chloritized krofite + hb - nearly complete - calcite patches
weak very minor sericitization of plg ± 30%

zoned plg - not very altered

Mineralization

Structure



SPECIMEN # BSW9-363
LOCALITY Buckskin, Douglas Co.,
FIELD NAME Muh
DDH # BSW9, 263 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

Volcanic breccia

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

1" or better frags

Alteration

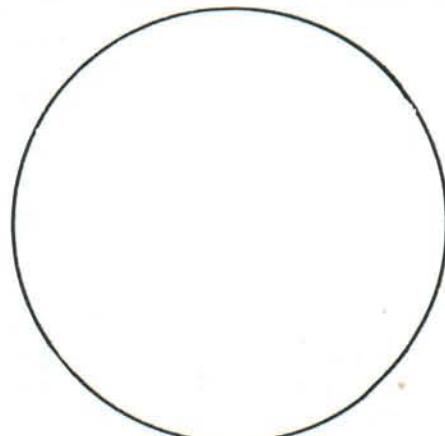
silica - fer - chl - very fine grained

strong to moderate pervasive propylitic alteration

Mineralization

Lab f pyrite - 4-6% disseminated - some small irregular fractures

Structure



SPECIMEN # BSW 9-738
LOCALITY Bksk - Nev
FIELD NAME Mvfa? Mv4
DDH # BSW 9, 738 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

fine porphyritic andesite

No K at all with stained plug.

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

andesite porphyry or

Alteration

sericitic - Hydrogrossular? or what's ~~sericitic~~

- chlorite - some clay?

strong sericitic-chlorite alt of some feldspars

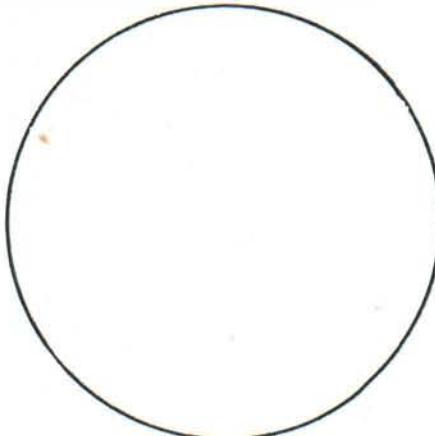
plug is often only 20% altered to ser

Mineralization

pyrite - some limonite(?) - thin clep?

Structure

None



SPECIMEN # BSW9-1006
LOCALITY Buckskin
FIELD NAME Fbhj
DDH # K3W9, 1006 ft.
DATE _____

PETROGRAPHIC ANALYSIS
William M. Oriel

MEGASCOPIC DESCRIPTION

fine botryoblastic-porphyry

MICROSCOPIC DESCRIPTION

Rock Type - Essentials and accessories

Actinolite - small stacked blocks - completely altered to chlorite + serpentine + siderite? (carbonate)?

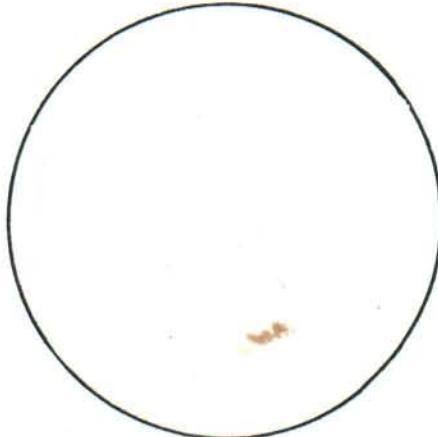
Alteration

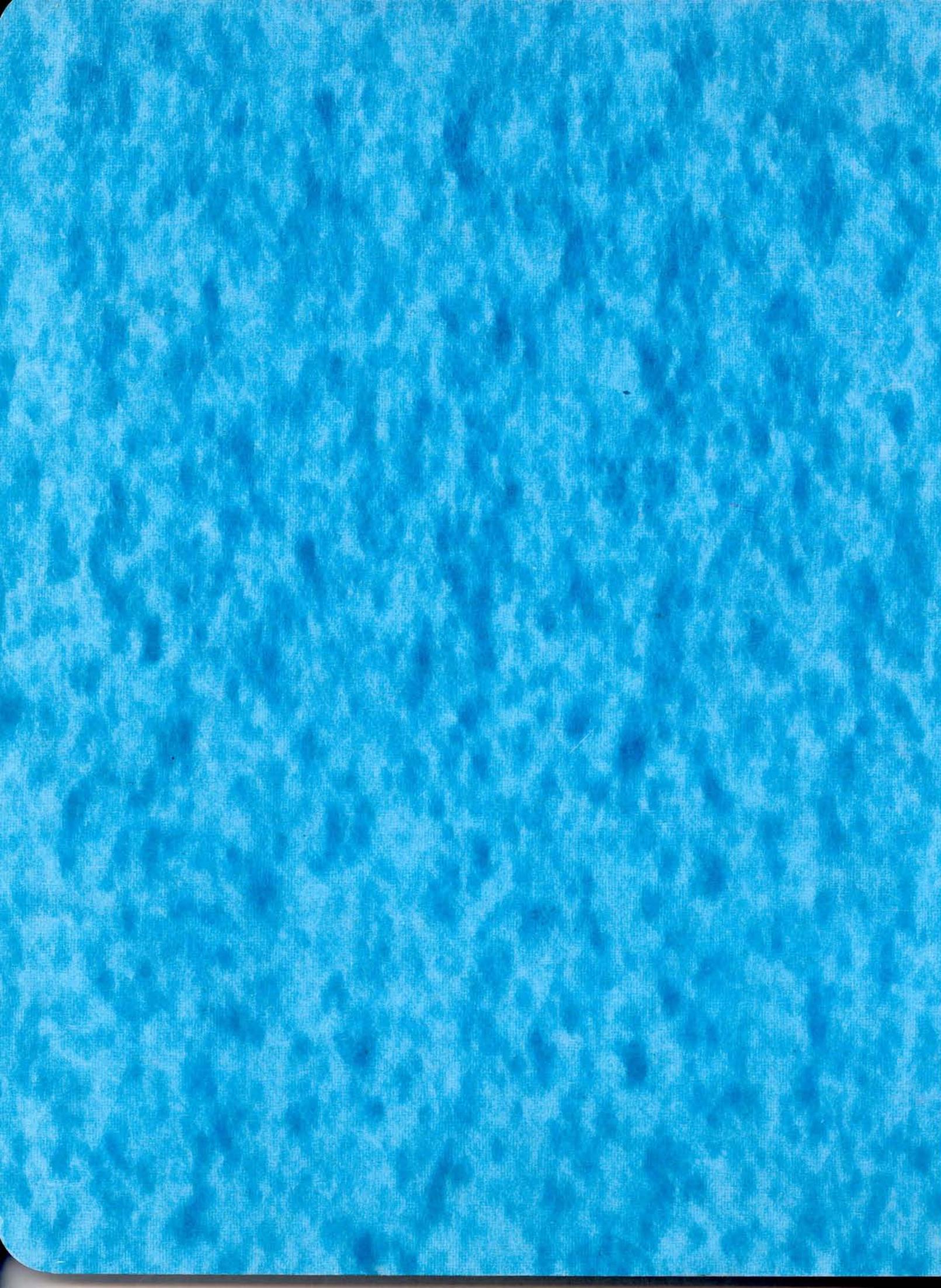
Serpentine-chlorite repl of actinolite - two habits - one very coarse w/ man extra + drastic relief change w/ plain light
Siderite? repl of plagioclase - spotty - no good cleavage - drastic relief change - yellow color

Mineralization

in higher Cu zone
dissen py+epy? major concentrate fine sulfides

Structure







Bear Creek Mining Company

**Spokane
Office**

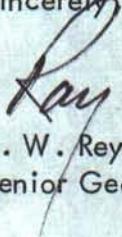
May 12, 1976

Mr. Pete Kerwin
Continental Oil Company
P. O. Box 7608
Reno, Nevada 89502

Dear Pete:

I had asked KEI, Salt Lake City, for any thin sections they might have of Buckskin core. Only thing they could turn up was petrologic reports that I have enclosed.

Sincerely,


R. W. Reynolds
Senior Geologist, Exploration

RWR/bb

Enc.

MAY 17 REC'D



Kennecott Exploration, Inc.

Exploration Services Department

Area (35)
Item 13
Geologic
Research
Division

December 7, 1970

PETROLOGIC PROBLEM STUDIES REPORT

Area: Buckskin Southwest, Douglas County, Nevada

Requested by: Peter H. Hahn

Nature of Request: Alteration mineralogy by petrographic examination.

A-7550

<u>Mineral</u>	<u>Grain Size</u>	<u>%</u>	<u>Development of crystal faces</u>
feldspars:			
orthoclase(?)	1.0-2.0 mm	25%	euhedral
Carlsbad twinned, all weakly to moderately sericitized.			
oligoclase(?)	.5-1.0 mm	15%	euhedral
Untwinned, moderately to rather strongly sericitized.			
fine-grained	.1 mm	15% (?)	anhedral
untwinned plagioclase in groundmass			
quartz in groundmass	.1 mm	25% (?)	anhedral
sericite	very fine grained	10%	anhedral
quartz veins	.2-.3 mm wide	3%	
hematite	.1 mm	2%	subhedral
goethite	very fine grained, washed throughout rock	3%	anhedral



Kennecott Exploration, Inc.

Exploration Services Department

Geologic
Research
Division

July 10, 1972

PETROGRAPHIC PROBLEM STUDIES REPORT

Area: Buckskin Southwest, Douglas County, Nevada

Requested by: Jeffrey B. Hulen

Nature of Request: Classification of rock type

BSW 294

The rock has a porphyritic texture. The euhedral plagioclase phenocrysts comprise 35-40% of the rock and average 0.75 mm in length. The plagioclase phenocrysts are moderately to intensely replaced by colorless chlorite with fuzzy rutile inclusions (minor), montmorillonite, and sericite (major). Many of the highly altered phenocrysts have a discontinuous rim of fine-grained secondary biotite.

The matrix probably had a fine-grained mosaic or aplitic texture. Matrix feldspars have been replaced by sericite, montmorillonite, and colorless chlorite (major).

The original mafics, probably hornblendes average 0.5 mm in length, have been replaced by a very fine-grained chlorite with fine-grained rutile inclusions.

Very fine-grained anhedral magnetite is disseminated throughout the rock.

A 0.3 mm wide quartz vein occurs narrow. Chlorite, carbonate, and magnetite stringers follow the same crack.

The original rock could have been a rhyodacite porphyry.

quartz	.001-.6 mm	30%	; plagioclase	.001-1.5 mm	10-15%
sericite	.001-.01 mm	20%	; montmorillonite	.001-.01 mm	7-10%
chlorite	.01-.1 mm	15-20%	; rutile	.001-.005 mm	0.1%
biotite	.01-.1 mm	3-4%	; apatite	.01-.1 mm	0.3%
carbonate	.01-.1 mm	0.5%	; magnetite	.01-.3 mm	1%
epidote	.01-.05 mm	>.1%			

Mary J. Sweeney
Mary J. Sweeney

MJS/db

Mine or Property - Buckskin, Lyon County, Nevada

Sample No. - BSW-9 @ 329' Section Type - T.S. Date & Done by - 10/74
MJS

Rock Name - Dacite porphyry

Field Name -

Megascopic Description -

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
plagioclase	40	0.3-4.0 mm; phenocrysts, 30-35% of rock, 50% altered to sericite; 0.01-0.05 mm; matrix, 30%
quartz	30	0.01-0.5 mm; a few quartz eyes rounded and embayed by resorption, 1% of rock
chlorite	10	0.05-0.5 mm; after mafics, hornblende and biotite
kaolinite?	5-7	after plagioclase
sericite	10-20	after plagioclase and mafics
rutile	1	0.01-0.05 mm; as inclusions in chlorite
pyrite	2-3	disseminated, mostly in mafic phenocrysts, and in 0.1-mm-wide quartz veins

Remarks - Same rock as above. Plagioclase phenocrysts only 50% altered. Mafics completely altered to chlorite with some pyrite, rutile, and sericite. 0.1-mm-wide quartz-pyrite-chlorite vein with a weakly developed sericite envelope.

7.1e Douglas Co

TO: Gary Heinemey and Jack Satkoski

Mine or Property - Buckskin, Lyon County, Nevada

10/74

Sample No. - BSW-9 @ 133'Section Type - T.S.Date & Done by - MJSRock Name - Dacite porphyryField Name -Megascopic Description -Microscopic Description (texture, grain size, etc.) -

<u>Minerals</u>	<u>vol. %</u>	<u>Description</u>
quartz	30-35	in matrix, after feldspar and in veins.
sericite	30-35	after feldspar and mafics
siderite	10-15	in plagioclase phenocrysts
chlorite	7	replaces biotite, hornblende, and plagioclase phenocrysts
kaolinite	7-10	
pyrite	2	occurs in veins, as disseminations, and as lining in vugs

Remarks - Rock contains 1-3 mm plagioclase phenocrysts, 30-35% of rock. Most of them have been completely replaced by sericite, siderite, and some kaolinite and chlorite. A few have been replaced by granular mosaic, quartz, and sericite. Primary mafics, biotite and hornblende, have been completely replaced by sericite, chlorite, and rutile. The matrix is a granular mosaic of feldspar and quartz, 0.075 mm grain size. The feldspar has been intensely (>90%) replaced by sericite. A 1-mm-wide pyrite-quartz vein crosscuts section; it has a 5-mm-wide (on each side) selvage of intense sericite alteration. No carbonate occurs in the selvage.

December 7, 1970

chlorite	.1-.2 mm aggregates	1%	subhedral
biotite	.1-.2 mm	2%	subhedral
opaques- magnetite		3%	subhedral

Rock is magnetic. Goethite is the result of oxidation of magnetite.

Rock name: Altered dacite porphyry

Alteration: Rock has been weakly sericitized; feldspars → sericite. Quartz veinlets and hematite veinlets cut the rock. The opaques are mainly magnetite. The rock is washed throughout by goethite derived from the oxidation of magnetite. A small amount of chlorite has been introduced.

Mary Jo Sweeney

MJS:ms



(MR)
Kennecott Exploration, Inc.
Exploration Services Department

35
Item 15
**Geologic
Research
Division**

July 10, 1972

PETROGRAPHIC PROBLEM STUDIES REPORT

Copy to "J" PLEASE
Area: Buckskin Southwest, Douglas County, Nevada

Requested by: Jeffrey B. Hulen

Nature of Request: Classification of rock type

BSW 294

The rock has a porphyritic texture. The euhedral plagioclase phenocrysts comprise 35-40% of the rock and average 0.75 mm in length. The plagioclase phenocrysts are moderately to intensely replaced by colorless chlorite with fuzzy rutile inclusions (minor), montmorillonite, and sericite (major). Many of the highly altered phenocrysts have a discontinuous rim of fine-grained secondary biotite.

The matrix probably had a fine-grained mosaic or aplitic texture. Matrix feldspars have been replaced by sericite, montmorillonite, and colorless chlorite (major).

The original mafics, probably hornblendes average 0.5 mm in length, have been replaced by a very fine-grained chlorite with fine-grained rutile inclusions.

Very fine-grained anhedral magnetite is disseminated throughout the rock.

A 0.3 mm wide quartz vein occurs narrow. Chlorite, carbonate, and magnetite stringers follow the same crack.

The original rock could have been a rhyodacite porphyry.

quartz	.001-.6 mm	30%	;	plagioclase	.001-1.5 mm	10-15%
sericite	.001-.01 mm	20%	;	montmorillonite	.001-.01 mm	7-10%
chlorite	.01-.1 mm	15-20%	;	rutile	.001-.005 mm	0.1%
biotite	.01-.1 mm	3-4%	;	apatite	.01-.1 mm	0.3%
carbonate	.01-.1 mm	0.5%	;	magnetite	.01-.3 mm	1%
epidote	.01-.05 mm	.1%	;			

Mary J. Sweeney

Mary Jo Sweeney

MJS/db

REQUEST TO GEOLOGIC RESEARCH DIVISION
FOR
MINERALOGICAL-PETROGRAPHIC WORK

1. District/Project INTERMOUNTAIN Date: 6-14-71

Area Code Name: BUCKSKIN SW Code Number: 12070337

State: NEVADA County: DOUGLAS

Budget Undertaking (if not Code Name): _____

2. Nature of Investigation (porphyry copper, massive sulfide, etc.):
Porphyry copper

Brief Geologic Setting: Qtz-sericitized, Early Cretaceous quartz latite porphyry and associated intrusive breccia intruding Upper Jurassic grp. & Triassic-Jurassic meta-andesite, overlain by Tertiary sediments & volcanics.

Identification of rock samples (field numbers, core intervals; copies of maps and logs):

A8115: Core sample from 292' in Buckskin SW drill hole #1:
Qtz-sericitized, qtz. monzonitic intrusive breccia

3. Request for (specify-- mineral identification, petrographic examination, alteration, etc.):

Whole rock x-ray to determine total alteration mineralogy
(Suspect mostly qtz. and ser., w/minor ankerite or dolomite,
possibly clinozoisite??)

4. Samples sent by: J. B. Hulen On: 6-14-71
from (address): 3075 Mill Street
Reno, Nevada 89502

Report sent to (same as above xx):

Date needed (as convenient): As soon as possible (currently writing report on area)

5. Justification:

Copy to District/Project Manager

By: Jeff Hulen
(Signature)



Kennecott Exploration, Inc.

Exploration Services Department

(35)
Item 15
Geologic
Research
Division

December 7, 1970

RECEIVED

DEC 8 1970

B. C. M. C.
RENO

Area: Buckskin Southwest, Douglas County, Nevada

Requested by: Peter H. Hahn

Nature of Request: Alteration mineralogy by petrographic examination.

A-7550

Mineral	Grain Size	%	Development of crystal faces
feldspars:			
orthoclase(?)	1.0-2.0 mm	25%	euhedral
	Carlsbad twinned, all weakly to moderately sericitized.		
oligoclase(?)	.5-1.0 mm	15%	euhedral
	Untwinned, moderately to rather strongly sericitized.		
fine-grained	.1 mm	15% (?)	anhedral
untwinned plagioclase in groundmass			
quartz in groundmass	.1 mm	25% (?)	anhedral
sericite	very fine grained	10%	anhedral
quartz veins	.2-.3 mm wide	3%	
hematite	.1 mm	2%	subhedral
goethite	very fine grained, washed throughout rock	3%	anhedral

Peter H. Hahn

-2-

December 7, 1970

chlorite	.1-.2 mm aggregates	1%	subhedral
biotite	.1-.2 mm	2%	subhedral
opaques- magnetite		3%	subhedral

Rock is magnetic. Goethite is the result of oxidation of magnetite.

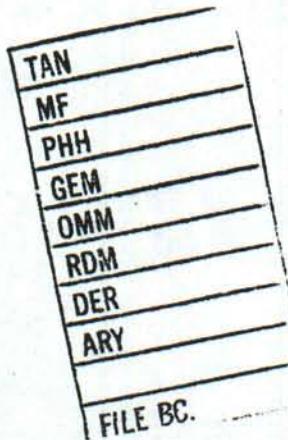
Rock name: Altered dacite porphyry

Alteration: Rock has been weakly sericitized; feldspars → sericite. Quartz veinlets and hematite veinlets cut the rock. The opaques are mainly magnetite. The rock is washed throughout by goethite derived from the oxidation of magnetite. A small amount of chlorite has been introduced.

Mary Jo Sweeney

Mary Jo Sweeney

MJS:ms



Elko

REQUEST TO GEOLOGIC RESEARCH DIVISION
FOR
MINERALOGICAL-PETROGRAPHIC WORK

1. District/Project NORTHWEST - BCIIC Date: 1/3/72

Area Code Name: BLICKSKIN SW Code Number: 05-01-0411

State: NEVADA County: Douglas

Budget Undertaking (if not Code Name): _____

2. Nature of Investigation (porphyry copper, massive sulfide, etc.):

PORPHYRY COPPER

Brief Geologic Setting:

REL. SMALL PPy Cu-TYPE SULFIDE SYSTEM LOCALIZED
IN INTENSELY SHATTERED K INTRUSION BRECCIA.

Identification of rock samples (field numbers, core intervals; copies of maps and logs): CORE SAMPLES

<u>BSW-7:</u>	(468)	656'	(812)	1010'	1221'	1410'	(1554)	<u>BSW-8</u>
	502'	(690)	816'	1050'	(1234)	(1458)	1612'	
	540'	726'	(893)	1104'	1260'	1466'	1660'	
	564'	746'	928'	1150'	1308'	1480'	(1700)	
	644'	(720)	946'	1160'	1340'	1494'	(1714)	
	652'	(786)	(956)	1204'	(1350)	1530'		

3. Request for (specify-- mineral identification, petrographic examination, alteration, etc.):

PETROGRAPHIC EXAMINATION - I'd like a report
on the circled samples on, if possible, a super-
rush basis. The doubly-circled samples
require sulfide mineral identification (any
tetrahedrite or enargite?)

4. Samples sent by: J.B. HULEN On: 1/4/72

from (address):

E. 7821 SPRAGUE AVENUE
SPOKANE, WASHINGTON

Report sent to (same as above ✓):

Note: The samples from
BSW-8 are labeled in
full (i.e. BSW-8, 117'); the
samples from BSW-7 show
only footages

Date needed (as convenient): JUST AS SOON AS POSSIBLE

5. Justification:

Thanks,

By: Jeffrey B. Hulen
(Signature)

Copy to District/Project Manager
M.D. REGAN
R.E. BRAY



Bear Creek Mining Company

(35) Item 15
Northwest
District

January 4, 1973

Ms. Mary Jo Sweeney
Kennecott Exploration, Inc.
Geologic Research Division
2300 West 1700 South
Salt Lake City, Utah 84104

Dear Mary Jo:

I've shipped to you today, under separate cover, a large box of core samples from the Buckskin Southwest prospect for petrographic examination, and selected a few of these samples for determination of sulfide mineralogy.

Drilling at Buckskin Southwest is tentatively scheduled to resume early in February, under the direction of R. Eldon Bray. Eldon would certainly appreciate some petrographic backup when he begins working with this year's Buckskin core. I've, therefore, selected several samples that I'd appreciate your handling, if possible, on a "super-rush" basis. I'd also like the thin-sections, plugs, and remnants returned to Spokane.

Thanks for your consideration.

Sincerely yours,



Jeffrey B. Hulen

JBH/bb

Enclosures: Request to GRD for Mineralogical-Petrographic Work
Drill Logs for BSW-7 and BSW-8

cc: M. D. Regan w/request sheet
R. E. Bray w/request sheet

REQUEST TO GEOLOGIC RESEARCH DIVISION
FOR
MINERALOGICAL-PETROGRAPHIC WORK

(35) Item 15

1. District/~~Project~~ NORTHWEST-BCMC Date: 1/3/72

Area Code Name: BLICKSKIN SW Code Number: 05-01-0411

State: NEVADA County: Douglas

Budget Undertaking (if not Code Name): _____

2. Nature of Investigation (porphyry copper, massive sulfide, etc.):

PORPHYRY COPPER

Brief Geologic Setting:

REL. SMALL PPy CU-TYPE SULFIDE SYSTEM LOCALIZED
IN INTENSELY SHATTERED K INTRUSION BRECCIA.

Identification of rock samples (field numbers, core intervals; copies of maps and logs): 1 CORE SAMPLES

<u>BSW-7</u> : (468)	656'	(812)	1010'	1221'	1410'	(1554)	<u>BSW-8</u>
502'	(690)	816'	1050'	(1234)	(1438)	1612'	
540'	726'	(898)	1104'	1268'	1466'	1660'	
564'	746'	928'	1130'	1308'	1480'	(1700)	
644'	(774)	936'	1160'	1340'	1494'	(1714)	
652'	(786)	(956)	1204'	(1352)	1530'		

3. Request for (specify-- mineral identification, petrographic examination, alteration, etc.):

PETROGRAPHIC EXAMINATION - I'd like a report
on the circled samples on, if possible, a super-
rush basis. The doubly-circled samples
require sulfide mineral identification (any
tetrahedrite or enargite?)

4. Samples sent by: J. B. Hulen On: 1/4/72

from (address):

E. 7821 SPRAGUE AVENUE
SPOKANE, WASHINGTON

Report sent to (same as above ✓):

Note: The samples from
BSW-8 are labeled in
full (i.e. BSW-8, 117'); the
samples from BSW-7 show
only footages

Date needed (as convenient): JUST AS SOON AS POSSIBLE

5. Justification:

Thanks,

Jeffrey B. Hulen
By: Jeffrey B. Hulen
(Signature)

Copy to District/~~Project~~ Manager
M.D. REGAN
R.E. BRAY

A 8091

? porphyry

Original rock:

Matrix \approx 40% wch

Mixture gtz and alkali fspas with a little plagi & minor mafics. Very fine grained

Phenocrysts \approx 60% wch

Plagioclase 40+ % oligo-and alb to ab partly avg size = 0.8 mm

Hornblende 5+ fresh mostly ~~abundant~~ avg size = 0.3 mm

Quartz 10+ varied in shape

Biotite 1 commonly basal, completely alb

Magnetite 1-

Apatite tr with red hematitic (?) stain on fract.

Present Mineralogy:

Plagioclase 40% prim + sec

Hbd 5 prim

Qtz 25 prim

Kspas 20-25 matrix only prim

~~Rht~~

Mag 1- prim

Ap tr prim

Ep (Piedmontite) 1 sec

Sericite 10± : sec

Calcite tr sec

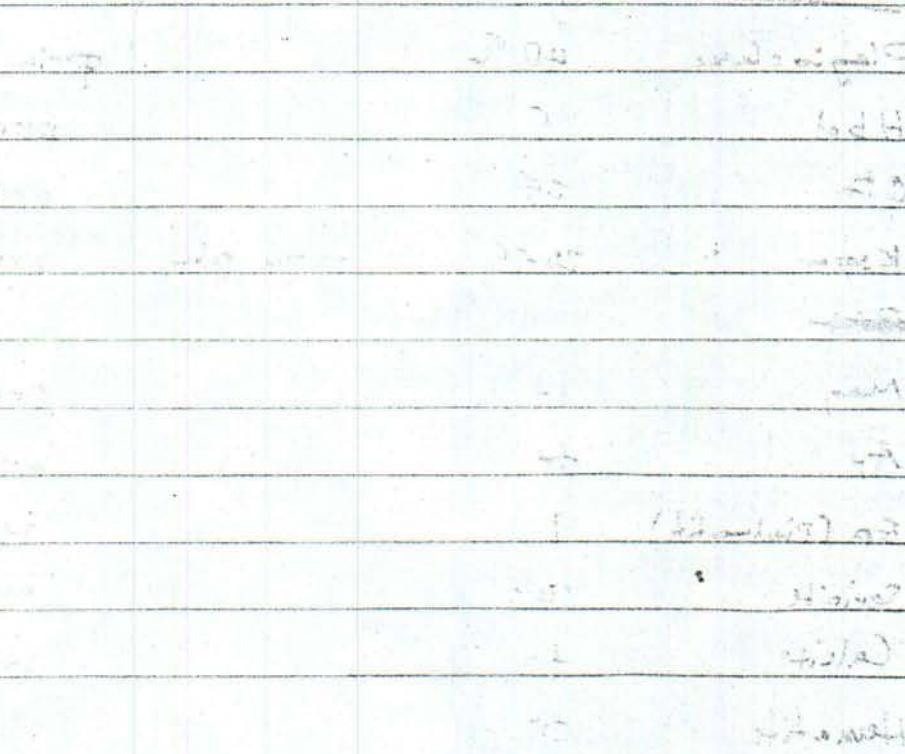
Hematite tr sec

Texture: Porphyry, microphylline groundmass. Most phenos broken or fractured (except for gtz). Fairly lot of elong di phenos.
(Corey)

Comments: Fl & cloudy, partly lit to service. Qtz phenos strongly embayed equant to nearly cubed & also as broken slivers. Most mostly fresh with possible coronas sec ampl. & some repl by calcite. Biot totally all to FeO + picomontite. Ap as inclusions to subbed small gas. Single clast of granular gts + ksp + epidote + may + calcite.

Orientation: Moderate. Recrystallization of plagi strong but otherwise fairly fresh rock.

Aspect in foliation	+ G1	MnS
for plagioclase + plumbonac.	+	2.5
-	-	1.5
at a low angle from the	+	1.5



reoriental. diagram

mineral lineations MnS

mineral axes Min A

A 8092

banded porphyry

Original Rock:

Matrix \approx 60-70% rock

Mixture of \pm alk fspas with minor plagi & mafics.

Two types matrix occurring in alternating layers:
one type is super fine E_1 ^{its grains are} nearly irresolvable, the
other type has angular spongy quartz masses to
about 0.25 mm. The latter type contains more
phenocrysts.

Phenocryst \approx 30-40% rock

Plagioclase	25% \pm	most broken to 2.5 mm avg = 0.9 mm
Hbd	5-10%	subbed-angular to 3.5 mm avg gr = 0.25 mm
Magnetite	1-2%	subbed-angular
Apatite	tr	subbed
Biot (?)	tr	thin flakes, altered.

Present Mineralogy

Plagioclase	15	prim
Polash feldspar	30	prim matrix only
Quartz	30+	prim + sec
Hbd	5	prim
Magnetite	1-2	prim
Apatite	tr	prim
Sericite	15	sec
Epidote	1-	sec
Calcite	tr	sec
Hematite	tr+	sec

Texture: Porphyry with microcrystine matrix. Many ^{common}

phenocrysts bnd in or fractured. Fe²⁺ elong of phenocrysts along banding. Qtz veins with some epidote parallel banding also. These appear to have been deformed by later flowage.

Comments: Plagioclase phenocrysts now made up of over half scoria. A few unaltered cores remain. Most mostly fresh. Biot & present wholly repl by FeOx + ep or FeOx + matrix minerals. App as subbed prisms.

Alteration: Moderate. Sericitization of plagioclase phenocrysts strong otherwise fairly fresh. Qtz - epidote rimming may be deuteric.

A 8093

Quartz - Sericite rock (alt. intrusive breccia?)

Original rock:

Original mineralogy and texture impossible to ascertain.

Present mineralogy:

Quartz 40-45%

Sericite 35-40%

Pyrite 8-9%

Clinzoisite 5%

Dolomite or Ankerite 2-3%

Clay min. 1-2%

Magnetite tr

Hematite tr

Texture:

Massive quartz - sericite intergrowths. Quartz as granular mosaic. Sericite as jumble of tiny flakes. Dolomite or ankerite veinlets cutting quartz - sericite vlt. Lensoid patches rich in clay and irregular patches with abundant clinzoisite.

Comments:

The pyrite occurs as mostly subhedral rounded to irregular grains. Subhedral py is rare. Clinzoisite as isolated subhedral - anhedral grains and in areas of granular to felty to radicolumnar accumulations of elongate grains. Magnetite probably present as repl. of

original matrix (involc. Hematite) & light reddish brown
dustings of irregular shape.

Alteration: Severe quartz-sericite alteration.
Quartz flooding & reworking. Planoise white mica
present in gts ults. Clinozoisite may be of
earlier stage than gts-sericite as it is corroded
in places. It might be in equilibrium with gts-
seric. alteration occurring after original leiolopas.
Carbonate reworking is latest. Pyrite appears to
be contemporaneous with gts-seric. alt.

A 8094

Fine-grained banded porphyry (mtr. breccia)

Original rock:

Matrix 60% +

Mixture quartz and alkali feldspar with possibly some plagioclase and minor mafics

Phenocrysts 30% +

Plagioclase 25% - probably oligo-anal. Avg size $\approx 0.25\text{ mm}$

Hed (?) 5% +

Biotite tr

Magnetite 5% ±

Present Mineralogy:

Plagioclase

~~25%~~ prim + sec

Alkali feldspar (incl. ab)

20-25 prim + sec (?)

Quartz

20-25 prim + sec (?)

Magnetite

10 prim + sec (?)

Sericite

2 sec

Epidote

2 sec

Iron hydroxide - Hematite

1-2 sec

Clay

2+ sec

Calcite

tr sec

Texture: porphyry, micromillimetric groundmass. Most phenos ~~not~~ broken or fractured, biot bent.

Banded w/ long axis phenos II. Bands are layers of differing phenocryst content & size.

Comments: Plagioclase cloudy partly ab to associate. Alk felscs matrix only seen to albite in partly over-

Quartz present in matrix and as patches of slightly larger grain size showing mosaic texture. Magnetite generally absent or a few scattered. Partly secondary. Original matrix totally altered to Fe ox + hydrox, epidote, sericite & gts. Epidote in patches with a little assoc. calcite, probably representing alt. hbds. Clay: ± Hem in matrix & after orig. matrix.

Alteration: Moderate. Secondary epidote, gts, sericite, Fe ox (hem) & hydrox, pyr and clay (?) present in about equal amounts. Some of magnetite may be secondary.

A 8096 porphyritic dacite

Original Mineralogy

Phenocrysts: 40-45%

Plagioclase 25-30% basic andesine An45

Biotite 9-10%

Quartz 3-4%

Hornblende possible 1-2%

Magnetite 1%

Apatite tr

Matrix: 55-60% - a mixture of gneiss-plagioclase-mafics, microcrystalline, contains mostly euhedral grains.

Present Mineralogy

Plagioclase 40-45%? matrix percentage estimated

Chlorite 15%

Quartz 15-20%? matrix percentage estimated

Epidote 5%

Potash feldspar 15-20%? estimate of and in matrix

Hematite-iron hydroxide 2%

Magnetite tr

Sericite 2-3%

Apatite tr

Texture Porphyritic with microcrystalline groundmass.

Massive. Avg phenocrst size \approx 2 mm.

Comments. Plagioclase phenocrysts mostly subhedral, show strong oscillatory zoning. Partial replacement by sericite, epidote, and albite. 5% ph. phenocrysts euhedral to subhedral wholly replaced by chlorite and epidote. Other phenocrysts rounded and embayed. Several irregularly shaped epidote-chlorite masses - may have been hornblende. (over)

Magnetite present as small euhedral- subbedent
grains marginally altered to hematite & iron hydroxides.
A few small apatite prisms present.

Alteration Propylitic facies. Not very severe, alteration
products make up less than 25% rocks

H-1 Porphyritic dacite

Original Mineralogy

Phenocrysts: 40%

Plagioclase 25-30%

Hornblende 7-8%

Biotite 3-4%

Quartz tr

Magnetite 1-2

Apatite tr

Matrix: 60% Microcline mixture plagi-ksp-gte-mafics, great majority grains equant.

Present Mineralogy

Plagioclase 20-25% matrix plagi rough estimate

Biotite 6-7% green secondary

Chlorite 5%

Quartz 10-15% matrix gte blind stab

Paragonfeldspar 10-15% " Ksp " "

Sericitic 15-20%

Magnetite 1%

Tourmaline - iron hydroxides 1-2%

Epidote 1%

Clay (?) 20%

Apatite tr

Texture Porphyritic with microcline groundmass. Faint flow fol. shown by aligned phenos. Avg phenos size \approx 2 mm

Comments Plagioclase phenocrysts mostly replaced, more than half replaced by sericitic (or possibly albite). Hornblende - replaced, replaced by fine sec. biot. with patches chlor. Biot phenos euhedral - replaced by chlor + seric + op + biot. at cover

phenocrysts were (d). Present rocks was in mixture of clay (kaol group) with some chlor, gla & fsp.

Magnetite goes small cubed - arched. Some completely altered to hem or iron hydroxide. A few small cubed apatite prisms present.

Alteration: Clay-sericite (?). Secondary biotite nearly restricted to occurrences after hb. Alteration fairly severe - alt. products 50-55°C rock.

Douglas

10/74

Mine or Property - Buckskin, Esmeralda County, NevadaSample No. - BSW-9 @ 133'Section Type - T.S.Date & Done by - MJSRock Name - Dacite porphyryField Name -Megascopic Description -Microscopic Description (texture, grain size, etc.) -

<u>Minerals</u>	<u>vol. %</u>	<u>Description</u>
quartz	30-35	in matrix, after feldspar and in veins.
sericite	30-35	after feldspar and mafics
siderite	10-15	in plagioclase phenocrysts
chlorite	7	replaces biotite, hornblende, and plagioclase phenocrysts
kaolinite	7-10	
pyrite	2	occurs in veins, as disseminations, and as lining in vugs

Remarks - Rock contains 1-3 mm plagioclase phenocrysts, 30-35% of rock. Most of them have been completely replaced by sericite, siderite, and some kaolinite and chlorite. A few have been replaced by granular mosaic, quartz, and sericite. Primary mafics, biotite and hornblende, have been completely replaced by sericite, chlorite, and rutile. The matrix is a granular mosaic of feldspar and quartz, 0.075 mm grain size. The feldspar has been intensely (>90%) replaced by sericite. A 1-mm-wide pyrite-quartz vein crosscuts section; it has a 5-mm-wide (on each side) selvage of intense sericite alteration. No carbonate occurs in the selvage.

Douglas

Mine or Property - Buckskin, ~~Eureka~~ County, Nevada

Sample No. - BSW-9 @ 329'

Section Type - T.S.

Date & Done by - 10/74
MJS

Rock Name - Dacite porphyry

Field Name -

Megascopic Description -

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
plagioclase	40	0.3-4.0 mm; phenocrysts, 30-35% of rock, 50% altered to sericite; 0.01-0.05 mm; matrix, 30%
quartz	30	0.01-0.5 mm; a few quartz eyes rounded and embayed by resorption, 1% of rock
chlorite	10	0.05-0.5 mm; after mafics, hornblende and biotite
kaolinite?	5-7	after plagioclase
sericite	10-20	after plagioclase and mafics
rutile	1	0.01-0.05 mm; as inclusions in chlorite
pyrite	2-3	disseminated, mostly in mafic phenocrysts, and in 0.1-mm-wide quartz veins

Remarks - Same rock as above. Plagioclase phenocrysts only 50% altered. Mafics completely altered to chlorite with some pyrite, rutile, and sericite. 0.1-mm-wide quartz-pyrite-chlorite vein with a weakly developed sericite envelope.

Kennecott Exploration, Inc.
Exploration Services Department

**Geologic
Research
Division**

January 29, 1973

PETROGRAPHIC PROBLEM STUDIES REPORT

Area: Buckskin Wash, Douglas County, Nevada

Requested by: Jeffrey B. Hulen

Nature of Request: Alteration mineralogy and rock classification

Summary of Alteration in BSW-DH 7

BSW-DH 7 intersects a zone of sericite-secondary biotite overlap.

The most intensely altered rock is a medium-grained porphyry(?). It is strongly fractured or brecciated. The alteration minerals, biotite and/or sericite, clays and quartz, strongly obliterate the primary texture. This strongly altered rock has been described in samples from 7-468', 7-754', 7-786', 7-898', and 7-1700'.

Diorite or diorite porphyry occurs in the samples at 7-956', 7-1234', 7-1438', 7-1554'. Alteration in the diorite includes the development of secondary biotite in primary mafics, in the matrix, and in the plagioclase laths. Sericite and kaolinite also occur as alteration products of plagioclase laths. Anhydrite-gypsum occurs in the diorite at 7-1438' and 7-1554'. Overall the diorite is consistently altered to biotite with lesser sericite. Plagioclase laths are 60-80% unaltered. Primary texture is well preserved.

Hornblende-biotite monzonite porphyry occurs at 7-842', 7-1352', and 7-1714'. Alteration in it is fairly erratic. Sample 7-842' is weakly to moderately (20%) altered to sericite-carbonate-chlorite. Sample at 7-1352' is strongly altered to sericite, montmorillonite, kaolinite, and carbonate, especially the phenocrysts. Sample at 7-1714' is totally altered to sericite-clay in vein envelopes but is nearly fresh beyond the vein envelopes. It appears that the monzonite porphyry was intruded after the development of secondary biotite in the diorite and the brecciated porphyry but before sericite-clay-pyrite alteration had ceased.

Mary Jo Sweeney

Mary Jo Sweeney

MJS:gp
Attachments

Mine or Property - Buckskin Wash, Douglas County, Nevada

Sample No. - BSW 7 - 468' Section Type - TS Date & Done by - 1/73 MJS

Rock Name - Quartz-sericite-pyrite Field Name -
altered porphyry

Megascopic Description -

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
sericite	15-20	0.001-0.1 mm
chlorite	5	0.05-0.3 mm; occurs around sulfide grains
kaolinite	20-25	0.001-0.01 mm
quartz	40	0.05-0.3 mm
pyrite	15	0.05-0.3 mm; in veins and disseminated

Remarks - Rock appears to be an altered porphyry. Matrix has been replaced by quartz with some sericite and clays. Phenocrysts have been replaced by sericite and kaolinite. The rock is intensely fractured and veined. The veins consist of sericite-kaolinite-pyrite 0.1-2.0 mm wide. The veins give the rock the appearance of being brecciated.

Mine or Property - Buckskin Wash, Douglas County, Nevada

Sample No. - BSW 7 - 690

Section Type - TS

Date & Done by - 1/73 MJS

Rock Name - Sericite-andalusite
kaolinite rock

Field Name -

Megascopic Description -

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
sericite	35	0.01-0.1 mm; mostly after andalusite
kaolinite	15	0.001-0.01 mm
quartz	10-15	0.01-0.2 mm
andalusite	25-30	0.1-0.6 mm; subhedral prisms whose rims may be partially altered to sericite; occur in aggregates with a granoblastic texture
rutile	1	0.01-0.1 mm; as scattered grains and in aggregates
pyrite	5	0.01-0.1 mm; disseminated as irregularly shaped grains which occur interstitially to andalusite grains

Remarks - Rock has a very patchy texture. Andalusite tends to occur in granoblastic aggregates. Sericite tends to occur in rectangular patches, probably after andalusite. Kaolinite occurs in sort of wormy looking aggregates. Rock is too highly altered to have any idea of what the original rock texture was. The composition of the alteration products allows it to have been a feldspar-rich rock or it may be an aluminum-rich sedimentary inclusion.

Mine or Property - Buckskin Wash, Douglas County, Nevada

Sample No. - BSW 7 - 754' Section Type - TS Date & Done by - 1/73 MJS

Rock Name - Biotite-sericite-chlorite Field Name -
altered porphyry(?)

Megascopic Description -

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
sericite	25-30	0.01-0.1 mm
chlorite	15	0.01-0.3 mm; pennine; occurs in veinlets, as an envelope of the latest vein, and around sulfide grains
biotite	25-30	0.05-0.3 mm; pale brown, either bleached or phlogopitic
quartz	20	0.01-0.2 mm
carbonate	3	0.05-0.2 mm; disseminated and in a 0.5-mm-wide veinlet
apatite	tr.	0.1 mm; in a vein
rutile	1	0.01-0.1 mm
pyrite	7	0.01-0.4 mm; disseminated and in veinlets

Remarks - Texture of original rock is largely obliterated by alteration. The secondary biotite, sericite, chlorite, and quartz have a patchy distribution with no obvious relation to a primary texture; however, one gets the impression that the original rock was a medium-grained porphyry. Sulfides are disseminated and occur in veinlets. Veinlets have a frequency of 1 vein/cm. A carbonate-sulfide veinlet with a chloritic envelope cuts earlier quartz-chlorite-sulfide veinlets.

Mine or Property - Buckskin Wash, Douglas County, Nevada

Sample No. - BSW 7 - 786' Section Type - TS Date & Done by - 1/73 MJS

Rock Name - Biotite-sericite altered Field Name -
hornblende-biotite dacite porphyry

Megascopic Description - Medium-grained porphyry with an aphanitic matrix.

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
sericite (illite)	10-15	
chlorite	4	0.01-0.1 mm; in veins and after amphibole; pennine
biotite	15-20	0.01-0.2 mm; light greenish-brown; all secondary
quartz	15	0.01-0.6 mm
orthoclase	5-10	0.1-0.5 mm
plagioclase	40-45	0.1-0.4 mm
carbonate	0.5	0.1-0.3 mm
rutile	0.3	0.01-0.05 mm
magnetite	0.75	0.01-0.1 mm; occurs in quartz veinlets
pyrite	0.5	0.05-0.2 mm

Remarks - Rock contains flow-lineated plagioclase phenocrysts, albite, and Carlsbad-twinned, 0.5-4.0 mm long, 20%, rounded quartz eyes, 0.1-0.6 mm, 1-2%, and hornblende and biotite, 0.1-2.0 mm, 5-7%, all in a fine-grained, crudely flow-lineated matrix composed of plagioclase laths with some interstitial quartz and orthoclase.

Plagioclase phenocrysts are 10-100%, average 30%, altered to sericite (illite?), and secondary biotite. Mafics have been totally replaced by secondary biotite, sericite (illite?), and chlorite. The matrix is essentially unaltered, except for very fine-grained secondary biotite being disseminated in it. Secondary biotite is stable to the edge of veins.

Magnetite occurs in veinlets, 0.1-0.2 mm wide, 1 vein/4 cm. Sulfides occur as dissemination, generally in biotitized phenocrysts.

Mine or Property - Buckskin Wash, Douglas County, Nevada

Sample No. - BSW 7 - 842' Section Type - TS Date & Done by - 1/73 MJS

Rock Name - Hornblende-biotite monzonite porphyry Field Name -

Megascopic Description -

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
sericite	10	0.01-0.1 mm
chlorite	7	0.1-0.5 mm
biotite	0.2	0.01-0.5 mm; primary
quartz	20	0.02-0.1 mm
orthoclase	10	0.02-0.1 mm
plagioclase	45	0.02-5.0 mm
calcite	5	0.1-0.3 mm; disseminated, after mafics and in veins
rutile	0.5	0.01-0.1 mm
magnetite	1	0.01-0.1 mm; disseminated
pyrite	1	0.05-0.2 mm, in veinlets

Remarks - Rock contains plagioclase phenocrysts, 0.4-5.0 mm in length, 35-40% of rock, and strongly chlorite-carbonate altered biotite and hornblende phenocrysts, 0.2-2.0 mm, 7% of rock, all in a fine-grained 0.03- to 0.1-mm aplitic matrix composed of plagioclase, orthoclase, and quartz. Rock contains no quartz eyes.

This sample at 842 feet and the one at 786 feet are probably not the same rock. Sample at 786 feet is probably a dike, sill or flow-lineated border phase of a stock. The sample at 842 feet has the appearance of being a stock.

Plagioclase phenocrysts are 20% altered to sericite with a trace of carbonate. Mafics are almost completely altered to chlorite-carbonate. A trace of unaltered biotite remains. The matrix feldspars are weakly (<15%) altered to sericite-carbonate.

Pyrite-chlorite veins and pyrite-carbonate-chlorite veins, 0.05-0.2 mm wide, occur with a frequency of [1 vein/1-2 cm]. Magnetite is disseminated in the matrix.

Mine or Property - Buckskin Wash, Douglas County, Nevada

Sample No. - BSW 7 - 898' Section Type - TS Date & Done by - 1/73 MJS

Rock Name - Biotite-sericite-
orthoclase altered porphyry Field Name -

Megascopic Description -

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
sericite	20	0.01-0.2 mm
chlorite	10	0.1-0.3 mm
biotite	20	0.01-0.2 mm; greenish-brown, medium intensity color; all secondary
quartz	25	0.01-0.4 mm; in veins and in rock
orthoclase	15	0.05-0.3 mm
plagioclase	5-7	0.01-0.4 mm; fine grained, anhedral, untwinned
carbonate	1	0.01-0.2 mm
rutile	0.5	0.01-0.1 mm; occurs in center of biotite veinlets and in clusters after mafics
magnetite	2	0.01-0.3 mm; occurs in veinlets and in envelopes of veinlets
chalcopyrite	0.5	0.01-0.3 mm; disseminated and in veinlets
pyrite	2	0.01-0.5 mm; disseminated and in veinlets

Remarks - Rock texture is largely obscured by alteration. Probably the rock was originally a feldspar porphyry somewhat similar to BSW 7 at 842 feet. It appears that orthoclase veining and flooding along with development of secondary biotite were the initial alteration products. Later sericite-chlorite alteration has been superposed. Sulfide-quartz-chlorite veins, 0.1-0.2 mm wide, occur with a frequency of 1-2 veins/cm. Later nearly sulfide-free quartz veins occur which are 1-3 mm wide, 1 vein/1-2 cm.

Mine or Property - Buckskin Wash, Douglas County, Nevada

Sample No. - BSW 7 - 956' Section Type - TS Date & Done by - 1/73 MJS

Rock Name - Biotitized diorite Field Name -

Megascopic Description -

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
sericite	5	0.01-0.1 mm
kaolinite	7	0.001-0.01 mm
chlorite	5	0.1-0.5 mm; largely in veins
biotite	20	0.01-0.2 mm; medium brown, all secondary
quartz	10	0.01-0.3 mm; in veins and interstices
orthoclase	3-5	0.05-0.3 mm; in veinlets
plagioclase	50	0.1-6.0 mm
carbonate	1-2	0.05-0.3 mm; largely in veins
epidote	0.4	0.1-0.6 mm; in veins or vein envelopes
rutile	0.75	0.01-0.1 mm; in aggregates in the center of secondary biotite clots
chalcopyrite	0.1	
pyrite	1	0.1-0.5 mm; in veinlets and disseminated

Remarks - Rock contains plagioclase laths, 0.2-6.0 mm in length, 65-70% of rock, which have a subparallel orientation. Probably 10% of the rock was originally hornblende. However, all the mafics have been biotitized and biotite has flooded the matrix of the rock and partially altered the plagioclase laths.

Earliest veins, 0.1-0.2 mm wide, 1 vein/1-2 cm, contain quartz with a little chlorite and sulfide. A crosscutting vein 1-2 mm wide contains pyrite, chlorite, orthoclase, epidote, and kaolinite, 1 vein/5 cm. Orthoclase also forms an envelope 1 mm wide on this vein.

Mine or Property - Buckskin Wash, Douglas County, Nevada

Sample No. - BSW 7 - 1234' Section Type - TS Date & Done by - 1/73 MJS

Rock Name - Biotitized diorite
porphyry Field Name -

Megascopic Description -

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
sericite	5-7	0.01-0.1 mm, mostly in vein envelopes and veins
kaolinite	5	0.001-0.01 mm
chlorite	7	0.01-0.1 mm; in veinlets and in clots in rock
biotite	20	0.01-0.1 mm; all secondary
quartz	10	0.05-0.2 mm; in veinlets and in rock matrix
plagioclase	40	0.1-3.0 mm; phenocrysts 40% altered
calcite	7	0.1-0.6 mm; occurs chiefly in the latest veins
rutile	1	0.01-0.1 mm
magnetite	0.5	0.01-0.2 mm
pyrite	3	0.05-0.2 mm

Remarks - Rock is very similar to sample described at 7 - 956', except the proportion of large (0.5-3.0 mm) plagioclase phenocrysts is less, plagioclase phenocrysts, 0.5-3.0 mm, 40% of rock, and the matrix is composed of very fine-grained laths of plagioclase. Both phenocrysts and matrix plagioclase laths have fairly well-developed flow lineation.

Primary mafics, mainly hornblende(?), probably accounted for 10% of rock. All mafics have been biotitized, and fine-grained secondary biotite is disseminated throughout the matrix. Plagioclase phenocrysts are 40% altered to biotite, kaolinite, and sericite.

Earliest veins are 0.1-mm-wide quartz veins, 1 vein/2 cm. The next vein set, 0.1 mm wide, contains sulfides and sericite and/or biotite, 1 vein/1-2 cm. The next vein set, 2-4 mm wide, contains sericite, quartz, carbonate, and sulfides, 1 vein/2-3 cm. The last veins, 0.2-0.5 mm wide, contain sulfides, carbonate, quartz, and chlorite.

Mine or Property - Buckskin Wash, Douglas County, Nevada

Sample No. - BSW 7 - 1352' Section Type - TS Date & Done by - 1/73 MJS

Rock Name - Hornblende-biotite
monzonite porphyry

Field Name -

Megascopic Description -

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
sericite	20-25	0.01-0.5 mm
kaolinite	5-7	0.001-0.01 mm
montmoril-lonite	10	0.001-0.01 mm
quartz	25	0.05 -0.3 mm
orthoclase	20	0.05-0.3 mm; in matrix
plagioclase	2	0.1-0.2 mm
calcite	10	0.1-0.3 mm; disseminated
rutile	0.5	0.01-0.05 mm
pyrite	1	0.01-0.5 mm; mostly in veinlets

Remarks - Same rock as BSW 7 - 842'. Rock contains plagioclase phenocrysts 0.3-5.0 mm, 35%; hornblendes 0.2-1.0 mm, 5%; and biotites 0.2-1.0 mm, 3-5%, all in a fine-grained orthoclase-quartz aplitic matrix. The original rock minerals are almost totally replaced by alteration products, although the primary rock texture is well preserved. Plagioclase phenocrysts are 90% replaced by montmorillonite, sericite, kaolinite, and calcite. Mafics are 100% replaced by sericite, calcite, quartz, and clays.

Matrix feldspar is weakly replaced by calcite, clays, and sericite.

Veins 0.01-0.5 mm wide contain pyrite and sericite. The largest vein has a 2-mm-wide quartz-sericite envelope. Vein frequency is 1 vein/cm.

Mine or Property - Buckskin Wash, Douglas County, Nevada

Sample No. - BSW 7 - 1438'

Section Type - TS

Date & Done by - 1/73 MJS

Rock Name - Biotitized diorite

Field Name -

Megascopic Description -

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
sericite	10	0.01-0.2 mm
chlorite	7	0.05-0.2 mm
biotite	10	0.05-0.4 mm; very pale brown; phlogopitic or bleached(?); all secondary
quartz	10-15	0.1-0.3 mm
plagioclase	55-60	0.2-2.0 mm
carbonate	5	0.05-0.3 mm
gypsum	2	0.05-1.0 mm; in veins; probably after anhydrite
anhydrite	tr.	0.1 mm; remnant left in gypsum
rutile	0.5	0.01-0.05 mm
pyrite	4	0.01-1.0 mm; disseminated and in veinlet

Remarks - Rock is composed of stubby laths of albite and Carlsbad-twinned plagioclase, originally 70% of rock, with interstitial, anhedral plagioclase and quartz. What primary mafics, if any, existed is difficult to determine.

One 1.0-mm-wide veinlet which contains gypsum, pyrite, quartz, and carbonate occurs; it has one 1- to 2-mm-wide sericite-quartz envelope. Several earlier 0.1-mm-wide veins occur; one contains quartz-gypsum-pyrite, another contains sericite-carbonate-pyrite. This rock is fairly similar to 7-956' and 7-1234'.

Mine or Property - Buckskin Wash, Douglas County, Nevada

Sample No. - BSW 7 - 1554' Section Type - TS Date & Done by - 1/73 MJS

Rock Name - Biotitized diorite

Field Name -

Megascopic Description -

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
chlorite	5-7	0.05-0.3 mm
biotite	15-20	0.01-0.2 mm; medium brown; all secondary
quartz	10	0.1-0.3 mm; interstitial to plagioclase laths and in veinlets
plagioclase	60	0.2-2.0 mm
gypsum	1	0.05-0.2 mm; in veins and disseminated
anhydrite	3	0.1-0.3 mm; in veins and disseminated
rutile	0.2	0.01-0.1 mm
chalcopyrite	tr.	
pyrite	3	0.05-0.5 mm; in vein and disseminated

Remarks - Rock is composed of crudely flow-lineated, stubby plagioclase laths, originally 75-80% of rock, with interstitial anhedral quartz and feldspar. Primary mafics may have constituted 5-7% of rock. The mafics have been totally altered to biotite and chlorite. Secondary biotite has flooded the matrix or interstitial spaces between plagioclase laths. Some biotite also occurs in plagioclase laths. Veinlets are discontinuous. They are 0.05-0.2 mm wide and contain pyrite, quartz, anhydrite-gypsum, chlorite, and biotite. They have weakly developed biotite envelopes.

Mine or Property - Buckskin Wash, Douglas County, Nevada

Sample No. - BSW 7 - 1700'

Section Type - TS

Date & Done by - 1/73 MJS

Rock Name - Sericite-chlorite
altered breccia

Field Name -

Megascopic Description -

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
sericite	30	0.01-0.2 mm
chlorite	10-15	0.1-0.5 mm
biotite	3	0.01-0.1 mm; medium brown, secondary
quartz	20	0.1-0.3 mm; mostly in veins
orthoclase	3	0.1-0.5 mm; erratically scattered clots
plagioclase	30	0.2-0.6 mm; anhedral-subhedral; some albite twinning
apatite	1	0.1-0.4 mm; mostly in veinlets
rutile	1	0.01-0.1 mm
pyrite	2	0.05-0.2 mm

Remarks - Rock is brecciated. Fragments probably have not moved much, if at all. Quartz-sericite occurs in interfragmental veins. Texture of the original rock is completely obliterated by alteration.

Mine or Property - Buckskin Wash, Douglas County, Nevada

Sample No. - BSW 7 - 1714' Section Type - TS Date & Done by - 1/73 MJS

Rock Name - Hornblende-biotite
monzonite porphyry

Field Name -

Megascopic Description -

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
sericite	5-7	0.01-0.1 mm
kaolinite	7	0.001-0.1 mm
montmoril-lonite	3	0.001-0.1 mm
chlorite	2	0.1-0.2 mm
biotite	3	0.1-2.0 mm; primary
quartz	30	0.05-0.2 mm
orthoclase	15-20	0.1-0.2 mm
plagioclase	20	0.3-5.0 mm; oligoclase, albite and Carlsbad twinned; strongly zoned
calcite	2	0.1-0.5 mm
hornblende	3	0.1-1.0 mm; strong green color
pyrite	1	0.001-0.1 mm; in veinlet and disseminated
magnetite	1	0.01-0.2 mm; disseminated in fresh part of rock

Remarks - Same rock as at 7-1352' and 7-842'. Thin section contains a zone where several 0.1- to 0.6-mm-wide sulfide-carbonate-sericite veinlets occur. Each of these veinlets has 3- to 10-mm-wide sericite-clay envelopes which coalesce so that one-half of the thin section is strongly altered. The plagioclase phenocrysts are 95% altered to sericite-clay and carbonate. Mafics are totally altered to sericite. The matrix orthoclase is replaced by sericite within 5 mm of vein edge, beyond which it is largely unaltered.

On the edge of the sericite envelope, the biotites are chloritized over a distance of 5 mm. Otherwise the edge of the envelope is quite sharp. Plagioclase phenocrysts change from 90% altered to less than 10% altered over a distance of 1-3 mm. Beyond the sericite envelope plagioclase phenocrysts are ~10% altered to sericite-clays, primary biotites are fresh, and primary hornblendes are 5-25% altered to chlorite. Magnetite is disseminated in the fresh part of the rock. Pyrite is disseminated in the altered part.

Summary of Alteration in BSW - DH 8

Rocks in DH 8 are intensely altered to sericite-quartz-pyrite with some chlorite. Virtually no original feldspar remains. No orthoclase occurs as evidenced by lack of staining (HF, sodium cobaltinitrite). Pyrite content varies from 3-15 vol.%; it occurs in veinlets and as disseminations.

Veining is intense. Very narrow veinlets, 0.05-0.1 mm wide, often occur with a frequency of 1 vein/2 mm. Wider veins, 1-10 mm, are less common, i.e., 1 vein/10-30 mm. The wider veins tend to have massive quartz-sericite envelopes in which the texture of the original rock is wiped out.

(35) Item 15

Mine or Property - Buckskin Wash, Douglas County, Nevada

Sample No. - BSW 8 - 4521 Section Type - TS Date & Done by - 1/73 MJS

Rock Name - Sericite-quartz
altered breccia

Field Name -

Megascopic Description -

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
sericite	60	0.001-0.1 mm
quartz	35	0.05-0.5 mm
carbonate	5	0.05-0.5 mm; disseminated throughout rock
zeolite??	0.5	0.05-0.2 mm; very fuzzy mineral; parallel extinction; first-order gray birefringence, high relief
rutile	1-2	0.01-0.1 mm; occurs in diffuse aggregates, possibly where mafics were; also in skeleton crystal aggregates which outline cleavages of hornblende(?) phenocrysts
pyrite	4	0.03-0.2 mm; disseminated and in veinlets

Remarks - Rock is so thoroughly altered that the original texture is obscure. However, hazy outlines of breccia fragments can be discerned. The fragments range from 0.1-10.0 mm in size. They are angular. Pyrite is generally disseminated in the finer matrix material.

The rock may be a lapilli tuff or it could be an intrusive breccia related to a breccia pipe.

Mine or Property - Buckskin Wash, Douglas County, Nevada

Sample No. - BSW 8 - 506' Section Type - TS Date & Done by - 1/73 MJS

Rock Name - Sericite altered breccia Field Name -

Megascopic Description -

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
sericite	50	0.001-0.01 mm
chlorite	25	0.01-0.1 mm; colorless, very low birefringence
quartz	10	0.01-0.2 mm; largely in veinlets
carbonate	4	0.05-0.5 mm
leucoxene	3	0.05-0.2 mm; fuzzy semiopaque mineral; whitish reflectance
pyrite	2	0.01-0.2 mm; mostly in narrow (0.1-0.5 mm) sericite-quartz veinlets

Remarks - Rock is composed of what appears to be porphyritic lithic fragments 0.5-10.0 mm in size. The matrix is either igneous or tuffaceous; it contains outline of feldspars which are either phenocrysts or crystal clasts. Alteration has obscured the rock's texture.

Very narrow 0.1- to 0.5-mm sericite-quartz-pyrite veinlets occur with a frequency of 1 vein/2 mm.

Mine or Property - Buckskin Wash, Douglas County, Nevada

Sample No. - BSW 8 - 562' Section Type - TS Date & Done by - 1/73 MJS

Rock Name - Sericite-quartz-
pyrite rock

Field Name -

Megascopic Description -

Microscopic Description (texture, grain size, etc.) -

Minerals	vol. %	Description
sericite	70	0.001-0.01 mm
quartz	20	0.01-0.2 mm
apatite?	0.2	0.05-0.2 mm; anhedral; secondary
carbonate	1	0.05-0.2 mm
rutile	0.5	0.01-0.1 mm
leucoxene	2	0.05-0.3 mm
pyrite	5	0.01-0.3 mm; disseminated and in veinlets

Remarks - Texture of this rock is very obscure. Original rock may have been a breccia of a fine-grained porphyry.

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*Nev-Lorraine
Geochron*

Sample No.	COPPER	ZINC	LEAD	MOLYBDENUM
BU-00-1E	625	180	40	6
BU-00-00	210	700	35	3
BU-00-1W	725	400	45	27
BU-00-2W	450	575	95	16
BU-00-3W	280	725	425	7
BU-00-4W	290	700	185	12
BU-00-5W	350	875	270	7
BU-00-6W	125	330	140	4
BU-00-7W	155	270	140	3
BU-00-8W	160	155	190	3
BU-00-4N	30	200	85	3
BU-00-9W	120	110	50	6
BU-00-10W	60	95	50	4
BU-00-11W	40	75	35	4
BU-00-12W	100	175	135	2

Sample No.	COPPER	ZINC	LEAD	MOLYBDENUM
BU-1N-00	625	330	25	11
BU-1N-1E	500	230	35	12
BU-1N-2E	575	320	75	22
BU-1N-1W	175	220	25	6
BU-1N-2W	375	350	110	12
BU-1N-3W	290	370	80	7
BU-1N-4W	525	1450	165	6
BU-1N-5W	700	1250	175	10
BU-1N-6W	300	320	95	8
BU-1N-7W	230	1000	220	5
BU-1N-8W	350	575	290	3
BU-1N-9W	80	95	70	3
BU-1N-10W	70	310	115	2
BU-1N-11W	110	170	290	7
BU-1N-12W	150	200	250	5

Sample No.	COPPER	ZINC	LEAD	MOLYBDENUM
BU-2N-00	2000	2000	525	8
BU-2N-1E	1700	875	90	6
BU-2N-2E	290	350	200	5
BU-2N-1W	250	475	105	4
BU-2N-2W	475	625	1350	9
BU-2N-3W	425	750	625	10
BU-2N-4W	220	675	140	3
BU-2N-5W	125	220	80	3
BU-2N-6W	160	625	350	6
BU-2N-7W	675	390	120	3
BU-2N-8W	220	145	135	6
BU-2N-9W	70	100	125	2
BU-2N-10W	50	75	300	2
BU-2N-11W	40	50	310	3
BU-2N-12W	50	100	70	2

Sample No.	COPPER	ZINC	LEAD	MOLYBDENUM
BU-3N-00	280	550	230	9
BU-3N-1E	155	220	40	3
BU-3N-2E	125	90	35	5
BU-3N-3E	20	15	5	1
BU-3N-1W	190	210	70	4
BU-3N-2W	110	30	65	10
BU-3N-3W	125	60	35	4
BU-3N-4W	65	60	50	3
BU-3N-5W	65	95	45	3
BU-3N-6W	70	170	70	2

Soil Sample Results (PPM)

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Sample No.	COPPER	ZINC	LEAD	MOLYBDENUM
BU-4N-1E	50	165	100	3
BU-4N-2E	75	145	40	2
BU-4N-3E	100	125	25	2
BU-4N-4E	160	320	70	3
BU-4N-1W	45	180	40	2
BU-4N-2W	140	80	45	6
BU-4N-3W	250	145	35	1
BU-4N-6W	60	60	25	3

Sample No.	COPPER	ZINC	LEAD	MOLYBDENUM
BU-1S-00	475	675	15	12
BU-1S-1E	725	650	25	10
BU-1S-2E	150	230	80	5
BU-1S-3E	230	350	125	5
BU-1S-1W	950	650	55	7
BU-1S-2W	160	230	165	4
BU-1S-3W	475	450	400	3
BU-1S-4W	210	950	165	7
BU-1S-5W	300	1400	280	10
BU-1S-6W	270	2500	800	9
BU-1S-7W	180	450	160	7
BU-1S-8W	290	65	50	2
BU-1S-9W	40	55	15	2
BU-1S-10W	20	60	10	2
BU-1S-11W	30	80	15	1
BU-1S-12W	40	60	35	6

SURFACE SAMPLES - ASSAYS

82

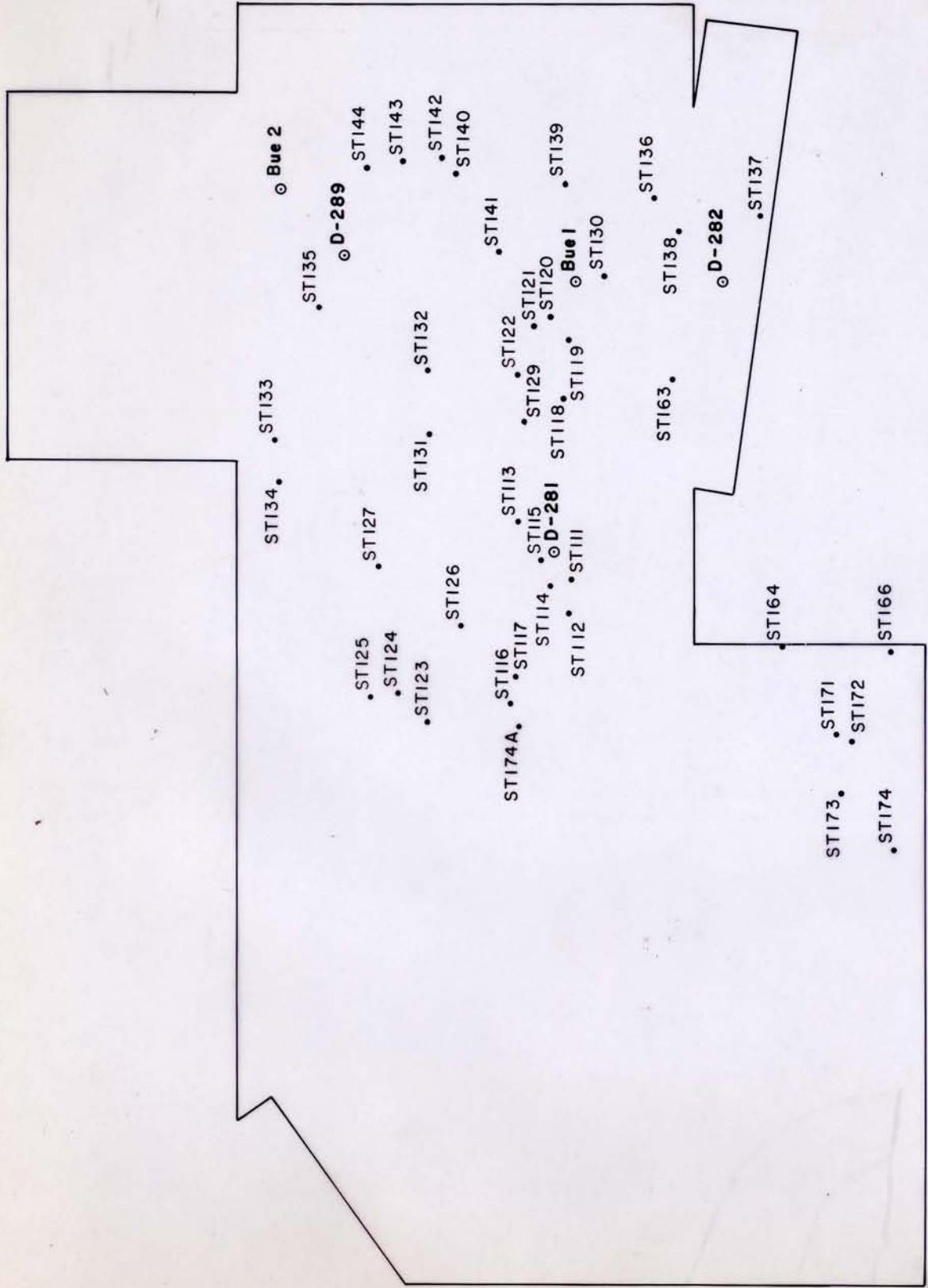
SAMPLE NO.	COPPER %		Ag (oz)	Ag (oz)	MoS ₂ %	Pb %	Zn %	
B-1489	0.14		Tr	Tr	Tr	0.60	0.05	
B-1490	0.33		Tr	0.15	Tr	0.57	0.05	
B-1491	8.87		0.56	0.88	Tr	0.30	0.15	
B-1492	0.084		Tr	Tr	Tr	0.54	Tr	
B-1493	0.11		Tr	Tr	Tr	0.31	Tr	
B-1494	0.066		Tr	Tr	Tr	0.36	0.01	
B-1495	0.075		Tr	Tr	Tr	0.54	Tr	

~~WUDG-SWAN~~
GRANIGEN RESULTS - SURFACE SAMPLES

PPM

SAMPLE ID	W	Zn	Pb	Mg
SEC 12 1RBL	130	475	250	2
2RBL	15	220	250	1
3RBL	240	120	90	32
4RBL	190	300	155	17
5RBL	1500	45	220	10
6RBL	20	45	185	4
7RBL	80	25	145	3
8RBL	150	35	80	3
9RBL	10	75	50	1
10RBL	140	90	70	2
13RBL	230	230	5	5
14RBL	160	155	35	-1
15RBL	115	115	120	1
16RBL	825	390	5	5
17RBL	125	60	50	6
18RBL	195	170	260	2
1RLB	20	15	85	6
2RLB	70	200	270	-1
3RLB	250	330	200	8
4RLB	625	200	95	7
5RLB	90	450	25	-1

SEC 13 4RBL 240 130 65 3



SAMPLE & DRILLING LOCATIONS

SMITH-HARCOURT LEASE AREA
BUCKSKIN MINING DISTRICT
DOUGLAS COUNTY, NEVADA

SCALE : 1" = 1000'

by THE ANACONDA COMPANY
 November, 1975

35
Item 15

(35) Item 15

GEOCHEMISTRY OF SULFIDE CONCENTRATE SAMPLES
FROM DRILL HOLES BUE-1, BUE-2, BSW-7, AND
BSW-9 - CONOCO BUCKSKIN PROJECT,
DOUGLAS COUNTY, NEVADA

By: Robert W. Bamford
April, 1978

file

(35)
Item 15

GEOCHEMISTRY OF SULFIDE CONCENTRATE SAMPLES
FROM DRILL HOLES BUE-1, BUE-2, BSW-7, and BSW-9
CONOCO BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADA

by

Robert W. Bamford

Salt Lake City, Utah
April, 1978

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B Mineralogy of +3.3 sp. gr. heavy liquid fraction less
magnetic fraction

PRINCIPAL CONCLUSIONS AND RECOMMENDATIONS

1. The concept that the Buckskin sulfide system has been tilted to the west and now plunges about 30° to the east is consistant with new data presented in this report and still constitutes a best best-fit interpretation for establishing further target priorities.
2. Data for DDHs BUE-1 and BUE-2 tenuously suggest these holes are situated closer to deeper parts of a porphyry(?) system (possible a deep root zone) than other Buckskin holes studied. Combined with surface data, they also suggest that the eastern part of the prospect area around BUE-1 and BUE-2 may have been uplifted relative to western part as a result of postmineral faulting.
3. Data for DDHs BSW-7 and BSW-9 coupled with that for BC-2 not only provide support for the preferred interpretation (#1 above), but also suggest improved but less consistent alternative interpretations. These alternative interpretations should be carefully evaluated in the context of all currently available information on the prospect as soon as possible.
4. Target priorities remain as previously described in the BC-2/BC-3 report pending comparison and integration of the geochemical results with the work of the project geologist.
5. Deepening of BC-3 by about 1500 feet is tentatively recommended as a next step in the evaluation work.

INTRODUCTION

Results of geochemical studies of drill core samples from drill holes BUE-1, BUE-2, BSW-7, and BSW-9, CONOCO Buckskin Project, are reported below. This work is part of a geochemical evaluation program requested by ~~CONOCO~~ as follow up to an initial surface geochemical survey (Bamford, 1977A) and the evaluation of drill holes BC-2 and BC-3 (Bamford 1977B). Its general purpose is the independent prediction of locations of centers of higher grade mineralization within the Buckskin sulfide system. The approach involves determination of multi-element geochemical zoning and gradients using an enhancement technique for generation of the geochemical data (see below). Limited heavy mineral zoning data are also obtained. Interpretation of both data types is accomplished by comparison with generalized geochemical models based on similarly derived data for known porphyry copper and porphyry molybdenum deposits and their surroundings. Independence of the approach is reasonably assured since the ultimate data base for the models is probably unique both in character and comprehensiveness. As previously agreed upon, no specific information on either the models or the data base is to be discussed.

Enhancement of geochemical signatures is accomplished by separation and analysis of a non-magnetic heavy liquid (HL) fraction (+3.3 sp. gr.) from composite drill core sample pulps. This sample fraction (referred to as a sulfide concentrate) is a mixture of both vein and disseminated sulfides and oxides (usually >90% sulfides) which are largely of hydrothermal origin. Removal of rock and alteration silicate materials relatively impoverished in hydrothermally derived trace elements results in a large (3 to more than 10 fold) systematic enhancement of trace element signatures relative to whole rock data without corresponding increase in geochemical noise. Other

advantages of this approach relative to conventional whole rock and soil geochemistry include: 1) detection of useful trace element patterns at up to twice the effective distance from ore, 2) significantly improved definition of chemical zoning and gradients relative to ore, and 3) the frequent addition of Bi, Te, As, In, Sn, W, Co, and Ni to the spectrum of trace elements which can usefully be incorporated into geochemical exploration schemes. Comparable enhanced data is obtained in surface geochemical surveys through use of modified chip-composite sampling techniques and analogous sample preparation procedures.

In the work reported here a total of 47 sulfide concentrates were separated from CONOCO drill core composite samples using heavy liquid media (+3.0 sp. gr. for the first sample in each hole and +3.3 sp. gr. thereafter). Magnetite and other magnetic materials were removed from the sulfide concentrates prior to analysis by means of a laboratory hand magnet. Approximate mineralogic composition of the sulfide concentrate samples (Appendix B) were determined by binocular microscope examinations.

The sulfide concentrate samples were analyzed for Cu, Mo, Pb, Zn, Ag, Mn, Co, Ni, and Fe by atomic absorption spectrophotometry (AAS) and for As by a colorimetric method. This analytical work and all sample preparation were carried out by Rocky Mountain Geochemical Corporation, Salt Lake City, following specified procedures. Where AAS analyses were performed on samples of less than 100 mg and trace element contents were low, higher detection limits were obtained (see data Appendix A). Additional analyses for Bi, Te, In, Tl, Sn, and W were performed by COORS Spectro-Chemical Laboratory, Golden, Colorado, using optical emission spectrographic (OES) techniques.

Comparison of duplicate OES analyses from Kennecott Exploration

Services (KES) and COORS indicated that data from the two laboratories correlated adequately for Bi, Te, and In, but differed systematically in magnitude for Sn and W (Bamford, 1977B). KES values for Sn and W were consistently higher than COORS and should be divided by 3 and 2, respectively, before comparisions of magnitude are made. The KES laboratory carried out OES analyses for the Buckskin surface geochemical survey.

All geochemical and heavy mineral data in this report have been plotted in bar graph form using computer graphics methods to obtain simplicity and clarity in presentation. Interpretation is based primarily on generally observed consistencies of such data from other deposits, as described earlier, and is made in the context of all data currently available on mineralization in the Buckskin Project area. Results of CONOCO ~~geologic~~ and alteration studies reported since May 1977 were not available, however, and still must be integrated with the geochemical results to determine if and to what extent these provide converging lines of evidence for particular target concepts.

RESULTS

In the following text terms such as low, moderate or high used to express general magnitudes of element or mineral concentrations indicate relative magnetude within the Buckskin sulfide system only unless otherwise indicated.

BSW-7

Important characteristics of BSW-7 opaque mineralogy and sulfide concentrate geochemistry are: a) a systematic decrease in whole-rock total sulfide contents and a possible increase in total magnetite with depth (figure 1/BSW-7); b) the lack of a definite trend in Cu geochemistry, a downward positive Mo gradient, and relatively low total Pb and Zn contents with no definitive trends, (figure 2/BSW-7); e) relatively high arsenic and cobalt contents which possibly exhibit maximas in down hole trends and low overall manganese contents (Figure 3/BSW-7); and d) probable increases in Bi and Te with depth, and low W contents (Figure 4/BSW-7). Collectively, these features suggest BSW-7 is located within mineralization with many characteristics of a porphyry deposit copper zone, but that this is probably not a main porphyry deposit copper zone per se. Like BC-2 (Bamford, 1977B, p. 6), it is probable that BSW-7 has penetrated rocks originally situated several thousand feet above a porphyry copper deposit (capping mineralization) which are now part of a westward tilted system. It remains possible, but less likely, that BSW-7 has penetrated some other type of mineralization, e.g., the data can be alternately interpreted as indicating that BSW-7 has penetrated a low-dipping zoned vein-type copper deposit. The main evidence against this is the very broad and pervasive nature of the sulfide system at Buckskin.

DDH BSW-9

BSW-9 opaque mineralogy and sulfide concentrate geochemistry are similar to those of BSW-7 in many essential characteristics. Differences, which include higher overall Pb, Zn, As, Mn, and Bi and more complicated trends in BSW-9, suggest that BSW-9 penetrates an inner peripheral zone of the mineralization while BSW-7 for the most part penetrates a central zone. If the capping mineralization is hypothesized to consist of a 30° eastward inclined cylindrical core zone surrounded by coaxial cylindrical halo zones, BSW-9 could be considered to have just grazed the outside of the core zone while BSW-7 extends from somewhere above the axis of the core zone downward (originally an outward direction) to a location possible near or within an inner halo zone.

An alternative interpretation, similar to one made for BSW-7, is that BSW-9 has penetrated a small zoned low-dipping tabular vein-type copper deposit, which may or may not be related to conventional porphyry type mineralization. Although this is considered to be less likely than the concept of a westward tilted porphyry system, it is recommended that both BSW-9 and BSW-7 core be checked to see if vein-type mineralization of consistent orientation occurs in the higher grade zones of either or both drill hole. Other methods of evaluating this possibility should be considered as well.

BUE-1

BUE-1 is a relatively short drill which does not show definitive down hole data trends, therefore its important opaque mineralogy and sulfide concentrate geochemical characteristics are best expressed in terms of average values for the entire drill hole (Table 1). These include: relatively high Cu and Mo; moderate rather than low Sn and W; relatively low Pb, Zn, Mn, and

Te; moderate total sulfides and total magnetite; and high pyrite to chalcopyrite ratio as indicated by the Cu analytical data. They suggest that the hole may be situated reasonably close (within 1500 feet?) of a principal zone of higher grade base and/or precious metal mineralization, but do not independently provide information on the type of mineralization. Both vein type (similar to the Buckskin vein?) and porphyry type mineralization could give rise to these characteristics.

BUE-2

Important characteristics of BUE-2 opaque mineralogy and sulfide concentrate geochemistry include: moderate, as oppose to extreme, concentrations of most elements (in terms of averages for the entire drill hole--see Table 1); relatively high average concentrations of Sn and W; decrease in magnetite and possible increase in total sulfides with depth (figure 1/BUE-2); decreases in Pb, Zn, and possibly Mo with depth (figure 2/BUE-2); decreases in Mn and possibly Co and As with depth (figure 3/BUE-1); and increase in Bi and possible decrease in W with depth (figure 4/BUE-2). Because the hole is short, some or all of the trends described may be only apparent or related to small scale features of the mineralization such as individual veins. Interpretations of these result in terms of the sulfide system as a whole, therefore, must rely most heavily on the average results for the drill hole as with BUE-1. These suggest that BUE-2 may be within several thousand feet of a principal zone of higher grade base or precious metal mineralization and provide tenuous evidence that this location is (or originally was) closer to higher grade mineralization than most of the other holes analysed (see below).

DISCUSSION

Comparison of BSW-7, BSW-9, and BC-2 Concentrate Sample Geochemistry

Features of opaques mineral and concentrate geochemical data for BSW-7, BSW-9, and BC-2 most pertinent to overall interpretation are magnetudes and (especially) combined trends in total sulfides, total magnetite, Cu, Mo, Pb, Zn, Ag, As, Mn, Co, Bi, Te, Sn, and W. These, as described above and in previous text (Bamford, 1977B) strongly suggest that all three holes penetrate rocks with characteristics most similar to those found several thousand feet above a center of higher grade porphyry copper mineralization. The combination of high total sulfides, high pyrite-chalcopyrite ratios (determined from the Cu analytical data), alteration type and style, and low Sn and W contents make it unlikely that these holes have actually penetrated the higher grade mineralization itself.

Several data trends in BC-2 and BSW-7 can also be interpreted as indicating potential for a center of higher grade mineralization at depth beneath these holes. Important trends in this instance are those for Mo in BSW-7 and for Cu, Mo, and Pb over the lower 1000 feet of BC-2. In general, however, most other data trends for these holes either do not support this interpretation or are ambiguous (Bamford, 1977B, p. 6) Thus overall evidence for a deep target in the BC-2/BSW-7 area is still tenuous and of subordinate interest, but should not be totally ignored. If deepening of BC-2 is carried out to satisfy work requirements on Kennecott joint ventured lands, multi-element analyses of concentrates from the resultant core should be undertaken to further define data trends and thus improve interpretation.

Interpretation of Combined BSW-7, BWS-9, BC-1, BC-2, BC-3, BUE-1, BUE-2, and
Surface Concentrate Geochemistry

The preferred conceptual model for the Buckskin prospect from previous work, that of westward tilted 30° eastward inclined porphyry copper system with geochemically anomalous high-level cap rocks at the surface to the west and a higher grade mineralized center at depth to the east (Bamford, 1977B, p. 10), is consistent with new data presented in this report and constitutes a best best-fit interpretation for establishing further target priorities. Data for BUE-1 and BUE-2 permit possible refinement of the interpretation but do not make major modifications either necessary or desirable. Data for BSW-7 and BSW-9 support the preferred interpretation, but do not significantly enhance it or detract from it. They also suggest improved but less important alternate interpretations (see above).

Refinement of Target Concepts and Priorities

A refinement of the preferred Buckskin system model tentatively inferred from BUE-1 and BUE-2 data is that eastern rocks penetrated by these holes may be part of an upthrown structural block. The data tenuously suggest that both holes are (or originally were) situated closer to a principal zone of higher grade base and/or precious metal mineralization than most of the other holes studied (see above). If the concept of a single westward-tilted porphyry system at Buckskin is correct and if the limited data derived from BUE-1 and 2 are detecting system scale porphyry copper zoning rather than local zoning, the apparent close proximity of these holes to deeper parts of the system compared to holes like BC-3 would have to be a result of high angle postmineral faulting. Changes in surface geochemistry along a roughly north-northeast trend 2000 to 3000 feet west of BUE-1 and BUE-2 define the possible

location of one such fault (see Bamford, 1977A, figures and overlays). Relative movement would be up on the east. Should this interpretation be correct, it is still not clear that BUE-1 and 2 are detecting the highest grade part of a principal center of mineralization. It is equally possible that they are close to deep root zone mineralization and that the main target may lie to the west closer to or possibly under BC-3.

Target priorities remain as previously described in the BC-2/BC-3 report (Bamford 1977B, p. 12) pending comparison and integration of these results with the work of project geologist W.M. Oriel. It is tentatively suggested, however, that a particularly useful next step in the evaluation might be to deepen BC-3 by about 1500 feet before attempting selection of a deep drill target further to the east. If the preferred (tilted system) interpretation is correct, a significant increase in inner halo and ore zone indicator elements should be detected by such drilling and would provide cost-effective technical justification for additional deep drilling.

REFERENCES

Bamford, R. W., 1977A, Enhanced Surface geochemical survey, CONOCO Buckskin Project area: consulting report.

Bamford, R.W., 1977B, Geochemistry of sulfide concentrate samples from drill holes BC-2 and BC-3, CONOCO Buckskin Project, Douglas County, Nevada: consulting report.

FIGURE 1/BSW7

BSW-7

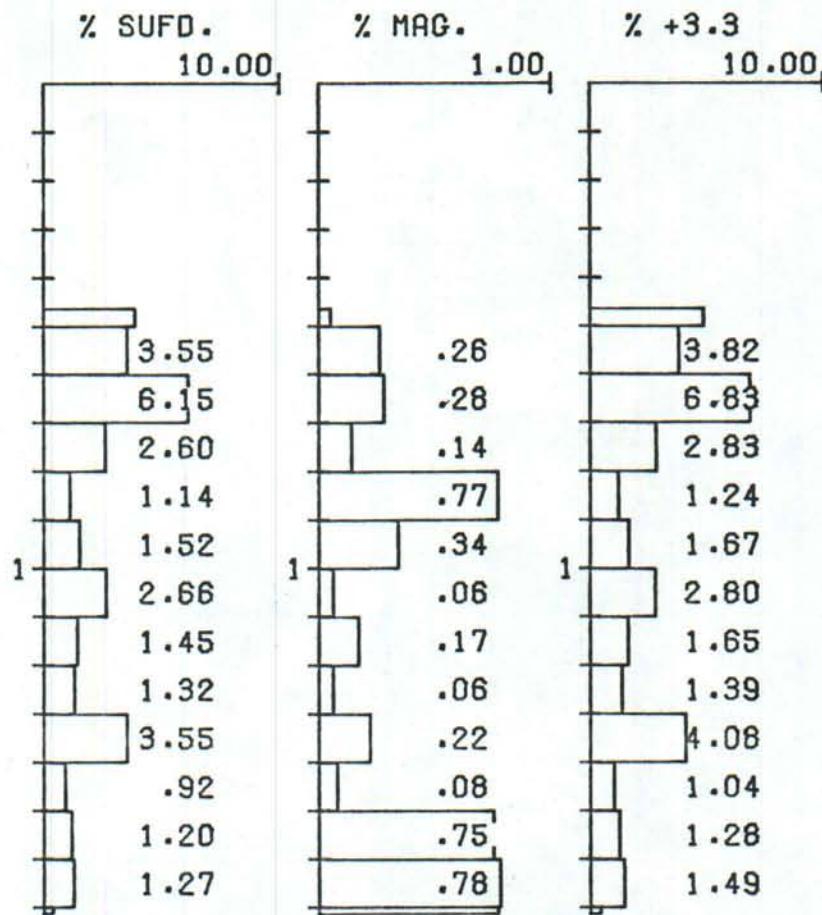
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE:
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

FIGURE 2/BSW7

BSW-7

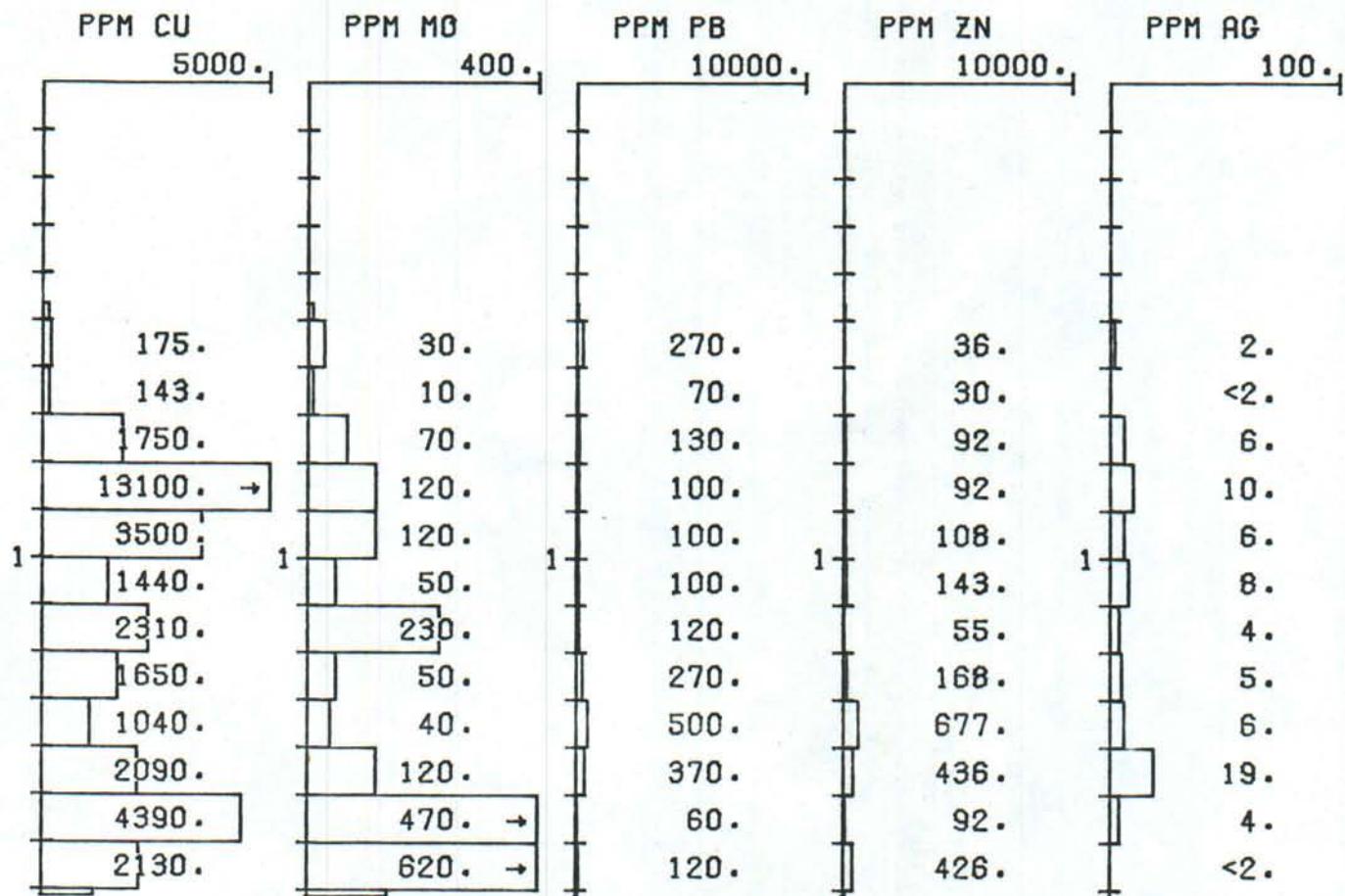
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 H.L. CONC.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

FIGURE 3/BSW7

BSW-7

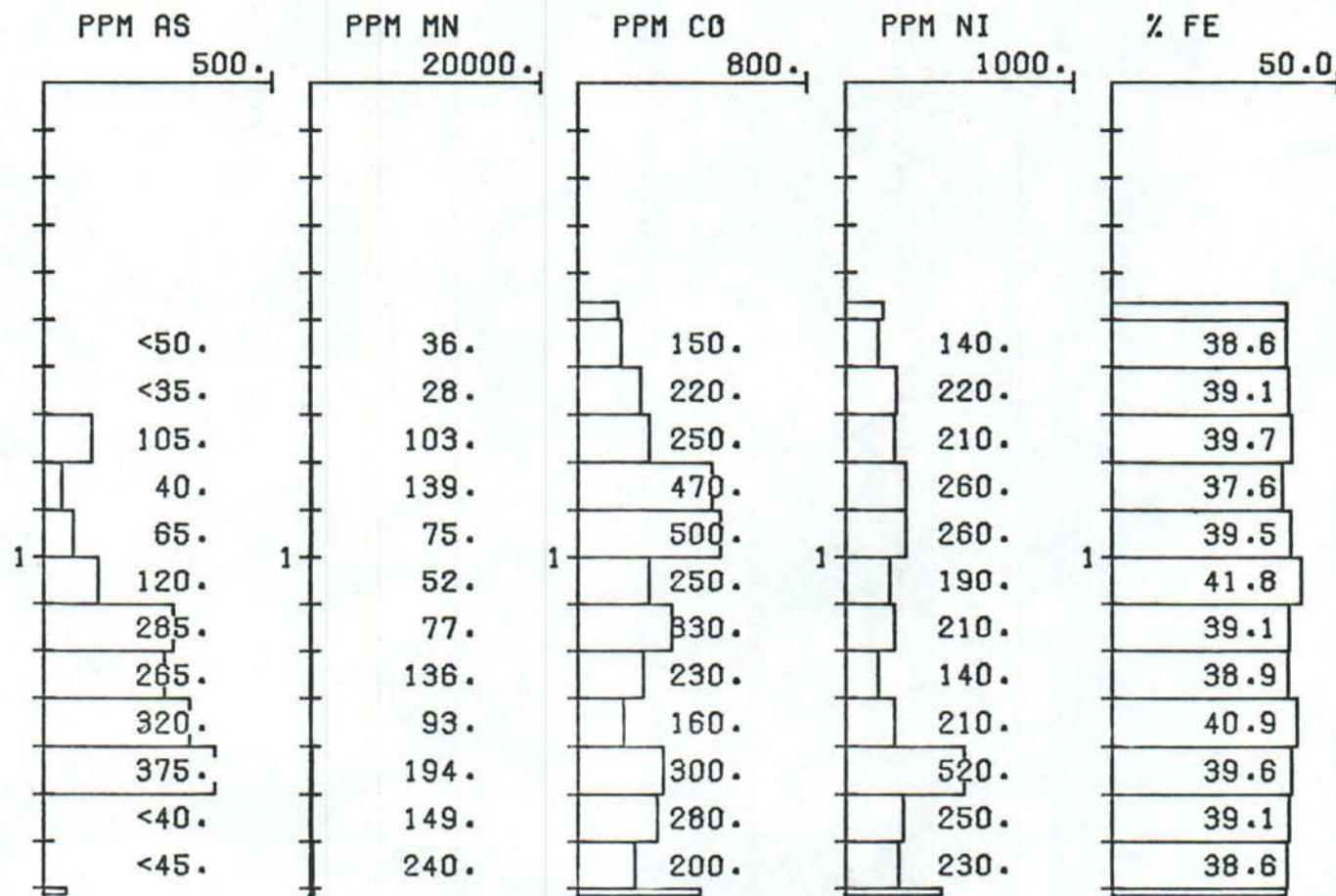
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 H.L. CONC.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

FIGURE 4/BSW7

BSW-7

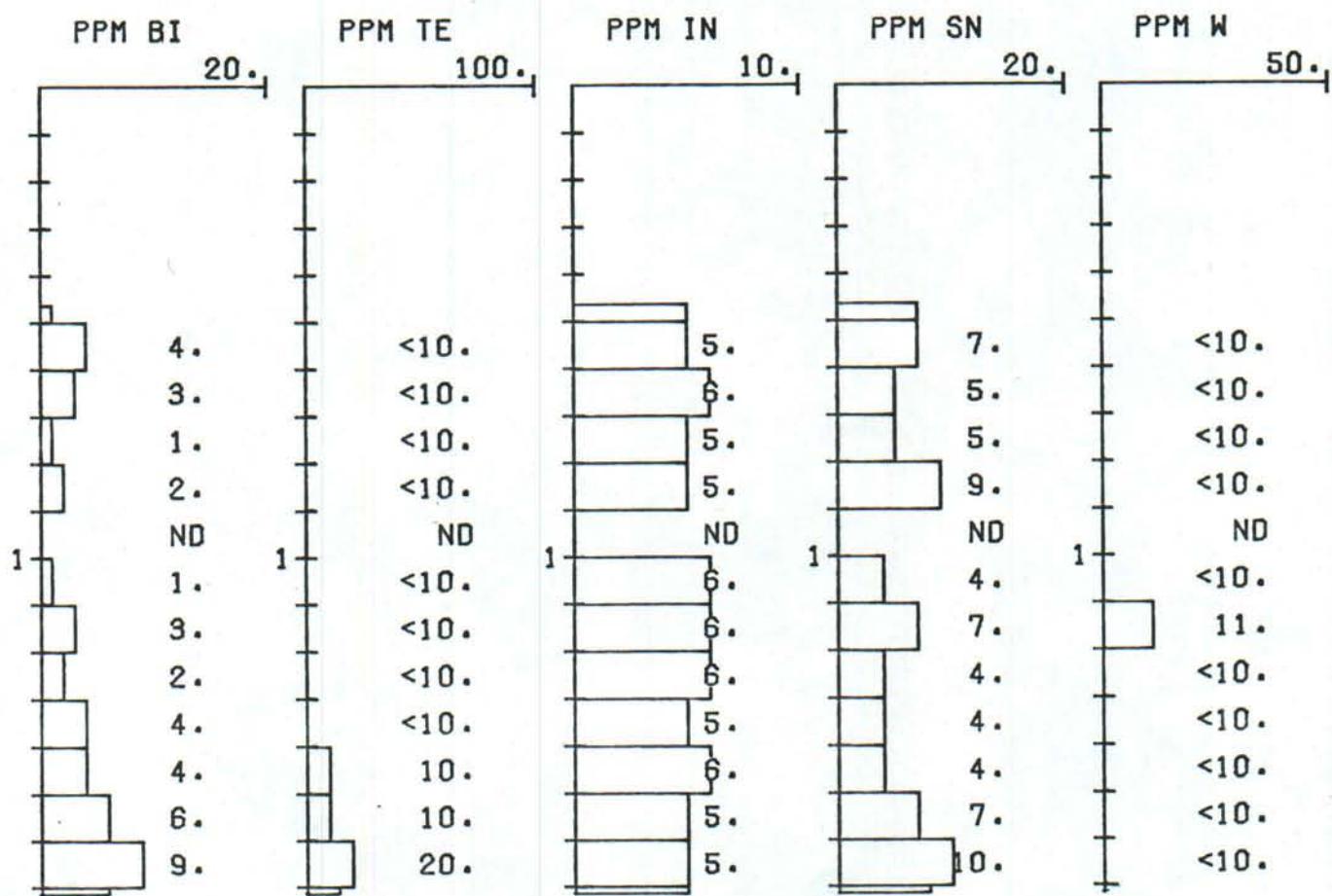
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 H.L. CONC.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

FIGURE 1/BSW9

BSW-9

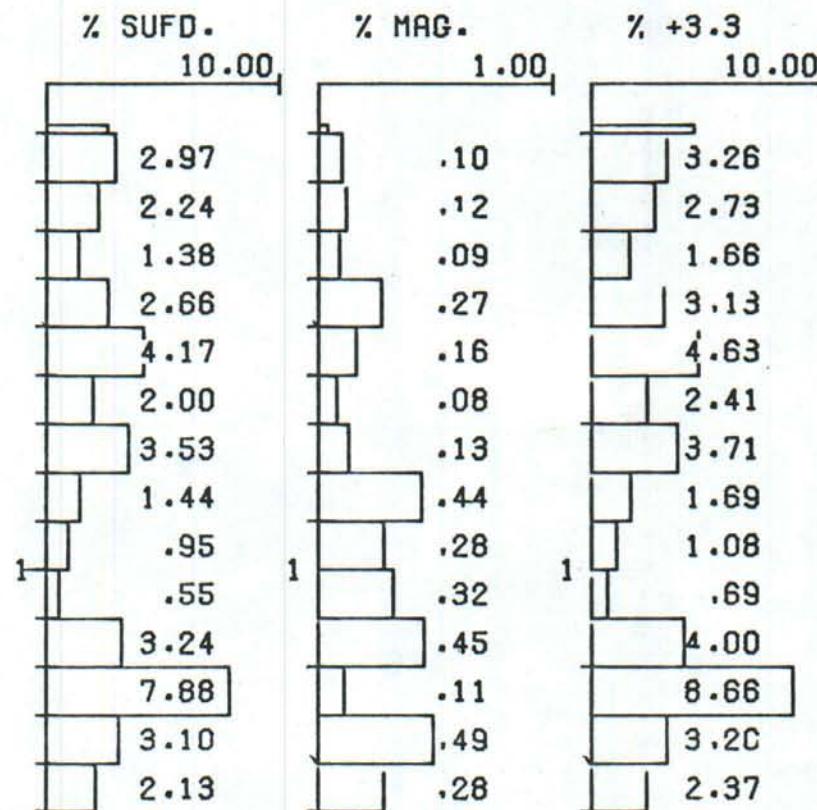
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE:
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

FIGURE 2/BSW9

BSW-9

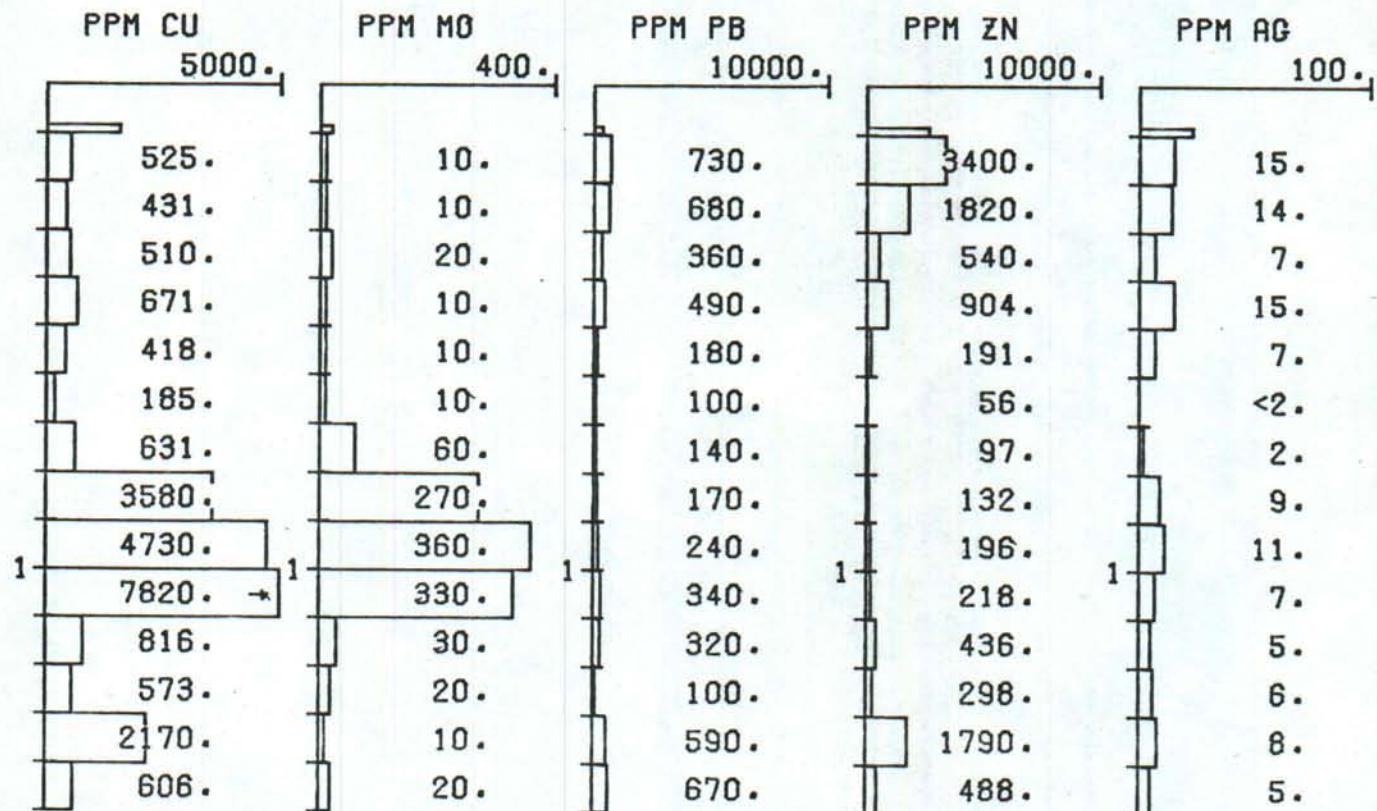
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 H.L. CONC.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

FIGURE 3/BSW9

BSW-9

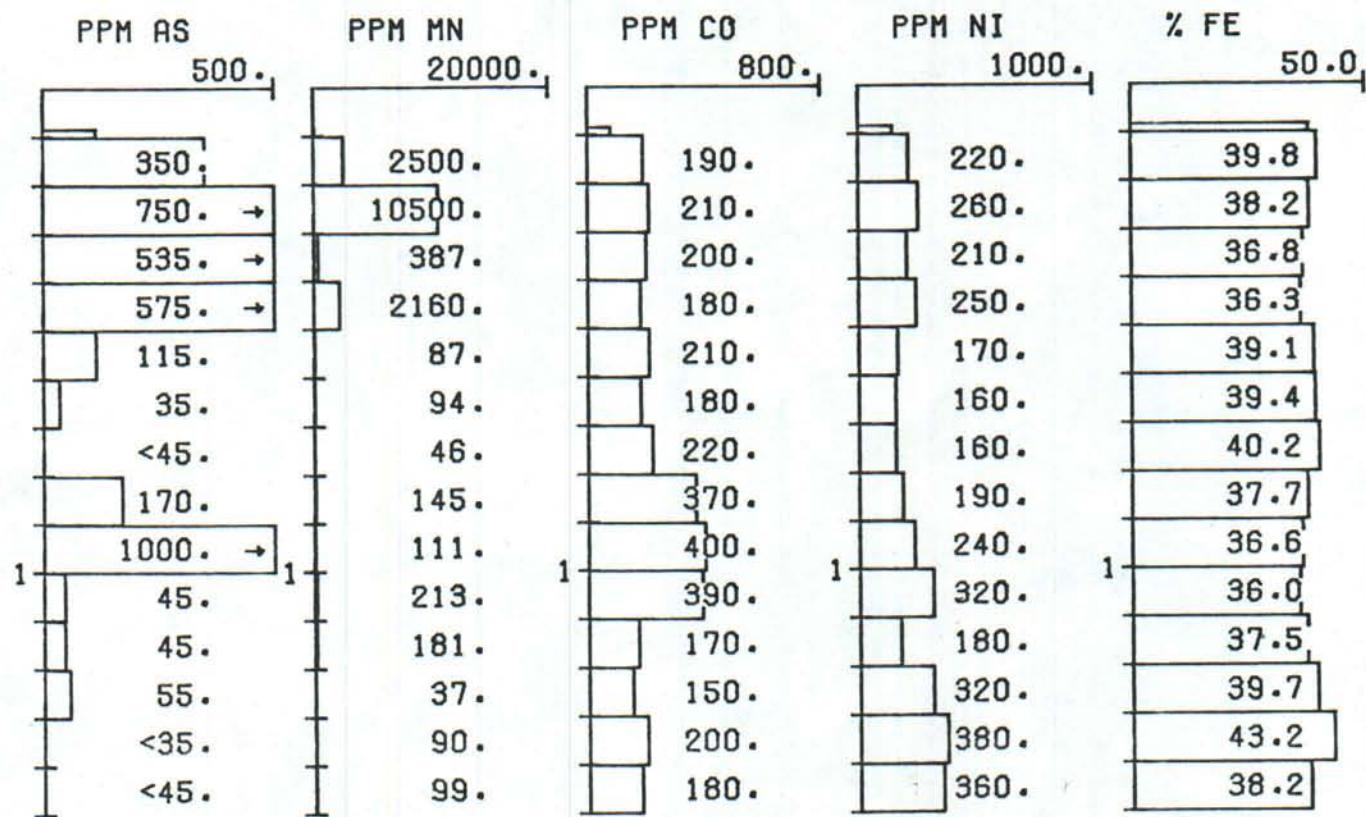
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 H.L. CONC.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

FIGURE 4/BSW9

BSW-9

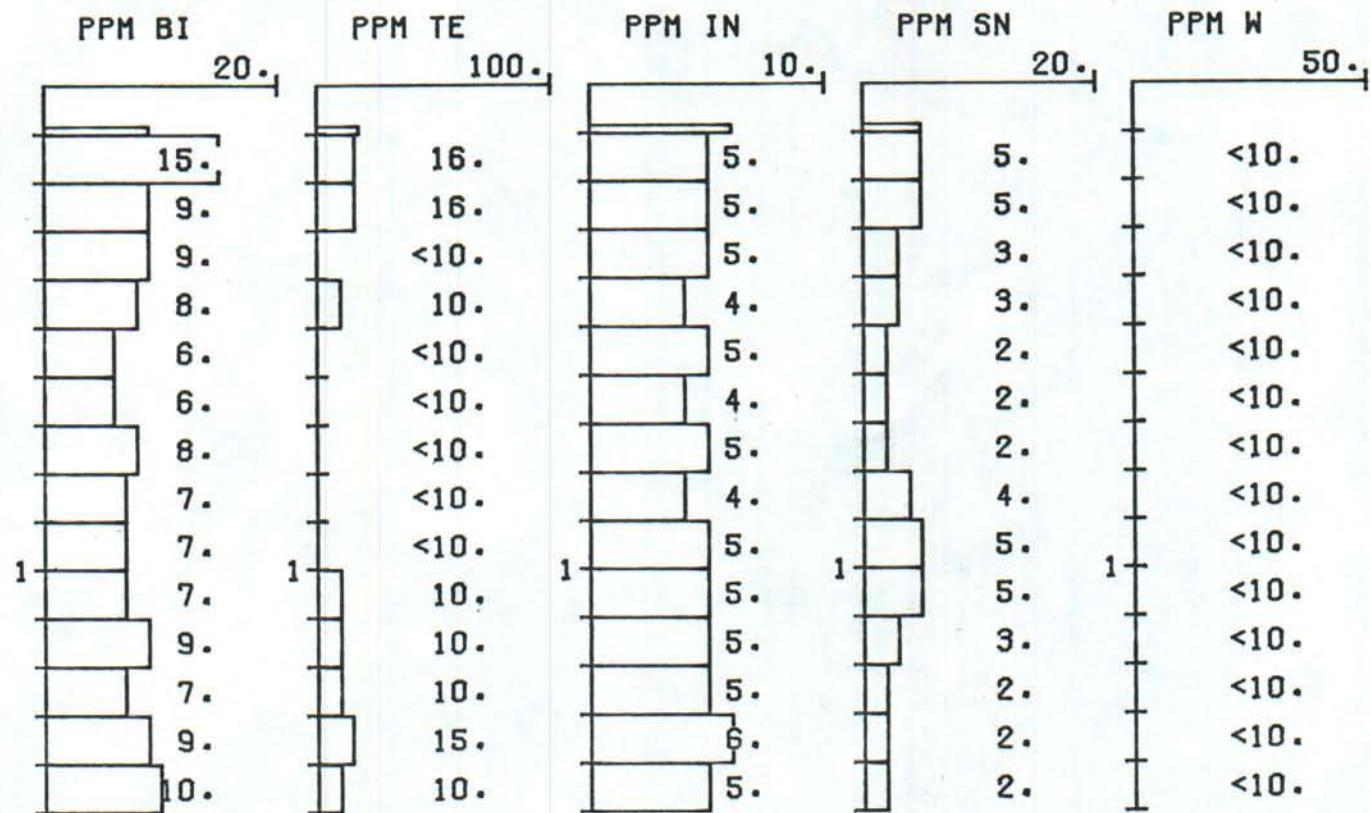
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 H.L. CONC.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

FIGURE 1/BUE1

BUE-1

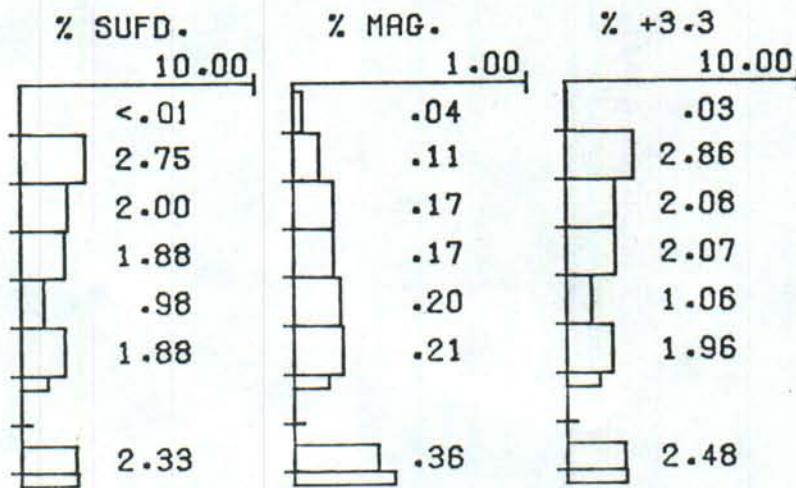
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE:
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

FIGURE 2/BUE1

BUE-1

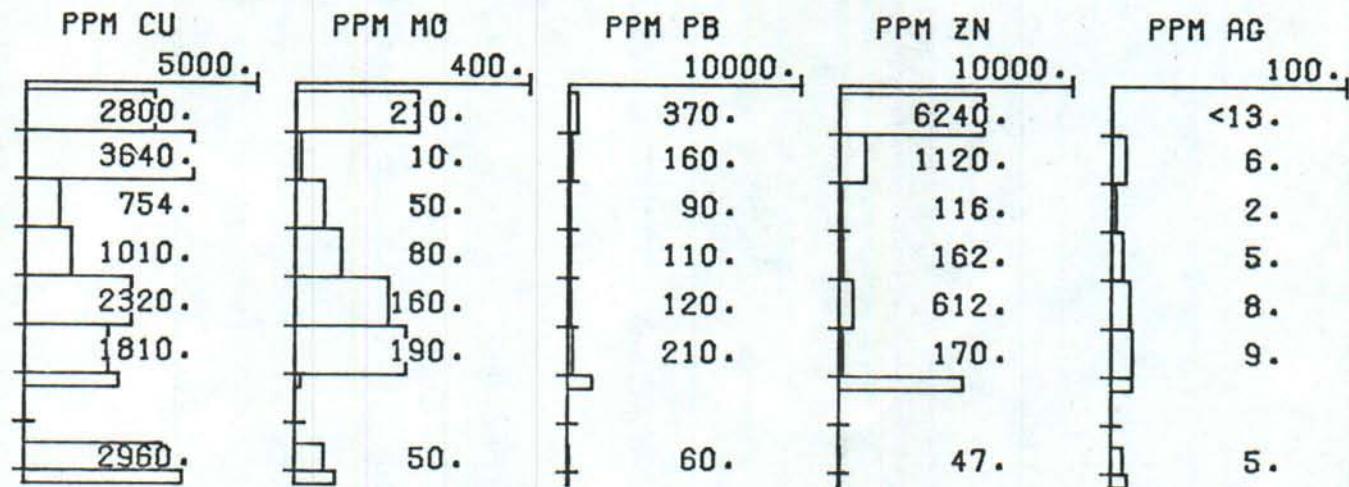
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 H. L. CONC.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

FIGURE 3/BUE1

BUE-1

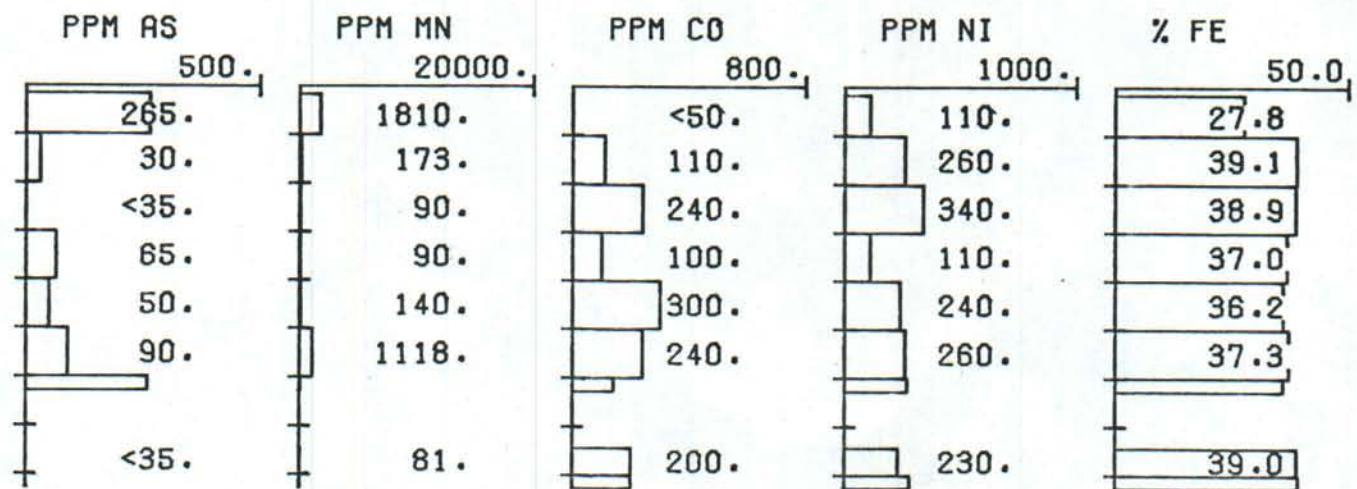
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 H.L. CONC.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

FIGURE 4/BUE1

BUE-1

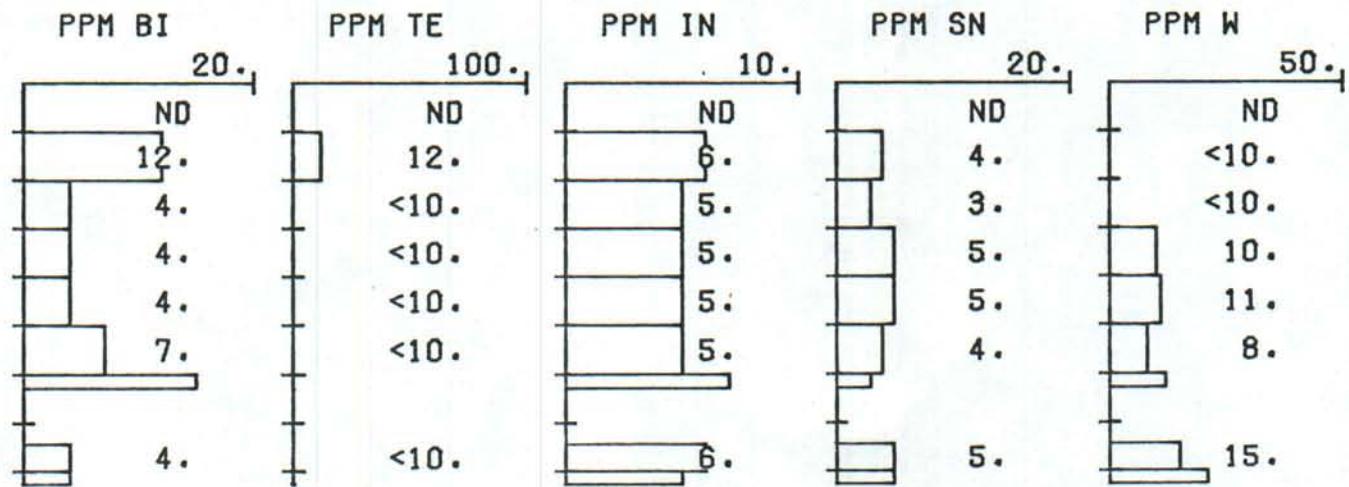
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 H.L. CONC.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

FIGURE 1/BUE2

BUE-2

BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADA

SAMPLE TYPE:

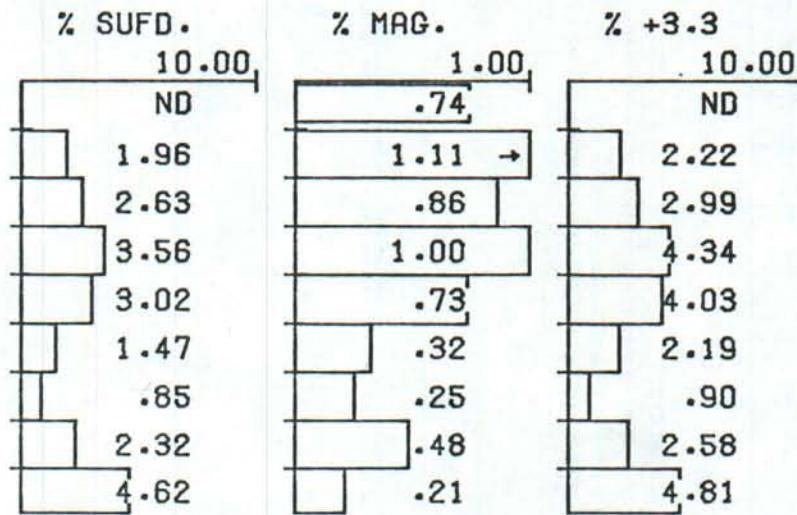
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

FIGURE 2/BUE2

BUE-2

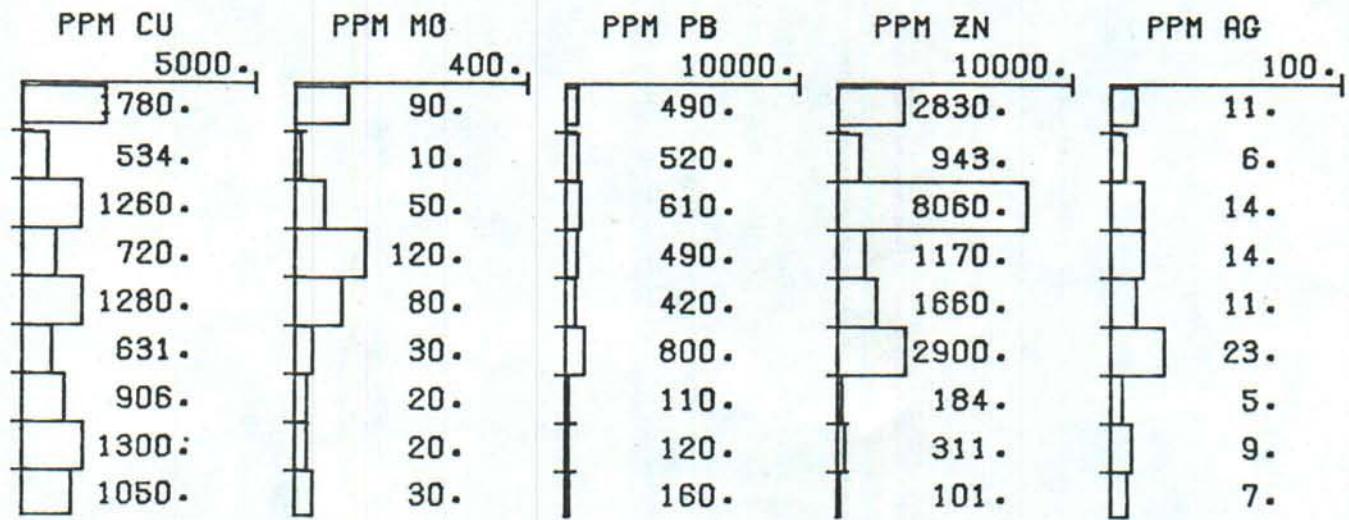
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 H.L. CONC.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

FIGURE 3/BUE2

BUE-2

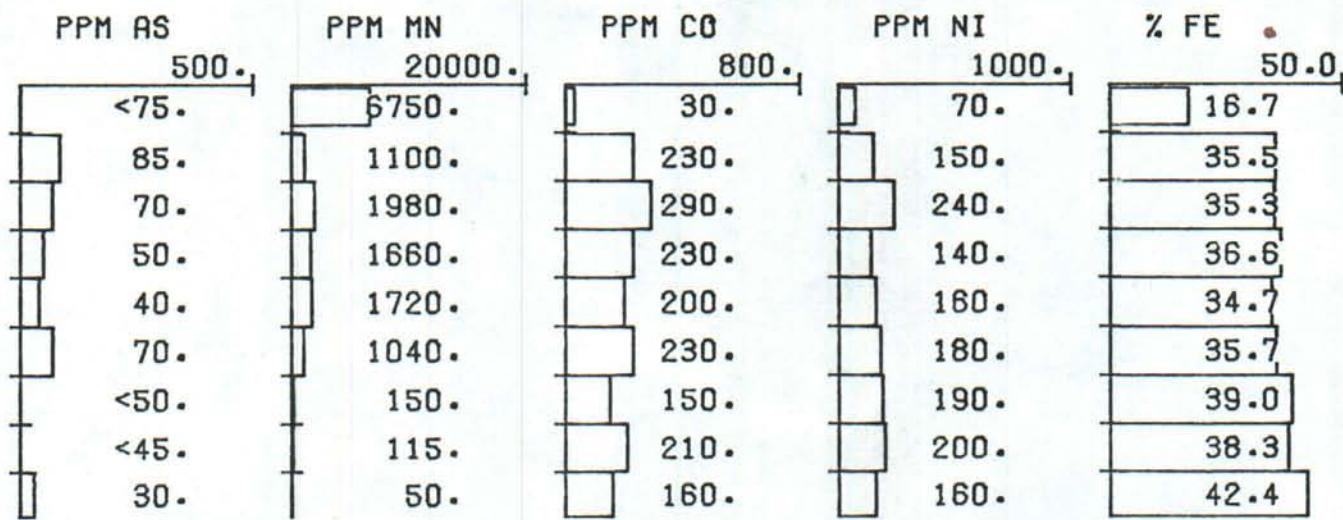
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 H.L. CONC.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

FIGURE 4/BUE2

BUE-2

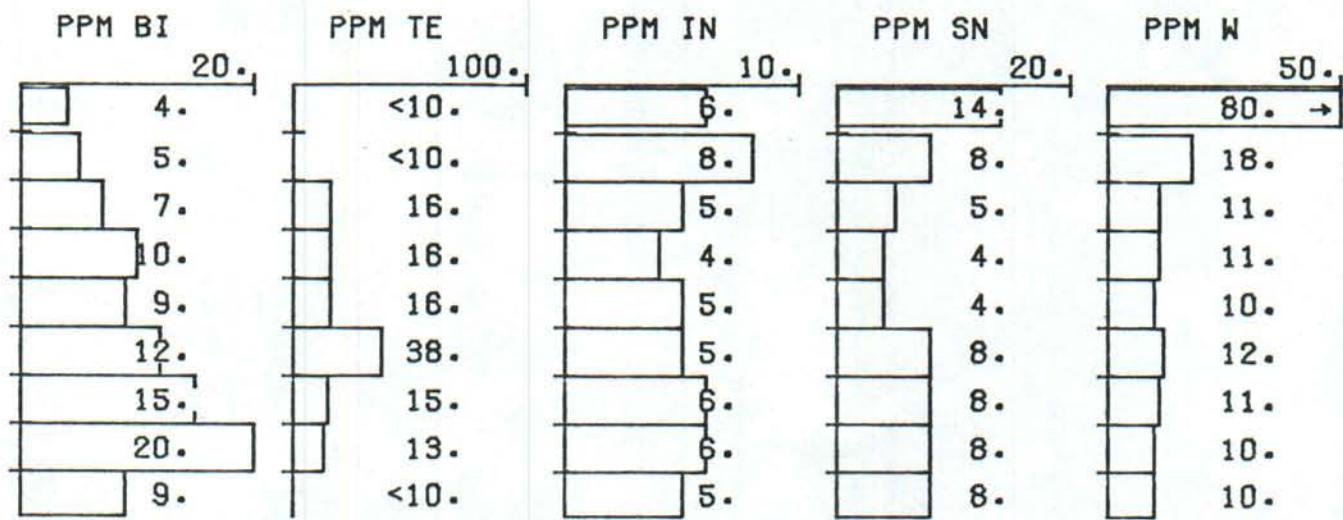
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 H.L. CONC.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

Table 1 - Summary of Geochemical and Opaque Mineral Data

	BSW - 9 (1500')			BSW - 7 (1715')			BC-2 (2500')			BC-1 (1960')			BC-3 (2463')			BVE-1 (828')			BVE - 2 (893')			
	Range	Avg.	Trend	Range	Avg.	Trend	Range	Avg.	Trend	Range	Avg.	Trend	Range	Avg.	Trend	Range	Avg.	Trend	Range	Avg.	Trend	
28	Cu (ppm)	185 to 7820	1689	Max	125 to 13100	2633	NT	272 to 7100	2096	ID	548 to 4798	1327	DD	210 to 1580	611	NT	754 to 3640	2166	NT	720 to 1300	945	NT
	Mo (ppm)	10 to 360	83	Max	10 to 620	156	ID	<10 to 560	104	ID?	10 to 104	41	DD	<10 to 240	<36	ID	10 to 210	103	NT	10 to 120	49	DD?
	Pb (ppm)	100 to 730	365	Min	60 to 500	179	NT	14 to 14200	1469	DD	254 to 20000	5162	DD	330 to 11000	2267	Max	60 to 1050	195	NT	110 to 800	413	DD?
	Zn (ppm)	56 to 3400	778	Min	50 to 677	191	ID	10 to 26500	3067	Min?	235 to 21000	6554	DD	330 to 18800	4498	Max?	47 to 6240	1100	DD?	101 to 8060	2013	DD
	Ag (ppm)	<2 to 23	<8	DD	<2 to 19	6	Max	<2 to 200	30	ID?	7 to 59	20	Min	5 to 38	15	ID?	2 to 9	<7	NT	5 to 23	11	NT
	As (ppm)	<35 to 1000	<270	DD	<35 to 375	<141	Max	<50 to 300	<95	NT	35 to 496	137	Min	<50 to 360	<88	Max	<35 to 265	<86	NT	30 to 85	<57	DD?
	Mn (ppm)	37 to 10500	1176	DD	34 to 328	111	NT	225 to 28800	7127	DD	1179 to 12960	4915	Min	625 to 18900	3343	DD	38 to 1810	465	NT	50 to 6750	1490	DD
	Co (ppm)	80 to 400	230	Max	140 to 500	276	NT	30 to 600	286	Max	25 to 367	236	DD?	120 to 360	234	NT	<50 to 300	178	NT	30 to 290	197	DD?
	Ni (ppm)	150 to 380	243	ID	140 to 520	237	NT	100 to 1060	383	ID?	135 to 432	251	Min?	230 to 640	342	NT	110 to 340	228	NT	70 to 240	168	NT
	Fe (%)	36.0 to 43.2	38.5	NT	38.6 to 41.8	39.3	NT	32.2 to 45.5	41.2	NT	38.0 to 44.8	40.4	NT	17.0 to 44.0	40.1	NT	27.8 to 39.3	36.6	NT	16.7 to 42.4	35.4	ID?
	Bi (ppm)	6 to 15	8	Min	1 to 9	4	ID	1 to 10	2	Min	4 to 20	7	ID	1 to 10	6	Max	4 to 15	6	NT	4 to 20	10	ID
	Te (ppm)	<10 to 18	<11	Min	<10 to 20	<11	ID	<10 to 18	<11	NT	<20 to 30	<21	ID	<10 to 18	<11	Max	<10 to 12	<10	NT	<10 to 38	<16	Max
	In (ppm)	4 to 6	5	Min?	5 to 6	5	NT	<1 to 1	<1	NT	<2 to 4	<2	DD?	1 to 5	2	ID	5 to 7	5	NT	4 to 8	6	NT
	Tl (ppm)	<10	<10	NT	<10	<10	NT	<10	<10	NT	<2	<2	NT	<10	<10	NT	<10	<10	NT	<10	<10	NT
	Sn (ppm)	2 to 5	3	Max?	4 to 10	6	NT	1 to 10	2	Min?	<2* to 6*	3*	ID	<1 to 3	<2	ID?	3 to 5	4	NT	4 to 14	7	NT
	W (ppm)	<10	<10	NT	<10 to 11	<10	NT	<10	<10	NT	5* to 25*	10*	Min	<10 to 21	<11	ID?	<10 to 21	<11	ID?	10 to 80	18	DD?
	Total Sufds. (%)	0.55 to 7.88	2.73	NT	0.92 to 6.15	2.30	DD?	0.64 to 4.8	2.19	DD	3.2 to 7.9	4.68	ID?	0.85 to 5.81	2.62	NT	<0.01 to 2.75	1.71	NT	0.85 to 4.62	2.54	ID?
	Mag. (%)	0.04 to 0.49	0.23	ID	0.05 to 0.78	0.32	ID?	<0.01 to 0.90	0.13	ID	<10 to 1.8	<0.22	ID?	<0.01 to 0.17	<.05	ID	0.04 to 0.43	0.18	ID?	0.21 to 1.11	0.63	DD

* KES Sn values divided by 3 and W values divided by 2 to make equivalent to COORS values.

Trend designations: ID = increase downward; DD = decrease downwards; Max = goes thru a maxima, Min = goes thru a minima and NT = no definite trend.

APPENDIX A

Geochemical Data, DDHs BSW-7, BSW-9, BUE-1, and BUE-2



WEST JORDAN OFFICE

ROCKY MOUNTAIN GEOCHEMICAL CORP.

1323 W. 7900 SOUTH • WEST JORDAN, UTAH 84084 • PHONE: (801) 255-3558

Certificate of Analysis

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Page 1 of

Date: January 17, 1978

RMGC Numbers:

Client: Robert W. Bamford
1138 Gilmer Drive
Salt Lake City, Utah 84105

Local Job No.: 77-71-11SL

Foreign Job No.: 77-27-19R

Invoice No.: M 92069

Client Order No.: None

Report On: 47 Samples

Submitted by: Robert W. Bamford

Date Received: 12/6/77

Analysis: Cobalt, Silver, Manganese, Nickel, Lead, Zinc, Copper, Iron, Molybdenum, Arsenic, Weight % +3.0, Weight % +3.3, Weight % Magnetite and Sample Weight

Analytical Methods: Arsenic determined colorimetrically
Remaining elements determined by Atomic Absorption

Remarks:

cc:
enc.
file(2)
LRR/hf

Analytical Precision:

Zinc	\pm 7%	Silver	\pm 10%
Copper	\pm 5%	Lead	\pm 7%
Iron	\pm 2%	Manganese	\pm 5%
Molybdenum	\pm 8%	Nickel	\pm 4%
Cobalt	\pm 7%	Arsenic	\pm 6%

All values are reported in parts per million unless specified otherwise. A minus sign (—) is to be read "less than" and a plus sign (+) "greater than." Values in parenthesis are estimates. This analytical report is the confidential property of the above mentioned client and for the protection of this client and ourselves we reserve the right to forbid publication or reproduction of this report or any part thereof without written permission.
ND = None Detected 1 ppm = 0.0001% 1 Troy oz./ton = 34.286 ppm 1 ppm = 0.0292 Troy oz./ton

Client Robert W. Bamford

Date 1/17/78

RMGC Job No. 77-27-19R

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<u>Sample No.</u>	<u>Weight % +3.0</u>	<u>Weight % +3.3</u>	<u>Weight % Magnetite</u>	<u>Weight of Sample Analyzed in Grams</u>
BUE-1				
15-100	0.03		0.04	0.0189
100-200		2.86	0.11	0.1574
200-300		2.08	0.17	0.1356
300-400		2.07	0.17	0.1574
400-500		1.06	0.20	0.1000
500-600		1.96	0.21	0.1393
600-629		1.42	0.15	0.1164
744-800		2.48	0.36	0.1488
800-828		2.54	0.43	0.1373



ROCKY MOUNTAIN GEOCHEMICAL CORP.

SALT LAKE CITY, UTAH

RENO, NEVADA

TUCSON, ARIZONA

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RMGC Job No. 77-27-19R

77-71-11SL
77-27-19R

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<u>Sample No.</u>		<u>ppm Cobalt</u>	<u>ppm Silver</u>	<u>ppm Manganese</u>	<u>ppm Nickel</u>	<u>ppm Lead</u>
BUE-1						
15-100	+3.0	-50	-13	1810	110	370
100-200	+3.3	110	6	173	260	160
200-300	+3.3	240	2	90	340	90
300-400	+3.3	100	5	90	110	110
400-500	+3.3	300	8	140	240	120
500-600	+3.3	240	9	1118	260	210
600-629	+3.3	140	9	127	270	1050
744-800	+3.3	200	5	81	230	60
800-828	+3.3	200	7	38	280	60

<u>Sample No.</u>		<u>ppm Zinc</u>	<u>ppm Copper</u>	<u>% Iron</u>	<u>ppm Molybdenum</u>	<u>ppm Arsenic</u>
BUE-1						
15-100	+3.0	6240	2800	27.8	210	265
100-200	+3.3	1120	3640	39.1	10	30
200-300	+3.3	116	754	38.9	50	-35
300-400	+3.3	162	1010	37.0	80	65
400-500	+3.3	612	2320	36.2	160	50
500-600	+3.3	170	1810	37.3	190	90
600-629	+3.3	5350	2040	36.1	10	260
744-800	+3.3	47	2960	39.0	50	-35
800-828	+3.3	53	3420	39.3	70	-35



ROCKY MOUNTAIN GEOCHEMICAL CORP.

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RMGC Job No.

77-71-11SL
77-27-19R

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<u>Sample No.</u>	<u>Weight % +3.0</u>	<u>Weight % +3.3</u>	<u>Weight % Magnetite</u>	<u>Weight of Sample Analyzed in Grams</u>
BUE-2				
5.9- 82.4	0.15		0.74	0.0689
102-200		2.22	1.11	0.1156
200-300		2.99	0.86	0.1083
300-400		4.34	1.00	0.1462
400-500		4.03	0.73	0.1305
500-600		2.19	0.32	0.1105
600-700		0.90	0.25	0.1046
700-800		2.58	0.48	0.1156
800-893		4.81	0.21	0.1775



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<u>Sample No.</u>		<u>ppm Cobalt</u>	<u>ppm Silver</u>	<u>ppm Manganese</u>	<u>ppm Nickel</u>	<u>ppm Lead</u>
BUE-2						
5.9-82.4	+3.0	30	11	6750	70	490
102-200	+3.3	230	6	1100	150	520
200-300	+3.3	290	14	1980	240	610
300-400	+3.3	230	14	1660	140	490
400-500	+3.3	200	11	1720	160	420
500-600	+3.3	230	23	1040	180	800
600-700	+3.3	150	5	150	190	110
700-800	+3.3	210	9	115	200	120
800-893	+3.3	160	7	50	160	160

<u>Sample No.</u>		<u>ppm Zinc</u>	<u>ppm Copper</u>	<u>% Iron</u>	<u>ppm Molybdenum</u>	<u>ppm Arsenic</u>
BUE-2						
5.9-82.4	+3.0	2830	1780	16.7	90	-75
102-200	+3.3	943	534	35.5	10	85
200-300	+3.3	8060	1260	35.3	50	70
300-400	+3.3	1170	720	36.6	120	50
400-500	+3.3	1660	1280	34.7	80	40
500-600	+3.3	2900	631	35.7	30	70
600-700	+3.3	184	906	39.0	20	-50
700-800	+3.3	311	1300	38.3	20	-45
800-893	+3.3	101	1050	42.4	30	30



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77-71-11SL
RMGC Job No. 77-27-19R

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<u>Sample No.</u>	<u>Weight % +3.3</u>	<u>Weight % Magnetite</u>	<u>Weight of Sample Analyzed in Grams</u>
BSW-7			
464-500	4.86	0.05	0.1485
500-600	3.82	0.26	0.1030
600-700	6.83	0.28	0.1418
700-800	2.83	0.14	0.1191
800-900	1.24	0.77	0.1245
900-1000	1.67	0.34	0.0765
1000-1100	2.80	0.06	0.1640
1100-1200	1.65	0.17	0.1355
1200-1300	1.39	0.06	0.1029
1300-1400	4.08	0.22	0.1259
1400-1500	1.04	0.08	0.1472
1500-1600	1.28	0.75	0.1190
1600-1700	1.49	0.78	0.1061
1700-1715	0.44	0.77	0.1036



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Client Robert W. Bamford

Date 1/17/78

77-71-11SL
77-27-19R

RMGC Job No.

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<u>Sample No.</u>		<u>ppm Cobalt</u>	<u>ppm Silver</u>	<u>ppm Manganese</u>	<u>ppm Nickel</u>	<u>ppm Lead</u>
BSW-7						
464- 500	+3.3	140	-2	34	160	60
500- 600	+3.3	150	2	36	140	270
600- 700	+3.3	220	-2	28	220	70
700- 800	+3.3	250	6	103	210	130
800- 900	+3.3	470	10	139	260	100
900-1000	+3.3	500	6	75	260	100
1000-1100	+3.3	250	8	52	190	100
1100-1200	+3.3	330	4	77	210	120
1200-1300	+3.3	230	5	136	140	270
1300-1400	+3.3	160	6	93	210	500
1400-1500	+3.3	300	19	194	520	370
1500-1600	+3.3	280	4	149	250	60
1600-1700	+3.3	200	-2	240	230	120
1700-1715	+3.3	430	-2	328	420	80



ROCKY MOUNTAIN GEOCHEMICAL CORP.

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TUCSON, ARIZONA

Client Robert W. BamfordDate 1/17/7877-71-11SL
RMGC Job No. 77-27-19RPage 8 of 11

<u>Sample No.</u>		<u>ppm Zinc</u>	<u>ppm Copper</u>	<u>% Iron</u>	<u>ppm Molybdenum</u>	<u>ppm Arsenic</u>
BSW-7						
464-	500	+3.3	50	125	38.7	10
500-	600	+3.3	36	175	38.6	30
600-	700	+3.3	30	143	39.1	10
700-	800	+3.3	92	1750	39.7	70
800-	900	+3.3	92	1.31%	37.6	120
900-1000		+3.3	108	3500	39.5	120
1000-1100		+3.3	143	1440	41.8	50
1100-1200		+3.3	55	2310	39.1	230
1200-1300		+3.3	168	1650	38.9	50
1300-1400		+3.3	677	1040	40.9	40
1400-1500		+3.3	436	2090	39.6	120
1500-1600		+3.3	92	4390	39.1	470
1600-1700		+3.3	426	2130	38.6	620
1700-1715		+3.3	80	1140	38.4	-45
						50



ROCKY MOUNTAIN GEOCHEMICAL CORP.

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TUCSON, ARIZONA

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Date 1/17/78

RMGC Job No. 77-27-19R

77-71-11SL

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<u>Sample No.</u>	<u>Weight % +3.0</u>	<u>Weight % +3.3</u>	<u>Weight % Magnetite</u>	<u>Weight of Sample Analyzed in Grams</u>
BSW-9				
82.5-100	4.44		0.04	0.1308
100- 200		3.26	0.10	0.1000
200- 300		2.73	0.12	0.1727
300- 400		1.66	0.09	0.1265
400- 500		3.13	0.27	0.1524
500- 600		4.63	0.16	0.1491
600- 700		2.41	0.08	0.1432
700- 800		3.71	0.13	0.1081
800- 900		1.69	0.44	0.1341
900-1000		1.08	0.28	0.1099
1000-1100		0.69	0.32	0.1103
1100-1200		4.00	0.45	0.1066
1200-1300		8.66	0.11	0.1360
1300-1400		3.26	0.49	0.1534
1400-1500		2.37	0.28	0.1085



ROCKY MOUNTAIN GEOCHEMICAL CORP.

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Client Robert W. BamfordDate 1/17/7877-71-11SL
RMGC Job No. 77-27-19RPage 10 of 11

<u>Sample No.</u>		<u>ppm Cobalt</u>	<u>ppm Silver</u>	<u>ppm Manganese</u>	<u>ppm Nickel</u>	<u>ppm Lead</u>
BSW-9						
82.5-100	+3.0	80	23	74	150	390
100- 200	+3.3	190	15	2500	220	730
200- 300	+3.3	210	14	1.05%	260	680
300- 400	+3.3	200	7	387	210	360
400- 500	+3.3	180	15	2160	250	490
500- 600	+3.3	210	7	87	170	180
600- 700	+3.3	180	-2	94	160	100
700- 800	+3.3	220	2	46	160	140
800- 900	+3.3	370	9	145	190	170
900-1000	+3.3	400	11	111	240	240
1000-1100	+3.3	390	7	213	320	340
1100-1200	+3.3	170	5	181	180	320
1200-1300	+3.3	150	6	37	320	100
1300-1400	+3.3	200	8	90	380	590
1400-1500	+3.3	180	5	99	360	670



ROCKY MOUNTAIN GEOCHEMICAL CORP.

SALT LAKE CITY, UTAH

RENO, NEVADA

TUCSON, ARIZONA

Client

Robert W. Bamford

Date 1/17/78

RMGC Job No.

77-71-11SL
77-27-19R

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Sample No.	ppm Zinc	ppm Copper	% Iron	ppm Molybdenum	ppm Arsenic
BSW-9					
82.5-100	2680	1570	38.2	20	115
100- 200	3400	525	39.8	10	350
200- 300	1820	431	38.2	10	750
300- 400	540	510	36.8	20	535
400- 500	904	671	36.3	10	575
500- 600	191	418	39.1	10	115
600- 700	56	185	39.4	10	35
700- 800	97	631	40.2	60	-45
800- 900	132	3580	37.7	270	170
900-1000	196	4730	36.6	360	1000
1000-1100	218	7820	36.0	330	45
1100-1200	436	816	37.5	30	45
1200-1300	298	573	39.7	20	55
1300-1400	1790	2170	43.2	10	-35
1400-1500	488	606	38.2	20	-45

BY:

Lawrence R. Reid



ROCKY MOUNTAIN GEOCHEMICAL CORP.

SALT LAKE CITY, UTAH

RENO, NEVADA

TUCSON, ARIZONA

Coors / SPECTRO-CHEMICAL LABORATORY

DIVISION OF COORS PORCELAIN COMPANY
GOLDEN, COLORADO, U.S.A.

303-279-6565 Ext. 3202

Mailing Address:
P.O. Box 500
Golden, Colorado 80401

Analytical Report

CI-1317

Please Note
Our New Phone Number Is
(303) 278-4000

TO: Mr. Robert W. Bamford

LABORATORY NUMBER	93759
DATE	2-15-78
CUSTOMER ORDER NO.	

Sample I.D.		Tin (ppm)	Tungsten (ppm)	Indium (ppm)	Bismuth (ppm)	Tellurium (ppm)	Thallium (ppm)
BUE-1							
+ 3.3	100-200	4	< 10	6	12	12	< 10
	200-300	3	< 10	5	4	< 10	< 10
	300-400	5	10	5	4	< 10	< 10
	400-500	5	11	5	4	< 10	< 10
	500-600	4	8	5	7	< 10	< 10
	600-629	3	12	7	15	< 10	< 10
	744-800	5	15	6	4	< 10	< 10
	800-828	5	21	5	4	< 10	< 10
BUE-2							
+ 3.0	5.9-82.4	14	80	6	4	< 10	< 10
BUE-2							
+ 3.3	102-200	8	18	8	5	< 10	< 10
	200-300	5	11	5	7	16	< 10
	300-400	4	11	4	10	16	< 10
	400-500	4	10	5	9	16	< 10
	500-600	8	12	5	12	38	< 10
	600-700	8	11	6	15	15	< 10
	700-800	8	10	6	20	13	< 10
	800-893	8	10	5	9	< 10	< 10

< = Less than

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BY

Frank B. Schweitzer / SPECTRO-CHEMICAL LABORATORY

Frank B. Schweitzer, Manager

Coors / SPECTRO-CHEMICAL LABORATORY

DIVISION OF COORS PORCELAIN COMPANY
GOLDEN, COLORADO, U.S.A.

303-279-6565 Ext. 3202

Mailing Address:
P.O. Box 500
Golden, Colorado 80401

Analytical Report

CI-1317

TO: Mr. Robert W. Bamford

Please Note —
Our New Phone Number Is
(303) 279-4000

LABORATORY NUMBER	93759
DATE	2-15-78
CUSTOMER ORDER NO.	

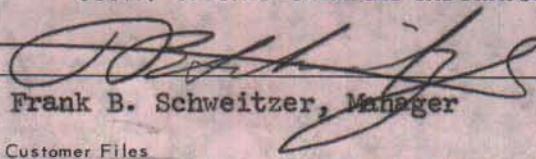
Sample I.D.	Tin (ppm)	Tungsten (ppm)	Indium (ppm)	Bismuth (ppm)	Tellurium (ppm)	Thallium (ppm)
BSW-7						
+ 3.3	464-500	7	< 10	5	1	< 10
	500-600	7	< 10	5	4	< 10
	600-700	5	< 10	6	3	< 10
	700-800	5	< 10	5	1	< 10
	800-900	9	< 10	5	2	< 10
	1000-1100	4	< 10	6	1	< 10
	1100-1200	7	11	6	3	< 10
	1200-1300	4	< 10	6	2	< 10
	1300-1400	4	< 10	5	4	< 10
	1400-1500	4	< 10	6	4	10
	1500-1600	7	< 10	5	6	10
	1600-1700	10	< 10	5	9	20
	1700-1715	8	< 10	5	6	14
BSW-9						
+ 3.0	82.5-100	5	< 10	6	9	18
BSW-9						
+ 3.3	100-200	5	< 10	5	15	16
	200-300	5	< 10	5	9	16
	300-400	3	< 10	5	9	< 10
	400-500	3	< 10	4	8	10
	500-600	2	< 10	5	6	< 10

< = Less than

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Coors / SPECTRO-CHEMICAL LABORATORY

BY



Frank B. Schweitzer, Manager

Coors / **SPECTRO-CHEMICAL LABORATORY**
 DIVISION OF COORS PORCELAIN COMPANY
 GOLDEN, COLORADO, U.S.A.

303-279-6565 Ext. 3202

Mailing Address:
 P.O. Box 500
 Golden, Colorado 80401

Analytical Report

CI-1317

Please Note
 Our New Phone Number Is
 (303) 278-4000

TO: Mr. Robert W. Bamford

LABORATORY NUMBER	93759
DATE	2-15-78
CUSTOMER ORDER NO.	

Sample I.D.	Tin (ppm)	Tungsten (ppm)	Indium (ppm)	Bismuth (ppm)	Tellurium (ppm)	Thallium (ppm)
BSW-9						
+ 3.3	600-700	2	< 10	4	6	< 10
	700-800	2	< 10	5	8	< 10
	800-900	4	< 10	4	7	< 10
	900-1000	5	< 10	5	7	< 10
	1000-1100	5	< 10	5	7	< 10
	1100-1200	3	< 10	5	9	10
	1200-1300	2	< 10	5	7	10
	1300-1400	2	< 10	6	9	15
	1400-1500	2	< 10	5	10	< 10

< = Less than

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Coors / SPECTRO-CHEMICAL LABORATORY

BY

Frank B. Schweitzer, Manager

APPENDIX B

Mineralogy of +3.3 sp. gr. heavy liquid fraction
less magnetic fractions

SAMPLE NUMBER FOOTAGE	WT. % TOTAL SULFIDE IN ROCK (SULFUR ANALYSIS)	WT. % TOTAL SULFIDE IN ROCK (HEAVY LIQUID CONCENTRATION)	WT. % HEAVY LIQUID CONCENTRATE	COMPOSITION OF HEAVY LIQUID CONCENTRATE (ESTIMATED VOLUME %)								OTHER MINERALS NOTES	
				Sp. Gr.	R.	O.	A.	SULFIDES	LIMONITES	MAGNETITE	OTHER DRY OXIDIZED MINERALS	PYRROPHITE	
825-100'	2.62	4.44	✓ 59	25	TR.	1	15						
100-200'	2.97	3.26	✓ 91	-	1	TR.	7	1	-				
200-300'	2.24	2.73	✓ 82	-	TR.	1	17	-	-				ZIRCON
300-400'	1.38	1.66	✓ 83	-	TR.	TR.	17	-	-				"
400-500'	2.66	3.13	✓ 85	-	TR.	1	12	2	-				
500-600'	1.17	4.63	✓ 90	-	TR.	TR.	10	TR.	-				
600-700'	2.00	2.41	✓ 83	-	TR.	TR.	17	-	-				
700-800'	3.53	3.71	✓ 95	-	TR.	TR.	5	-	-				tr. galena
800-900'	1.44	1.69	✓ 85	-	TR.	TR.	15	-	-				"
900-1000'	0.95	1.08	✓ 88	-	TR.	TR.	12	-	-				
1000-1100'	0.55	0.69	✓ 80	-	TR.	TR.	15	5	TR.				
1100-1200'	3.24	4.00	✓ 81	-	TR.	TR.	12	7	TR.				
1200-1300'	7.88	8.66	✓ 71	-	TR.	TR.	9	-	-				
1300-1400'	3.10	3.26	✓ 95	-	TR.	TR.	5	-	-				
1400-1500'	2.13	2.37	✓ 90	-	TR.	TR.	10	-	-				

DH BSW-9

ESTIMATED COMPOSITION OF SPECIFIC GRAVITY CONCENTRATE

SAMPLE NUMBER FOOTAGE	WT. % TOTAL SULFIDE IN ROCK (SULFUR ANALYSIS)	WT. % TOTAL SULFIDE IN ROCK (HEAVY LIQUID CONCEN- TRATION)	WT. % HEAVY LIQUID CONCEN- TRATE	Sp. Gr.	COMPOSITION OF HEAVY LIQUID CONCENTRATE (ESTIMATED VOLUME %)								OTHER MINERALS	
					R.	M.	S.	L.	M.	OTHER DARK OCTAHEDRAL MINERALS	DETAILED CLAY MINERALS	EPIDOTE	BTUILLITE?	
BUE-1														
15-100'	<0.01	0.03	✓	1	17	2	10	70	-	TR.				
100-200'	2.75	2.86	✓	96	-	TR.	1	2	1	TR.				
200-300'	2.00	2.08	✓	96	TR.	TR.	TR.	3	1	TR.				
300-400'	1.88	2.07	✓	91	-	TR.	TR.	7	1	1				
400-500'	0.98	1.06	✓	92	-	1	1	5	TR.	1				
500-600'	1.88	1.96	✓	96	-	TR.	TR.	7	TR.	TR.				
600-629'	1.13	1.42	✓	80	-	TR.	-	20	-	-				9M, SP, CPY present
744-800'	2.33	2.48	✓	94	-	TR.	-	4	-	2				TR. SIRCON
800-828'	2.39	2.54	✓	94	-	TR.	TR.	5	-	3				"
BUE-2														
5.9-82.4'	0.15	✓			MISSING									
102-200'	1.96	2.22	✓	83	-	1	4	3	5	TR.				
200-300'	2.63	2.99	✓	58	-	1	1	5	5	TR.				
300-400'	3.56	4.34	✓	82	-	1	3	9	10	TR.				
400-500'	3.02	4.03	✓	75	-	1	3	5	15	1				
500-600'	1.47	2.19	✓	57	-	1	5	5	12	TR.				
600-700'	0.85	0.90	✓	97	-	1	2	1	2	TR.				
700-800'	2.32	2.58	✓	90	-	TR.	1	5	4	-				
800-893	1.62	4.81	✓	96	-	TR.	TR.	2	2	TR.				

DRILL HOLES
BUE-1 & BUE-2

ESTIMATED COMPOSITION OF SPECIFIC GRAVITY CONCENTRATE

File - 14

Robert W. Bamford
Consulting Geologist/Geochemist
1138 Gilmer Drive
Salt Lake City, Utah 84105

Bill Oriel
CONTINENTAL OIL COMPANY
P.O. Box 7608
Reno, Nevada 89510

Dear Bill:

Enclosed with this letter are two sets of geochemical plots and mineralogical data for drill hole BC-2, incorporating data for the recently deepened part of the hole (2500 to 4000 feet). I have not attempted to provide a formal report for the new data because they don't really warrant it. I feel I can comment adequately on them in this letter. The new plots, mineralogical data, and the letter should simply be integrated into the existing report on drill holes BC-2 and BC-3.

The new data in general support previous conclusions regarding a lack of potential for higher grade porphyry copper mineralization in the vicinity of BC-2. Downward trends of decreasing total sulfide, Cu, and Ag and a lack of significant increase in W are quite convincing in this regard. The probability of finding porphyry ore beneath BC-2 (in an unfaulted continuation of rocks presently penetrated by the hole) is very low and suggests that exploration efforts should focus elsewhere in the system.

Because of these new Buckskin data and because I have recently made some useful additions to my data base for the geochemistry of the tops of known deep porphyry copper systems, I have taken a couple of hours to review the entire Buckskin data package. The review did not change my thinking about Buckskin greatly, but did suggest that an increased priority might be given to a target that occupies the southwestern part of the original target area 1 (see 1977 report--Enhanced Surface Geochemical Survey, CONOCO Buckskin Project Area--and the attached copy of overlays A and B from the report). This target could be an important addition to concepts already being tested at Buckskin if it is supported by field criteria (e.g., evidence from mapping of relatively pervasive moderate to high total sulfide in the area). Our field notes from the survey suggest this criterion is possibly satisfied, but the notes only apply to the immediate vicinity of sample sites. Data from more comprehensive mapping is needed.

I feel it is important that we get together as soon as convenient to discuss this and other target concepts, and to more fully integrate the total geochemical data package with the revised geologic information you have mentioned is available. We probably have not been communicating enough in a direct manner to maximize benefits from our separate efforts. Hopefully we can correct this.

Best regards,



Robert W. Bamford

2/26/79

A1

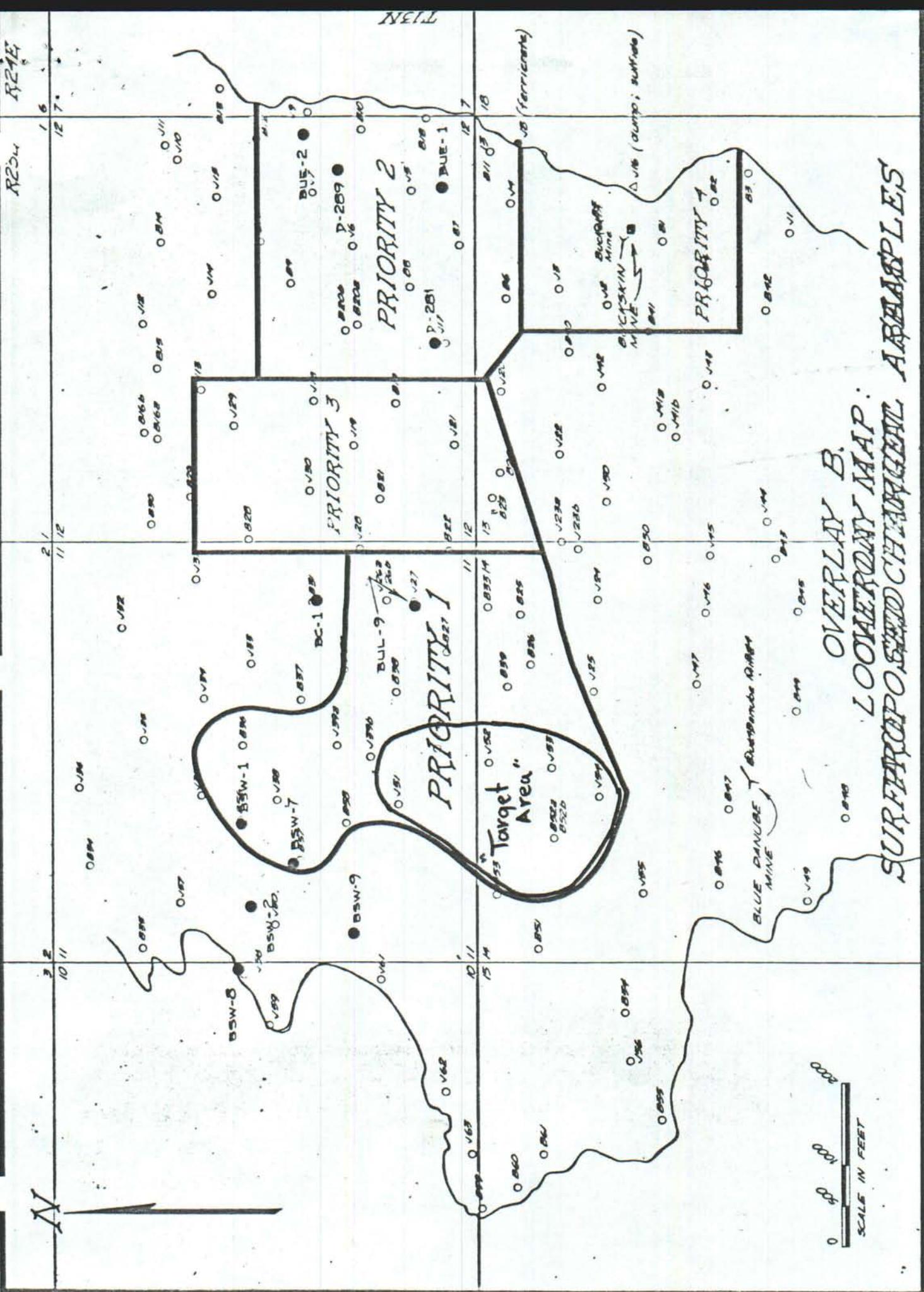


FIGURE 1

DDH BC-2

BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADA

SAMPLE TYPE:

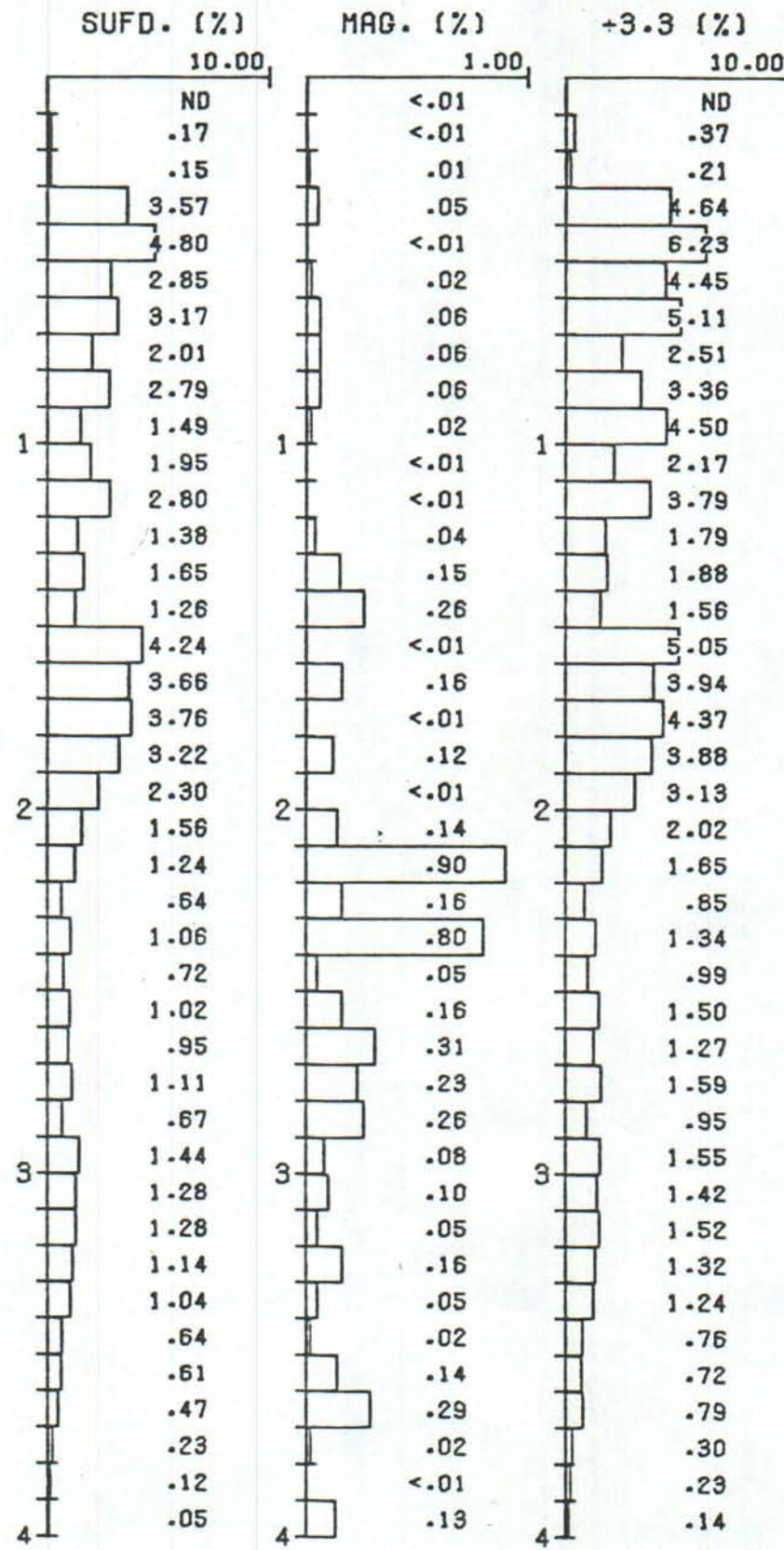
VERT. SCALE: 500.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

FIGURE 2

DDH BC-2

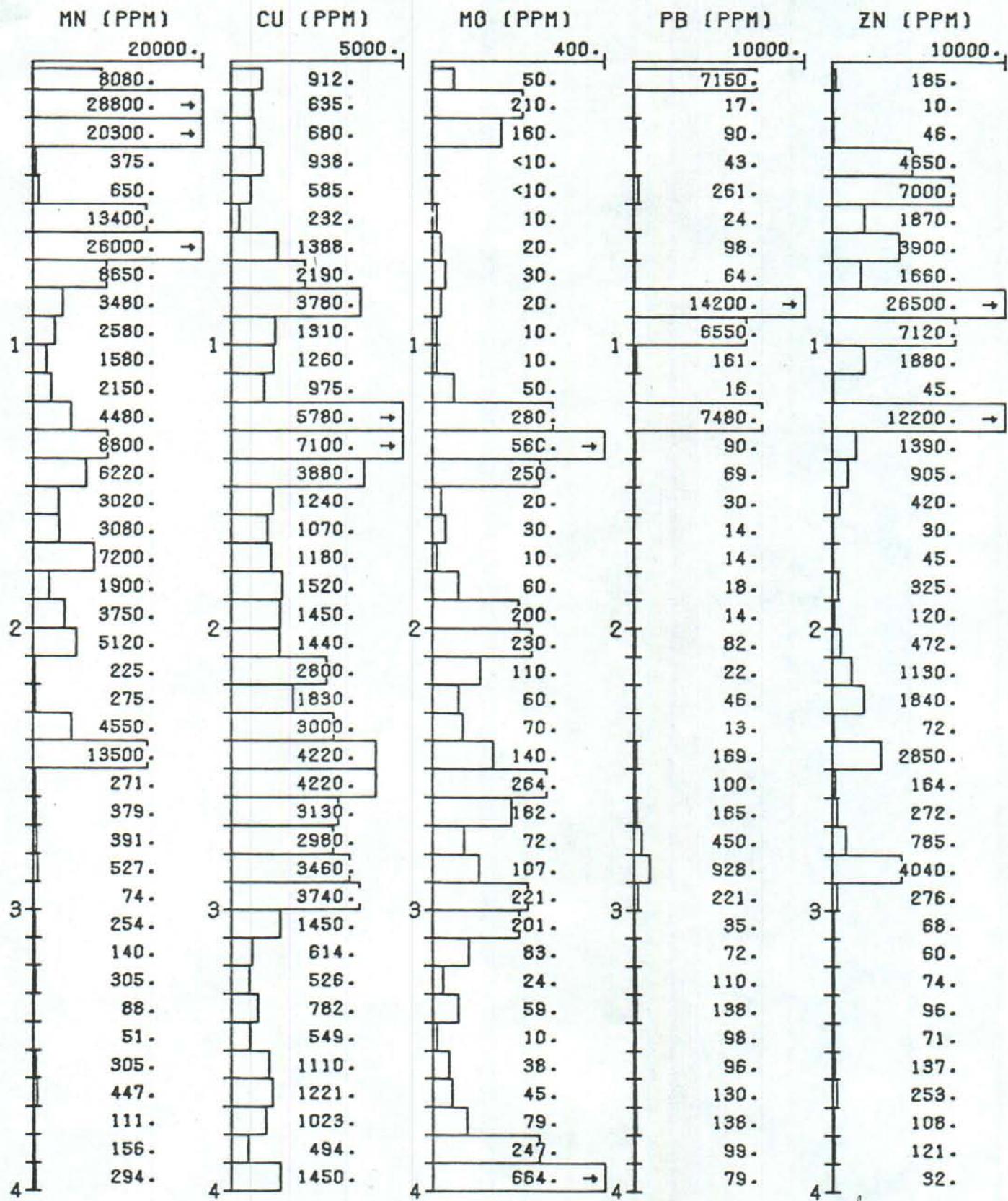
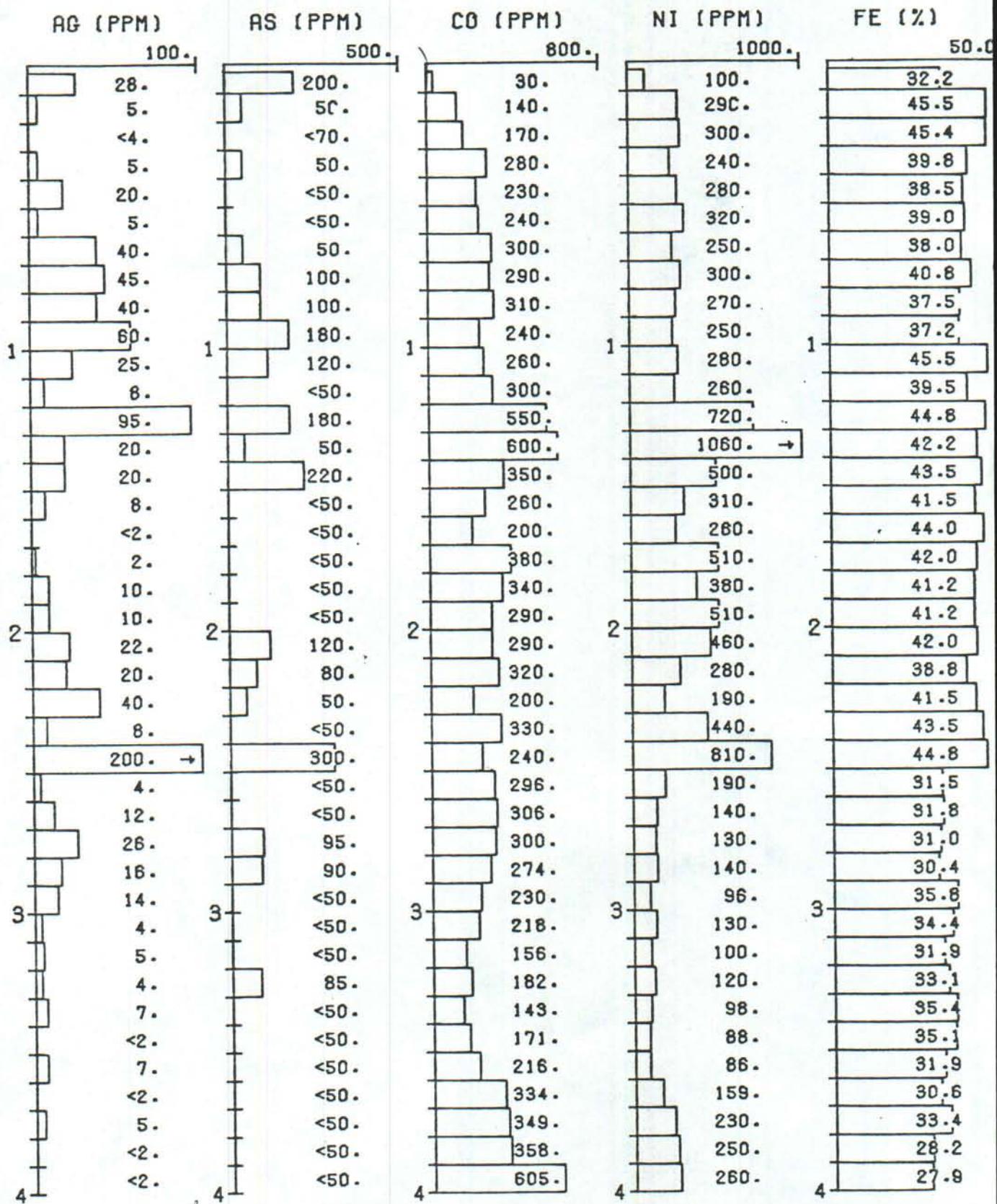
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 SP. GR. FRACT
VERT. SCALE: 500.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

FIGURE 3

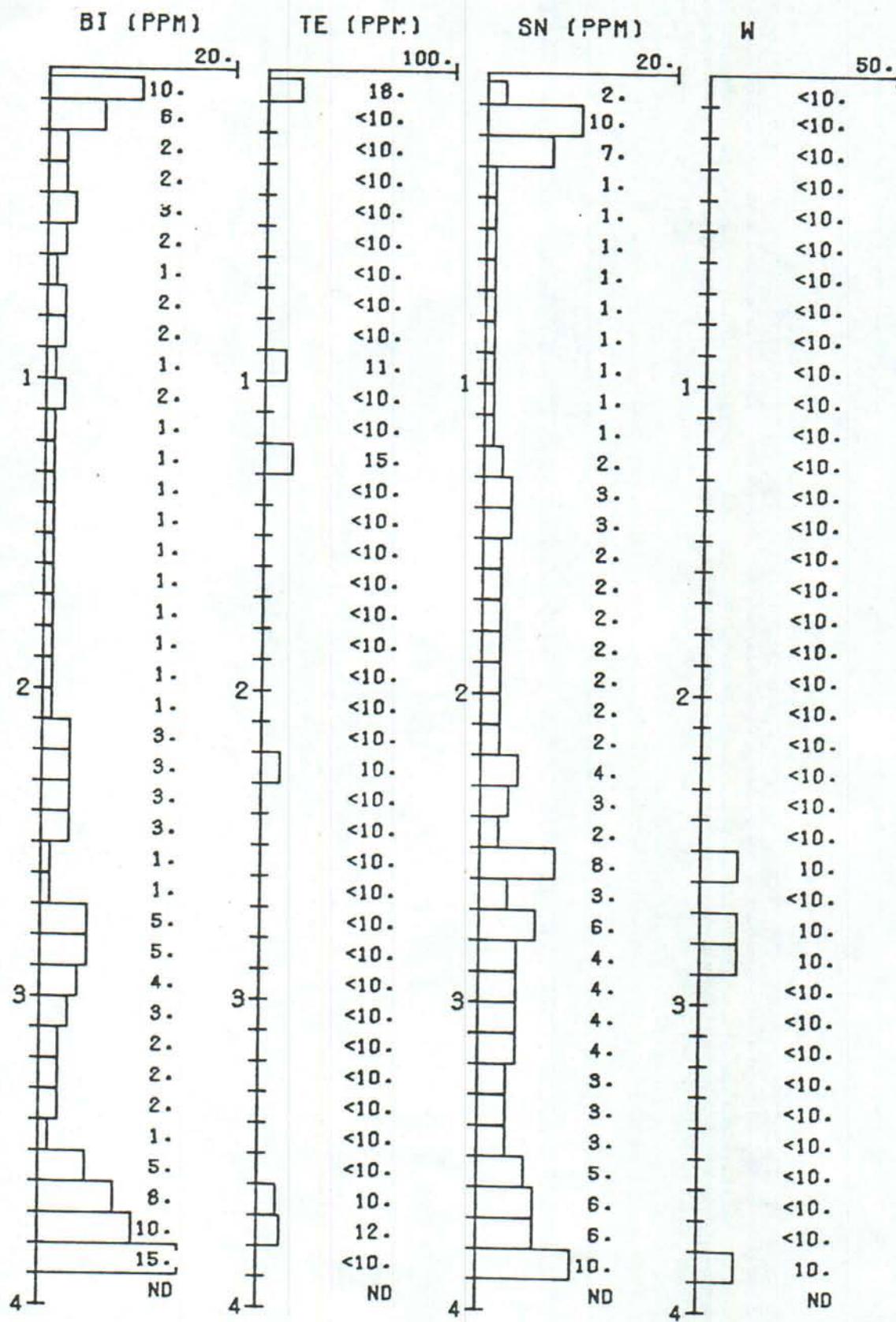
DDH BC-2

BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 SP. GR. FRAC
VERT. SCALE: 500.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)

DDH BC-2
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADA

FIGURE 4

SAMPLE TYPE: +3.3 SP. GR. FRACT
VERT. SCALE: 500.0 FT./IN.
(DEPTH SHOWN IN KILOFEET)





WEST JORDAN OFFICE

ROCKY MOUNTAIN GEOCHEMICAL CORP.

1323 W. 7900 SOUTH • WEST JORDAN, UTAH 84084 • PHONE: (801) 255-3558

2-70-4600-4

Certificate of Analysis

4

Page 1 of

Date: January 10, 1979

RMGC Numbers:
78-28-02-SLClient: Robert C. Bamford
1138 Gilmer Drive
Salt Lake City, Utah 84105Local Job No.:
Foreign Job No.:
M 93986
Invoice No.:

Client Order No.: none

Report On: 15 Samples

Submitted by: Robert C. Bamford

Date Received: 11/10/78

Analysis: Copper, Molybdenum, Lead, Zinc, Silver, Arsenic, Manganese, Nickel, Cobalt, Iron, Nickel and heavy minerals.

Analytical Methods: Determined by atomic absorption, except Arsenic which was determined colormetrically.

Remarks:

enc.

cc: file (2)
GJC/lw

Analytical Precision:

Copper	± 5%	Arsenic	± 10%
Molybdenum	± 8%	Manganese	± 3%
Lead	± 8%	Cobalt	± 8%
Zinc	± 4%	Iron	± 3%
Silver	± 10%	Nickel	± 6%

All values are reported in parts per million unless specified otherwise. A minus sign (—) is to be read "less than" and a plus sign (+) "greater than." Values in parenthesis are estimates. This analytical report is the confidential property of the above mentioned client and for the protection of this client and ourselves we reserve the right to forbid publication or reproduction of this report or any part thereof without written permission.
ND = None Detected 1 ppm = 0.0001% 1 Troy oz./ton = 34.286 ppm 1 ppm = 0.0292 Troy oz./ton

Client Robert C. Bamford

Date

1/10/79

RMGC Job No.

78-28-02-SL

Page 2 of 4

<u>Sample No.</u>	<u>ppm Copper</u>	<u>ppm Molybdenum</u>	<u>ppm Lead</u>	<u>ppm Zinc</u>	<u>ppm Silver</u>
BC-2 2500-2600	4220	264	100	164	4
2600-2700	3130	182	165	272	12
2700-2800	2980	72	450	785	26
2800-2900	3460	107	928	4040	16
2900-3000	3740	221	221	276	14
3000-3100	1450	201	35	68	4
3100-3200	614	83	72	60	5
3200-3300	526	24	110	74	4
3300-3400	782	59	138	96	7
3400-3500	549	10	98	71	-2
3500-3600	1110	38	96	137	7
3600-3700	1221	45	130	253	-2
3700-3800	1023	79	138	108	5
3800-3900	494	247	99	121	-2
3900-4000	1450	664	79	32	-2



ROCKY MOUNTAIN GEOCHEMICAL CORP.

SALT LAKE CITY UTAH

RENO NEVADA

TUCSON ARIZONA

Client Robert C. BamfordDate 1/10/79RMGC Job No. 78-28-02-SLPage 3 of 4

<u>Sample No.</u>	<u>ppm Arsenic</u>	<u>ppm Manganese</u>	<u>ppm Nickel</u>	<u>ppm Cobalt</u>	<u>% Iron</u>
BC-2 2500-2600	-50	271	190	296	31.5
2600-2700	-50	379	140	306	31.8
2700-2800	95	391	130	300	31.0
2800-2900	90	527	140	274	30.4
2900-3000	-50	74	96	230	35.8
3000-3100	-50	254	130	218	34.4
3100-3200	-50	140	100	156	31.9
3200-3300	85	305	120	182	33.1
3300-3400	-50	88	98	143	35.4
3400-3500	-50	51	88	171	35.1
3500-3600	-50	305	86	216	31.9
3600-3700	-50	447	159	334	30.6
3700-3800	-50	111	230	349	33.4
3800-3900	-50	156	250	358	28.2
3900-4000	-50	294	260	605	27.9



ROCKY MOUNTAIN GEOCHEMICAL CORP.

SALT LAKE CITY, UTAH

RENO, NEVADA

TUCSON, ARIZONA

Client Robert C. Bamford

Date 1/10/79

RMGC Job No. 78-28-02-SL

Page 4 of 4

<u>Sample No.</u>	<u>Sample Wt Analyzed in grs</u>	<u>Wt % +3.3</u>	<u>Wt % Magnetite</u>	<u>Sample Wt Separated in grs</u>
BC-2 2500-2600	0.10955	1.50	0.72	80
2600-2700	0.10271	1.27	0.65	80
2700-2800	0.10413	1.59	0.65	80
2800-2900	0.10776	0.95	0.55	80
2900-3000	0.10427	1.55	0.40	80
3000-3100	0.13685	1.42	0.34	80
3100-3200	0.15360	1.52	0.059	80
3200-3300	0.13555	1.32	0.18	80
3300-3400	0.10162	1.24	0.059	80
3400-3500	0.10236	0.76	0.029	80
3500-3600	0.10418	0.72	0.15	80
3600-3700	0.12274	0.79	0.31	80
3700-3800	0.10143	0.30	0.026	80
3800-3900	0.10112	0.23	-0.002	80
3900-4000	0.10140	0.14	0.15	80

By Jim Cardwell
Jim Cardwell



ROCKY MOUNTAIN GEOCHEMICAL CORP.
SALT LAKE CITY, UTAH • RENO, NEVADA • TUCSON, ARIZONA

Coors / SPECTRO-CHEMICAL LABORATORY

DIVISION OF COORS PORCELAIN COMPANY

GOLDEN, COLORADO, U.S.A.

303-278-4000 Ext. 2302

Mailing Address:
P.O. Box 500
Golden, Colorado 80401*Analytical Report*

CI-1317-A

TO: Robert W. Bamford
1138 Gilmer Drive
Salt Lake City, UT 84105

LABORATORY NUMBER	97619
DATE	2-2-79
CUSTOMER ORDER NO.	

Conoco BC-2 +3.3

Sample I.D.	Tin	Bismuth	Indium	Tungsten	Thallium	Tellurium
2500-2600	8	1	< 1	10	< 10	< 10
2600-2700	3	1	< 1	< 10	< 10	< 10
2700-2800	6	5	< 1	10	< 10	< 10
2800-2900	4	5	< 1	10	< 10	< 10
2900-3000	4	4	< 1	< 10	< 10	< 10
3000-3100	4	3	< 1	< 10	< 10	< 10
3100-3200	4	2	< 1	< 10	< 10	< 10
3200-3300	3	2	< 1	< 10	< 10	< 10
3300-3400	3	2	< 1	< 10	< 10	< 10
3400-3500	3	1	< 1	< 10	< 10	< 10
3500-3600	5	5	< 1	< 10	< 10	< 10
3600-3700	6	8	< 1	< 10	< 10	10
3700-3800	6	10	< 1	< 10	< 10	12
3800-3900	10	15	< 1	10	< 10	< 10

Results are reported in parts per million.

< = less than

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Coors / SPECTRO-CHEMICAL LABORATORY

BY

LABORATORY MANAGER

Robert W. Bamford
Geologist/Geochemist

October 10, 1980

Gordon L. Pine
District Geologist
Minerals Department
CONOCO INC.
P. O. Box 7608
Reno, NV 89510

Dear Gordon:

This letter presents initial descriptions and interpretation of multi-element geochemical data for Buckskin Project DDH BC-5,5A (Figures 1/BC5-4/BC5 and original data tabulations). The data are, as in previous work, based on analysis of +3.3 specific gravity concentrates from 100-foot composite samples. As requested, the interpretation provided is largely confined to the BC-5,5A results and includes comments on possible geochemical indications of flat faults at 1200 and 1000 feet depths in BC-5,5A and BC-4, respectively. A more comprehensive review of target concepts in terms of these and previously developed geochemical data has been deferred until after we meet to review new data for the prospect area.

Several differences between the BC-5,5A data and previously generated concentrate geochemical data for the Bucksin Project should be noted. Sulfur determinations have been added to provide information on the composition and quantity of sulfides in the concentrate samples. These determinations replace routine binocular scope determinations of concentrate sample mineralogy. Sulfide contents of the BC-5,5A composite samples have been calculated from the sulfur values by assuming pyrite to be the only sulfur-bearing species present (see % CALC. PY, Figure 1/BC5). Determinations of Bi, Te, Sn, and W have been carried out for the first time by atomic absorption spectrophotometry (AAS) or colorimetry (COLOR) instead of optical emission spectrography (OES). This constitutes an attempt to improve data quality and decrease the overall time required for obtaining multielement data without increasing cost. In order to provide a basis for comparing these two groups of data, a suite of 10 samples previously analyzed by OES were submitted for repeat analyses by the new methods. The results indicate the BC-5,5A AAS-COLOR data can be adjusted for direct comparison with COORS Spectro-Chemical OES data by multiplying the BC-5,5A tin values by 0.5, the tellurium values by 3, and the bismuth values (all <0.5 ppm) by 30. Tungsten values for the two

CONOCO INC.

OCT 14 1980

Gordon L. Pine
October 10, 1980
Page Two

data groups are approximately equivalent. The large correction factor for the bismuth values results from apparently systematic analytical problems which should be eliminated in future work. The repeat analyses suggest these BC-5,5A bismuth data are meaningful, however. Relatively high iron values in the BC-5,5A data set compared to previous data sets probably reflect the incomplete removal of iron contamination caused by the use of steel pulverizer plates during sample preparation.

Overall geochemical signatures for the BC-5,5A samples suggest that rock penetrated by this hole was probably originally located much further from higher-grade copper-zone type mineralization than rock penetrated by DDH BC-4, which still remains one of the more encouraging holes drilled to date on this project (Re: my letter of 31 May, 1979). In the context of porphyry copper system geochemical models, the BC-5,5A geochemistry is most like that of an outer halo zone at a location near the outer limits of lead-zinc rich parts of this zone. Tellurium (adjusted values), bismuth (adjusted values of <15 ppm, not plotted), copper, molybdenum, tin (adjusted values), and tungsten values are either similar or lower in BC-5,5A than in BC-4 while manganese and arsenic values are significantly higher. As with the BC-4 and other results, however, these overall geochemical signatures are only definitive if related to a single mineralizing event. If, for example, the manganese and arsenic in BC-5,5A rocks were products of an event totally unrelated to that which gave rise to the copper and molybdenum mineralization, the interpretation provided above might be totally reversed.

Regarding geochemical indications of flat faults at or near 1200 feet and 1000 feet in BC-5,5A and BC-4, respectively, it appears that discontinuities in a few of the element distributions can be interpreted as being caused by fault offsets. Molybdenum distributions are the most convincing in this regard for both holes. In BC-5,5A molybdenum contents are relatively low in the upper part of the hole, increase sharply at 1200 feet, and remain generally higher in the lower part of the hole (Figure 2/BC5). A similar, although less well defined, geometry is observed for the molybdenum distribution in BC-4. Arsenic and possibly copper distributions in BC-5,5A (only) roughly mimic the molybdenum distribution (Figures 2/BC5 and 3/BC5) and constitute the only other reasonable geochemical evidence for the fault offsets. The presence or absence of flat faulting in BC-5,5A or BC-4 does not affect interpretation of the relative proximity of these holes to a target copper zone, since this interpretation is based on geochemical signatures which for the most part are developed throughout the holes.

Gordon L. Pine
October 10, 1980
Page Three

This, I believe, is all that can be usefully said about the BC-5,5A and BC-4 geochemical data until after we meet for a project review. Please let me know your selection of a meeting time as early as possible.

Best regards,



Robert W. Bamford

RWB:zr1

Enclosures

FIGURE 1/BC5

BC-5,5A

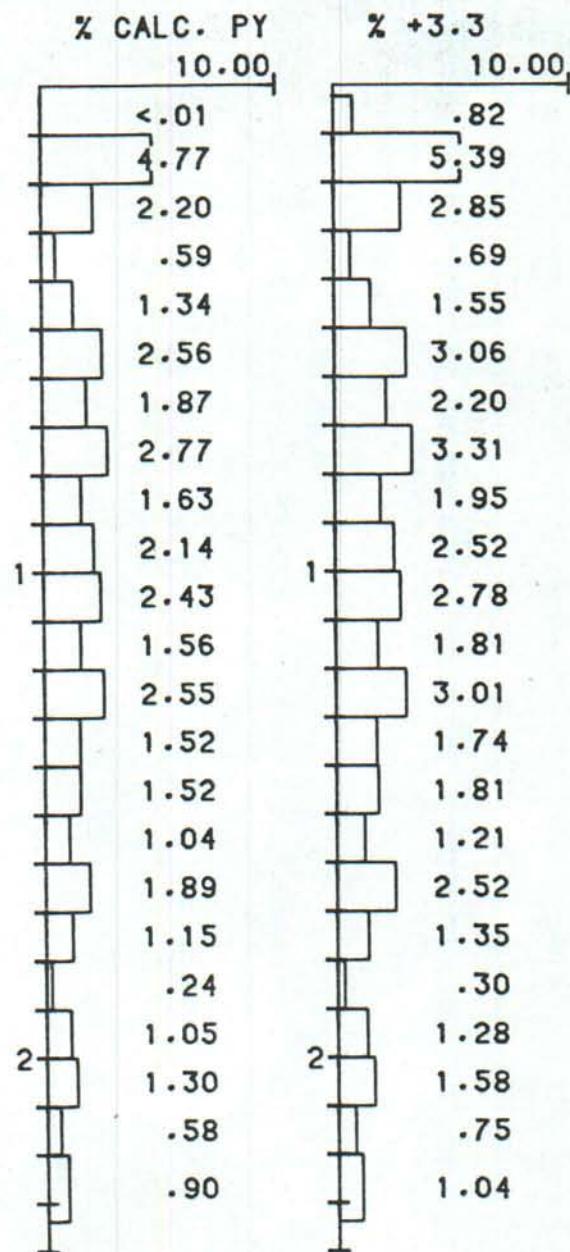
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: WHOLE ROCK
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN 1000 FT UNITS)

FIGURE 2/BC5

BC-5,5A

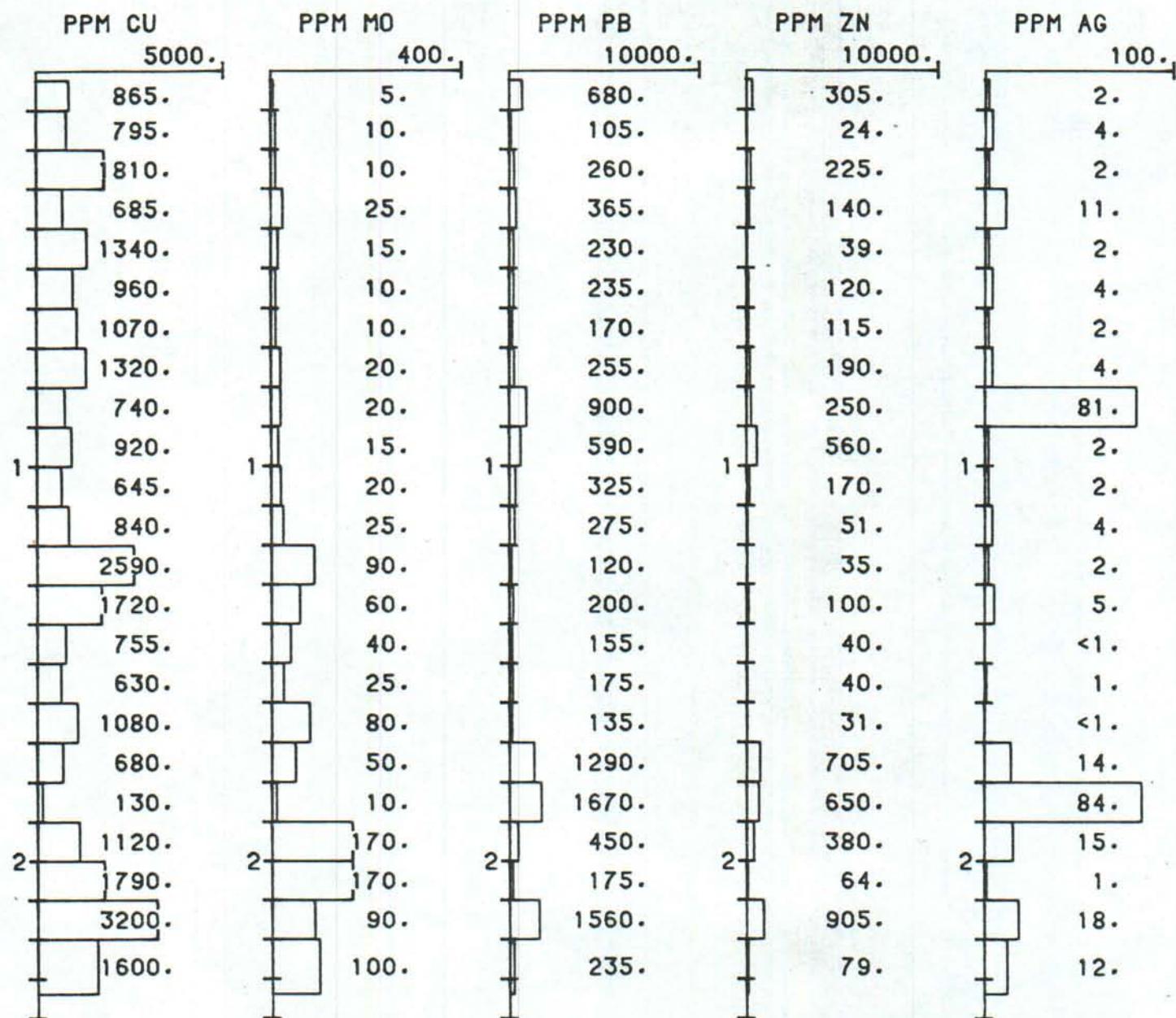
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 LESS MAG.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN 1000 FT UNITS)

FIGURE 3/BC5

BC-5,5A

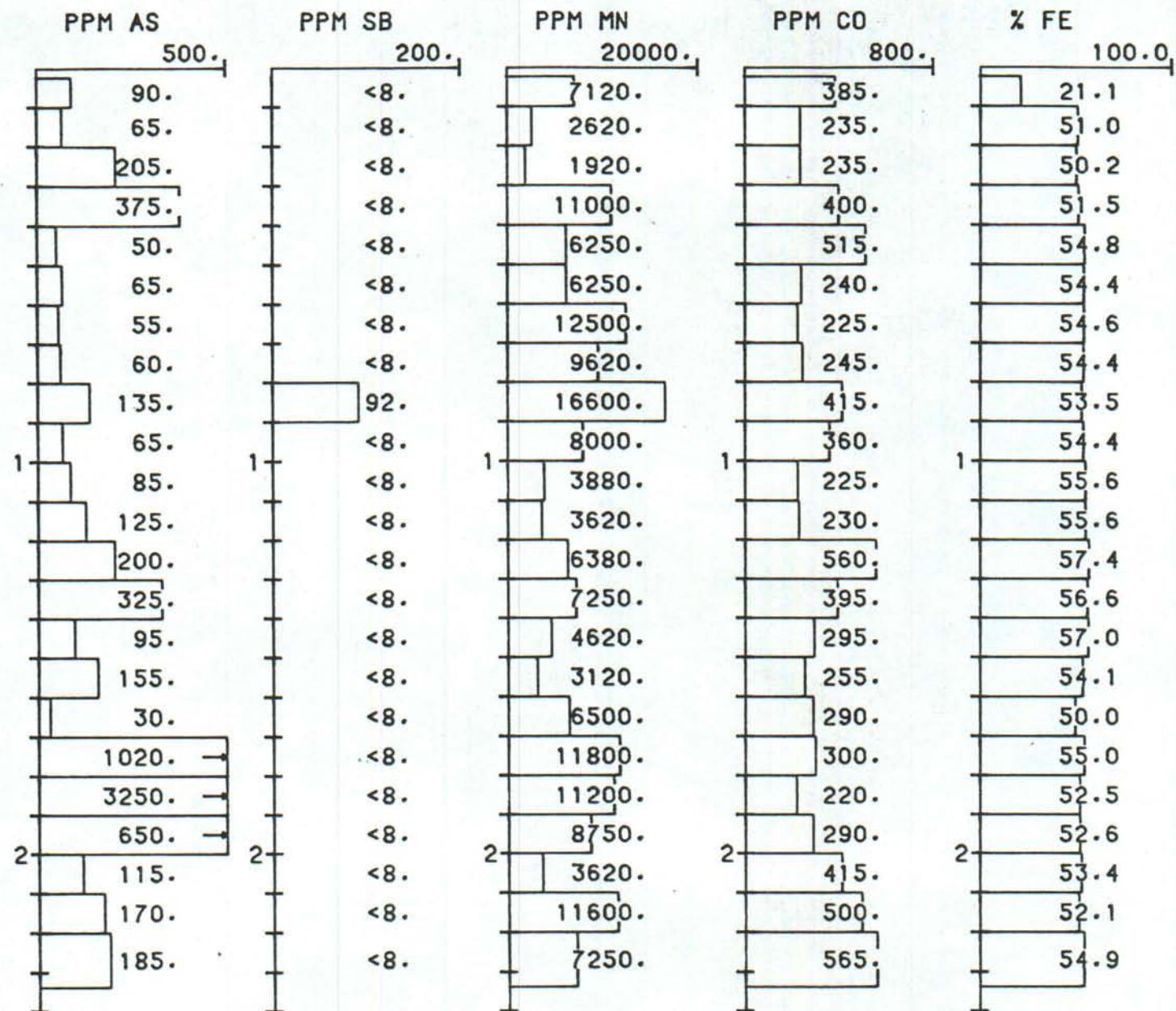
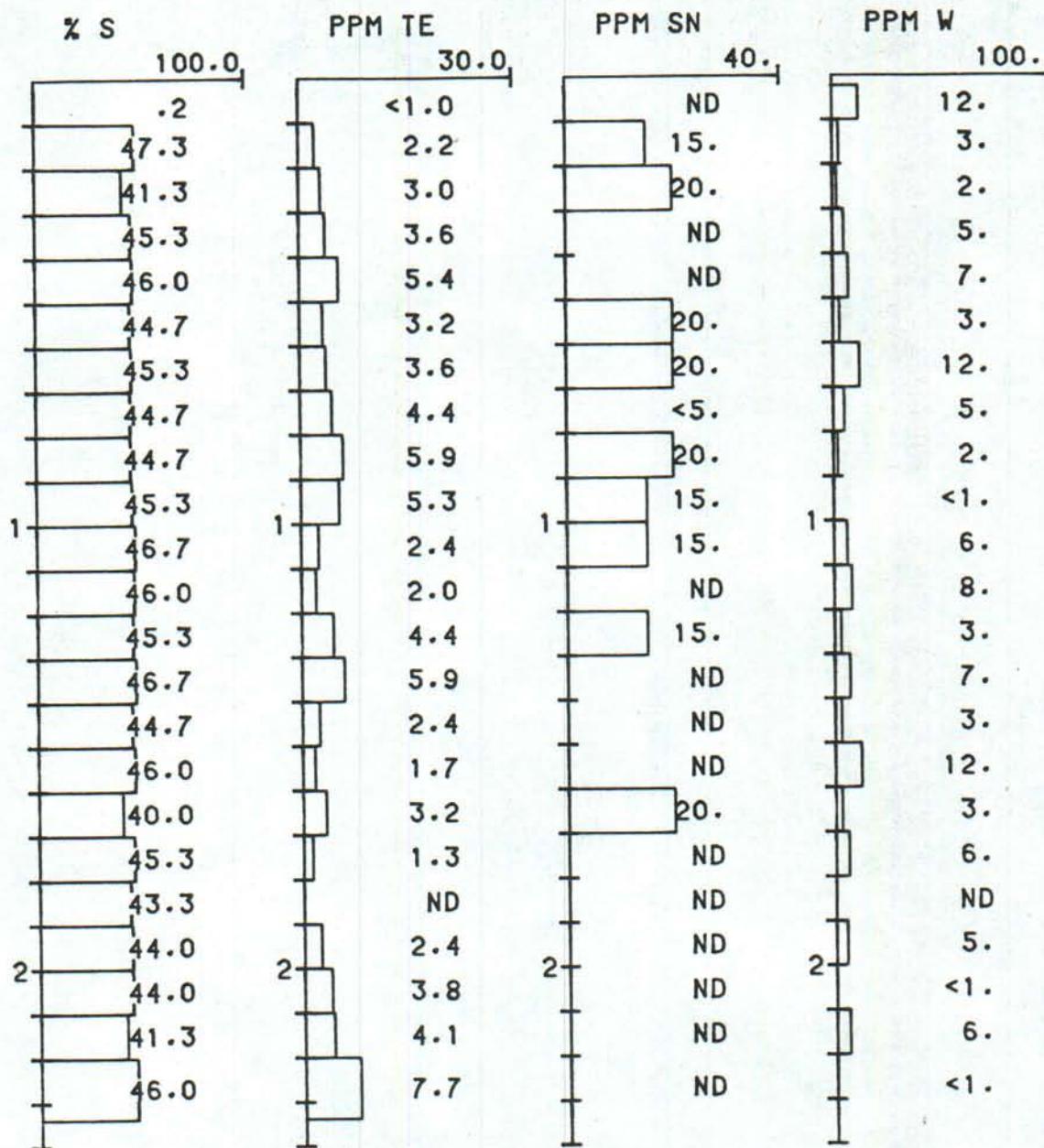
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 LESS MAG.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN 1000 FT UNITS)

FIGURE 4/BC5

BC-5,5A

BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 LESS MAG.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN 1000 FT UNITS)



WEST JORDAN OFFICE

ROCKY MOUNTAIN GEOCHEMICAL CORP.

1323 W. 7900 SOUTH • WEST JORDAN, UTAH 84084 • PHONE: (801) 255-3558

Certificate of Analysis

4

Page 1 of

Date: September 19, 1980

RMGC Numbers:

Local Job No.: 80-24-30-SL

Client: Robert W. Bamford
1138 Gilmer Dr.
Salt Lake City, Utah 84105

Foreign Job No.:

Invoice No.: M 102003

Client Order No.: none

Report On: 23 Composite Samples

Submitted by: Robert W. Bamford

Date Received: 8/18/80

Analysis: Heavy Mineral Separation, Copper, Lead, Zinc, Cobalt,
Molybdenum, Manganese, Sulfur, Silver, Iron, Antimony,

Analytical Methods: Arsenic and Tin.

Remarks: Sulfur determined by leco induction furnace. Arsenic
determined colorimetrically. Remaining elements determined
by atomic absorption.cc:
enc.
file (2)
GJC/lw

<u>Std Samples</u>	<u>ppm</u> <u>Tin</u>
J - 19	-5
J - 36	15
Beth - Con - 74	15
Lorn - Con - 74	10

All values are reported in parts per million unless specified otherwise. A minus sign (—) is to be read "less than" and a plus sign (+) "greater than." Values in parenthesis are estimates. This analytical report is the confidential property of the above mentioned client and for the protection of this client and ourselves we reserve the right to forbid publication or reproduction of this report or any part thereof without written permission.
ND = None Detected 1 ppm = 0.0001% 1 Troy oz./ton = 34.286 ppm 1 ppm = 0.0292 Troy oz./ton

Client Robert W. Bamford

Date

9/19/80

RMGC Job No.

80-24-30-SL

Page 2 of 4

<u>Sample No.</u>	<u>grams</u> <u>Wt +3.3</u>	<u>Wt %</u> <u>+3.3</u>	<u>grams</u> <u>Sample Wt separated</u>
23-100	0.66	0.82	80
100-200	4.31	5.39	80
200-300	2.28	2.85	80
300-400	0.55	0.69	80
400-500	1.24	1.55	80
500-600	2.45	3.06	80
600-700	1.76	2.20	80
700-800	2.65	3.31	80
800-900	1.56	1.95	80
900-1000	2.02	2.52	80
1000-1100	2.22	2.78	80
1100-1200	1.45	1.81	80
1200-1300	2.41	3.01	80
1300-1400	1.39	1.74	80
1400-1500	1.45	1.81	80
1500-1600	0.97	1.21	80
1600-1700	2.02	2.52	80
1700-1800	1.08	1.35	80
1800-1900	0.24	0.30	80
1900-2000	1.02	1.28	80
2000-2100	1.26	1.58	80
2100-2200	0.60	0.75	80
2200-2338	0.83	1.04	80



ROCKY MOUNTAIN GEOCHEMICAL CORP.

SALT LAKE CITY, UTAH

RENO, NEVADA

TUCSON, ARIZONA

BY Jim Cardwell
Jim Cardwell

Client Robert W. Bamford

Date

9/19/80

RMGC Job No. 80-24-30-SL

Page 3 of 4

<u>Sample No.</u>	<u>ppm Copper</u>	<u>ppm Lead</u>	<u>ppm Zinc</u>	<u>ppm Molybdenum</u>	<u>ppm Cobalt</u>	<u>ppm Manganese</u>
23-100	865	680	305	5	385	7120
100-200	795	105	24	10	235	2620
200-300	1810	260	225	10	235	1920
300-400	685	365	140	25	400	1.10%
400-500	1340	230	39	15	515	6250
500-600	960	235	120	10	240	6250
600-700	1070	170	115	10	225	1.25%
700-800	1320	255	190	20	245	9620
800-900	740	900	250	20	415	1.66%
900-1000	920	590	560	15	360	8000
1000-1100	645	325	170	20	225	3880
1100-1200	840	275	51	25	230	3620
1200-1300	2590	120	35	90	560	6380
1300-1400	1720	200	100	60	395	7250
1400-1500	755	155	40	40	295	4620
1500-1600	630	175	40	25	255	3120
1600-1700	1080	135	31	80	290	6500
1700-1800	680	1290	705	50	300	1.18%
1800-1900	130	1670	650	10	220	1.12%
1900-2000	1120	450	380	170	290	8750
2000-2100	1790	175	64	170	415	3620
2100-2200	3200	1560	905	90	500	1.16%
2200-2338	1660	235	79	100	565	7250



ROCKY MOUNTAIN GEOCHEMICAL CORP.

SALT LAKE CITY, UTAH

RENO, NEVADA

TUCSON, ARIZONA

<u>Sample No.</u>	<u>ppm Silver</u>	<u>% Iron</u>	<u>ppm Antimony</u>	<u>ppm Arsenic</u>	<u>% Sulfur</u>	<u>ppm Tin</u>
23-100	2	21.1	-8	90	0.18	
100-200	4	51.0	-8	65	47.3	15
200-300	2	50.2	-8	205	41.3	20
300-400	11	51.5	-8	375	45.3	
400-500	2	54.8	-8	50	46.0	
500-600	4	54.4	-8	65	44.7	20
600-700	2	54.6	-8	55	45.3	20
700-800	4	54.4	-8	60	44.7	-5
800-900	81	53.5	92	135	44.7	20
900-1000	2	54.4	-8	65	45.3	15
1000-1100	2	55.6	-8	85	46.7	15
1100-1200	4	55.6	-8	125	46.0	
1200-1300	2	57.4	-8	200	45.3	15
1300-1400	5	56.6	-8	325	46.7	
1400-1500	-1	57.0	-8	95	44.7	
1500-1600	1	54.1	-8	155	46.0	
1600-1700	-1	50.0	-8	30	40.0	20
1700-1800	14	55.0	-8	1020	45.3	
1800-1900	84	52.5	-8	3250	43.3	
1900-2000	15	52.6	-8	650	44.0	
2000-2100	1	53.4	-8	115	44.0	
2100-2200	18	52.1	-8	170	41.3	
2200-2338	12	54.9	-8	185	46.0	

By

Jim Cardwell
Jim Cardwell

ROCKY MOUNTAIN GEOCHEMICAL CORP.

SALT LAKE CITY, UTAH

RENO, NEVADA

TUCSON, ARIZONA

(35)

Item 15

1138 Gilmer Drive
Salt Lake City, Utah 84105
(801) 583-3366
May 20, 1977

Mr. William M. Oriel, Geologist
Continental Oil Company
P.O. Box 7608
Reno, Nevada 89510

Dear Bill:

Attached are sixteen figures showing the surface geochemical distributions established in our Buckskin survey. These include data for Cu, Mo, Pb, Zn, Ag, As, Bi, Te, Tl, In, Sn, W, Mg, Co, Ni, and Fe in the specific gravity concentrate samples. Also attached are corresponding geochemical data for drill hole BC-1 and an overlay showing the principal areas of interest (with priorities) indicated by this work. In addition to the surface geochemistry, some use was made of the drill hole data you sent us in establishing geochemical models and arriving at the indicated priorities.

Two principal conceptual models remain possible for the area:
(1) a westward tilted system with its top in the vicinity of the BSW drill holes and highest grade mineralization located to the east (more than 2000 feet?) and deep (more than 1000 feet), and
(2) an upright system with its center approximately located 1000 to 2000 feet east and southeast of BSW-7 (changes in element associations and offsets in the geochemical patterns suggest possible fault disruptions between BSW-7 and the hypothetical center).
Other interpretations are possible depending on structural complexity, but these two are the most probable in light of available data.

The "Priority 1" target area was so established because drilling within its central portions will permit at least partial testing of both concepts, and at worst valuable additional geologic and geochemical information can be obtained. A drill hole located at or within 500 feet south to 500 feet west of BUL-9 should test central to eastern mineralized portions of any upright system of reasonable size. It could also intersect upper portions of higher grade mineralization in a tilted system (at 2000 to 3000 feet depth?) or should at least provide useful additional information on the existence of such mineralization. Surface plus drill hole geochemical data suggest that the hole BC-1 was collared north and either east or west of best-grade copper mineralization. A hole positioned near the eastern margin of the Bear Creek claims along a bearing between BSW-7 and BUL-9 (as discussed by telephone) could test western mineralized portions of an upright system or might provide useful information on a tilted system.

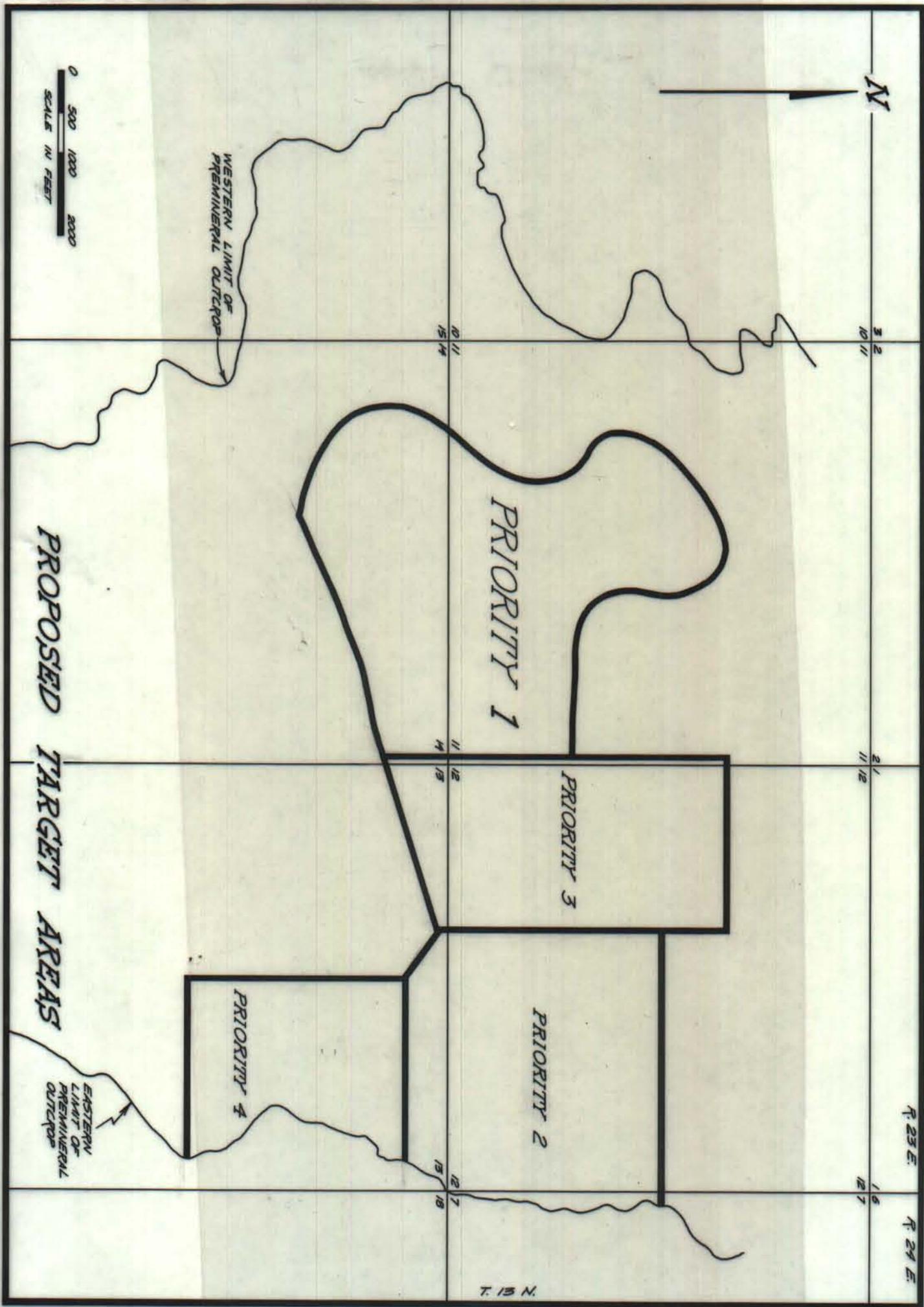
This information is hopefully enough to permit you to finalize plans for your initial 1977 drill hole. The final report on the geochemical surveys is nearing completion and, barring any unforeseen circumstances (like the flooding of Great Salt Lake), should be in the mail to you next week. It will present much of the rationale for what I described above and for selection of the other areas of interest and their priorities.

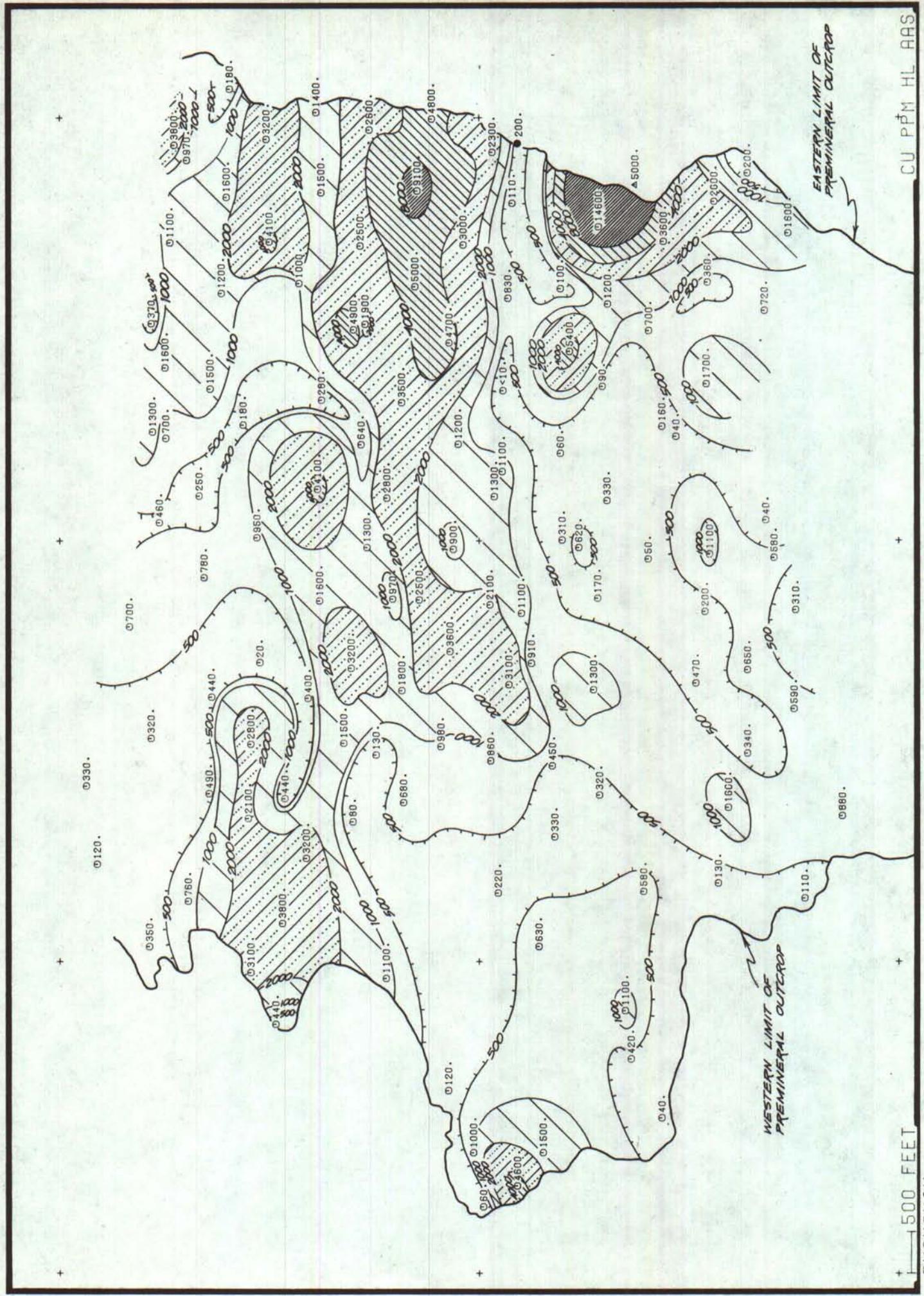
Good hunting.

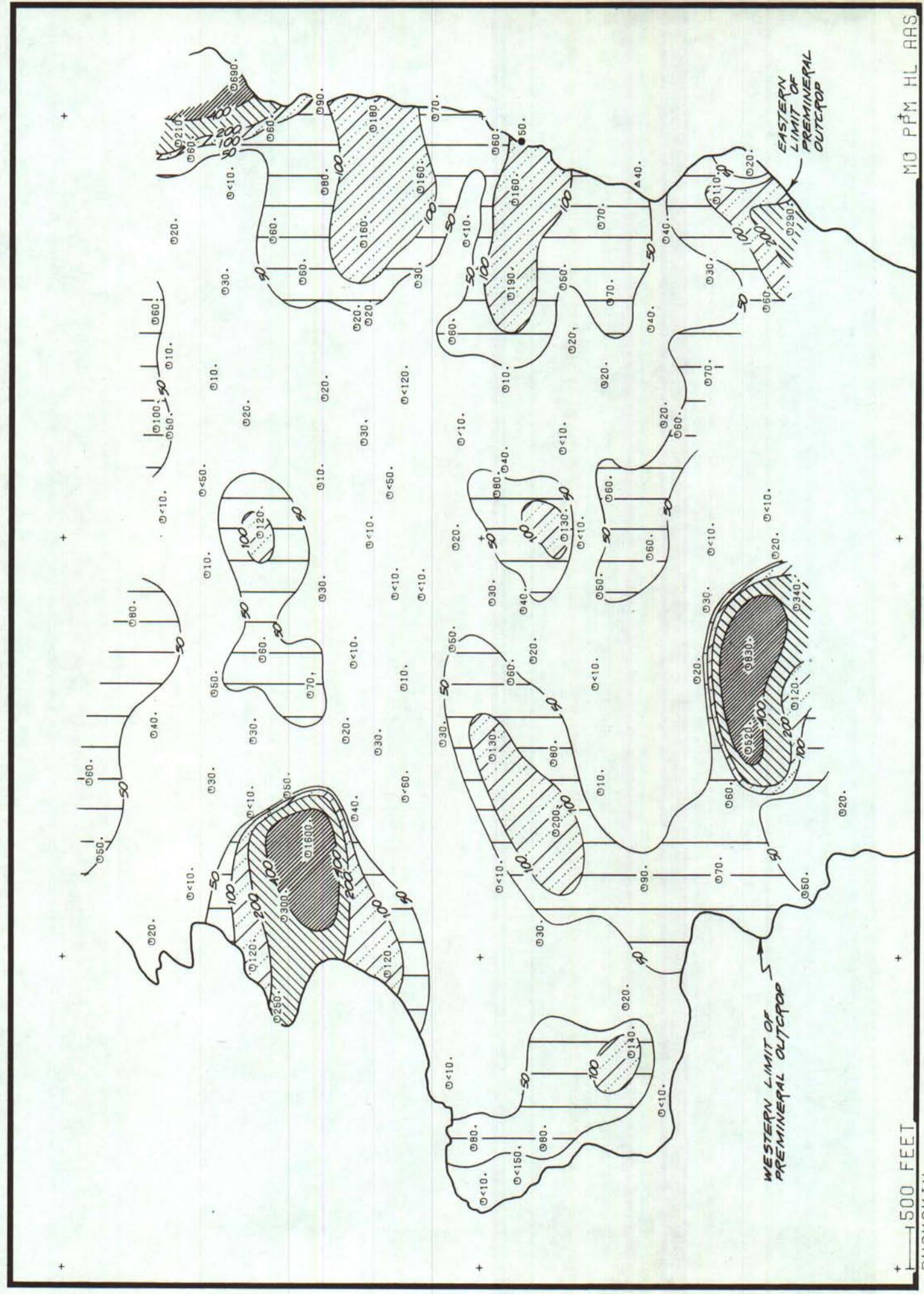
Best regards,

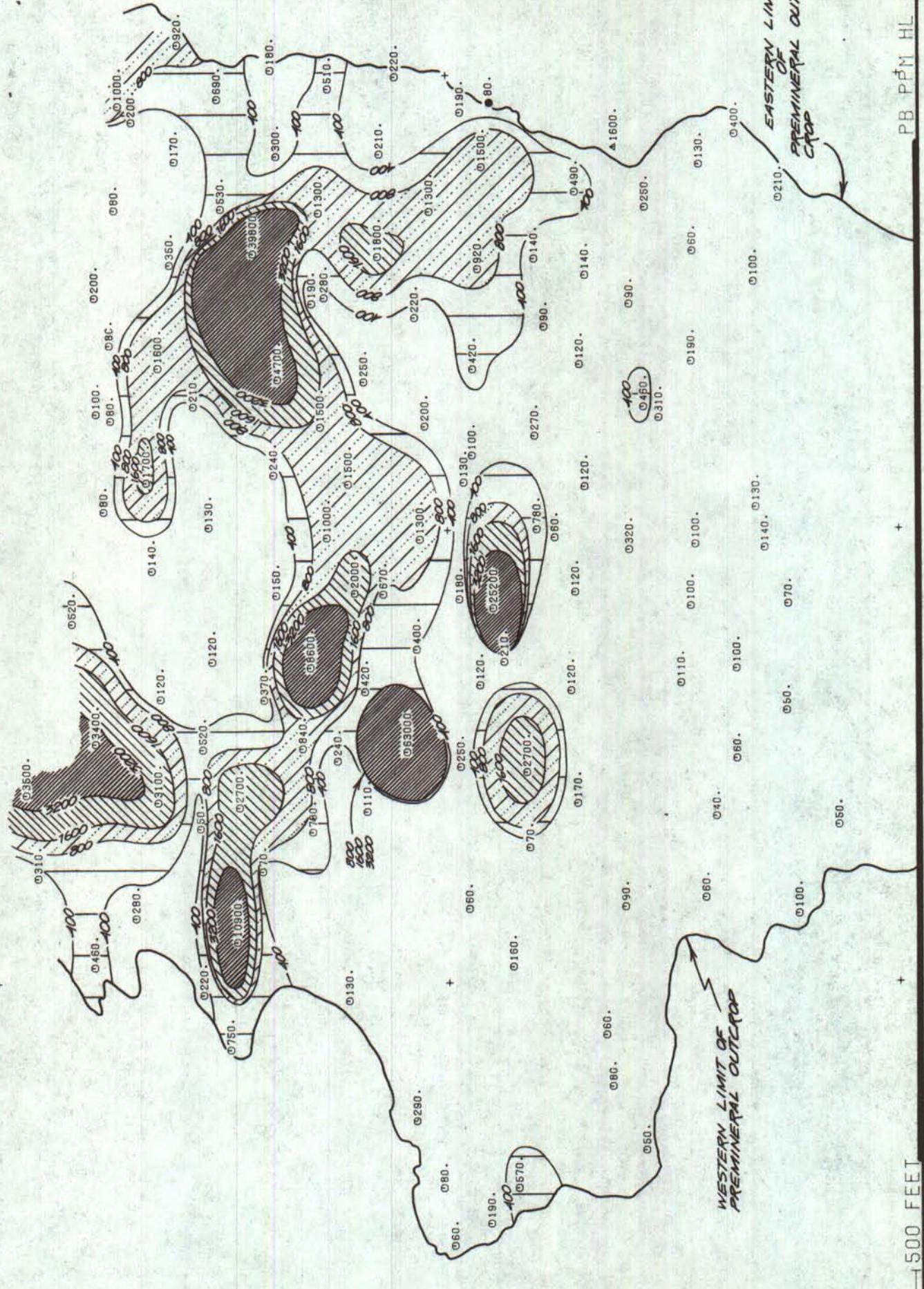


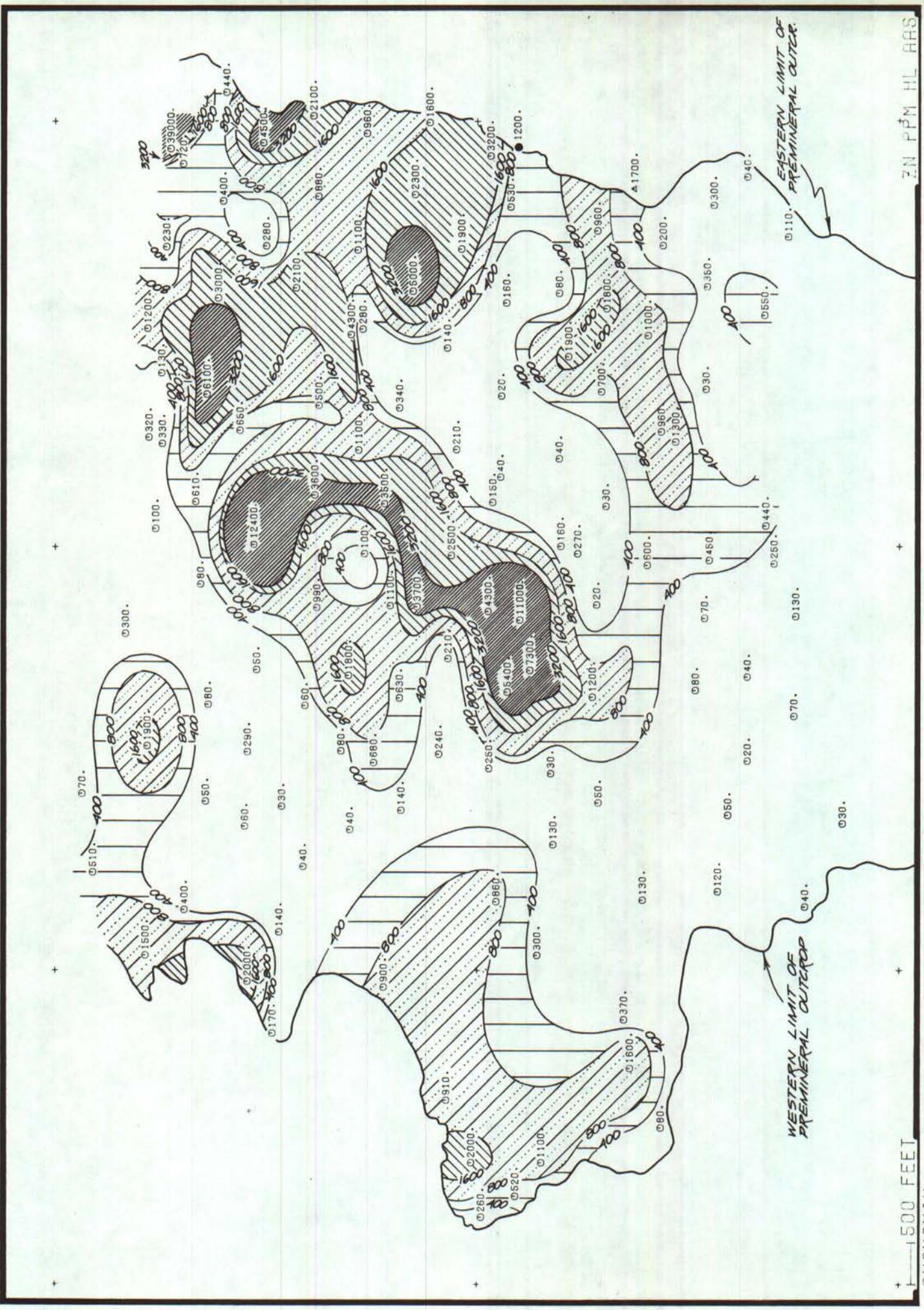
Robert W. Bamford
Consultant

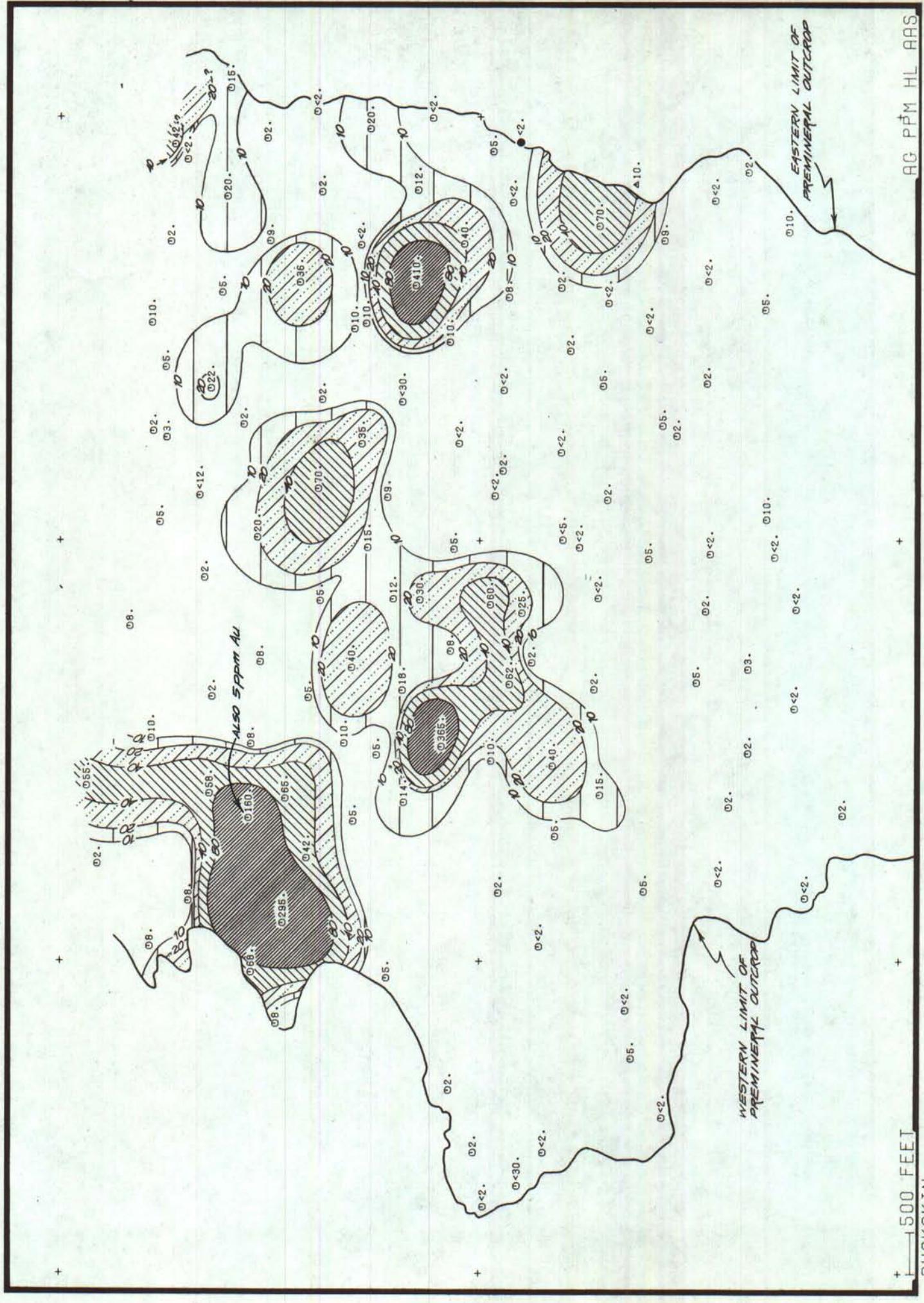


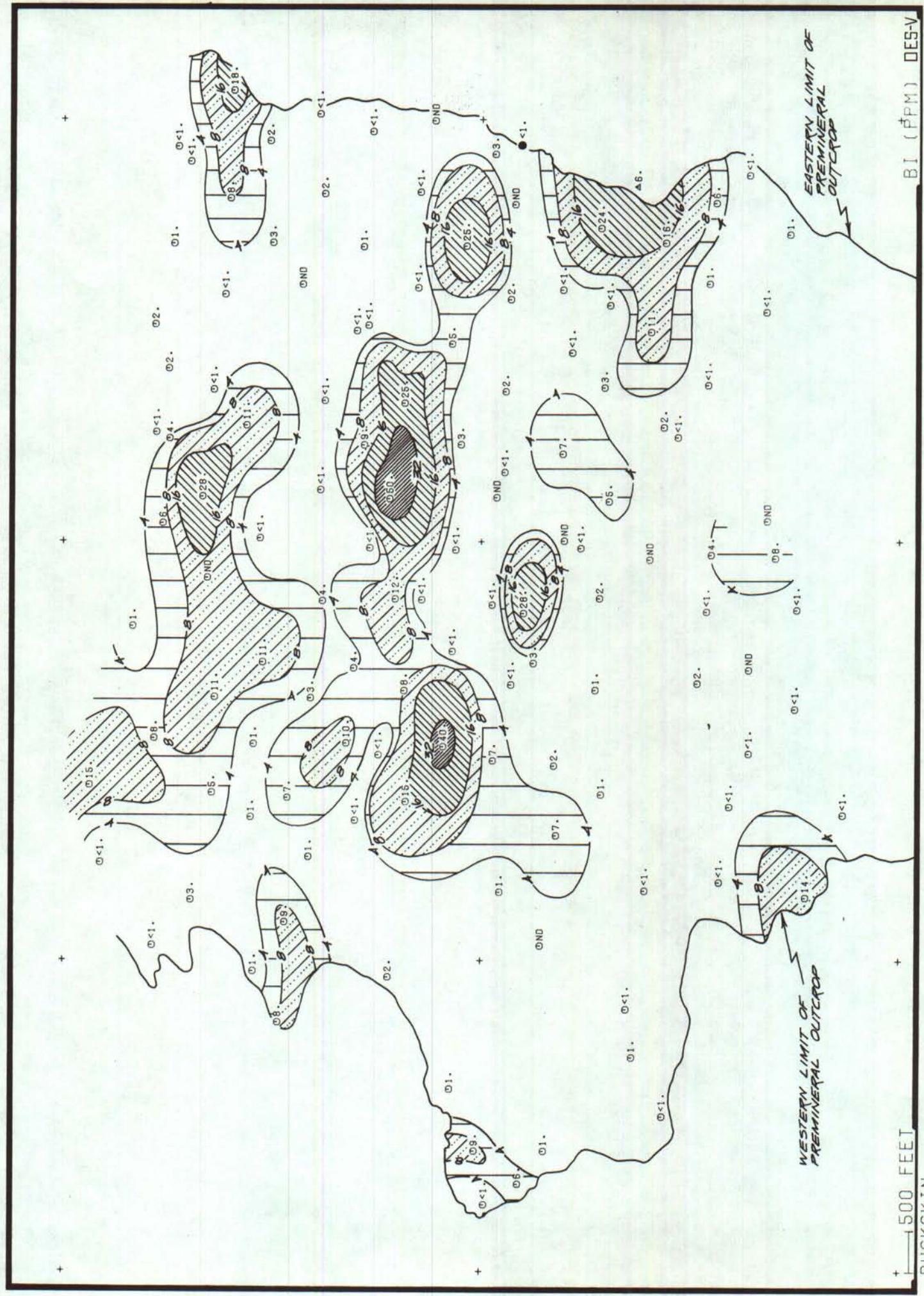


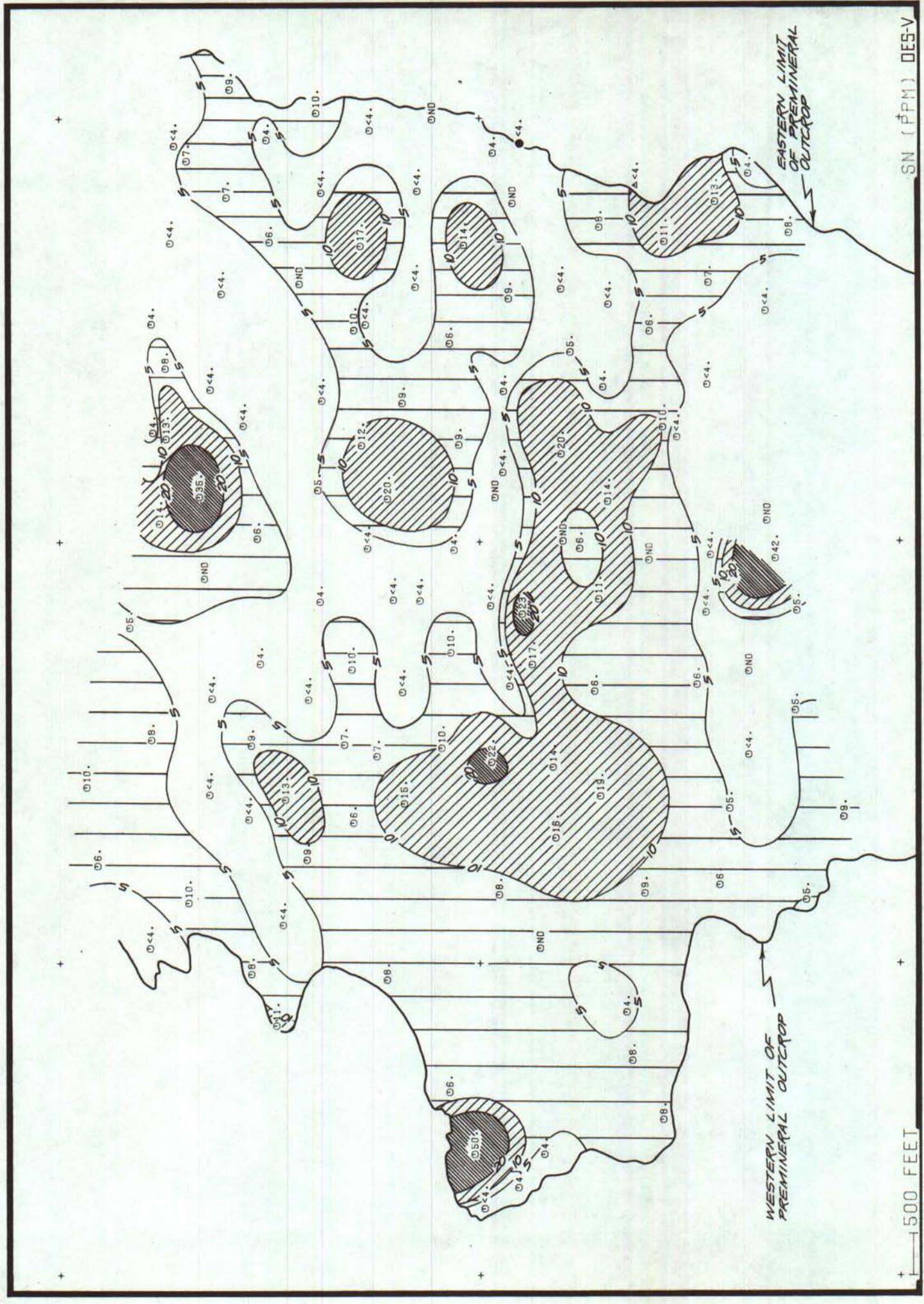


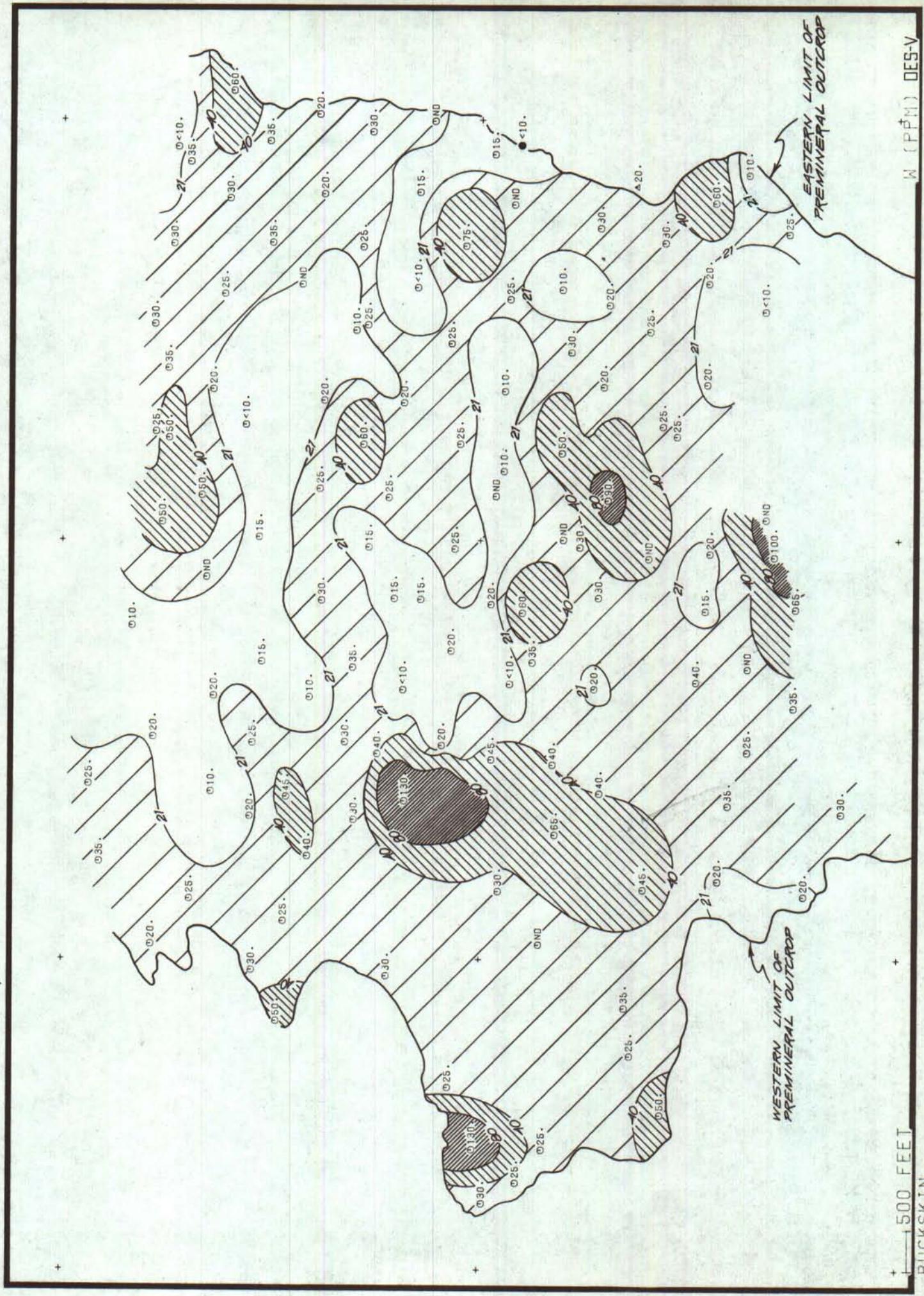


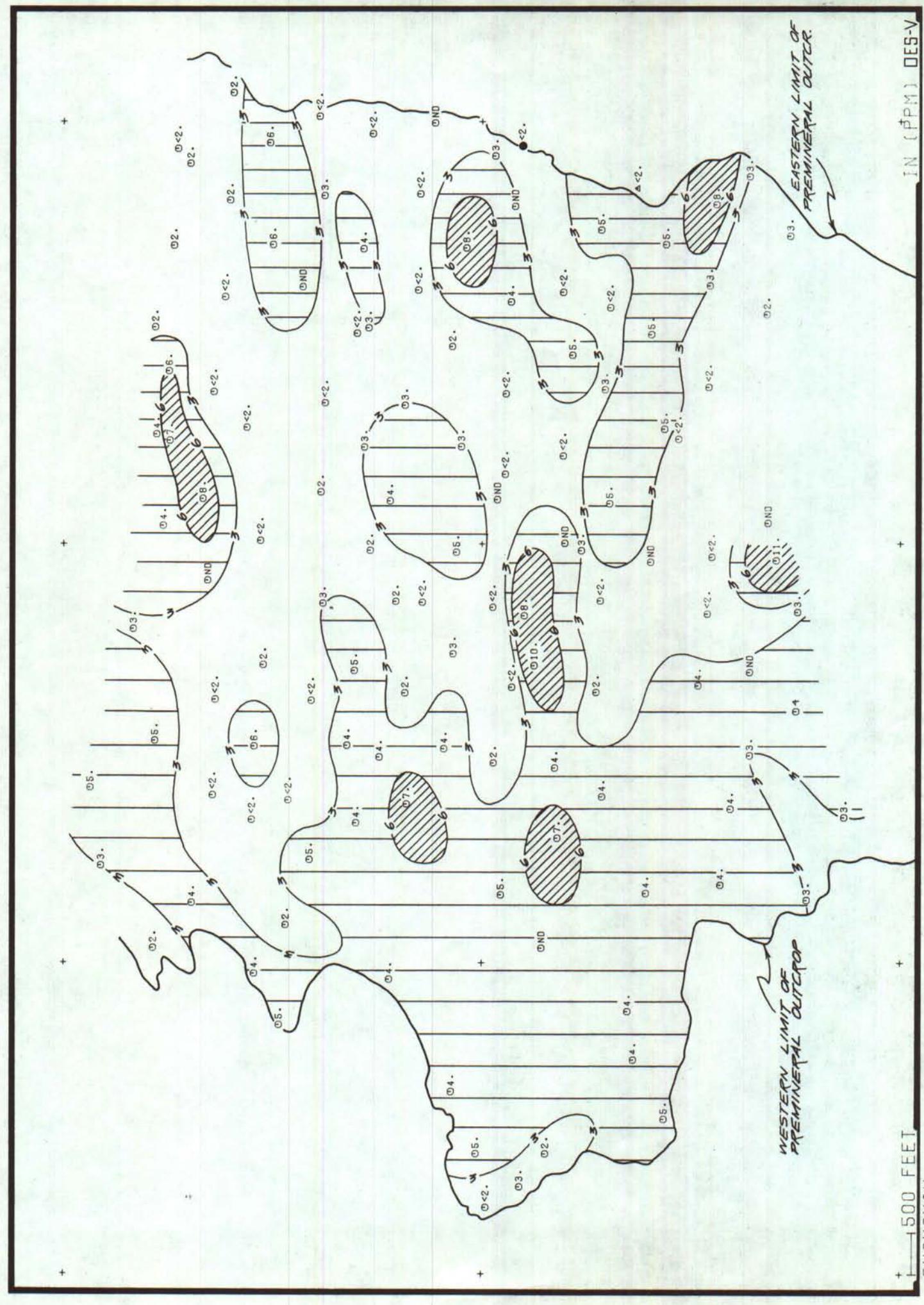












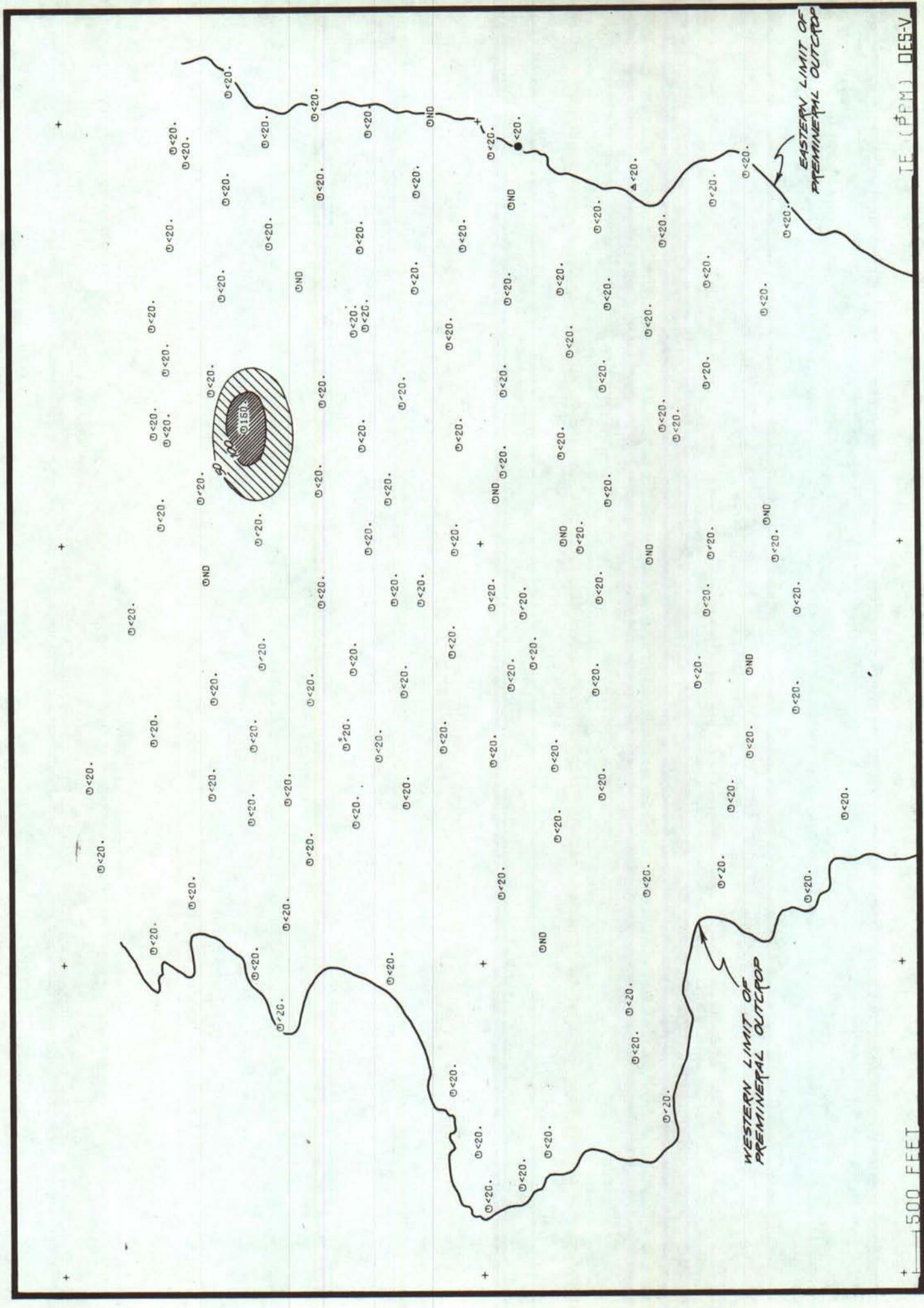
BUCKSKIN

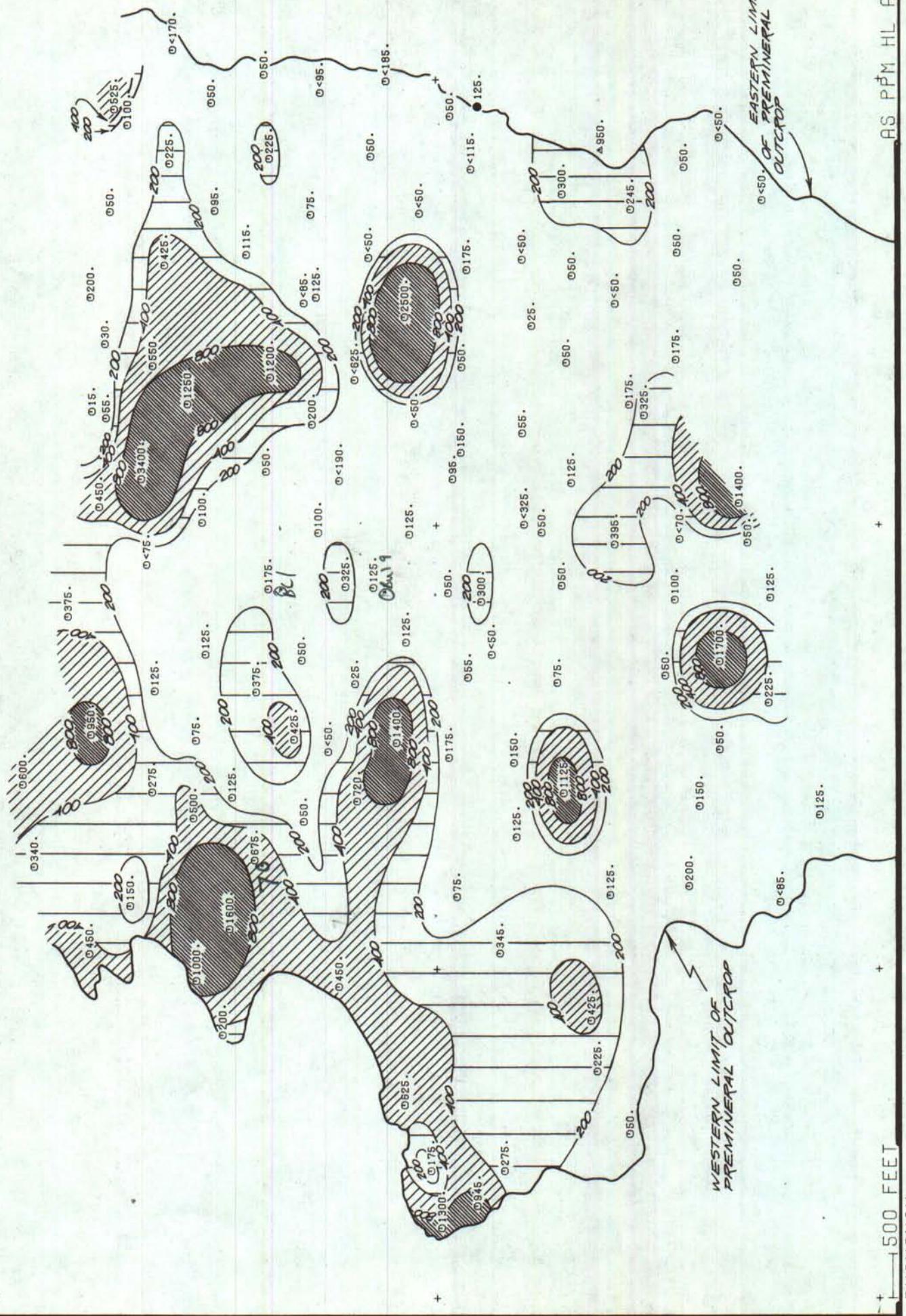
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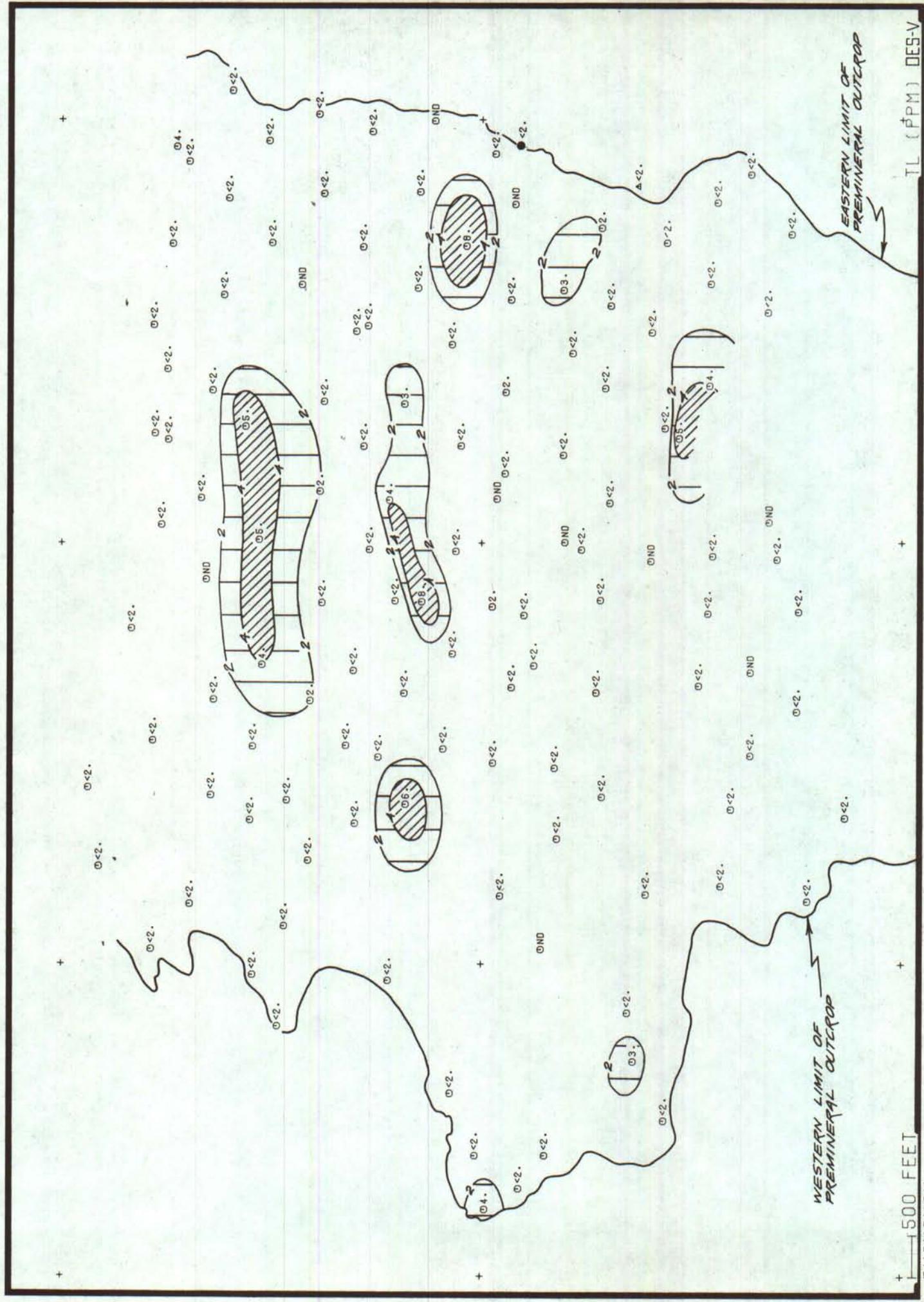
15 06/13/77 - 13120139

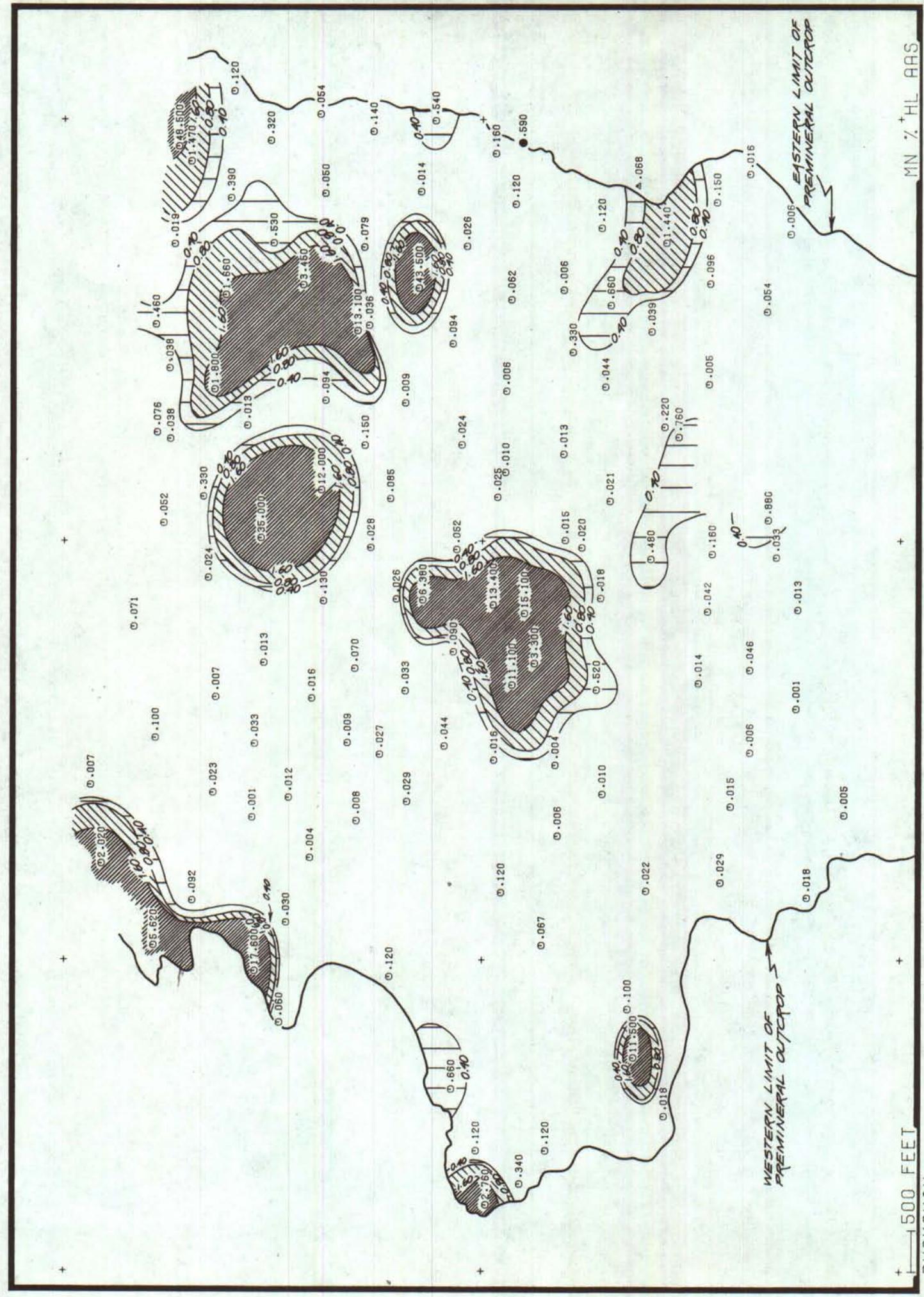
IN [PPM] OES-V

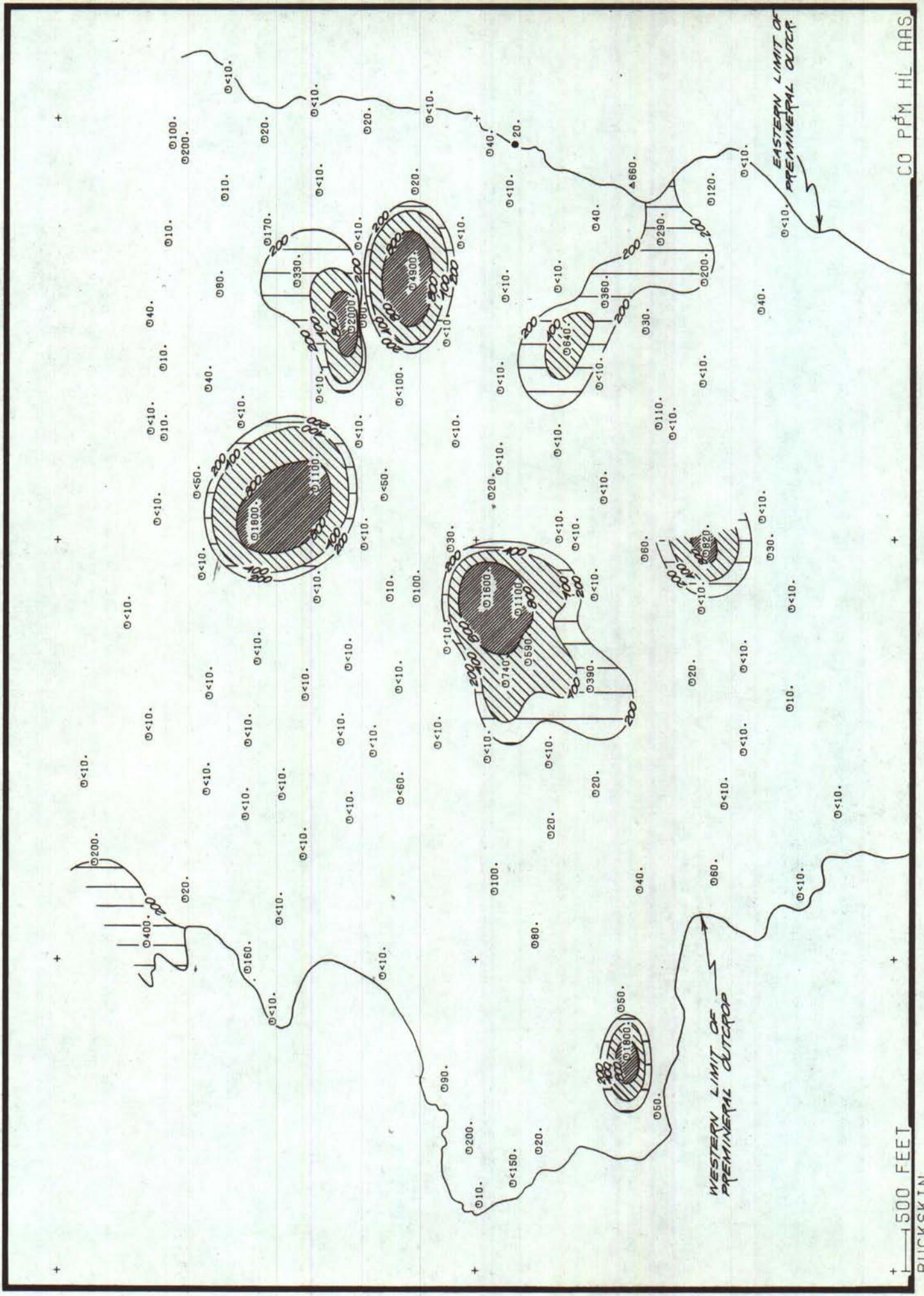


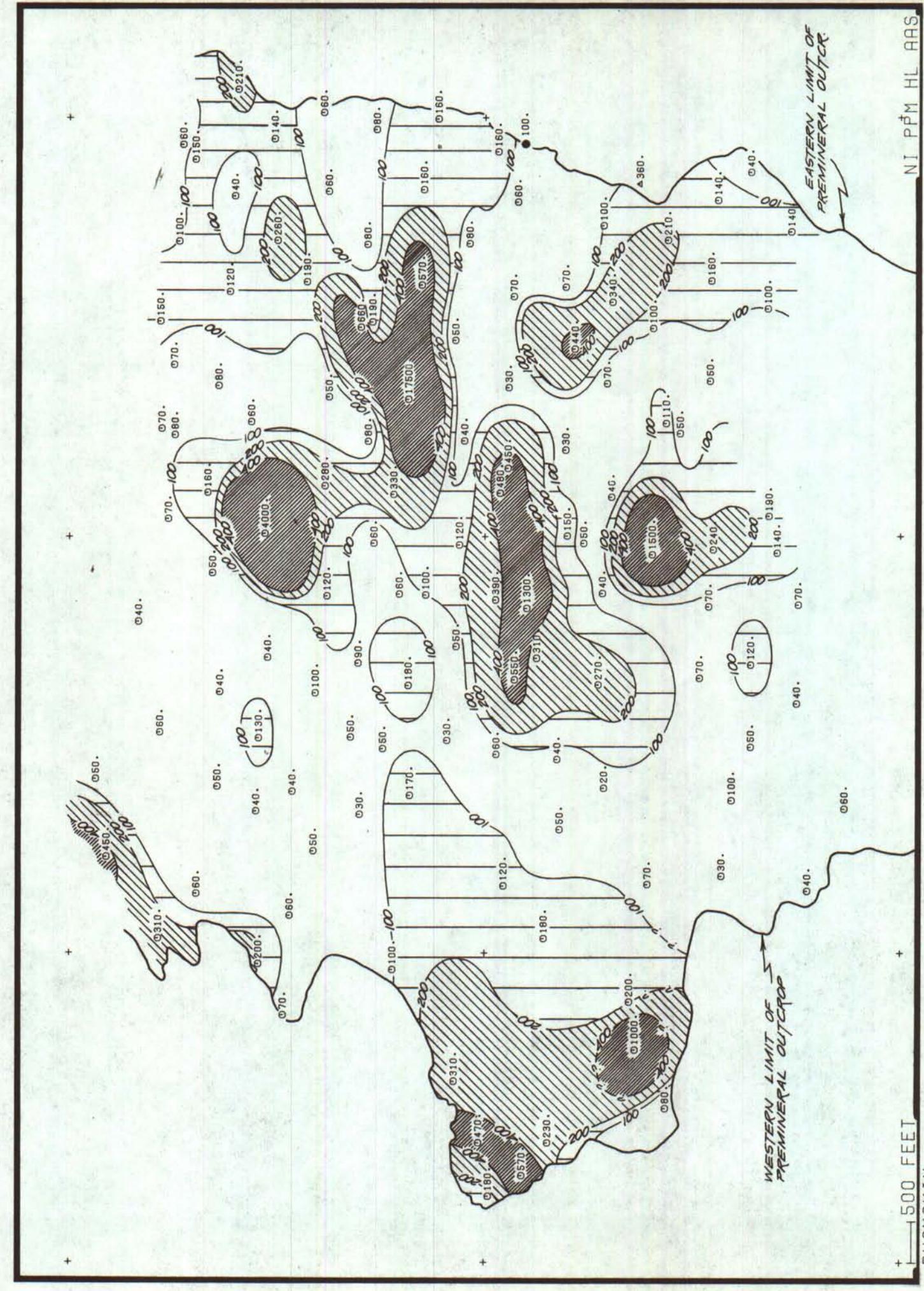










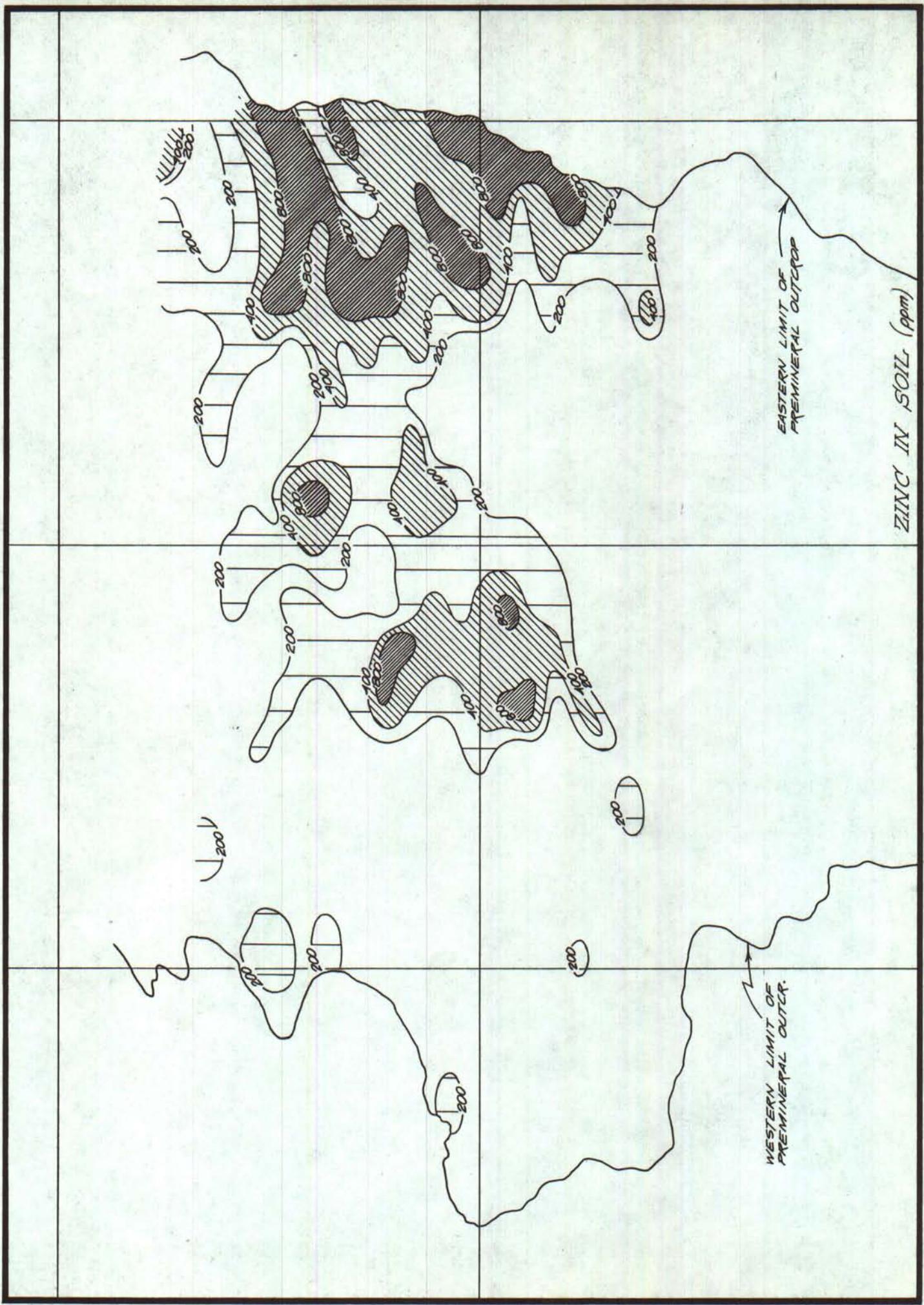


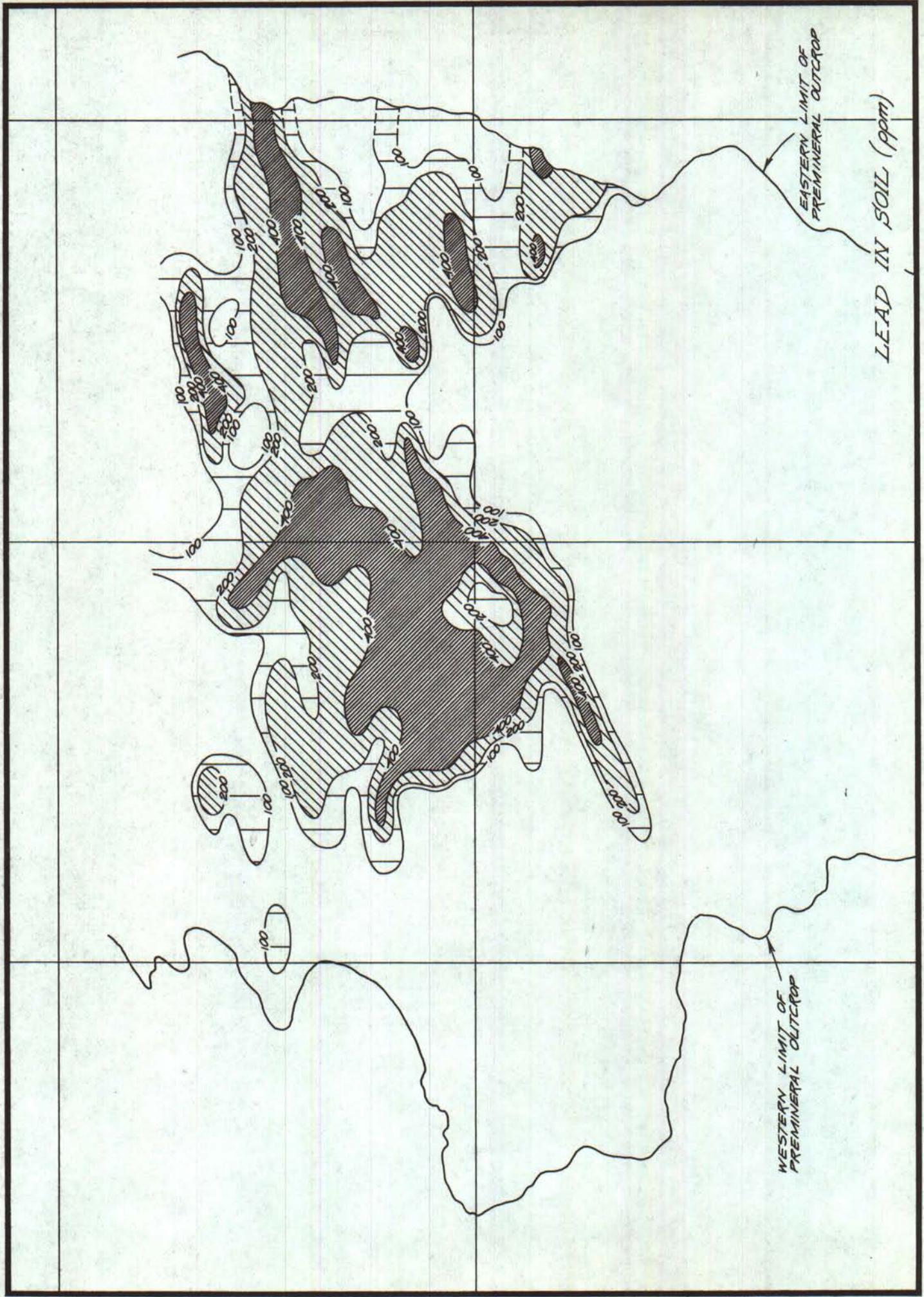
+ +	④42.1	④47.5	+ +
④44.0	④42.0	④47.0	
④48.6	④44.5	④44.8	④46.0 ④53.0 ④45.5 ④49.2 ④3.4 ④4.1 ④7.5 ④4.8 ④5.0 ④4.5
④29.2	④51.2	④60.1	④33.9 ④34.5 ④44.8 ④45.0 ④49.8 ④46.8
④42.0	④44.0	④38.8	④42.5 ④14.2 ④43.0 ④49.3 ④49.0 ④46.8
			④33.7
④48.5	④48.5	④48.2	④47.5 ④36.5 ④39.5 ④44.8 ④41.0 ④44.8
④45.0	④36.3	④47.0	④48.6 ④41.6 ④44.5 ④25.1 ④44.0 ④46.4 ④4.0 ④44.0 ④43.4 ④48.0
			④42.8 ④42.2 ④8.5 ④47.5 ④44.8
④47.5	④37.5	④48.2	④48.0 ④44.2 ④46.8 ④52.0 ④48.5 ④47.2 ④39.5 ④24.5 + ④46.2 ④35.5 ④48.0 ④37.8 ④56.2
+ ④47.1	④47.2	④42.5	④42.0 ④43.7 ④46.0 ④38.8 ④28.6 ④5.6 ④45.5 ④31.5 ④48.5 ④43.2 ④25.5 ④47.5 ④9.5 ④43.2 ④42.8 ④51.0 ④50.2 ④50.0 ④48.5
④47.5	④43.7	④47.2	④40.0 ④51.8 ④47.8 ④43.8 ④46.0 ④48.9 ④44.5 ④47.8 ④45.5 ④4.0 ④51.8 ④47.8 ④41.3 ④42.6 ④46.0 ④42.2 ④50.5 ④44.5 ④44.5
			④52.0 ④48.5 ④51.0 ④34.8 ④40.8 ④37.2 ④45.5 ④50.5 ④44.0 ④28.2 ④40.5 ④55.8 ④40.8 ④37.2 ④45.5 ④44.0 ④50.5 ④44.0
			④60.6 +
			FE (‡) HL AAS

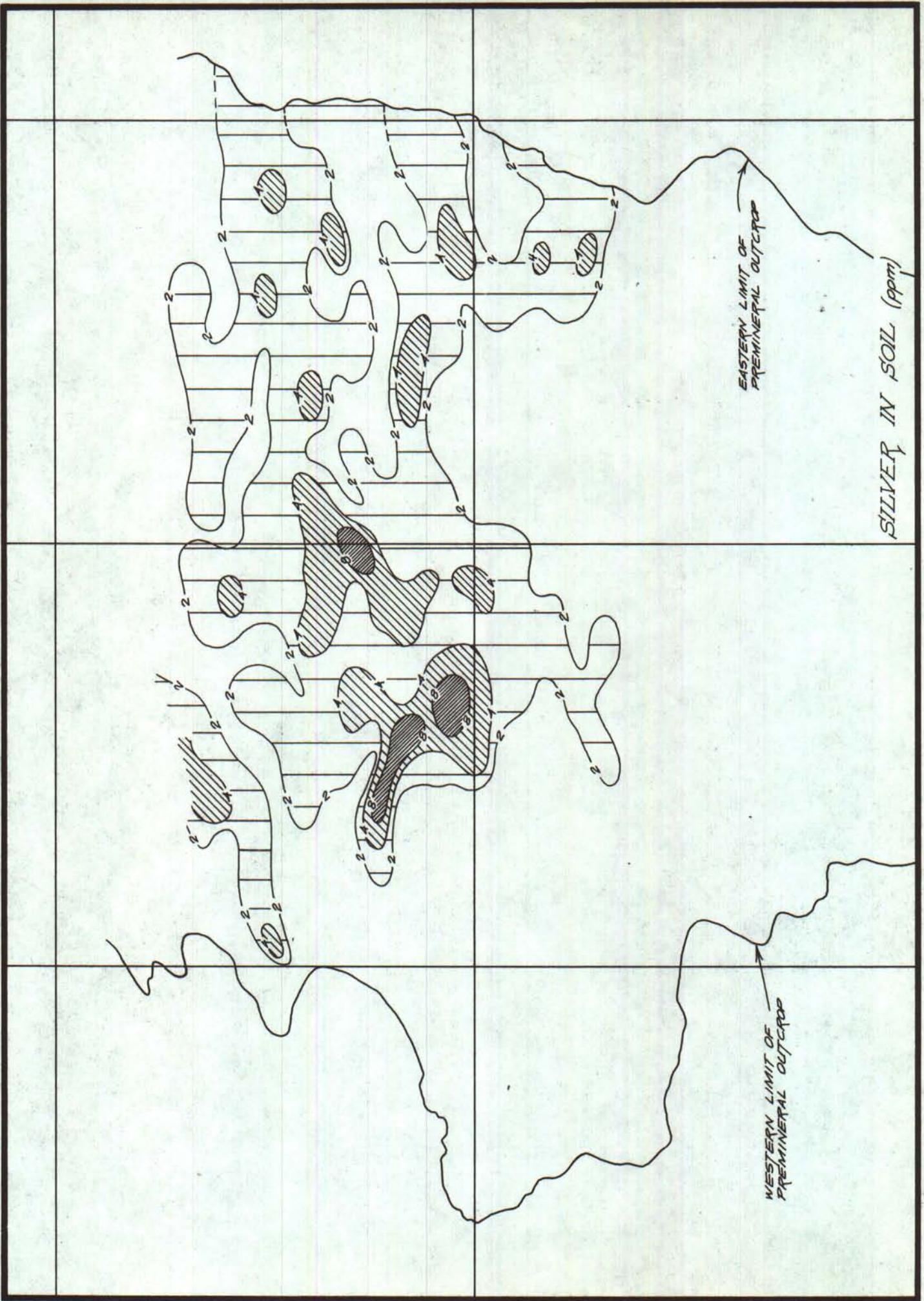
+ → 500 FEET
BUCKSKIN

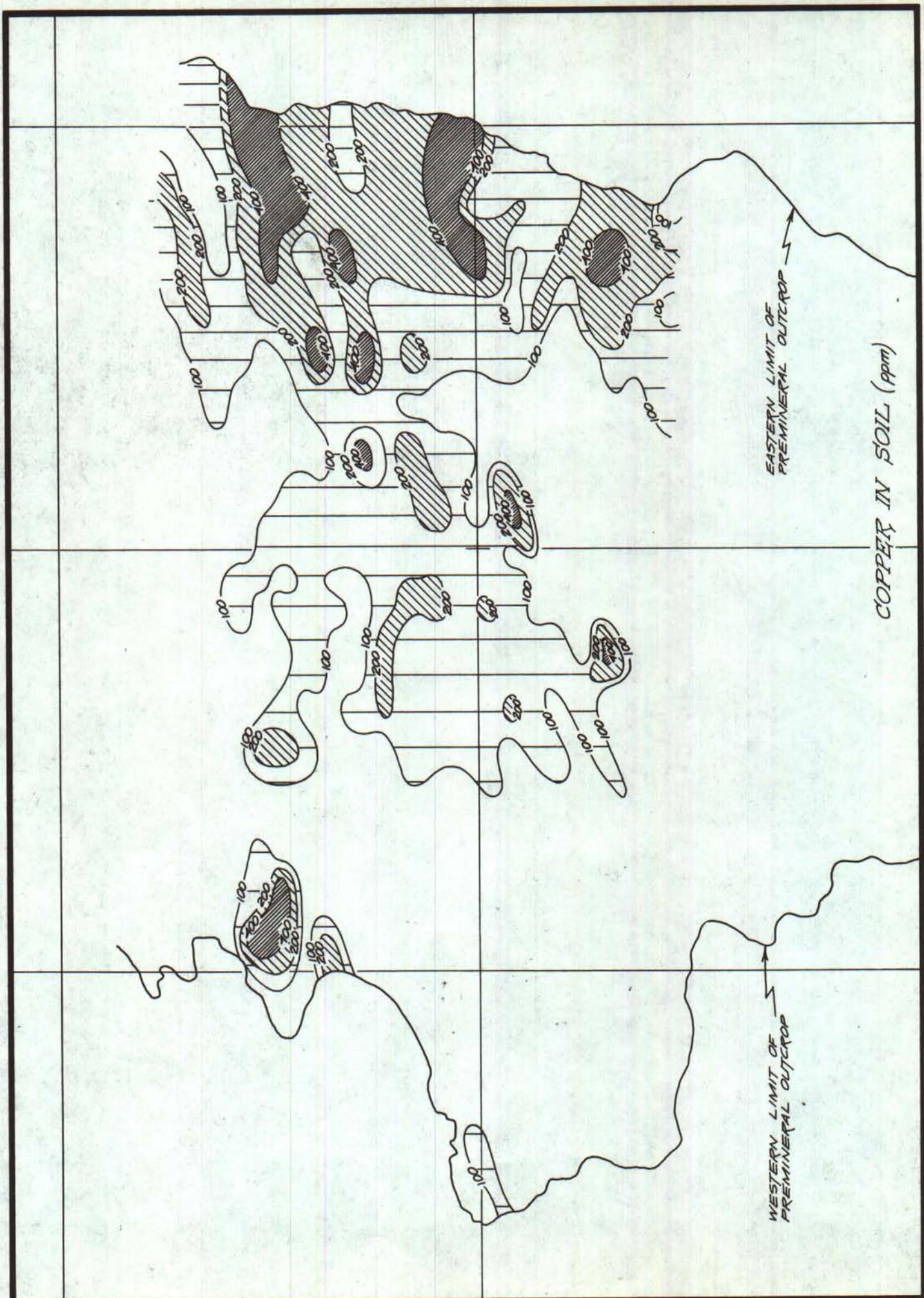
COMCO - 889200 (S1 87 23)
11 06/13/77 - 1328123











SULFIDE CONCENTRATE SAMPLE

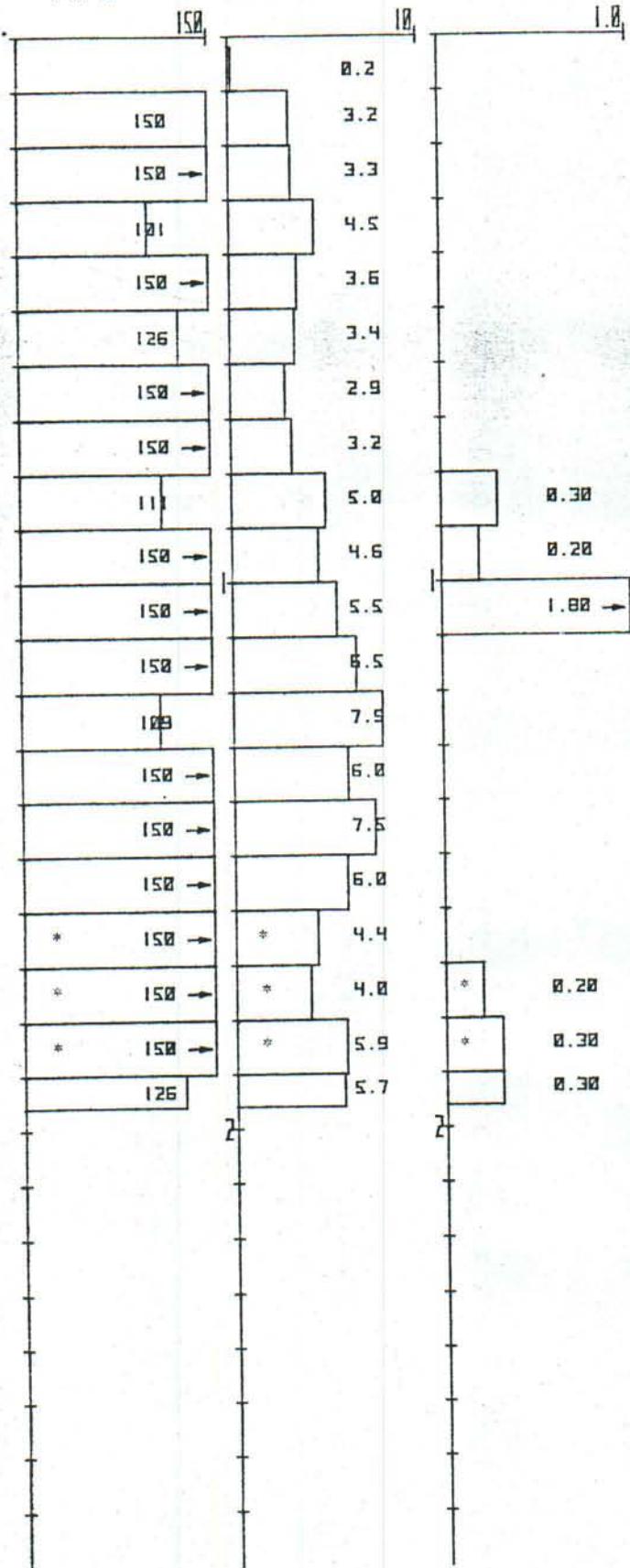
DEPTH IN THOUSANDS OF FEET

*SILICATE IMPURITIES >20%

PY/CP

% SULF.

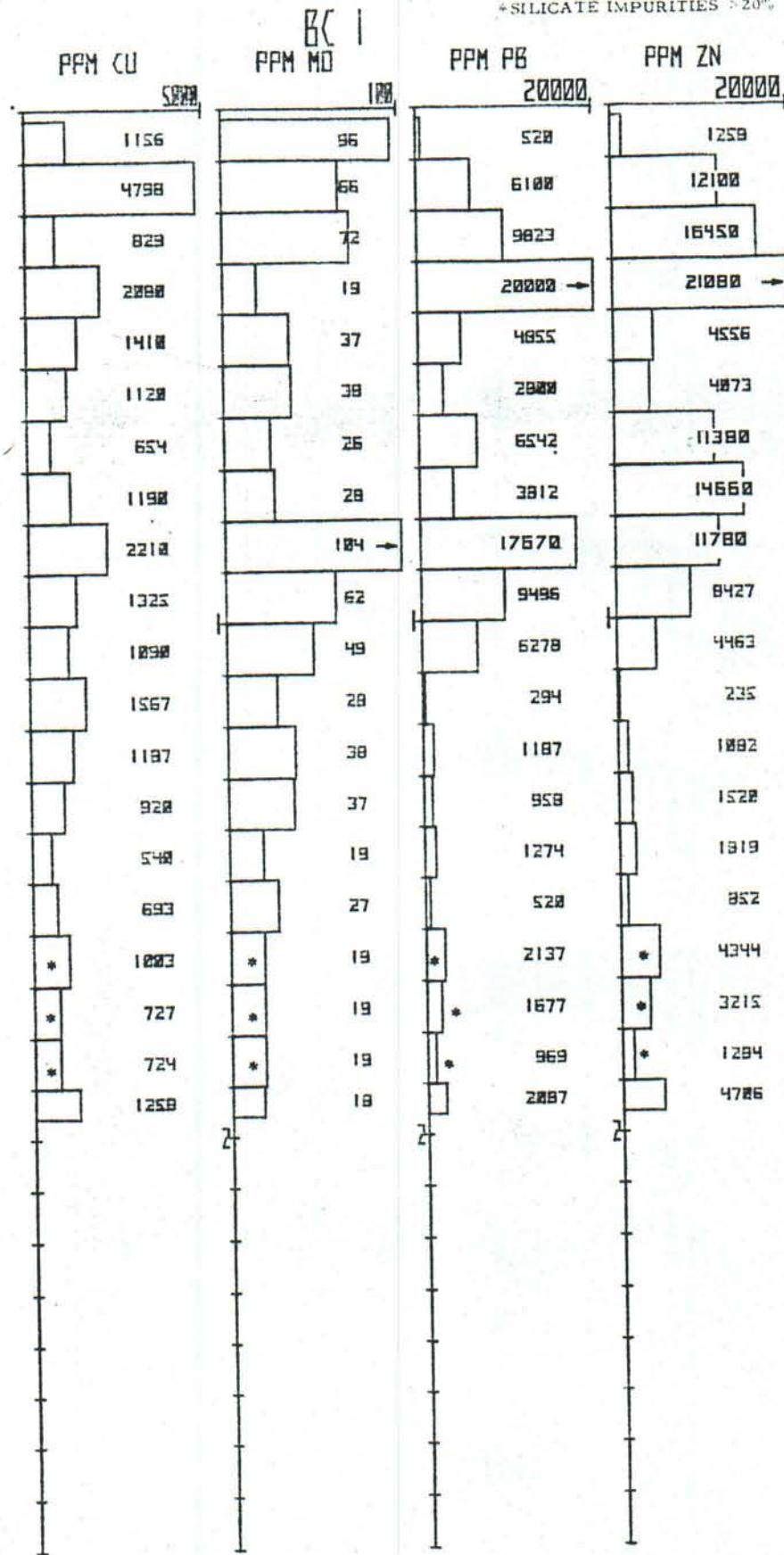
% MTE.



HL CONCENTRATE SAMPLE - AAS

DEPTH IN THOUSANDS OF FEET

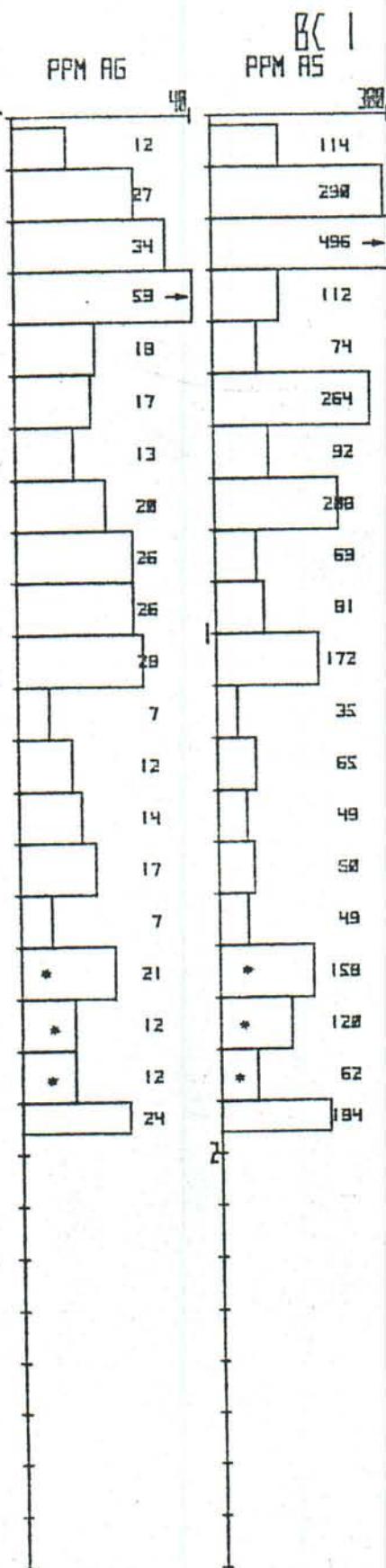
*SILICATE IMPURITIES > 20%



HL CONCENTRATE SAMPLE - AAS

DEPTH IN THOUSANDS OF FEET

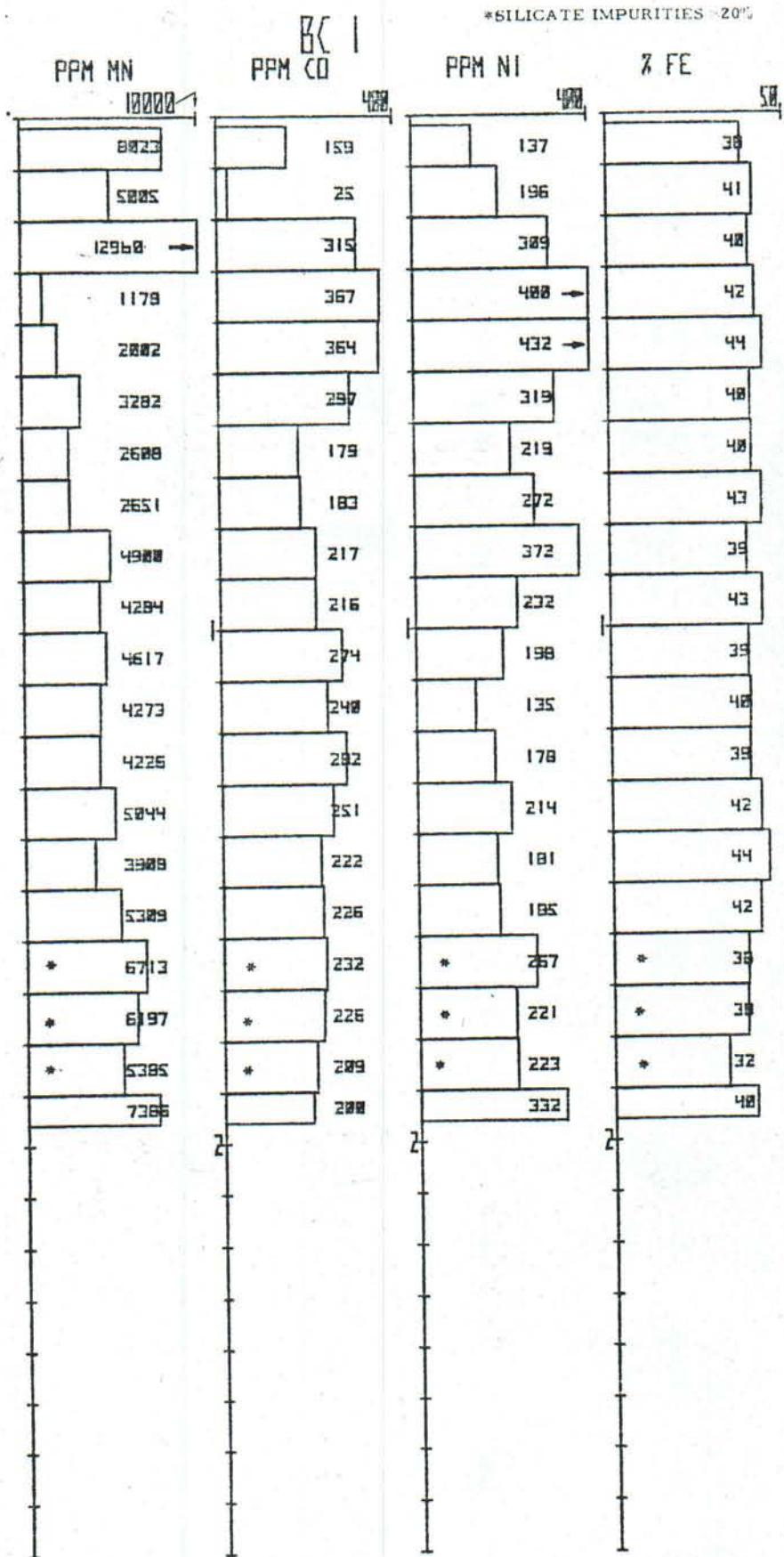
* SILICATE IMPURITIES > 20%



HL CONCENTRATE SAMPLE - AAS

DEPTH IN THOUSANDS OF FEET

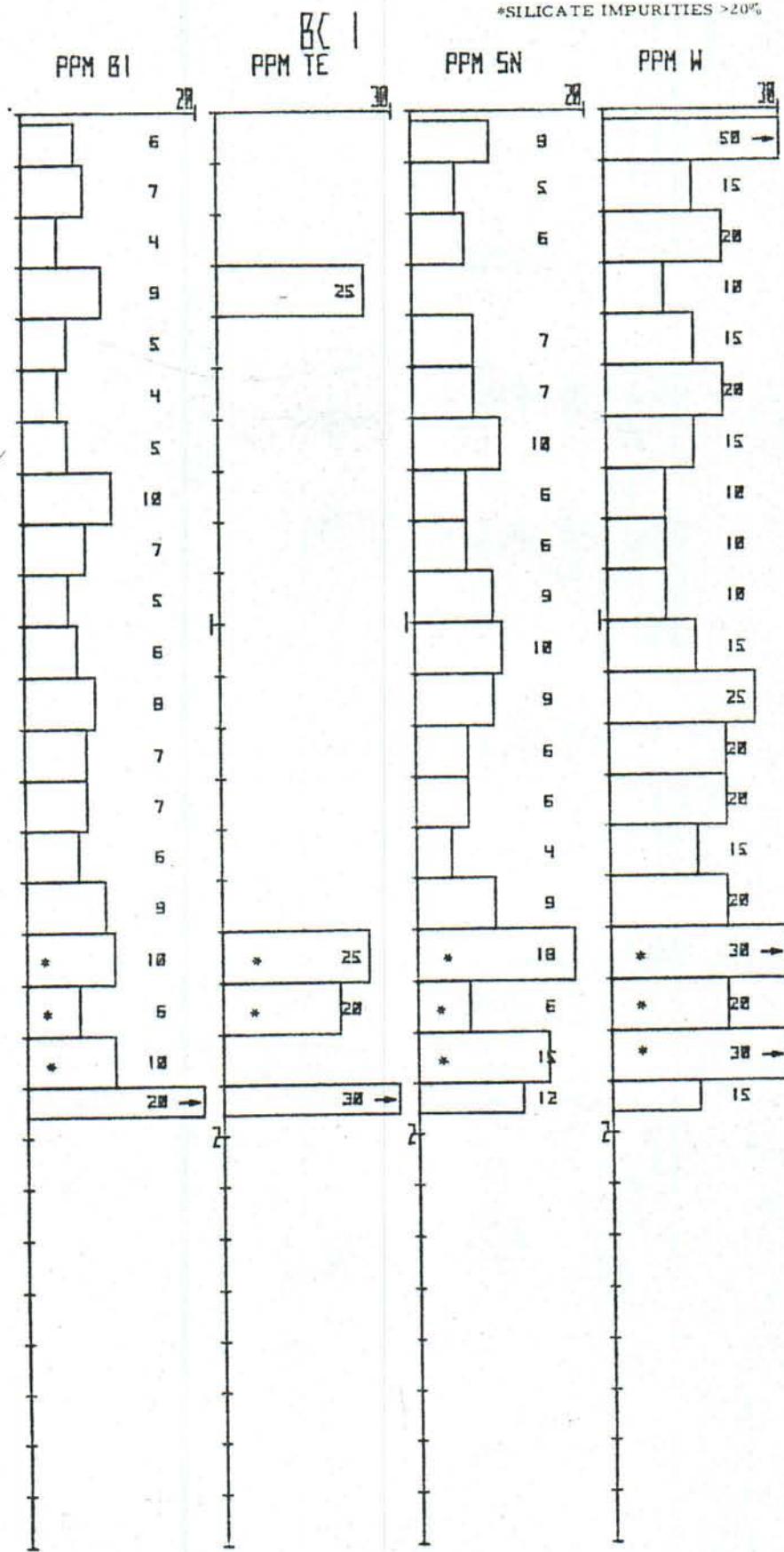
*SILICATE IMPURITIES ~20%



HL CONCENTRATE SAMPLE (IMPURE) - OES

DEPTH IN THOUSANDS OF FEET

*SILICATE IMPURITIES >20%

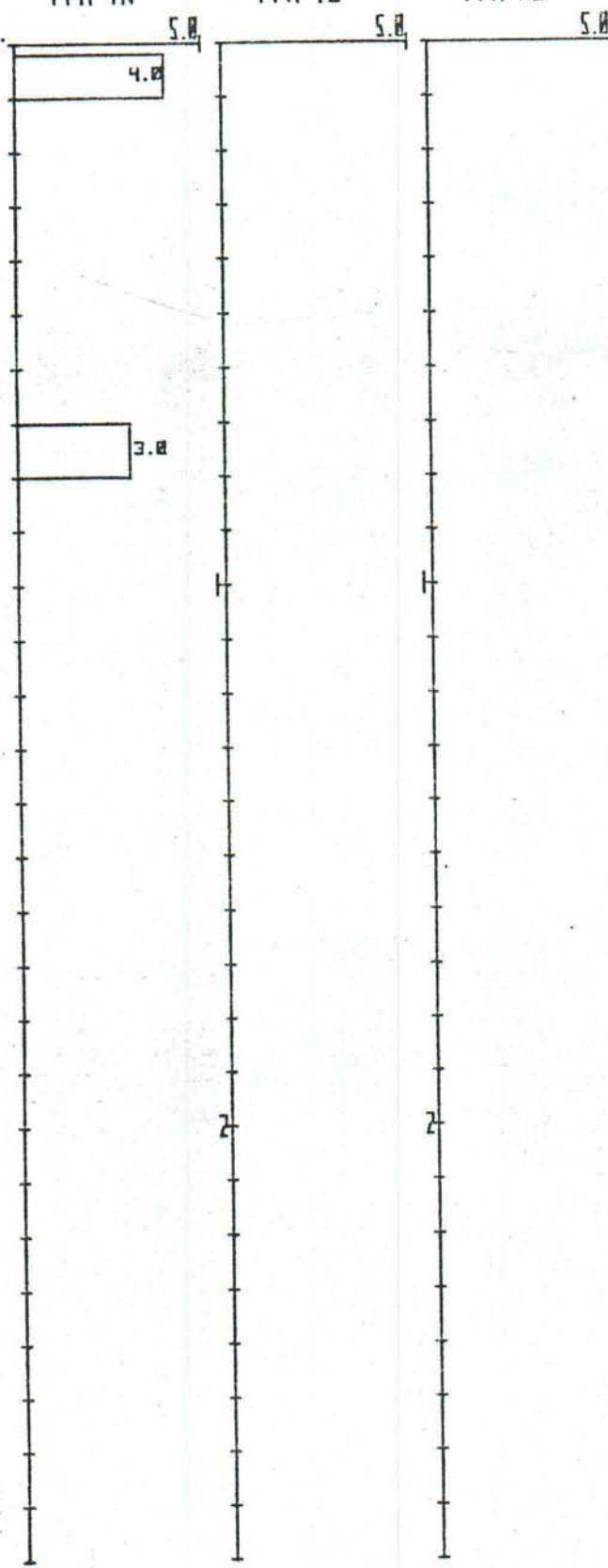


HL CONCENTRATE SAMPLE (IMPURE) - OES

DEPTH IN THOUSANDS OF FEET

*SILICATE IMPURITIES >20%

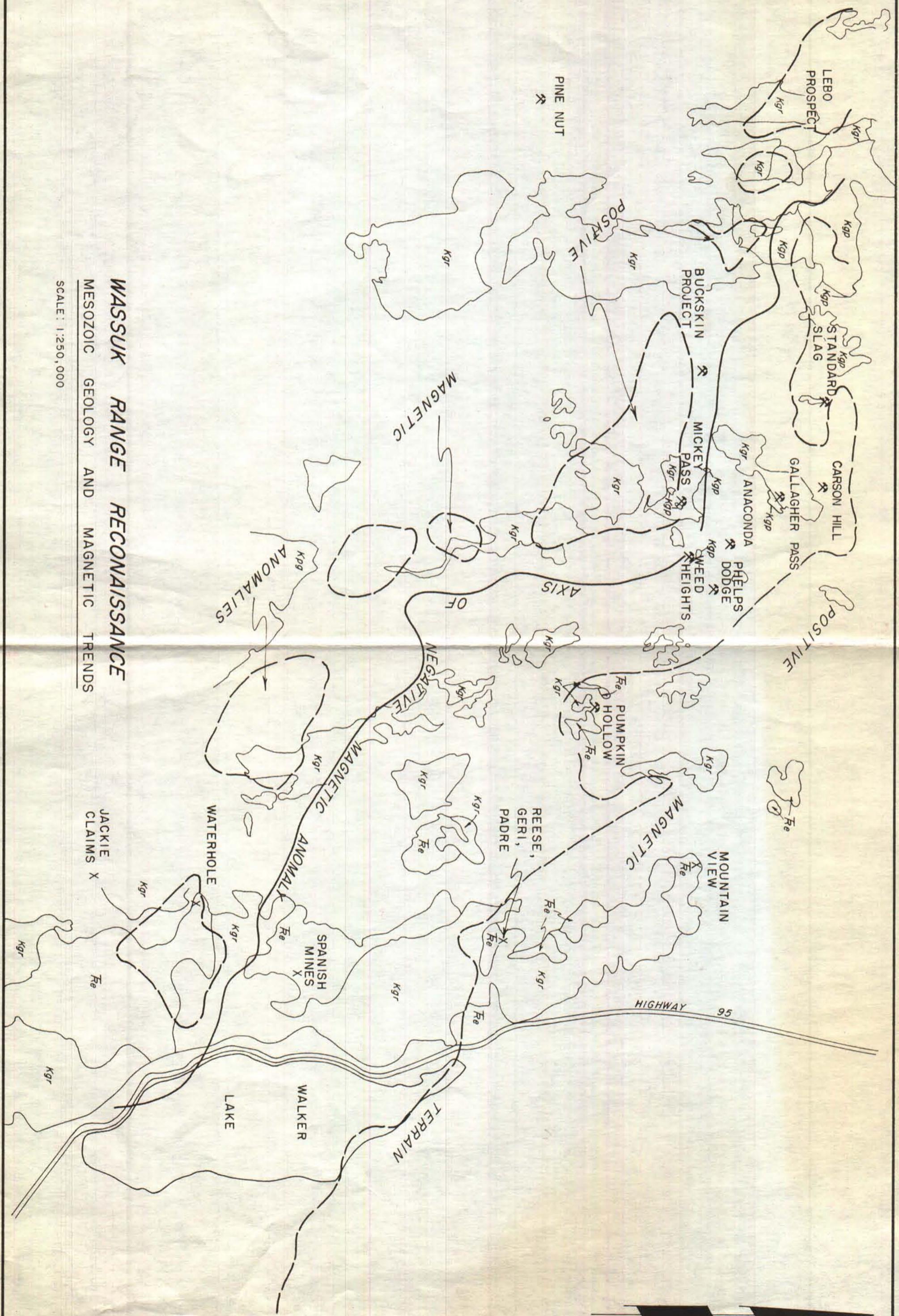
PPM IN BC | PPM TL PPM RU



MASSUK RANGE RECONNAISSANCE

MESOZOIC GEOLOGY AND MAGNETIC TRENDS

SCALE: 1:250,000



SUMMARY MAP

BUCKSKIN PROSPECT
LYON COUNTY, NEVADA

CONTINENTAL OIL COMPANY
MINERALS - METALLICS
RENO DISTRICT

February 1976

- Qal Alluvium
- T Tertiary
- C Country Rock
- I Intrusive
- - Faults

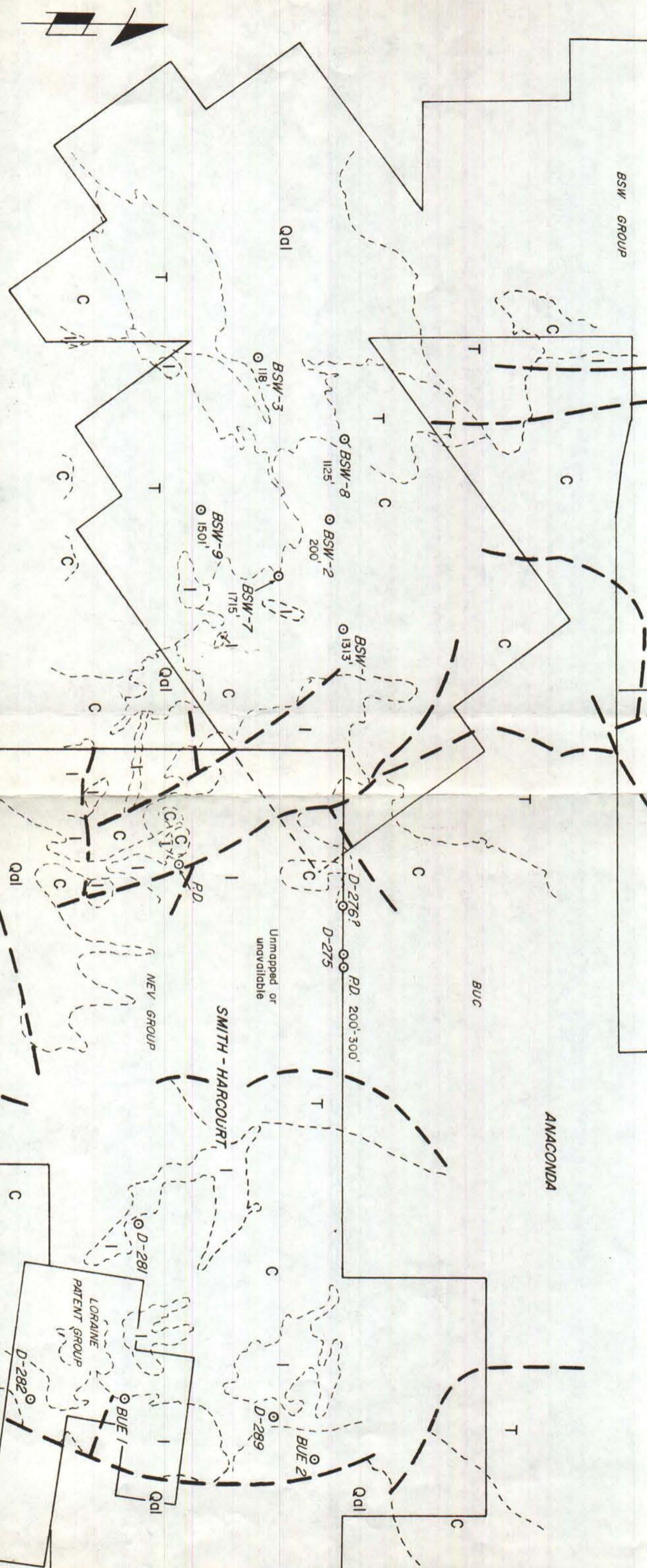
Scale 1" = 1000'
1000' 0 1000' 2000'

EXPLANATION

- D-273? Unmapped or unavailable
- BSW-3 118'
- BSW-2 200'
- BSW-7 1715'
- BSW-1 1313'
- BSW-9 1501'
- D-275 RD 200'-300'
- D-276? RD 200'-300'
- D-281
- D-282
- BUE 1
- BUE 2
- D-289
- ACM?

OTHER PATENTED CLAIMS

- LORAIN PATENT GROUP
- ANACONDA



OPEN?

BUC

BSW GROUP

BEAR CREEK

ANACONDA

BUC

T

C

BUC

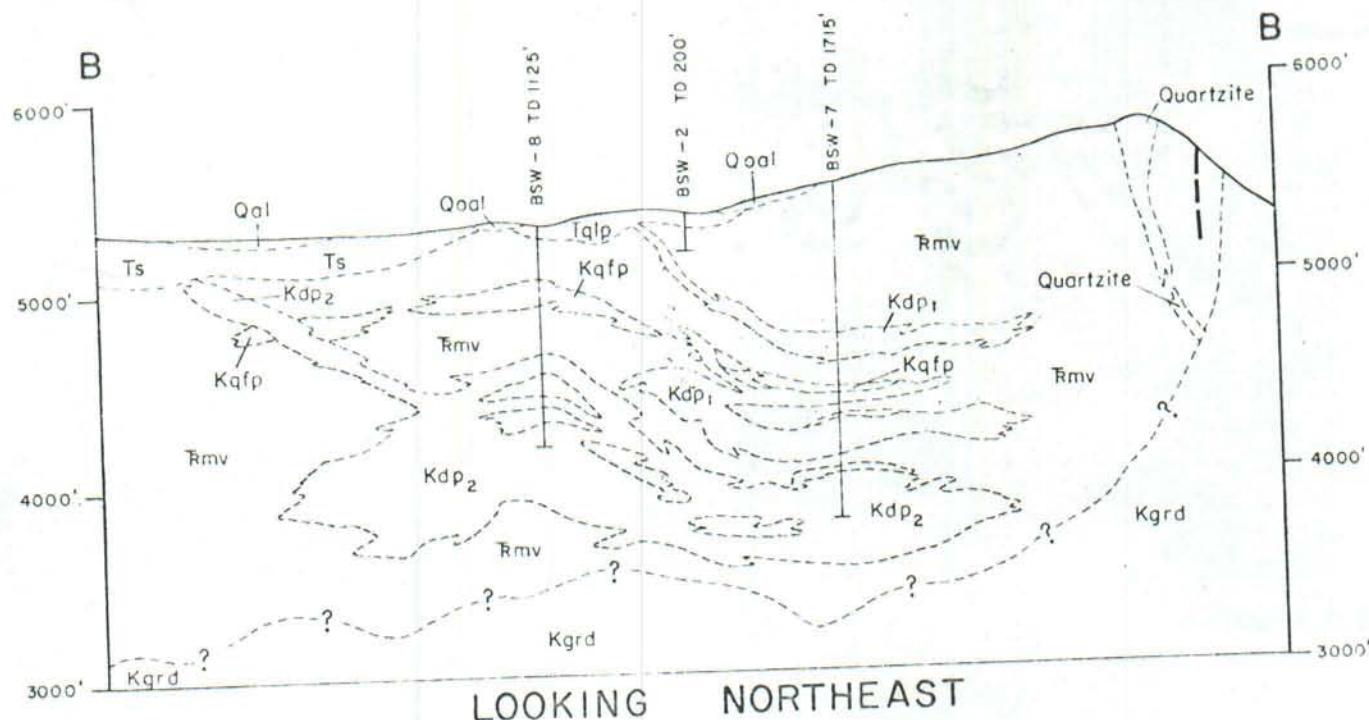
T

C

OPEN?

NEW TARGET CONCEPT

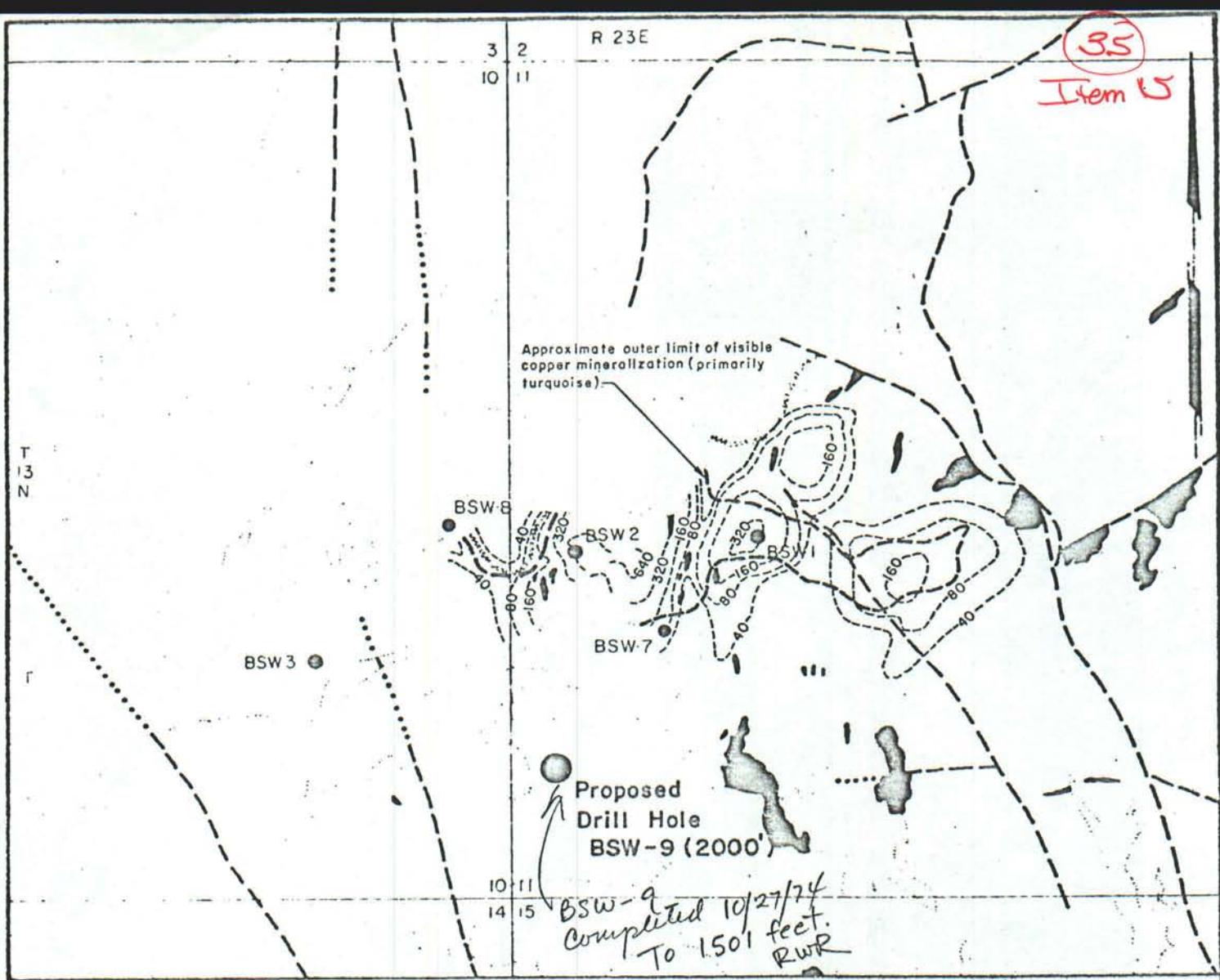
(35)
Item 15



EXPLANATION

- [Qal] Alluvium
- [Qoal] Older alluvium
- [Ts] Semi-consolidated tuffaceous sedimentary rocks
- [Trt] Rhyolitic ash-flow tuff (Section A-A')
- [Tqlp] Biotite, Hornblende, Quartz latite porphyry (Flows)
- [Kdp₁] Hornblende biotite (Kdp₁ - syn-mineral)
- [Kdp₂] Dacite porphyry intrusive (Kdp₂ - post-mineral)
- [Kqfp] Quartz - feldspar porphyry (Intrusive)
(Indeterminate original composition)
- [Kgrd] Hornblende granodiorite
- [Rmv] Intermediate Metavolcanic Rocks
(Predominantly flow breccias) (Including metaquartzites)

Conjectural contact
Conjectural fault
Rotary Diamond drill hole



EXPLANATION
COPPER IN ROCK (in ppm)

- Boundary of surficial deposit
 - Fault, approximate, concealed
 - ~~~~~ Boundary of tectched capping
 -  Triassic Quartzites
 - Rotary drill hole
- | | |
|--|------------|
| | 640 - 1280 |
| | 320 - 640 |
| | 160 - 320 |
| | 80 - 160 |
| | 40 - 80 |
| | 0 - 40 |

BUCKSKIN RANGE SOUTHWEST			
GEOCHEMICAL MAP: COPPER IN ROCK			
1000'	0'	1000'	2000'
SCALE 1:2,000			

DATA BY	JBH, GRH	STATE	NEVADA	MAP NO
DRAFTSMAN	SKM	DATE	7/26/74	
REVISIONS		COUNTY	DOUGLAS	
		TOWNSHIP	RANGE	
		T 13 N.	R 23 E.	
				FIGURE 8

35

Item 15

1138 Gilmer Drive
Salt Lake City, Utah 84105

May 31, 1979

William M. Oriel
Geologist
Continental Oil Company
1755 East Plumb Lane, Suite 160
P. O. Box 7608
Reno, Nevada 89510

Dear Bill:

Analysis of +3.3 specific gravity concentrates from BC-4 100-foot composite samples has been completed and the results plotted in bar graph form (figures 1/BC-4 to 4/BC-4, attached). Comments on these results and an interpretation made in the context of overall geochemical data for the Buckskin Project area follow.

BC-4 geochemical signatures indicate that the hole has penetrated mineralized rocks with characteristics similar to a porphyry copper intermediate halo zone. Similar or increased tellurium, bismuth, copper, and silver, and decreased manganese relative to the geochemistry of drill holes BC-1, BC-2, and BC-3 suggest that BC-4 is probably closer to a target copper zone than these previously drilled holes. These characteristics, however, are not definitive if more than one center of mineralization exists or if two distinct mineralizing episodes have occurred. The lack of significant molybdenum, tungsten, and tin in BC-4, and to a lesser extent the high lead and zinc values, suggest that potential target zones are still significantly distant (from one thousand to several thousands of feet, assuming no displacement of target zones relative to the hole location by post mineral faulting). Down hole geochemical trends do not provide any positive indication of a target directly below BC-4, and deepening of the hole should be given low priority at this time.

Final selection of a new drilling target would best be made after the work discussed in our April 2, 1979 meeting in Reno is completed. Especially important to the selection process is the information to be obtained on number, type, and relative ages of discrete mineralizing, igneous, and structural events. Until then, tentative drilling recommendations for your consideration are: (a) the drilling of a 2500' cased hole near sample location B-19 or, (b) the drilling of an equivalent hole between sample locations J-5 and J-6 (for sample location information see overlay B in the 1970 surface geochemical survey report). Alternative "a" is the more conservative of the two recommendations, constituting a step-out of about 2700 feet to the east of BC-3 along the axis of principal geochemical and IP anomalies. Alternative "b" is a similar but longer step-out of about 5000 feet to the east of BC-3. Both sites have been selected based on the assumption that evidence for a westward tilted porphyry system is correct. The correctness of the selection is

1-801-581-6783
I called Bob on Mon. 6/11/79
+ told him about our X-Rays work etc
+ that we will send him the data when
we can + shot I wanted to talk
over with him this fall.
Enc.

Page two
W. M. Oriel
May 31, 1979

thus limited by that assumption. The "b" site selection (and to a much lesser extent the "a" site selection) has also been influenced by relatively favorable geochemical characteristics of the J-5 and J-6 area and of the shallow drill hole BUE-2 (c.f. the surface geochemical survey report and the report with information on BUE-2 geochemistry).

Hope you find this helpful. Give me a call if you have any questions. The problem is, as we both know, somewhat more complicated than can be discussed in a letter.

Sincerely,



Robert W. Bamford
Consulting Geologist/Geochemist

RWB:kw
Attachments

FIGURE 1/BC-4

DDH BC-4

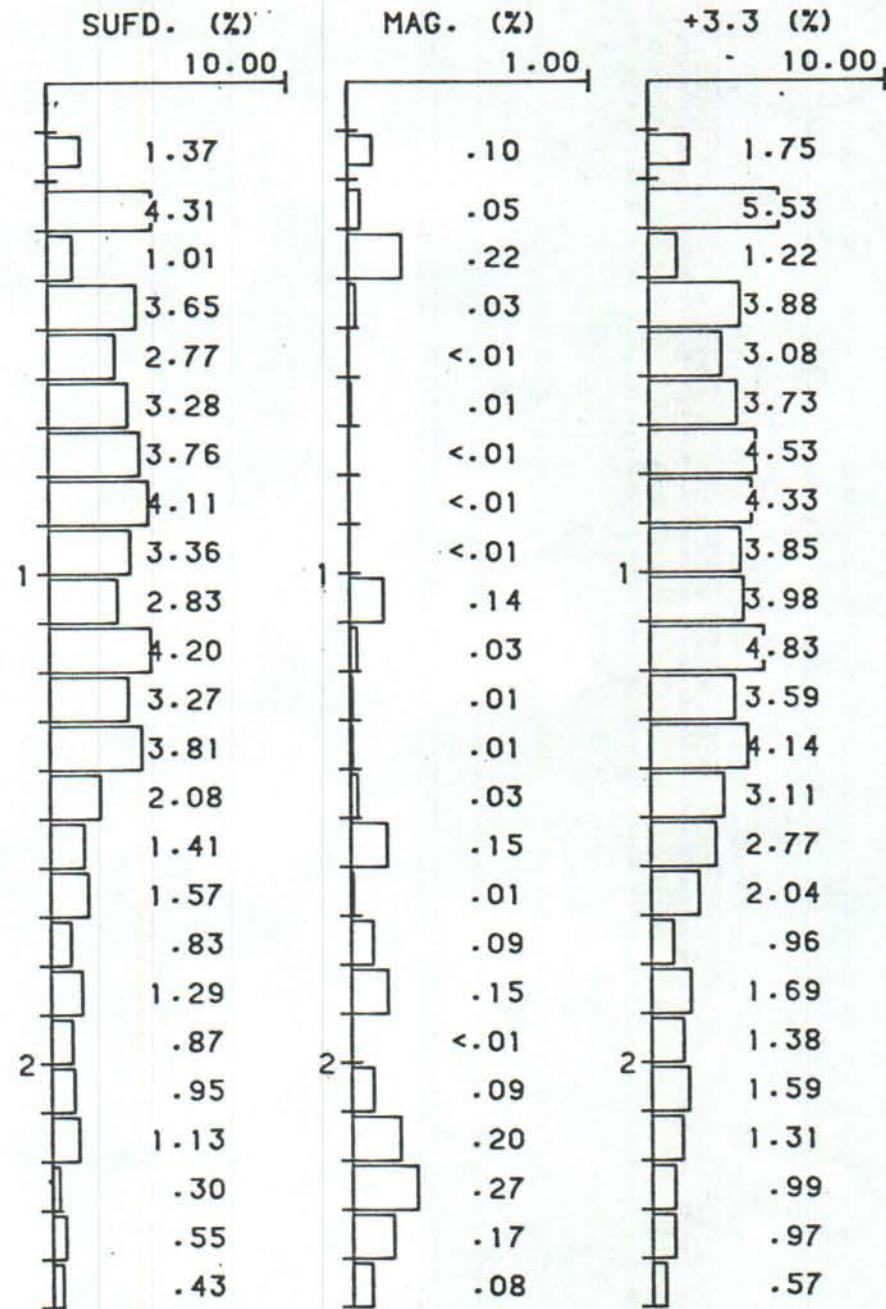
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: WHOLE ROCK
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN 1000 FT UNITS)

FIGURE 2/BC-4

DDH BC-4

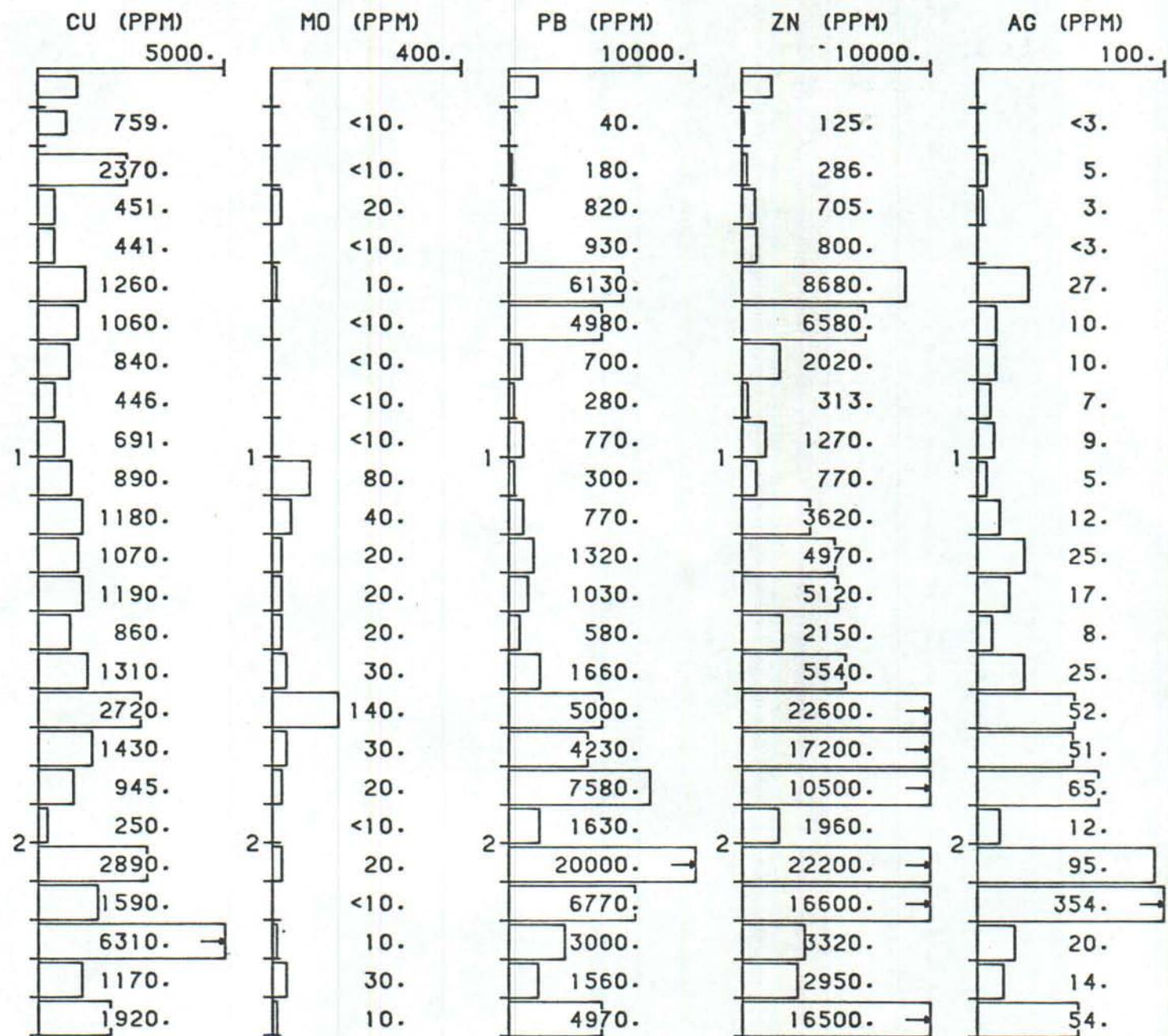
BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADASAMPLE TYPE: +3.3 LESS MAG.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN 1000 FT UNITS)

FIGURE 3/BC-4

DDH BC-4

BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADA

SAMPLE TYPE: +3.3 LESS MAG.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN 1000 FT UNITS)

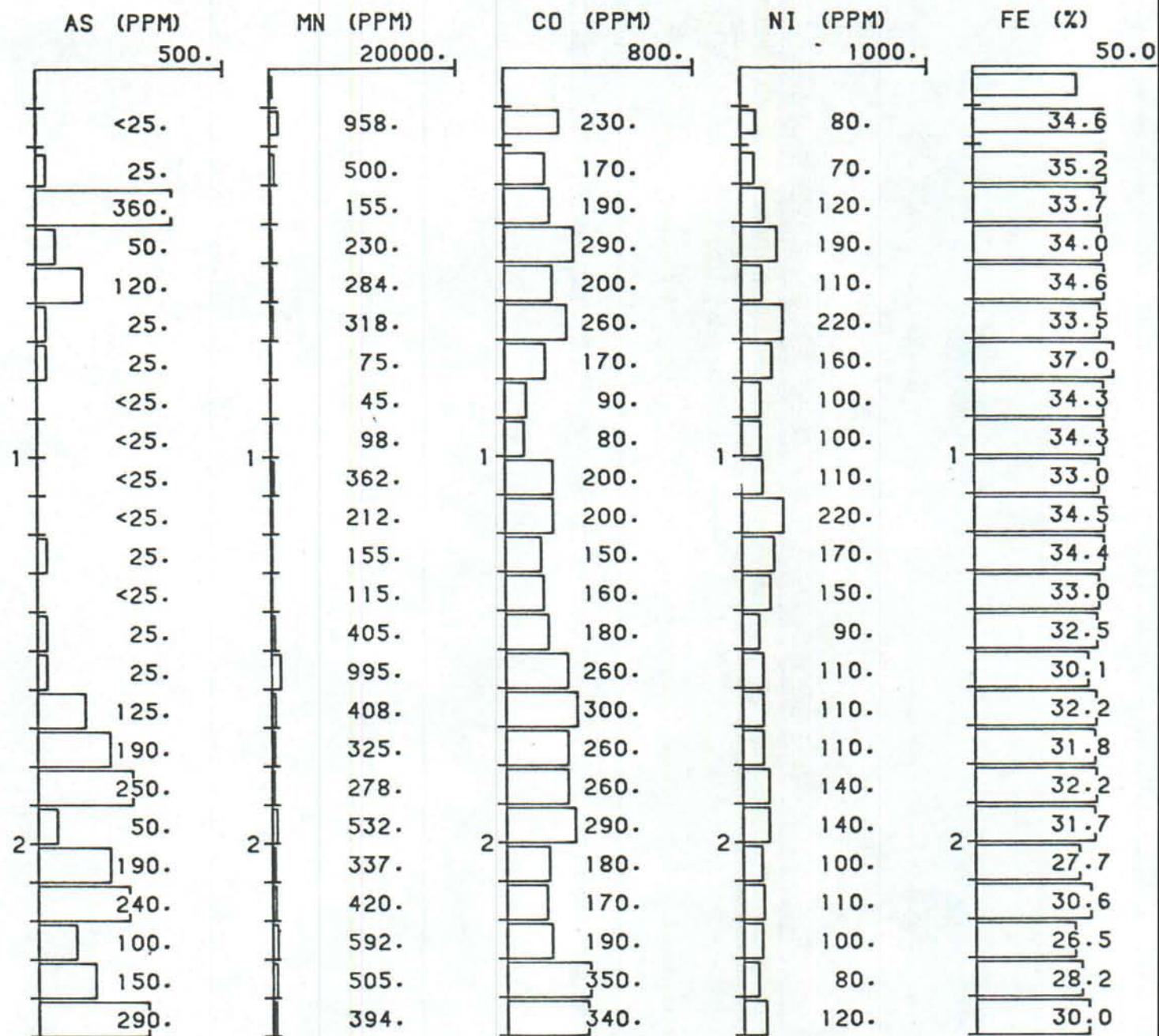
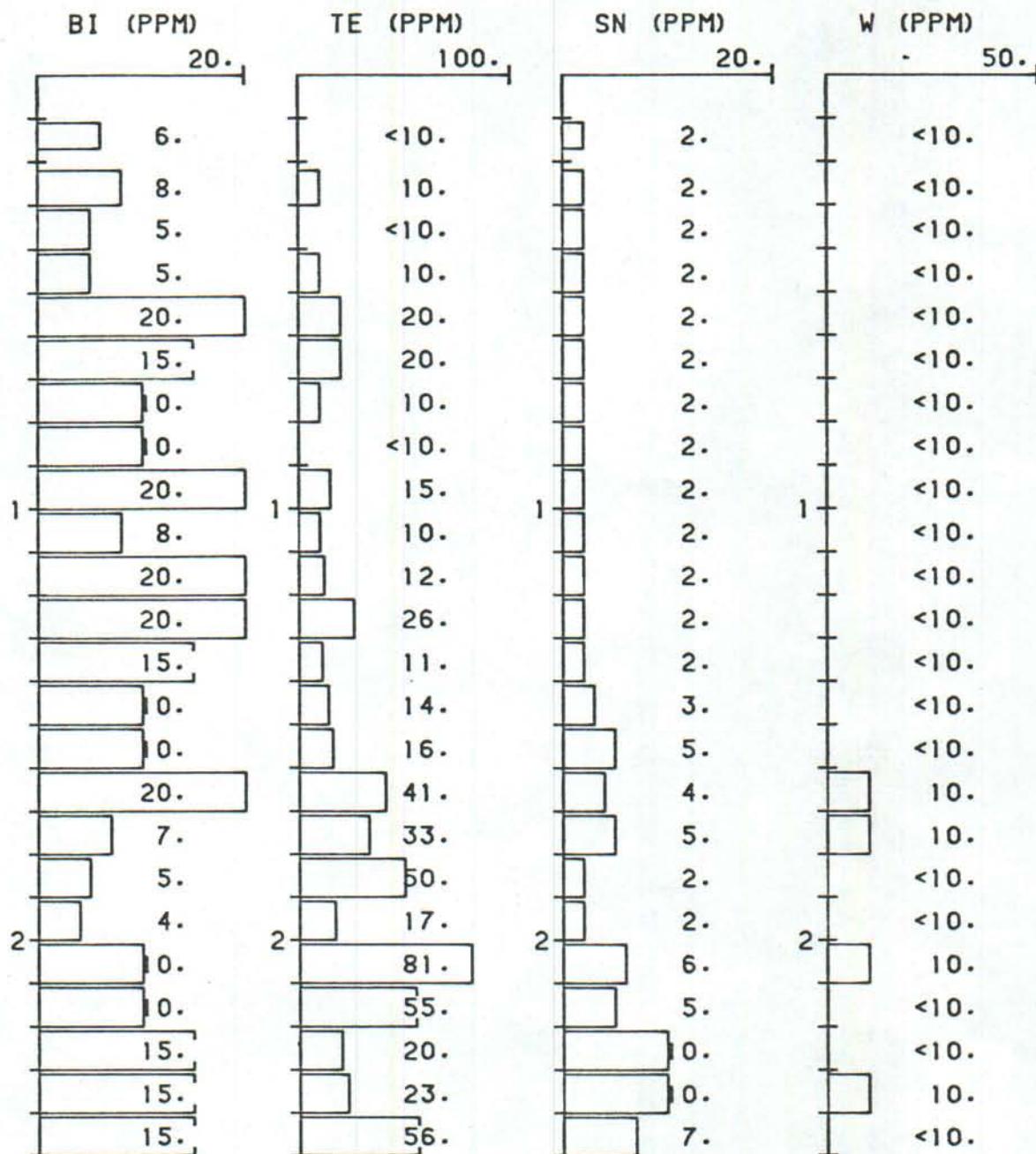


FIGURE 4/BC-4

DDH BC-4

BUCKSKIN PROJECT
DOUGLAS COUNTY, NEVADA

SAMPLE TYPE: +3.3 LESS MAG.
VERT. SCALE: 400.0 FT./IN.
(DEPTH SHOWN IN 1000 FT UNITS)



SAMPLE NUMBER FOOTAGE	WEIGHT PER CENT SULFIDE	WEIGHT PER CENT >3.3 SP. GR. CON- CENTRATE	Sp. Gr.	COMPOSITION OF >3.3 SP. GR. CONCENTRATE (ESTIMATED VOLUME %)										
				SULFIDES	GOETHITE	HEMATITE	DARK OXYQUE MINERALS	MAGNETITE	DRILL STEEL	SPHENE	EPIDOTE	ZIRCON	RUTILE	IRON MAGNETITE
20, 26, 33, 41, 51, 55, 65, 75	-0.01	0.03 ✓	7	2	75			Tr.		Tr. Tr.			21	MOST OF THE GOETHITE - HEM. IS REINHOLD'S SUBSTRASS; SOME IRON-TITANIOUS SULFIDES IN BOTH HORSES.
110-170'	1.37	1.75 ✓	78	3	78			Tr.		2			17	TR. CC. MICROKORNS OF ZIRCON, LIGHT CONTAMINANTS POSSIBLY BET. SER.
220-300'	1.31	5.53 ✓	78	Tr.				Tr.		Tr.			22	SAME AS ABOVE; GTZ-SER. ACCRE- GATES V. F. XLN. IN SOME PYROPHYL.
310-400'	1.01	1.22 ✓	83	Tr.	1.0	0.5				3	1.5		12	ZIRCONS ELIN. FINEST-M. ORANGE; MANY PT GERMIS; WEAKLY MAGNETIC.
410-500'	3.65	3.88 ✓	94	Tr.	Tr.	Tr.		Tr.	Tr.	Tr.	1	Tr.	5	DK. OPAQUE MAY INCLUDE SOME SPHALERITE.
510-600'	2.77	3.08 ✓	90	Tr.	5	Tr.		Tr.	Tr.	Tr.	Tr.	Tr.	7	© MUCH OF THE DARK OPAQUE COMPONENT IS AL- MOST ELECTRICAL SPHALERITE.
610-700'	3.28	3.73 ✓	59	Tr.	2	Tr.		Tr.	Tr.	Tr.	5	Tr.	5	SAME AS ABOVE - SOMETHING BRITTLE AND REINHOLD'S.
710-800'	3.76	1.53 ✓	53	Tr.	1	Tr.		Tr.	Tr.	Tr.	5	Tr.	9	SAME AS ABOVE.
810-900'	4.11	4.33 ✓	25	Tr.	Tr.	Tr.		Tr.			Tr.		5	
910-1000'	3.36	3.85 ✓	57	Tr.	1	Tr.				3	3	1	5	RUTILE DK. RED- DISH BROWN, TRANS. TRANS. SUBCONCH. FRCT.
1010-1100'	2.83	3.98 ✓	71	Tr.	2	Tr.			2	Tr.	Tr.	5	MANY OF THE DK. OPAQUES SLIGHT- LY MAGNETIC - PROB. MAGN.-ILMENITE	
1110-1200'	1.20	1.83 ✓	57	Tr.	2	Tr.				6	Tr.		5	MANY OF THE DK. OPAQUES PROBABLY SPHALERITE.
1210-1300'	3.27	3.59 ✓	91	Tr.	1	Tr.		Tr.	1	Tr.	Tr.	7	SAME AS ABOVE.	
1310-1400'	3.81	4.14 ✓	92	Tr.	2	Tr.			2	Tr.	Tr.	4	SAME AS ABOVE. POSS. TR. CALCO.	
1410-1500'	2.08	3.11 ✓	67	Tr.	3	Tr.		Tr.	2	Tr.	Tr.	5	DK. OPAQUES MAY INCLUDE SP. HEM.; EPIDOTE VORIES FR. IE ORANGE - PISTACHIO BINH - BLEACHED.	
1510-1600'	1.41	2.77 ✓	51	Tr.	5	0.5		Tr.	3	1	0.5	5	SAME AS ABOVE; SOME OPAQUE SP. IN DK. OPAQUES, WHICH MAY ALSO IN- CLUDE TR. AMPHOLE.	
1610-1700'	1.57	2.04 ✓	77	Tr.	5	Tr.			1	11	0.5	0.5	5	SPHENE RS. ABOVE; SPHENE IS TRANS. AND ORANGE. RUTILE "COOT BEAN" COLORED.
1710-1800'	0.83	0.96 ✓	87	Tr.	3	Tr.			7	5	Tr.	5	SAME AS ABOVE.	
1810-1900'	1.29	1.69 ✓	76	Tr.	5	Tr.		Tr.	13	0.5	0.5	5	SAME AS ABOVE.	
1910-2000'	0.87	1.38 ✓	63	Tr.	2	Tr.		Tr.	3	0.5	Tr.	3.5	SAME AS ABOVE.	
2010-2100'	0.95	1.59 ✓	71	Tr.	7	Tr.		?	7	10	Tr.	Tr.	5	SAME AS ABOVE; REFER ALSO TO FOOTNOTE BELOW.
2110-2200'	1.13	1.31 ✓	75	Tr.	4.5	Tr.			7	18	Tr.	Tr.	5	SAME AS ABOVE; ALSO 0.5% AMPHIBOLE.
2210-2300'	0.30	0.99 ✓	30	Tr.	7	20			29	12	Tr.	Tr.	5	SAME AS ABOVE; 1% DRILL STEEL.
2310-2400'	0.55	0.97 ✓	57	Tr.	7	1		1	11	Tr.	Tr.	5	Tr. AMPHIBOLE	
2410-2500'	0.43	0.57 ✓	75	Tr.	7	1		Tr.	7	15	Tr.	Tr.	5	
														# UPPER FIGURE PIS- TACHIO-COLORED; LOWER LT. DRAGOON (BODITE?)
														# BOTTOM 1ST IN- TERVAL HEM. IS MAROON / SUBMETAL- LIC, PROB. PRIMARY

DRILL HOLE BC-4
CONOCO BUCKSKIN PROJECT

ESTIMATED COMPOSITION OF
>3.3 SP. GR. CONCENTRATE.

SAMPLE NUMBER FOOTAGE	WT. % MAGNETITE	WT. % TOTAL SULFIDE	WT. % MAGNETIC CONCENTRATE	Sp. Gr.	COMPOSITION OF MAGNETIC (ESTIMATED VOLUME %)								CONCENTRATE		
					< 5.0	5.0 - 7.0	> 7.0	SULFIDES	GOETHITE ("RUST")	DARK OPAQUE MINERALS	MAGNETITE	STEEL	AMPHIBOLE	EPIDOTE	
20, 26, 33, 41, 51, 55, 65, 75	< 0.01	< 0.01	< 0.01		Tr.	3?	74	20						Tr.	3 HEMATITE
110-170'	0.10	0.24	5	10	3?	42	35							5	
220-300'	0.05	0.22	3	Tr.	1?	24	65							7	
310-400'	0.22	0.30	1	Tr.	3?	74	15							7	
410-500'	0.03	0.13	1	Tr.	2?	20?	70							7	
510-600'	< 0.01	0.01	20	3	3?	31?	70							2	1 HEMATITE
610-700'	0.01	0.01	15	Tr.	3?	51?	30?							1	
710-800'	< 0.01	0.01	3	Tr.	1?	5?	89							2	
810-900'	< 0.01	0.01	5	Tr.	2?	10?	81							2	
910-1000'	< 0.01	0.01	0.02	45	Tr.	1?	5	99						Tr.	
1010-1100'	0.14	0.19	7	Tr.	3?	74	Tr.	3	1					12	
1110-1200'	0.03	0.03	5	Tr.	5?	82	5	Tr.	Tr.					3	
1210-1300'	0.01	0.02	15	Tr.	5?	64	15							1	
1310-1400'	0.01	0.02	15	Tr.	3?	44	15	20?						3	AMPHIBOLE INTERGROWN WITH MAG.
1410-1500'	0.03	0.05	7	Tr.	5?	72	5	3	3					5	
1510-1600'	0.15	0.17	5	Tr.	3?	86	1	Tr.	3					2	
1610-1700'	0.01	0.02	5	Tr.	3?	71	20							1	
1710-1800'	0.09	0.11	2	Tr.	5?	81	2		Tr.					10	
1810-1900'	0.15	0.17	1	Tr.	5?	86	1							7	
1910-2000'	< 0.01	0.01	7	Tr.	Tr.?	7	89							2	
2010-2100'	0.09	0.11	5	Tr.	5?	83	2	5						Tr.	
2110-2200'	0.20	0.23	2	Tr.	5?	86	Tr.	5	1					1	
2210-2300'	0.27	0.32	2	Tr.	5?	83	Tr.	5	Tr.					5	
2310-2400'	0.17	0.21	1	Tr.	5?	80	Tr.	7	Tr.					7	
2410-2500'	0.08	0.11	2	Tr.	5?	75	5	3	Tr.					10	

DRILL HOLE BC-4
CONOCO BUCKSKIN PROJECT

ESTIMATED COMPOSITION OF
MAGNETIC CONCENTRATE.



WEST JORDAN OFFICE

ROCKY MOUNTAIN GEOCHEMICAL CORP.

1323 W. 7900 SOUTH • WEST JORDAN, UTAH 84084 • PHONE: (801) 255-3558

Certificate of Analysis

Page 1 of 4

Date: April 20, 1979

RMGC Numbers:
Local Job No. 79-36-26-SClient: Robert Bamford
1138 Gilmer Drive
Salt Lake City, Utah 84105Foreign Job No.:
Invoice No. M 94314

Client Order No.: none

Report On: 25 Samples

Submitted by: Bob Bamford

Date Received: 3/28/79

Analysis: Copper, Lead, Zinc, Nickel, Cobalt, Molybdenum, Manganese, Iron, Silver and Arsenic. Heavy Mineral Separations

Analytical Methods: Arsenic determined colorimetrically. Remaining elements determined by atomic absorption.

Remarks:

cc: enc.
file (2)
GJC/lw

Analytical Precision:

Arsenic	± 8%	Cobalt	± 7%
Copper	± 5%	Molybdenum	± 10%
Lead	± 12%	Manganese	± 7%
Zinc	± 9%	Iron	± 2%
Nickel	± 7%	Silver	± 5%

All values are reported in parts per million unless specified otherwise. A minus sign (—) is to be read "less than" and a plus sign (+) "greater than." Values in parenthesis are estimates. This analytical report is the confidential property of the above mentioned client and for the protection of this client and ourselves we reserve the right to forbid publication or reproduction of this report or any part thereof without written permission.
ND = None Detected 1 ppm = 0.0001% 1 Troy oz./ton = 34.286 ppm 1 ppm = 0.0292 Troy oz./ton

Client Robert Bamford

Date

4/20/79

RMGC Job No. 79-36-26-SL

Page 2 of 4

Sample No.	Wt +3.3 grs	Wt Mag. grs	Wt % +3.3	Wt % Mag.	Wt. Sep. in grs
BC-4 20,26,33,41, 51,55,65,75	0.0200	0.0010	0.02	-0.01	80
BC-#4 110-170	0.7000	0.0940	1.75	0.24	40
220-300	2.2070	0.0880	5.52	0.22	40
310-400	0.4875	0.1190	1.22	0.30	40
410-500	1.5525	0.0520	3.88	0.13	40
510-600	1.2330	0.0020	3.08	-0.01	40
610-700	0.7450	0.0020	3.72	0.01	20
710-800	0.9060	0.0015	4.53	0.01	20
810-900	0.8665	0.0010	4.33	-0.01	20
910-1000	0.7705	0.0045	3.85	0.02	20
10-10-1100	0.7963	0.0380	3.98	0.19	20
1110-1200	0.9665	0.0065	4.83	0.03	20
1210-1300	0.7180	0.0030	3.59	0.02	20
1310-1400	0.8270	0.0030	4.14	0.02	20
1410-1500	0.6225	0.0090	3.11	0.04	20
1510-1600	0.5530	0.0340	2.76	0.17	20
1610-1700	0.4080	0.0035	2.04	0.02	20
1710-1800	0.1915	0.0215	0.96	0.11	20
1810-1900	0.3380	0.0345	1.69	0.17	20
1910-2000	0.2765	0.0020	1.38	0.01	20
2010-2100	0.3180	0.0220	1.59	0.11	20
2110-2200	0.2625	0.0460	1.31	0.23	20
2210-2300	0.1970	0.0645	0.98	0.32	20
2310-2400	0.1940	0.0415	0.97	0.21	20
#4 2410-2500	0.2270	0.0445	0.57	0.11	40



ROCKY MOUNTAIN GEOCHEMICAL CORP.

SALT LAKE CITY, UTAH

RENO, NEVADA

TUCSON, ARIZONA

Client Robert Bamford

Date

4/20/79

RMGC Job No. 79-36-26-SL

Page 3 of 4

<u>Sample No.</u>	<u>Sample Wt Analyzed</u>	ppm Copper	ppm Lead	ppm Zinc	ppm Nickel	ppm Cobalt
BC- 4 20,26,33,41*	0.0190	1050	1530	1600	-50	-50
51,55,65,75						
BC-#4 110-170	0.1090	759	40	125	80	230
220-300	0.1050	2370	180	286	70	170
310-400	0.1030	451	820	705	120	190
410-500	0.1060	441	930	800	190	290
510-600	0.1020	1260	6130	8680	110	200
610-700	0.1000	1060	4980	6580	220	260
710-800	0.1000	840	700	2020	160	170
810-900	0.1070	446	280	313	100	90
910-1000	0.1020	691	770	1270	100	80
1010-1100	0.1000	890	300	770	110	200
1110-1200	0.1000	1180	770	3620	220	200
1210-1300	0.1010	1070	1320	4970	170	150
1310-1400	0.1015	1190	1030	5120	150	160
1410-1500	0.1000	860	580	2150	90	180
1510-1600	0.1020	1310	1660	5540	110	260
1610-1700	0.1000	2720	5000	2.26%	110	300
1710-1800	0.1070	1430	4230	1.72%	110	260
1810-1900	0.1000	945	7580	1.05%	140	260
1910-2000	0.1010	250	1630	1960	140	290
2010-2100	0.1030	2890	2.00%	2.22%	100	180
2110-2200	0.1030	1590	6770	1.66%	110	170
2210-2300	0.1010	6310	3000	3320	100	190
2310-2400	0.1035	1170	1560	2950	80	350
-#4 2410-2500	0.1010	1920	4970	1.65%	120	340



ROCKY MOUNTAIN GEOCHEMICAL CORP.

SALT LAKE CITY UTAH

RENO NEVADA

TUCSON ARIZONA

Client Bob BamfordDate 4/20/79RMGC Job No. 79-36-26-SL

<u>Sample No.</u>	<u>ppm Molybdenum</u>	<u>ppm Manganese</u>	<u>% Iron</u>	<u>ppm Silver</u>	<u>Page 4 of 4</u>
C- 4 20,26,33,41 51,55,65,75	-50	305	27.6	-15	-660
BC-#4 110-170	-10	958	34.6	-3	-25
220-300	-10	500	35.2	5	25
310-400	20	155	33.7	3	360
410-500	-10	230	34.0	-3	50
510-600	10	284	34.6	27	120
610-700	-10	318	33.5	10	25
710-800	-10	75	37.0	10	25
810-900	-10	45	34.3	7	-25
910-1000	-10	98	34.3	9	-25
1010-1100	80	362	33.0	5	-25
1110-1200	40	212	34.5	12	-25
1210-1300	20	155	34.4	25	25
1310-1400	20	115	33.0	17	-25
1410-1500	20	405	32.5	8	25
1510-1600	30	995	30.1	25	25
1610-1700	140	408	32.2	52	125
1710-1800	30	325	31.8	51	190
18±0-1900	20	278	32.2	65	250
1910-2000	-10	532	31.7	12	50
2010-2100	20	337	27.7	95	190
2110-2200	-10	420	30.6	354	240
2210-2300	10	592	26.5	20	100
2310-2400	30	505	28.2	14	150
BC-#4 2410-2500	10	394	30.0	54	290



ROCKY MOUNTAIN GEOCHEMICAL CORP.

SALT LAKE CITY UTAH

RENO NEVADA

TUCSON ARIZONA

By Jim Cardwell
Jim Cardwell

Coors / SPECTRO-CHEMICAL LABORATORY
 DIVISION OF COORS PORCELAIN COMPANY
 GOLDEN, COLORADO, U.S.A.

303-278-4000 Ext. 2302

Mailing Address:
 P.O. Box 500
 Golden, Colorado 80401

Analytical Report

CI-1317-A

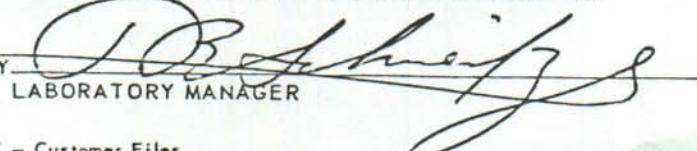
TO: Robert W. Bamford
 1138 Gilmer Drive
 Salt Lake City, UT 84105

LABORATORY NUMBER	99043
DATE	5-8-79
CUSTOMER ORDER NO.	

Conoco 79-36-26

Sample I.D.	Bismuth	Thallium	Tin	Tungsten	Tellurium
BC 4 + 3.3					
110-170'	6	< 10	2	< 10	< 10
220-300'	8	< 10	2	< 10	10
310-400'	5	< 10	2	< 10	< 10
410-500'	5	< 10	2	< 10	10
510-600'	20	< 10	2	< 10	20
610-700'	15	< 10	2	< 10	20
710-800'	10	< 10	2	< 10	10
810-900'	10	< 10	2	< 10	< 10
910-1000'	20	< 10	2	< 10	15
1010-1100'	8	< 10	2	< 10	10
1110-1200'	20	< 10	2	< 10	12
1210-1300'	20	< 10	2	< 10	26
1310-1400'	15	< 10	2	< 10	11
1410-1500'	10	< 10	3	< 10	14
1510-1600'	10	< 10	5	< 10	16
1610-1700'	20	< 10	4	10	41
1710-1800'	7	< 10	5	10	33
1810-1900'	5	< 10	2	< 10	50
1910-2000'	4	< 10	2	< 10	17
2010-2110'	10	< 10	6	10	81
2110-2200'	10	< 10	5	< 10	55
2210-2300'	15	< 10	10	< 10	20
2310-2400'	15	< 10	10	10	23
2410-2500'	15	< 10	7	< 10	56

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Coors / SPECTRO-CHEMICAL LABORATORY
 BY 
 LABORATORY MANAGER

EXPLANATION

Qal Quaternary alluvium

QTbf Pyroxene basalt flows

Tv Tertiary volcanics

UNCONFORMITY

Jkf Cretaceous (?) Fulstone volcanics & intrusives

Jqmp Jurassic quartz monzonite porphyry

Jm Jurassic mafic dikes

Js Jurassic silexite

Jqm Jurassic quartz monzonite

Jgd Jurassic granodiorite

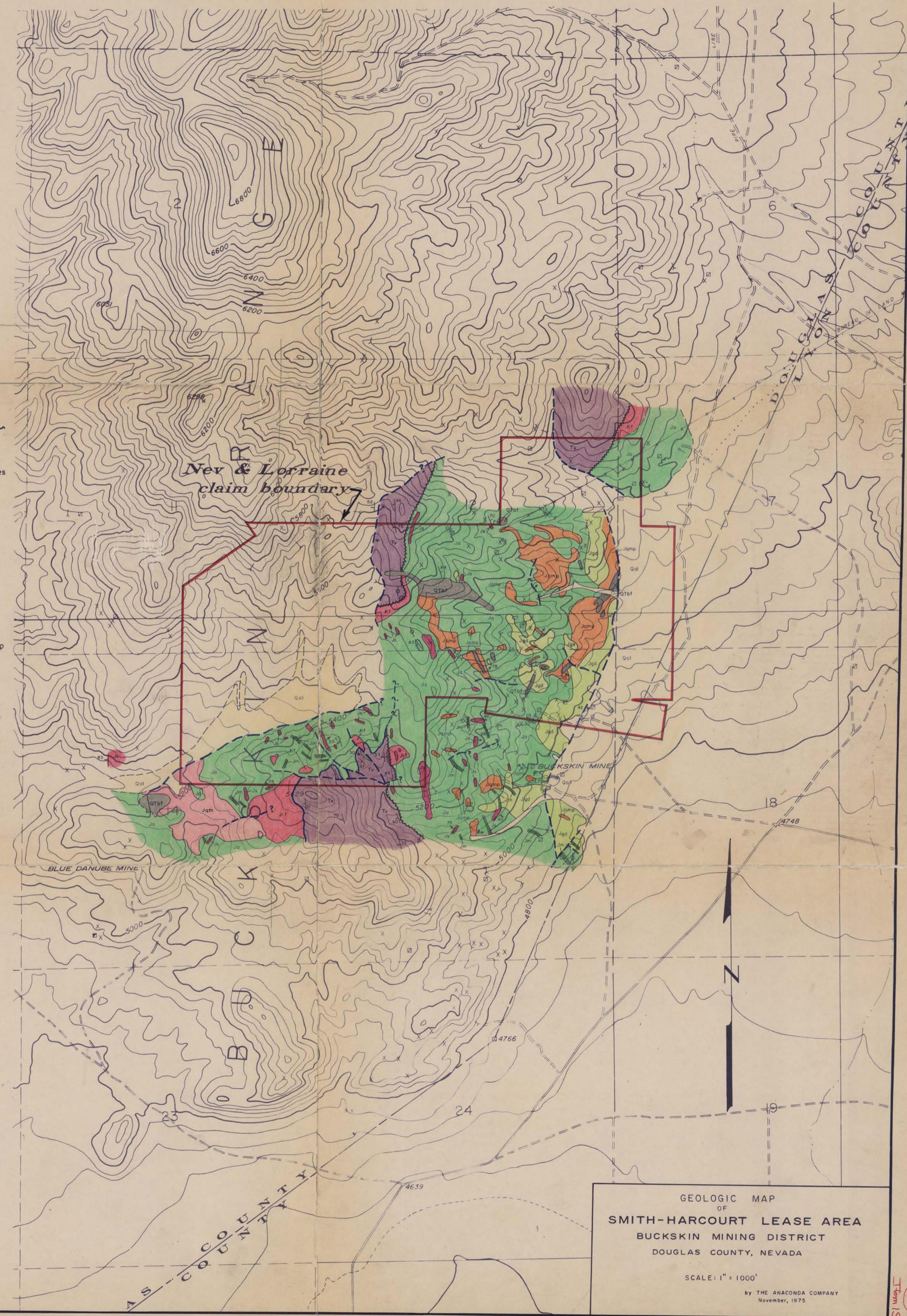
Ja Jurassic volcanics & intrusives - Artesia group

Contact

Fault

Strike and dip of bedding

Vertical bedding



OUTCROP MAP WEST SHEET
BUCKSKIN PROJECT AREA
LYON AND DOUGLAS COUNTIES, NEVADA

Scale 1"=200'

December, 1967

EXPLANATION

POST-MINERAL ROCKS

QoL Alluvium, overburden where blank.

Ti Intrusive

Ta Andesite

Tv Volcanics

PRE-MINERAL ROCKS

I Intrusive

If Feldspar Porphyry

Id Diorite

M Metamorphic

Py, cpy, cc Sulfides, Green copper
GC FeO Iron oxideser. Silicified
sil. Quartz

Brecia

Vein

Fault

Drill hole

Prospect pit

Assay sample

IRBL Thin section & Geochemical data.

BI490 Assay sample.




Plate 1C

COMPOSITE INTRUSION COLUMNAR SECTION OF THE
BUCKSKIN RANGE, NEVADA

Relative ages of intrusions are approximate due to lack of cross cutting relationships many instances. The relative ages of the northern Buckskin intrusives in relationship to other Tertiary intrusives is unknown.

ERATHEM	SYSTEM	SERIES	ABSOLUTE AGE (m.y.b.p.)	INTRUSION SYMBOL	RELATED INTRUSIONS	DESCRIPTION
MESOZOIC	JURASSIC					
CENOZOIC	TERTIARY	Miocene	15.7			<p>Basalt</p> <p>Hornblende andesite porphyry</p> <p>Coarse-grained hornblende biotite sanidine dacite porphyry</p> <p>Fine-grained hornblende quartz dacite porphyry</p> <p>Quartz biotite hornblende dacite porphyry</p> <p>Hornblende biotite andesite porphyry</p> <p>Porphyritic dacite (in part Jcci)</p> <p>Porphyritic hornblende dacite autobreccia</p> <p>Porphyritic hornblende dacite with quartz</p> <p>Biotite latite quartz porphyry (\pm trace hornblende)</p> <p>Intrusion breccia</p> <p>Fine-grained biotite (\pm hornblende)</p> <p>Biotite hornblende porphyry</p> <p>Biotite hornblende porphyry with quartz</p> <p>Biotite hornblende dacite porphyry with quartz</p> <p>Rhyolite porphyry</p> <p>Fine grained quartz biotite porphyry</p> <p>Hornblende biotite andesite porphyry</p> <p>Hornblende pyroxene diorite porphyry</p> <p>Porphyritic hornblende pyroxene andesite</p> <p>Hornblende pyroxene andesite porphyry</p> <p>Intrusive breccia</p> <p>Intrusive matrix breccia</p> <p>Fine-grained biotite pyroxene diorite</p> <p>Fine-grained quartz monzonite</p> <p>Medium grained pyroxene diorite</p> <p>Coarse-grained latite porphyry</p> <p>Coarse-grained latite porphyry with greater than 5% phenocrystic quartz</p> <p>Porphyritic and porphyry dacites and quartz latites of Churchill Canyon sequence</p> <p>Microgranodiorite</p> <p>Quartz monzonite porphyry</p> <p>Quartz monzonite porphyry intrusive breccia</p> <p>Fine-grained granodiorite (Black Mountain?)</p> <p>Coarse-grained granodiorite</p> <p>Fine grained pyroxene diorite</p>



BUCKSKIN PROJECT

SCALE 1" = 500'

500 0 500 1000 1500 2000'

CONTINENTAL OIL COMPANY
MINERALS - METALLICS
RENO DISTRICT

(33) Item 15

BUCKSKIN PROJECT ALTERATION

by

D. M. Hudson

An alteration study of the Buckskin Project area was conducted in April and May of 1979. Samples were collected during alteration mapping and 263 x-ray diffraction patterns were obtained to determine alteration mineralogy.

The geology of the prospect area is discussed by Oriel (1976, 1977, and 1978) and regional geology is discussed by Hudson (1977) and will not be discussed here.

Alteration types used in this report are as follows:

Propylitic: Minerals present include epidote, chlorite, albite, calcite, clays, illite, sericite, and montmorillonite. Mesozoic rocks are metamorphosed to the greenschist facies, but in general, the rocks in the prospect area are more strongly altered than the general greenschist metamorphism elsewhere in the range.

Illite-Feldspar: Albritic plagioclase, quartz, and illite are the main components of the assemblage which is probably a transition from propylitic to sericitic. Epidote, chlorite, and calcite are altered to illite. Illite content varies from 5% to 30%. Feldspar is usually present in amounts up to 50% although a few samples contained only illite and quartz altered from plagioclase.

Sericite-Feldspar: Similar to above, but sericite is present in place of illite.

Sericitic: Composed of sericite and quartz, usually with abundant sulfides or oxidized limonite products of sulfide.

Sericite-Kaolinite: Complete destruction of feldspars and altered to sericite, quartz, and kaolinite. The kaolinite may be supergene or hypogene, in which case the assemblage may represent a partial alteration of sericitic alteration to a low temperature alsic assemblage.

Alsic: An assemblage of aluminum and silicate minerals including pyrophyllite, andalusite, zonyite, topaz, corundum, diaspore, and quartz. Mesozoic rocks commonly contain 1/2% to 2% rutile. Pyrophyllite and quartz are the dominate minerals with other minerals locally abundant. The rocks contain sericite near the borders of alsic and sericitic assemblages. Original textures are usually obscured, but larger scale features (bedding, rock fragments, etc.) are normally preserved. The assemblage usually contains little or no sulfide.

Alunite-Alsic: Composed of a mixture of alunitic and alsic assemblages.

Alunitic: An assemblage containing alunite, quartz, and usually minor diaspore and sulfide. Original textures are obscured and larger scale features are partially obscured.

Silica: Composed of fine-grained quartz "reefs" of essentially pure quartz, but may contain minor sulfide. Textures are usually obscured.

Alteration zones form a crude cone in cone pattern with the apex of the cones pointed toward the heat source. Alsic alteration forms the inner-most cone with sericitic alteration the next outer cone, then the illite-feldspar cone, then the propylitic zone.

The alsic, alunitic, and silica alteration generally show strong bedding control while sericitic and illite-feldspar alteration form a more

east-west pattern that is probably controlled by vertical fractures.

Most of the alteration appears to have occurred prior to much of the low angle Proffett-type basin and range faulting. It is common to find alteration of one type (e.g. alsic) in one fault block juxtaposed next to alteration of another type (e.g. propylitic) in the adjacent fault block. Tertiary dikes exposed in the area appear to be late and/or post "main-stage" alteration and faulting. Several dikes intrude across low angle faults without further displacement. Dikes are commonly less altered than the rocks they intrude.

Figure 1 shows a diagrammatic east-west cross section showing alteration zonation, assuming the porphyry system was tilted westward about 65 degrees from vertical. Such tilting is consistent with alteration zonation and the regional structure of the area. Somewhat more or less tilting is probable. The distance between the base of alsic alteration and the top of mineralization is impossible to predict. If the top of mineralization is further to the east, (Figure 2) then stronger alteration than is present might be assumed to crop out on the east flank of the range. If the top of mineralization lies further to the west (Figure 3), then alsic alteration may have partially consumed the copper mineralization. If the system has been faulted by low-angle Basin and Range faults (Figure 4), then the system may lie considerably to the west.

The size of the system is far larger than previously thought (Oriel, 1976, 1977, 1979). The width of the alsic and sericitic cones taken on a north-south line through drill hole BC-2 and interpolated under alluvium is some 12,000 feet. Depth of emplacement was about 4 km.

Hill 5628

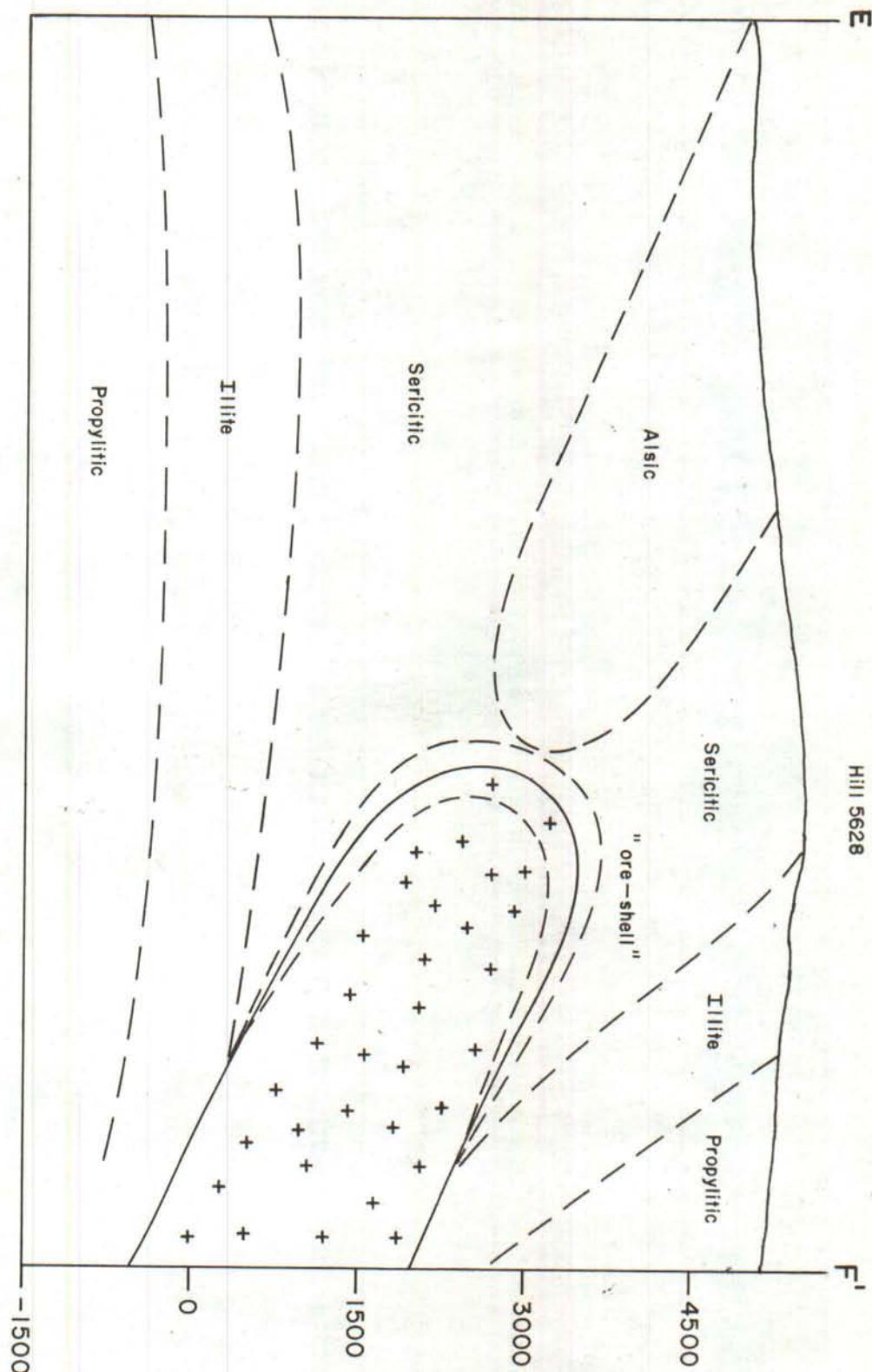


Figure 1. Diagrammatic cross section of the Buckskin Porphyry System showing alteration zonation.

0
750'
1500'

**DIAGRAMMATIC CROSS SECTION
OF THE
BUCKSKIN
PORPHYRY SYSTEM**

conoco	Continental Oil Company MINERALS DIVISION METALLICS DIVISION Reno, Nevada
DATA BY D. HUDSON	DATE 7/19/79 COUNTRY DRAWN BY J. RUSSELL STATE SCALE 1" = 1500'
	DRAW NO.

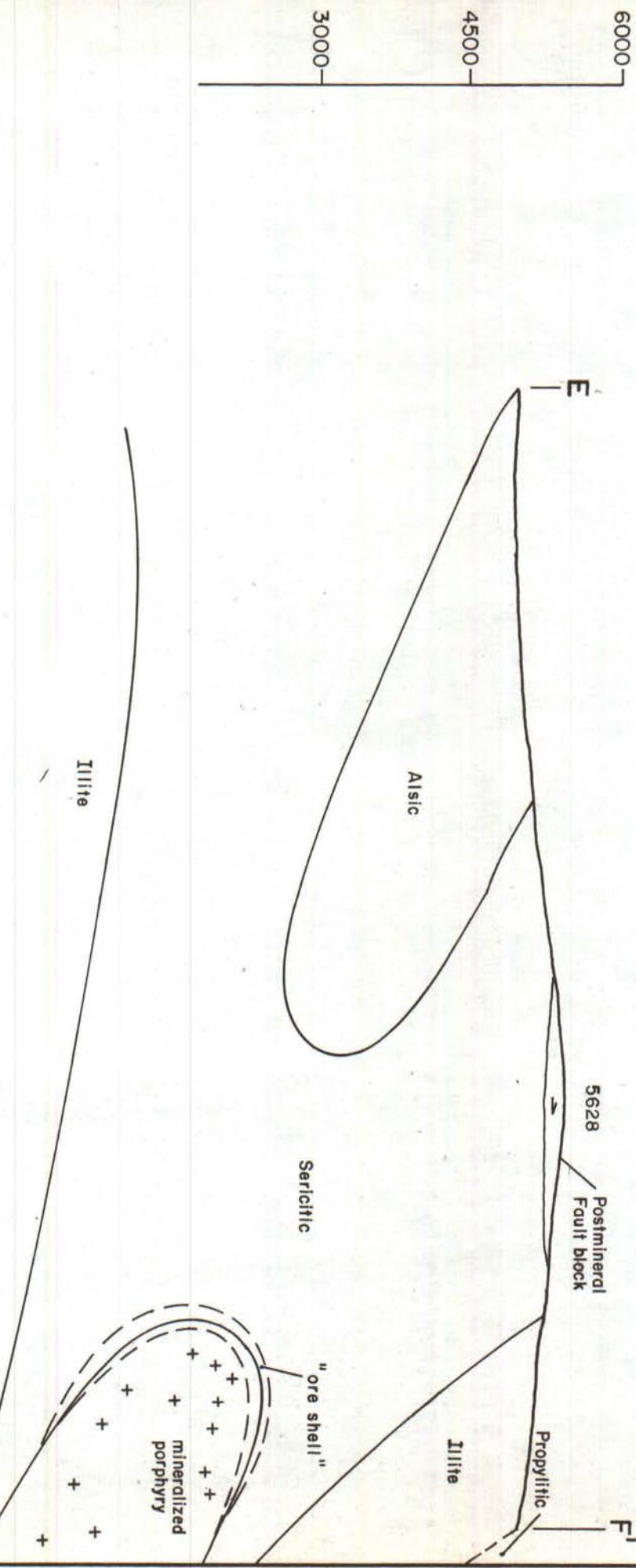
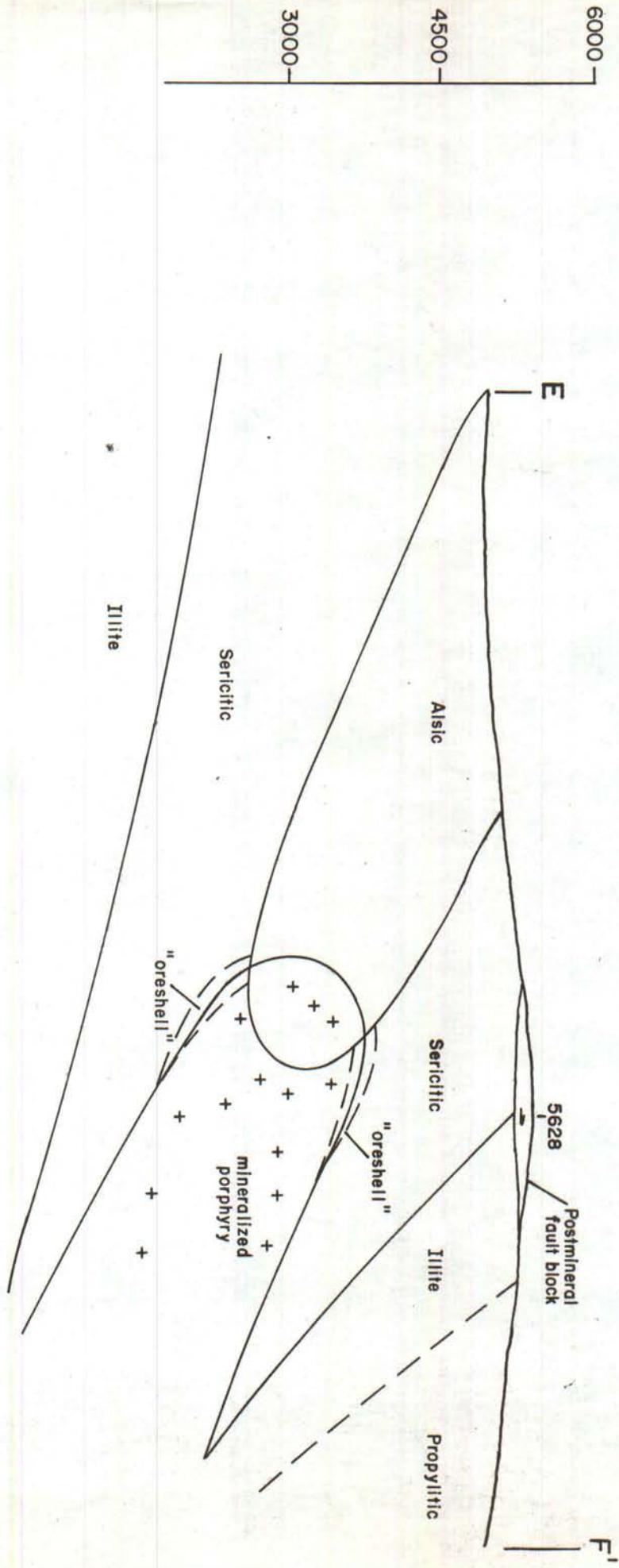


FIGURE 2. Possible case where mineralized porphyry lies further to the east than in Figure 1. Strong illite alteration and some sericitic alteration should crop out on the east flank of the range but in reality does not.

conoco	
Continental Oil Company MINERALS DEPARTMENT METALLICS DIVISION Reno, Nevada	
DATA BY D. HUDSON	DATE 6/79
DESIGN BY J. RUSSELL	SCALE 1:1500'
CROSS SECTION TO ACCOMPANY BUCKSKIN ALTERATION REPORT	

FIGURE 3. Possible case where mineralized porphyry lies further to the west than in Figure 1. Alsic alteration has partially destroyed copper mineralization at the top of the mineralized porphyry.



**HYPOTHETICAL CROSS SECTION
TO ACCOMPANY
BUCKSKIN ALTERATION REPORT**

conoco		Continental Oil Company MINERALS DEPARTMENT METALLURGICALS DIVISION Reno, Nevada		
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DRAWN BY J. RUSSELL			ONE NO.	

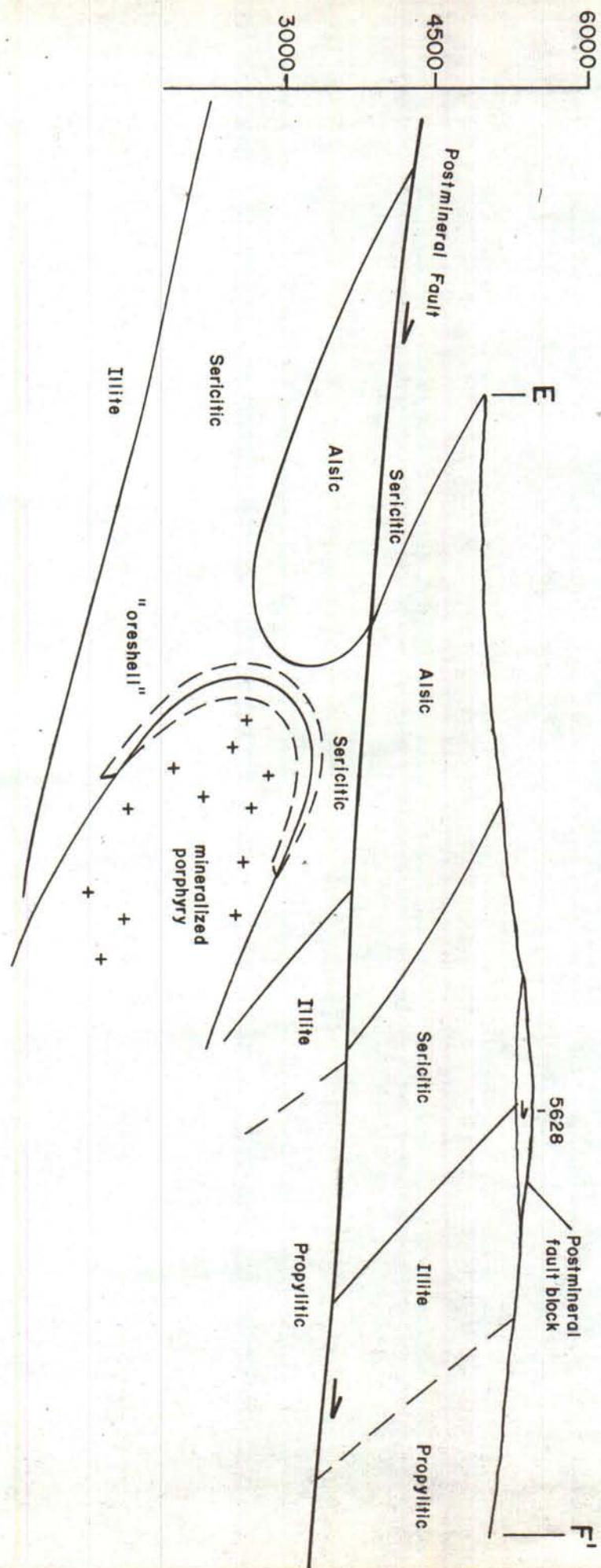


FIGURE 4. Possible case where post mineral low angle Basin and Range faulting has displaced alteration haloes eastward relative to mineralized porphyry.

NOTES & CORRECTIONS	
AREA & TYPE	
HYPOTHETICAL CROSS-SECTION TO ACCOMPANY BUCKSKIN ALTERATION REPORT	
Continental Oil Company MINERALS DEPARTMENT METALLICS DIVISION Hazard, Kentucky	
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	STATE
	DRILL NO.

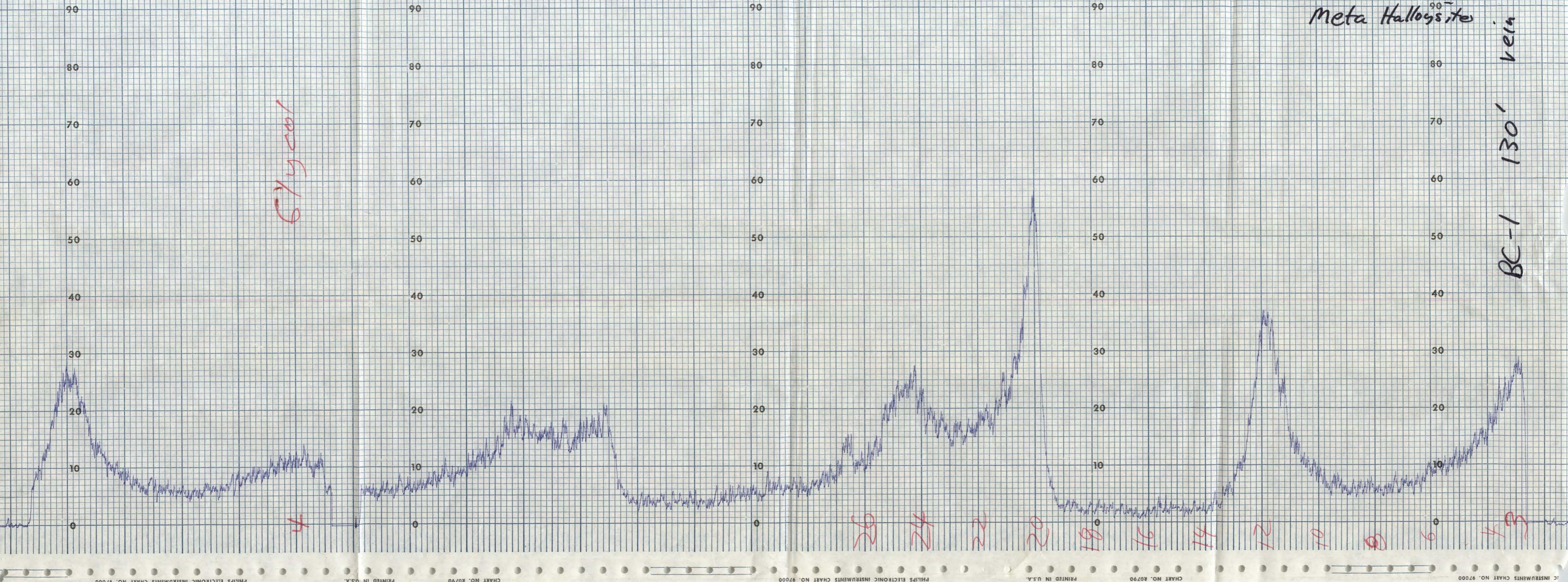
Meta Halloysite

vein

BC-1 130'

Glycol

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33
Item

Buckskin Project
XRD Sheets - UNR.

CHANGING CHART

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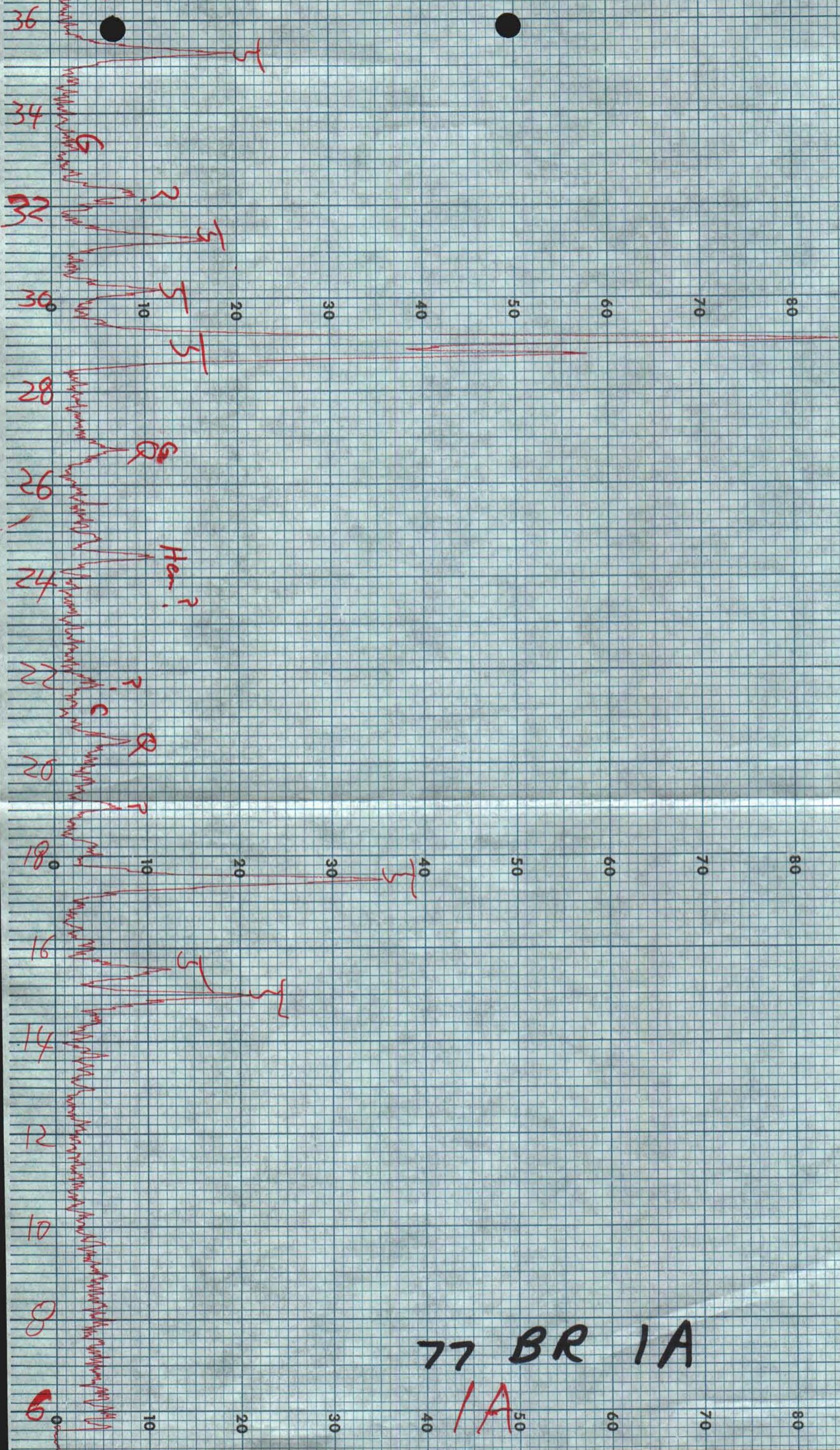
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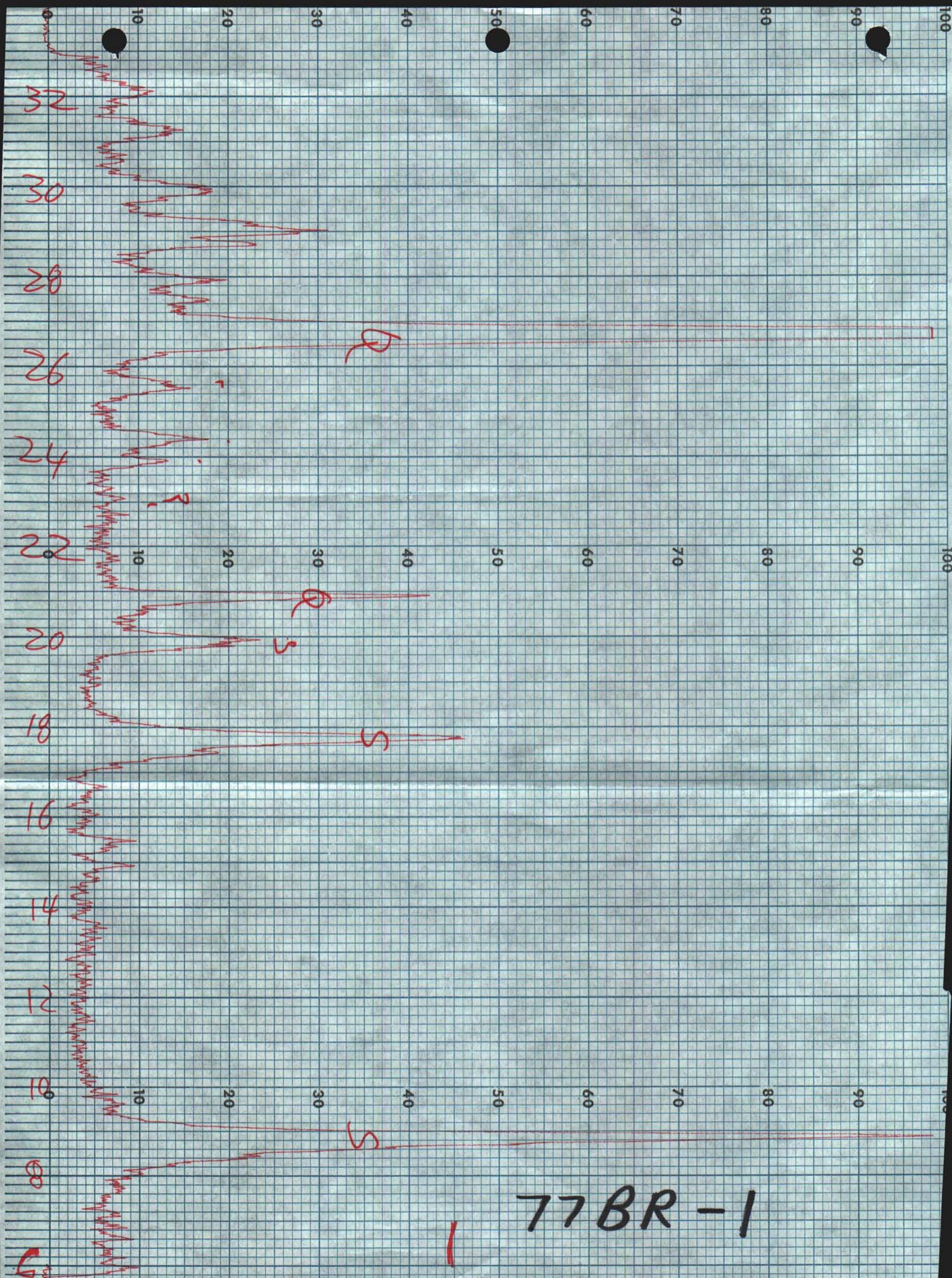
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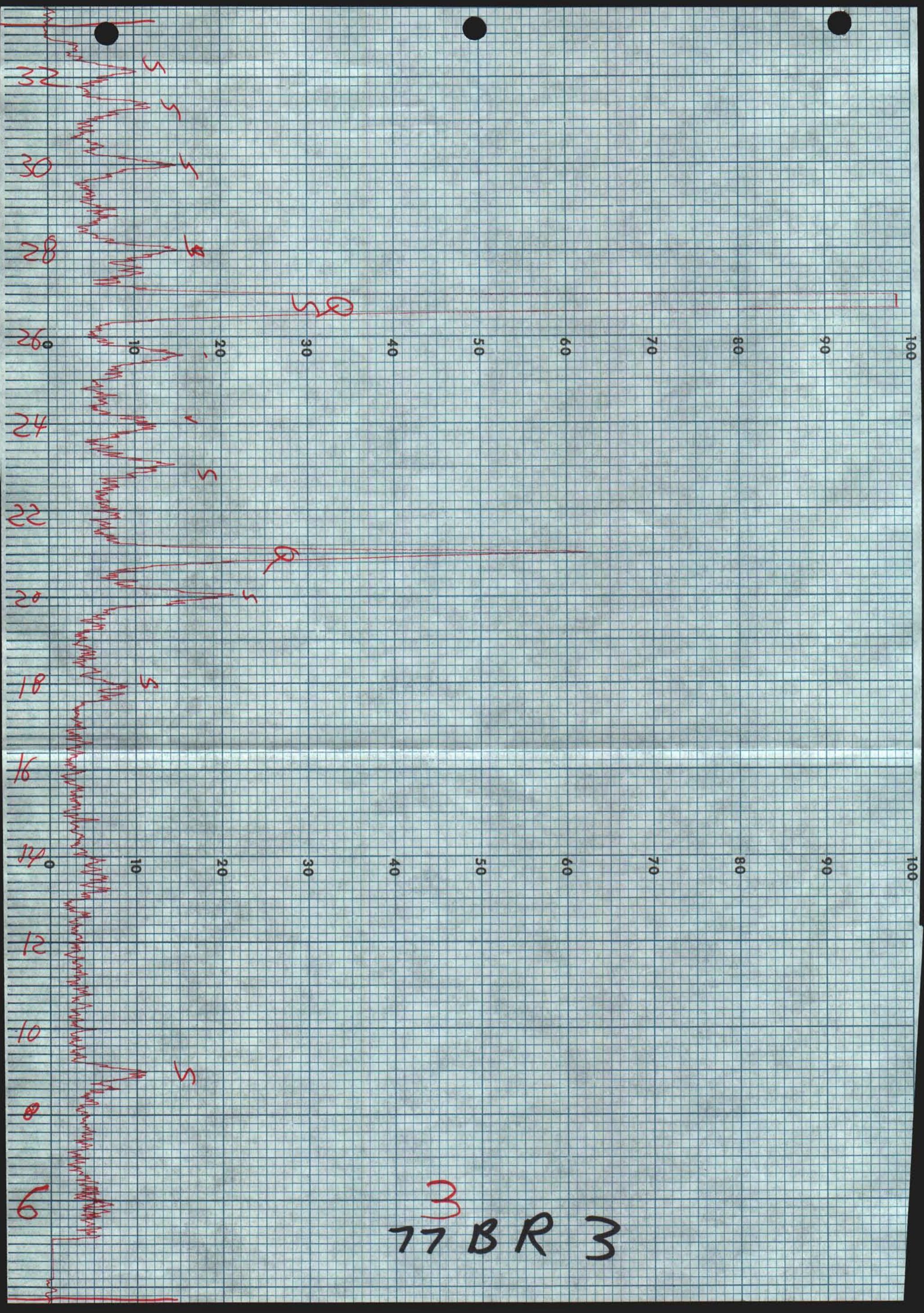
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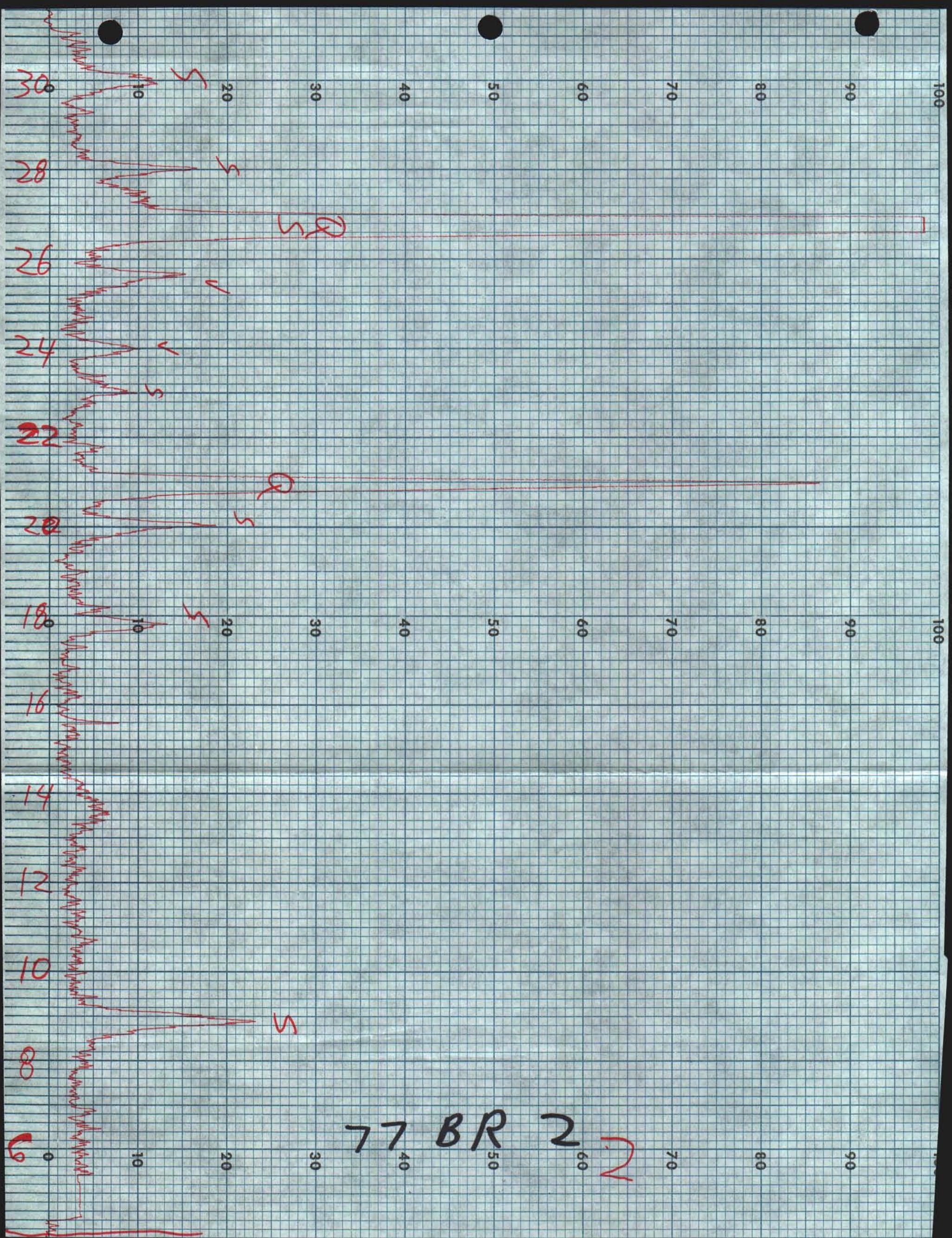
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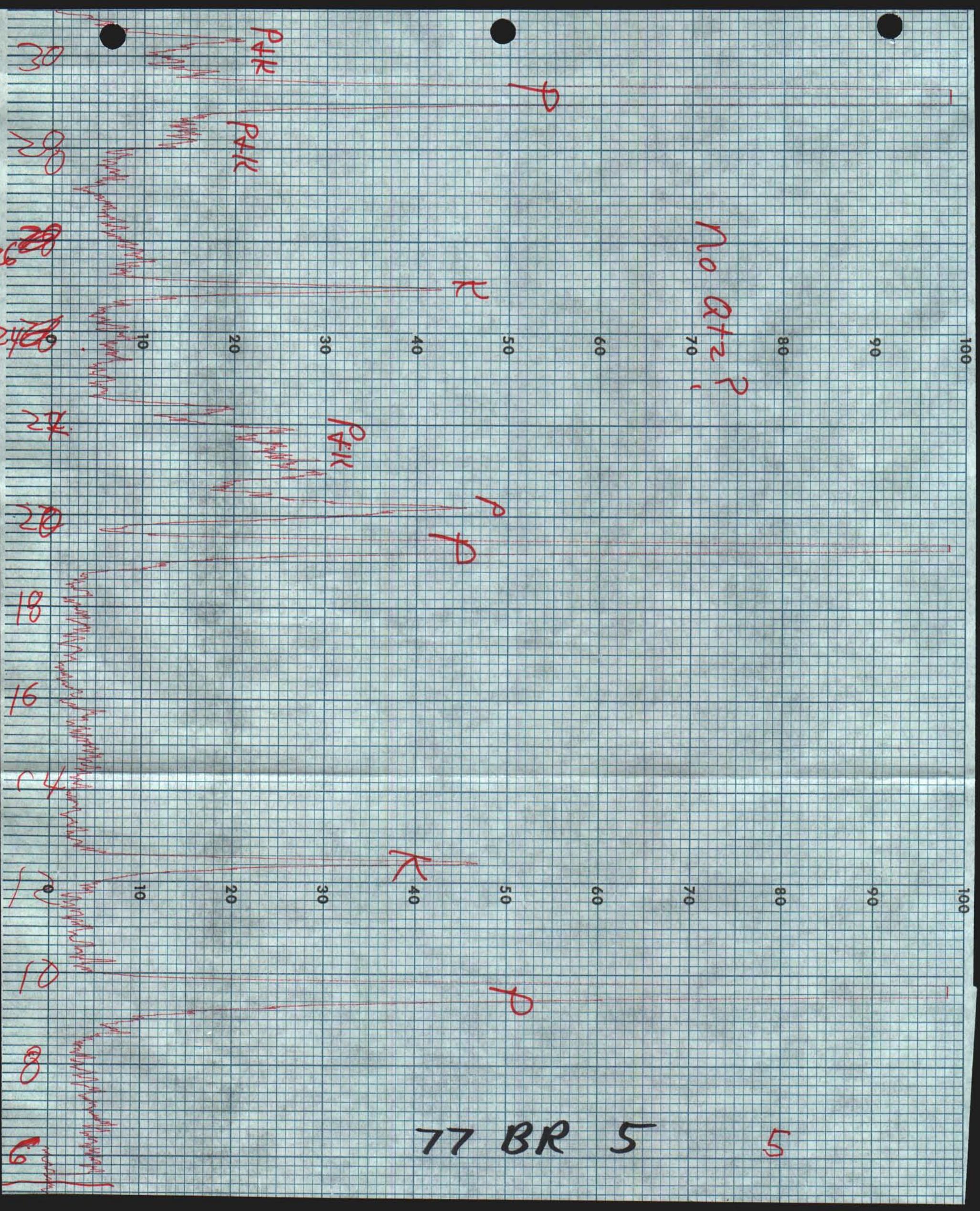
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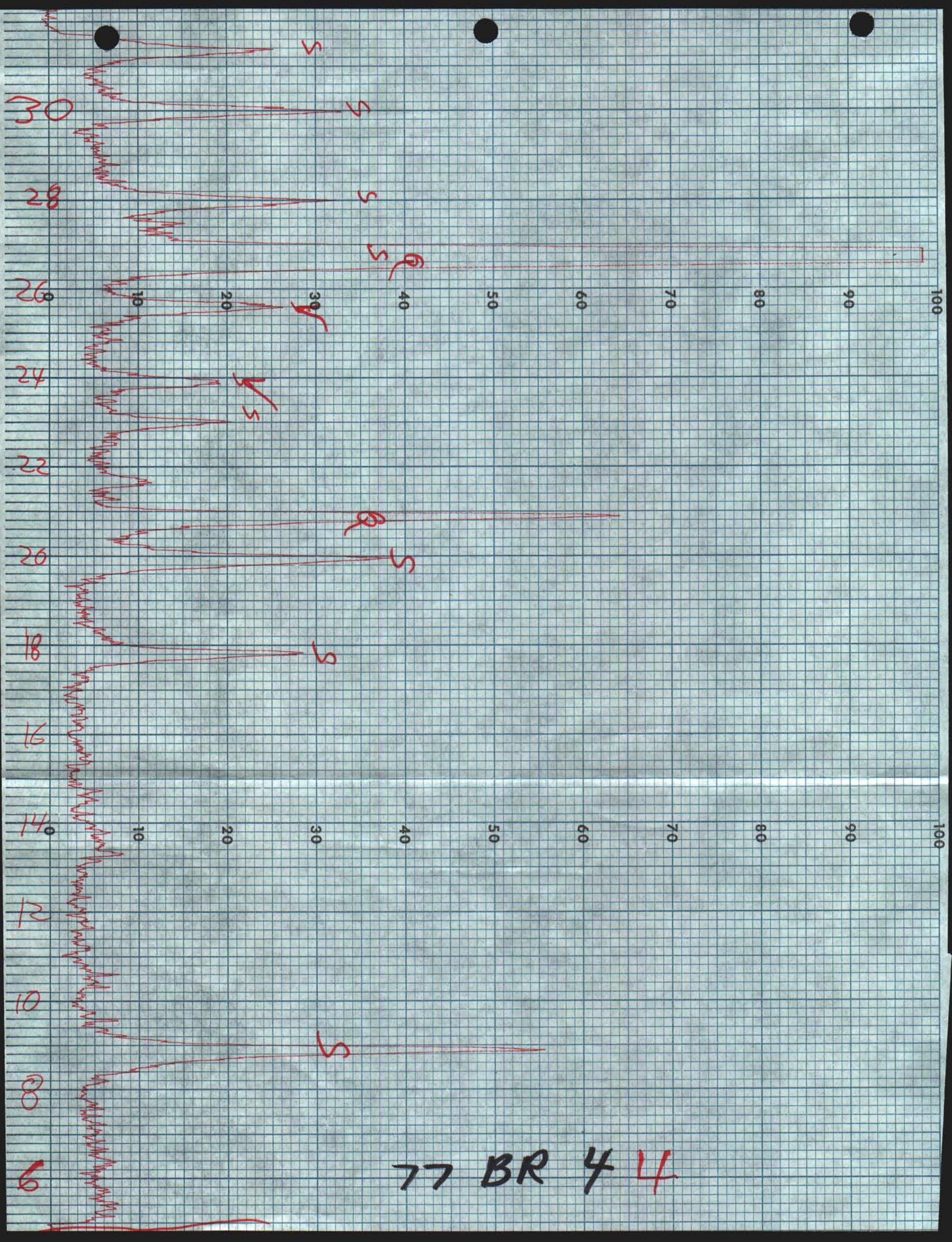


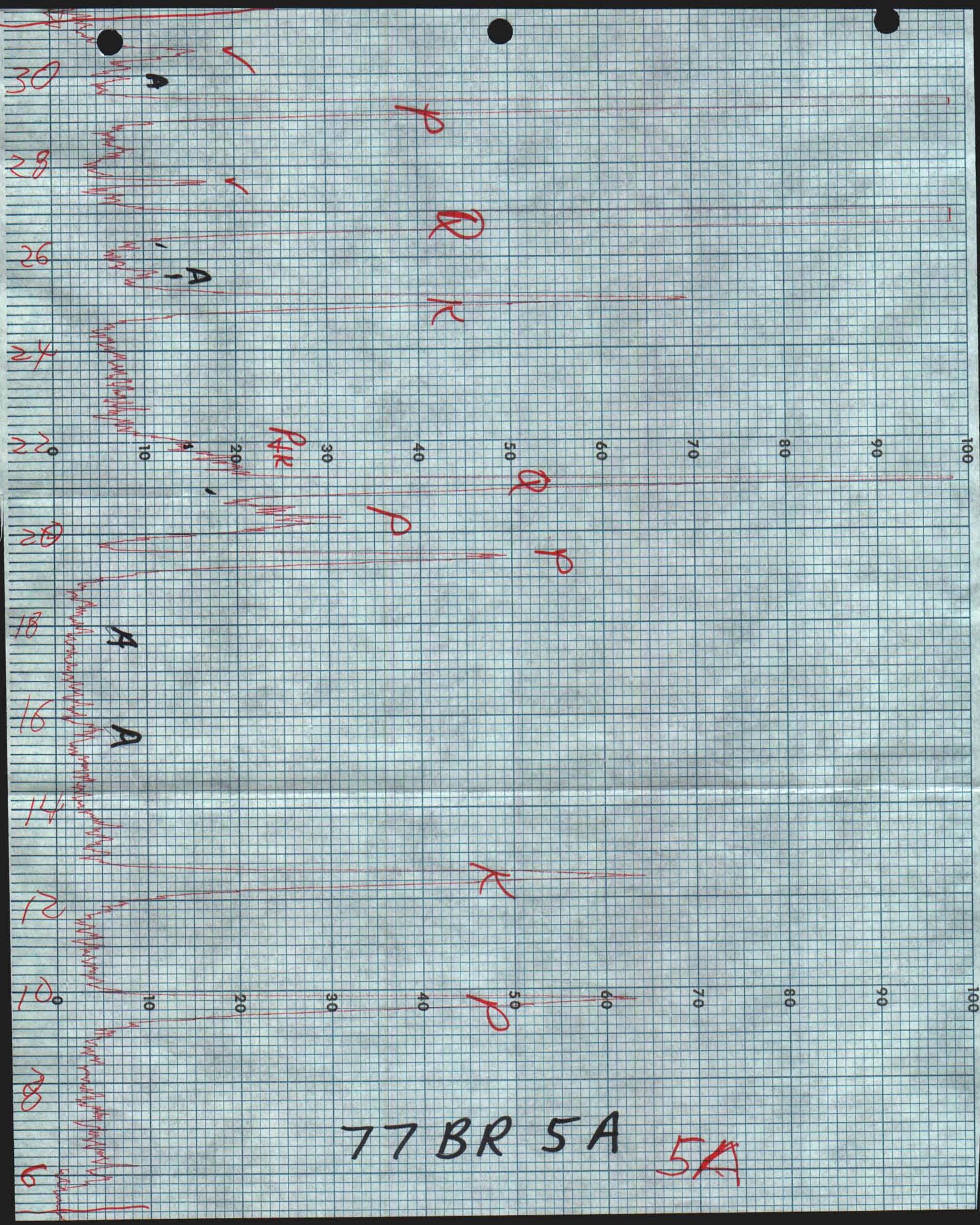












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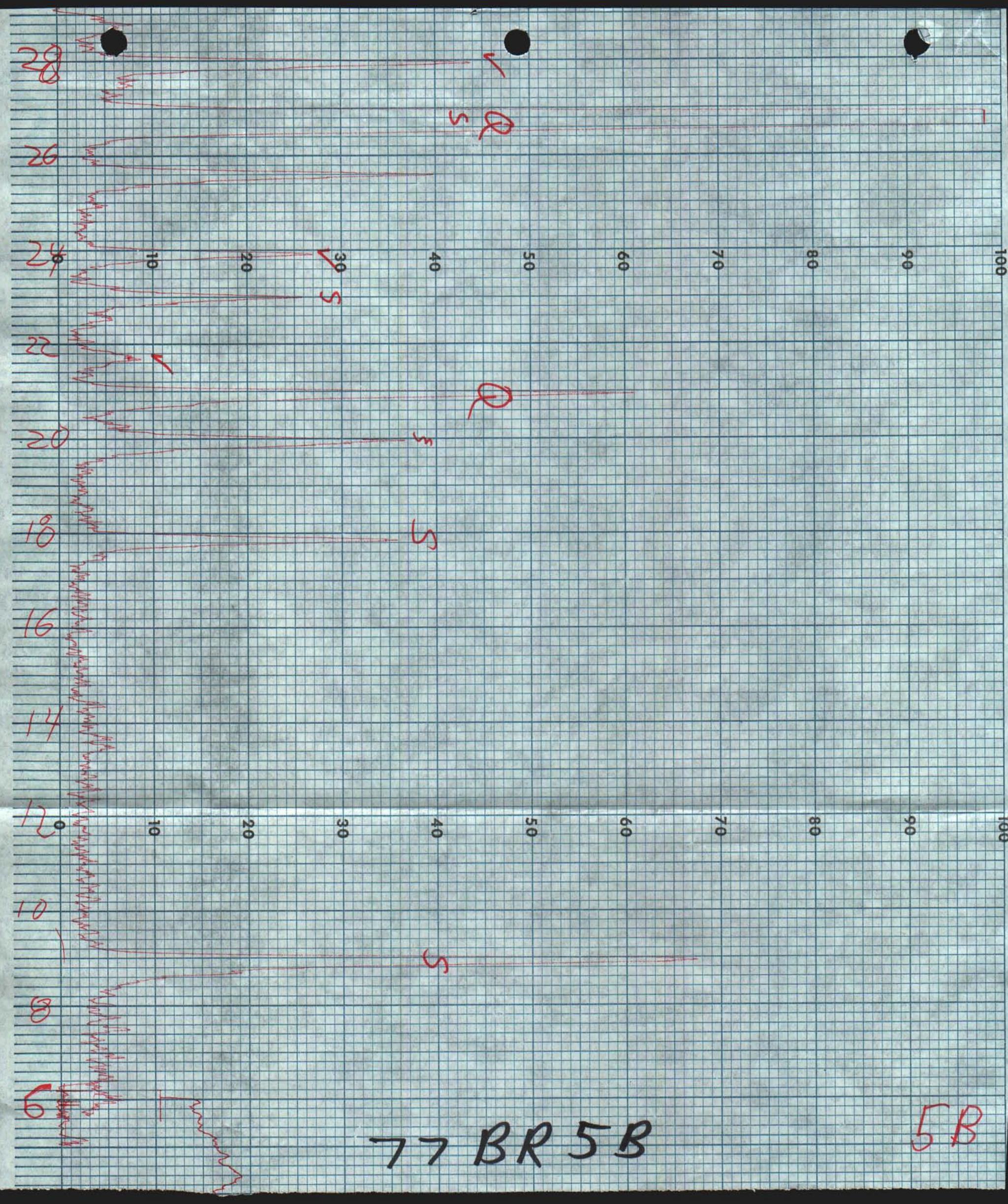
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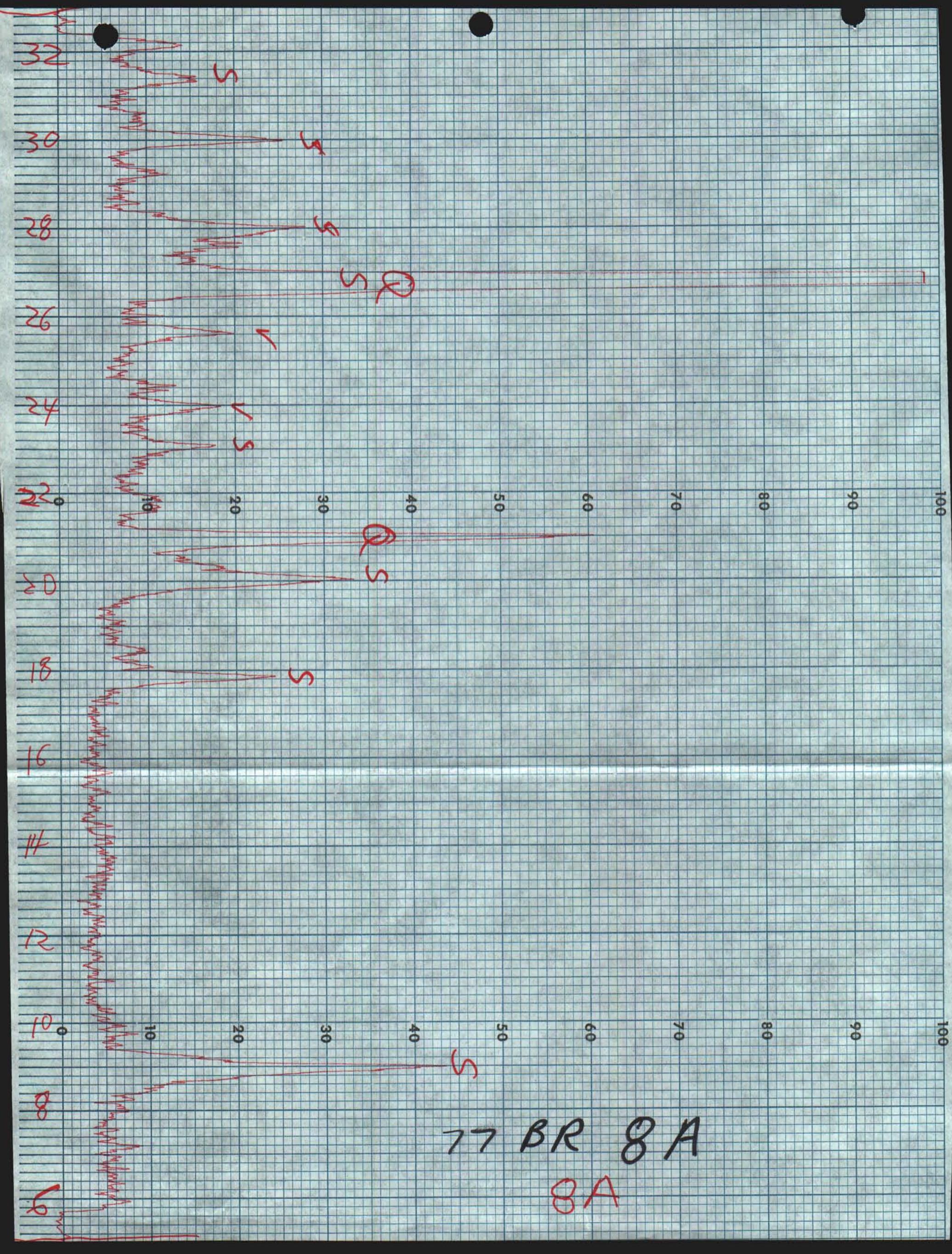
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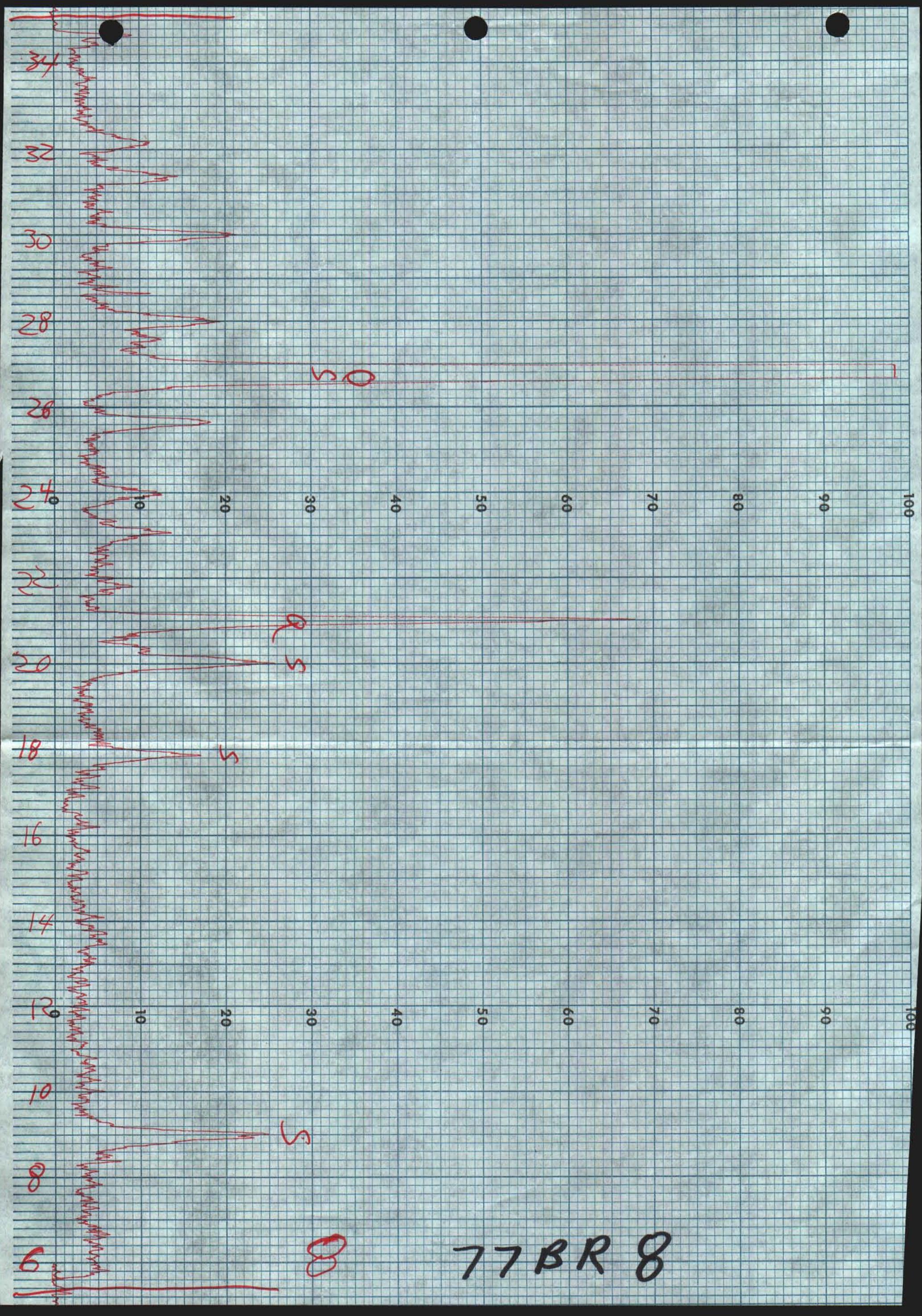
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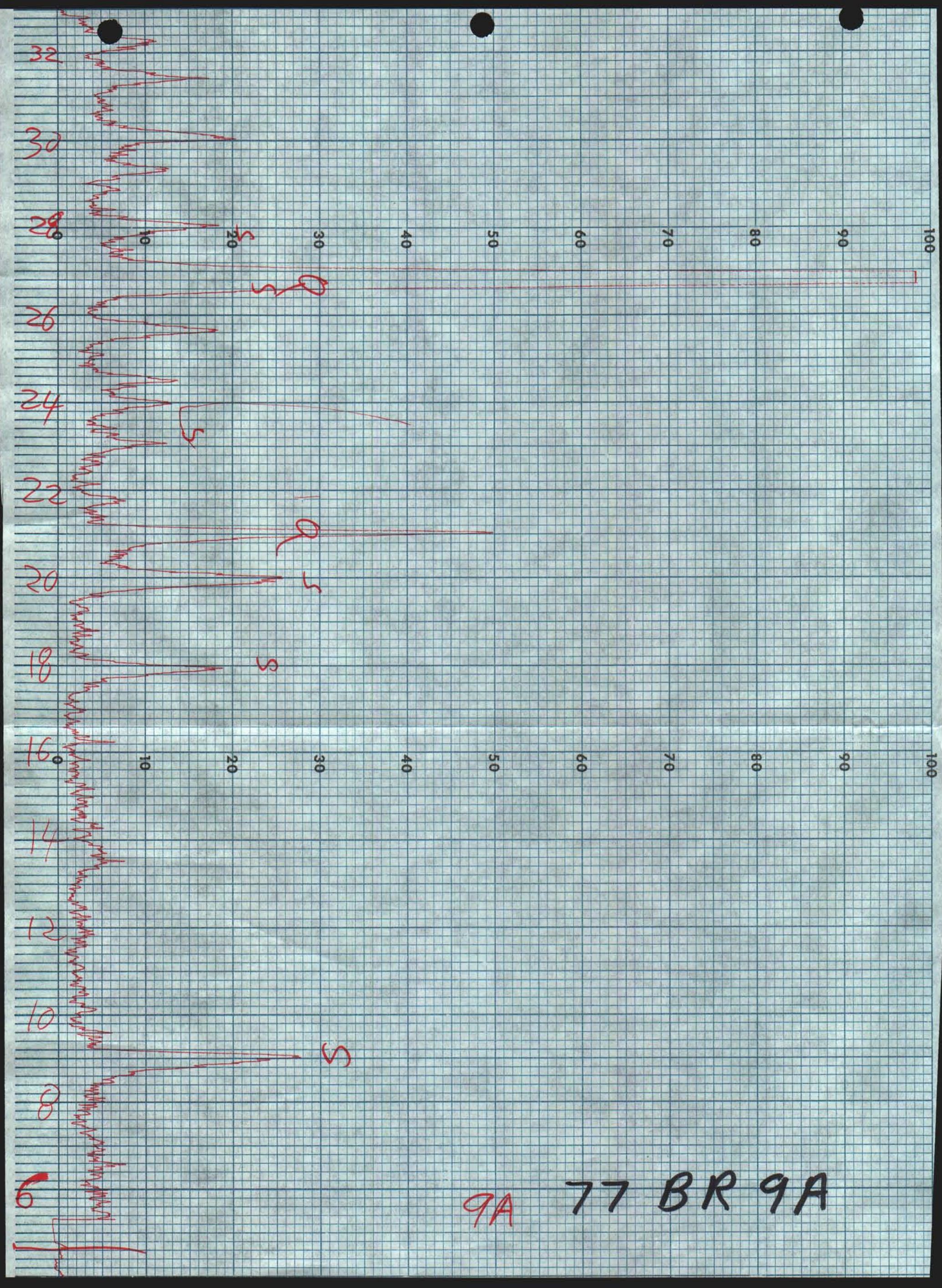
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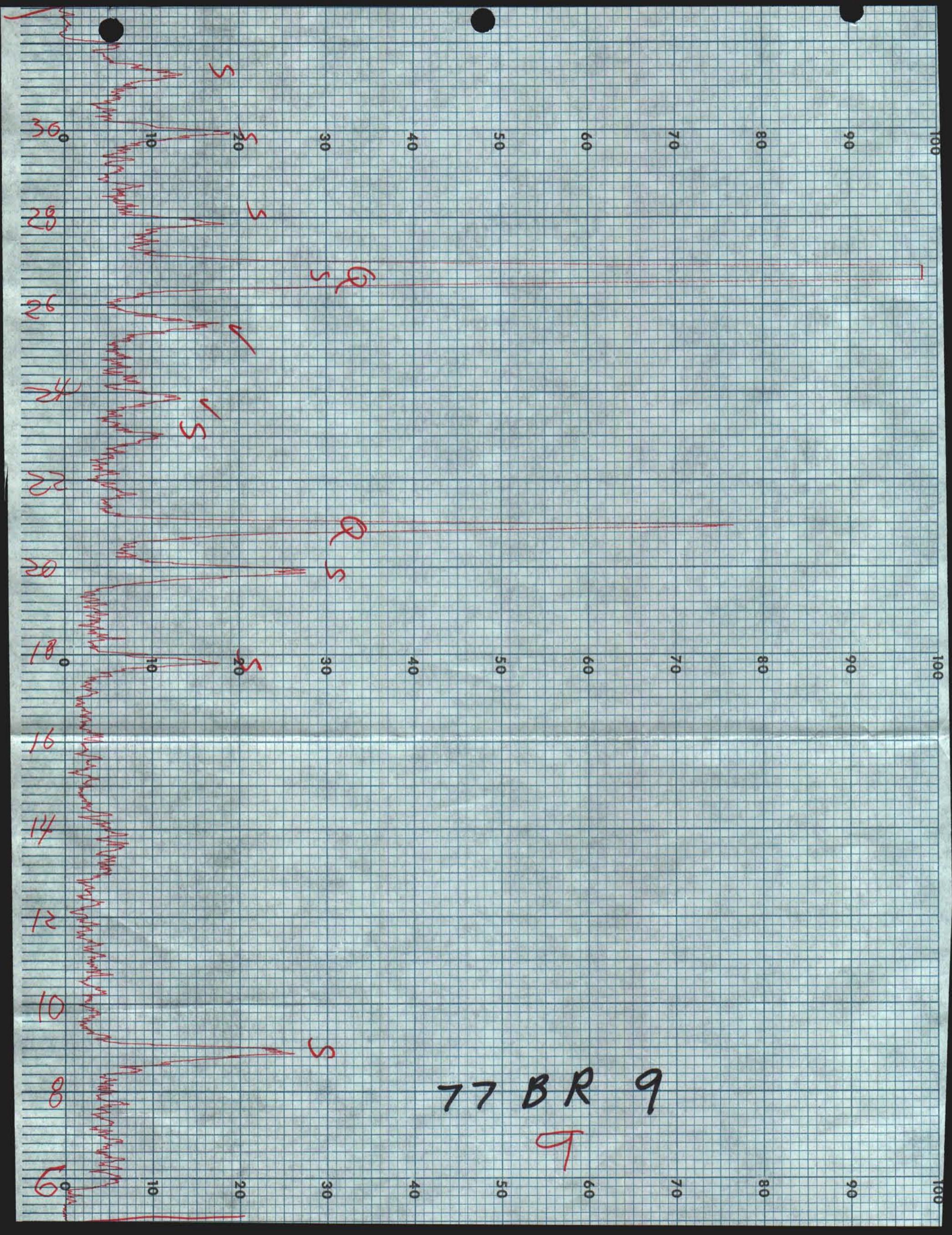
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CHANGE CHANGE

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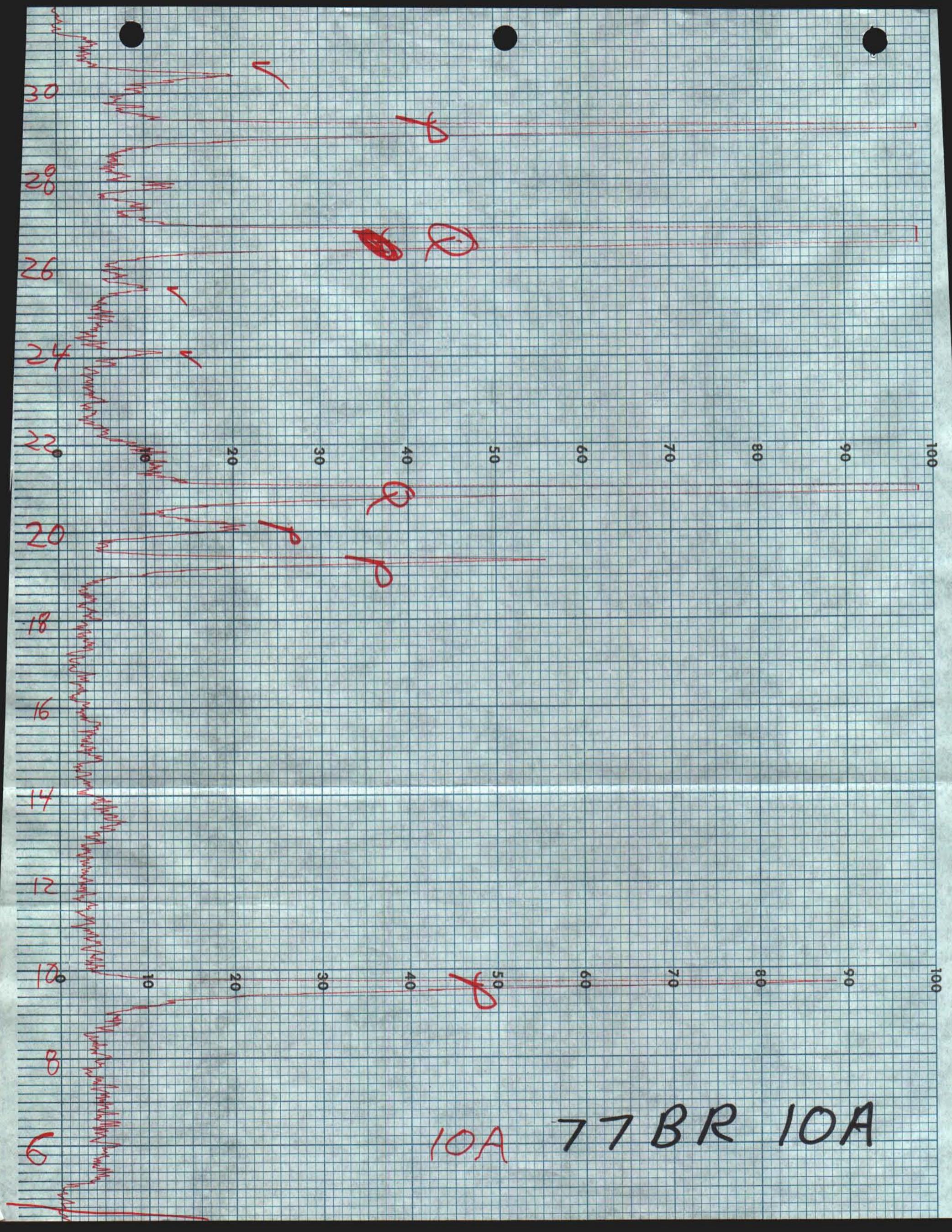
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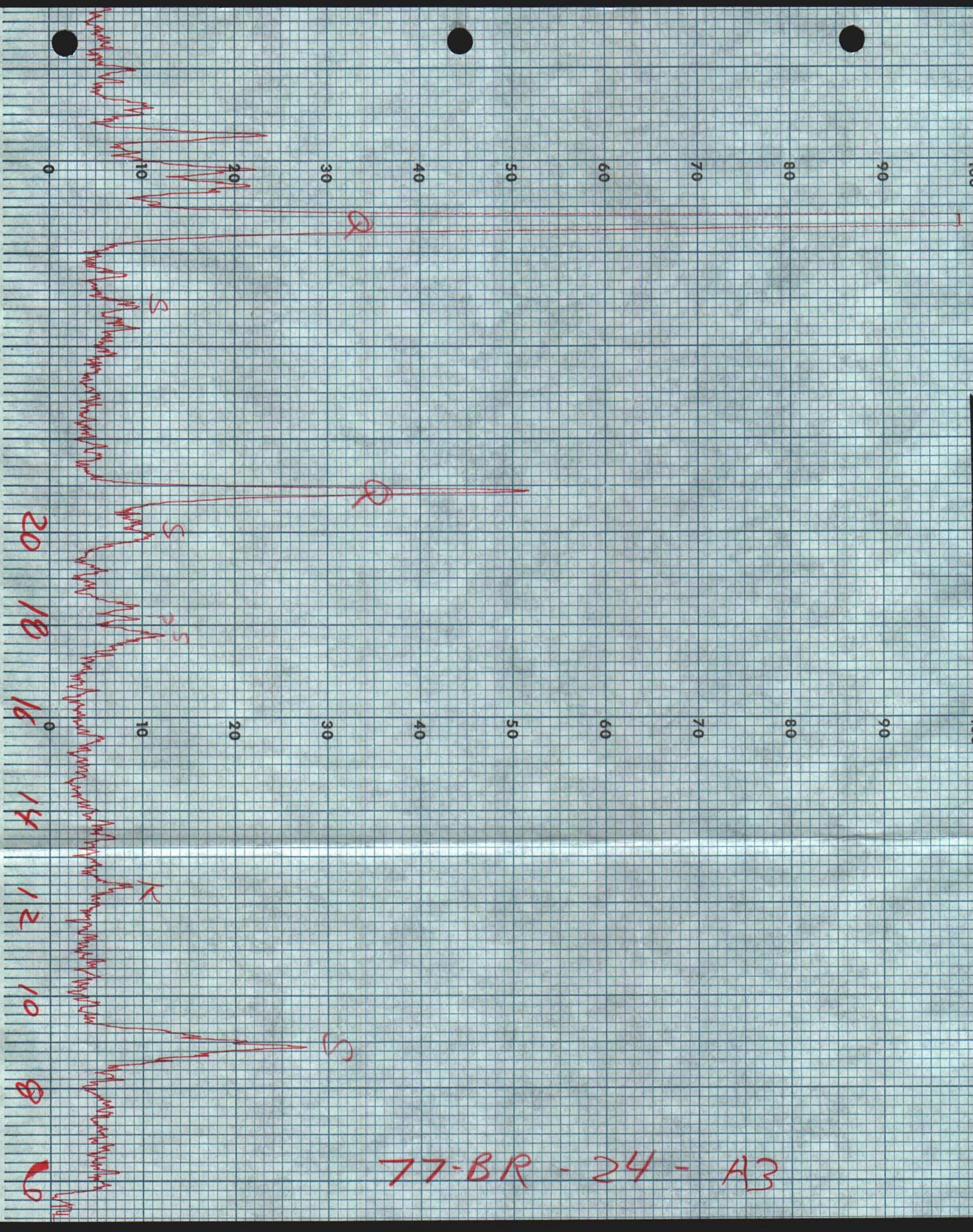
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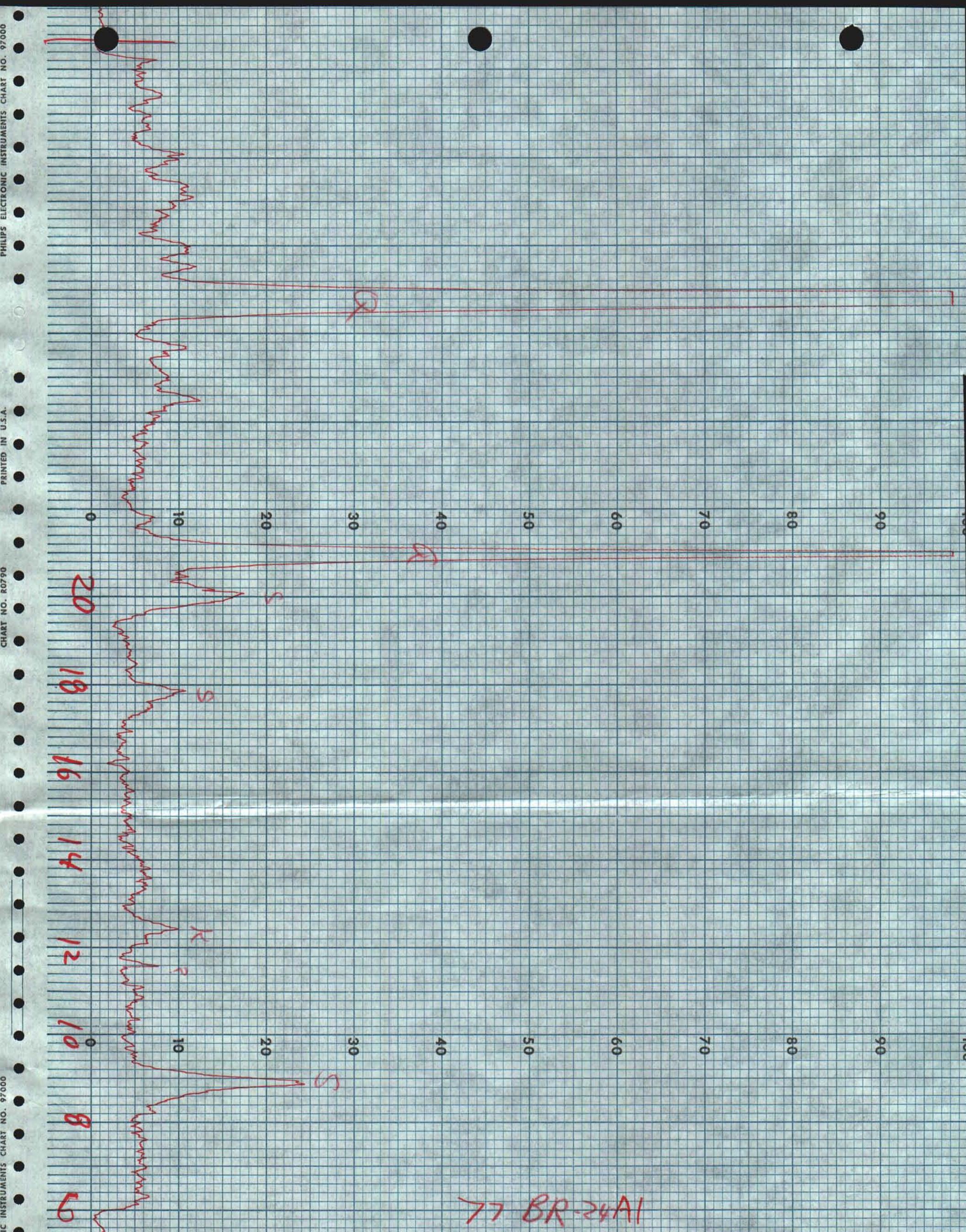
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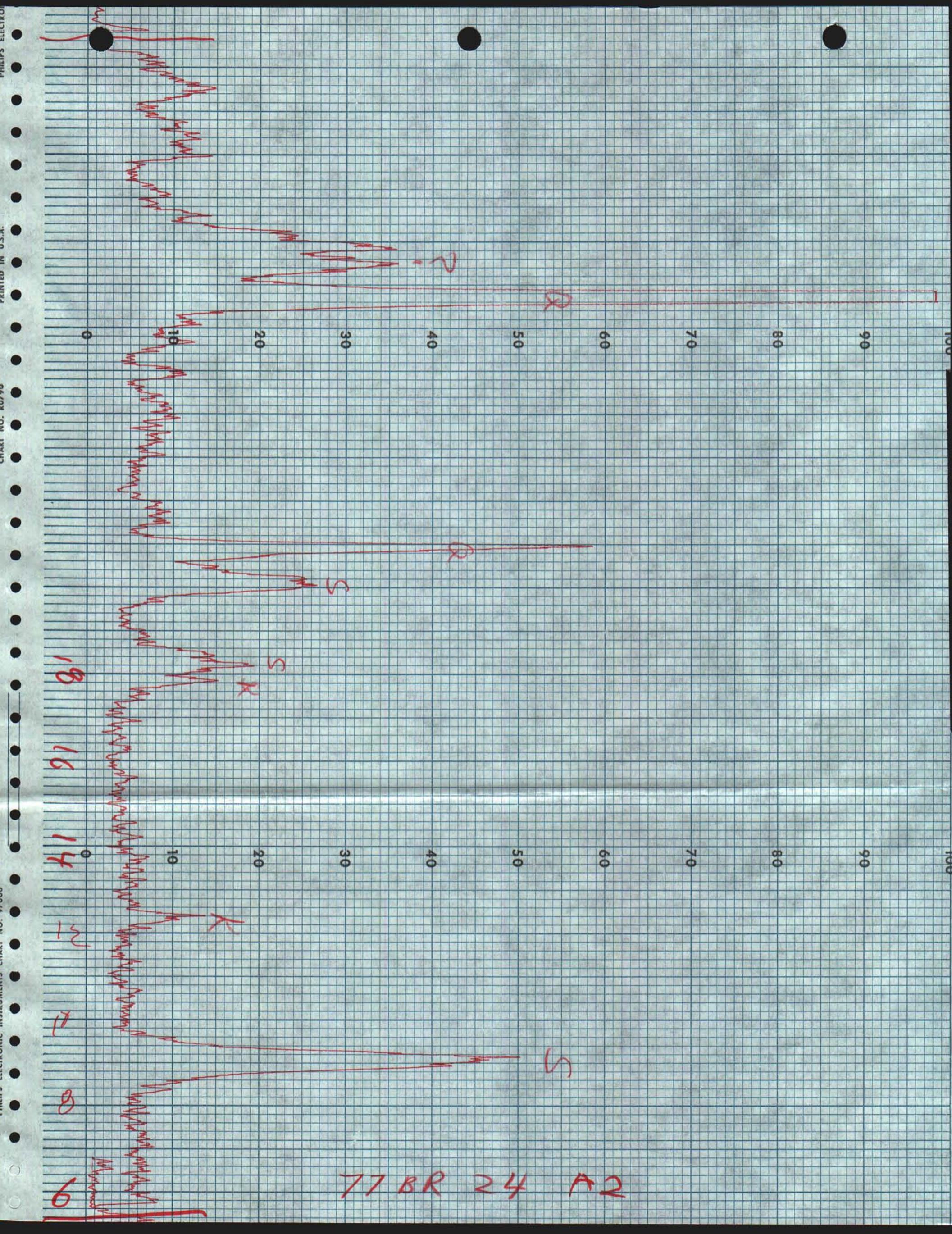
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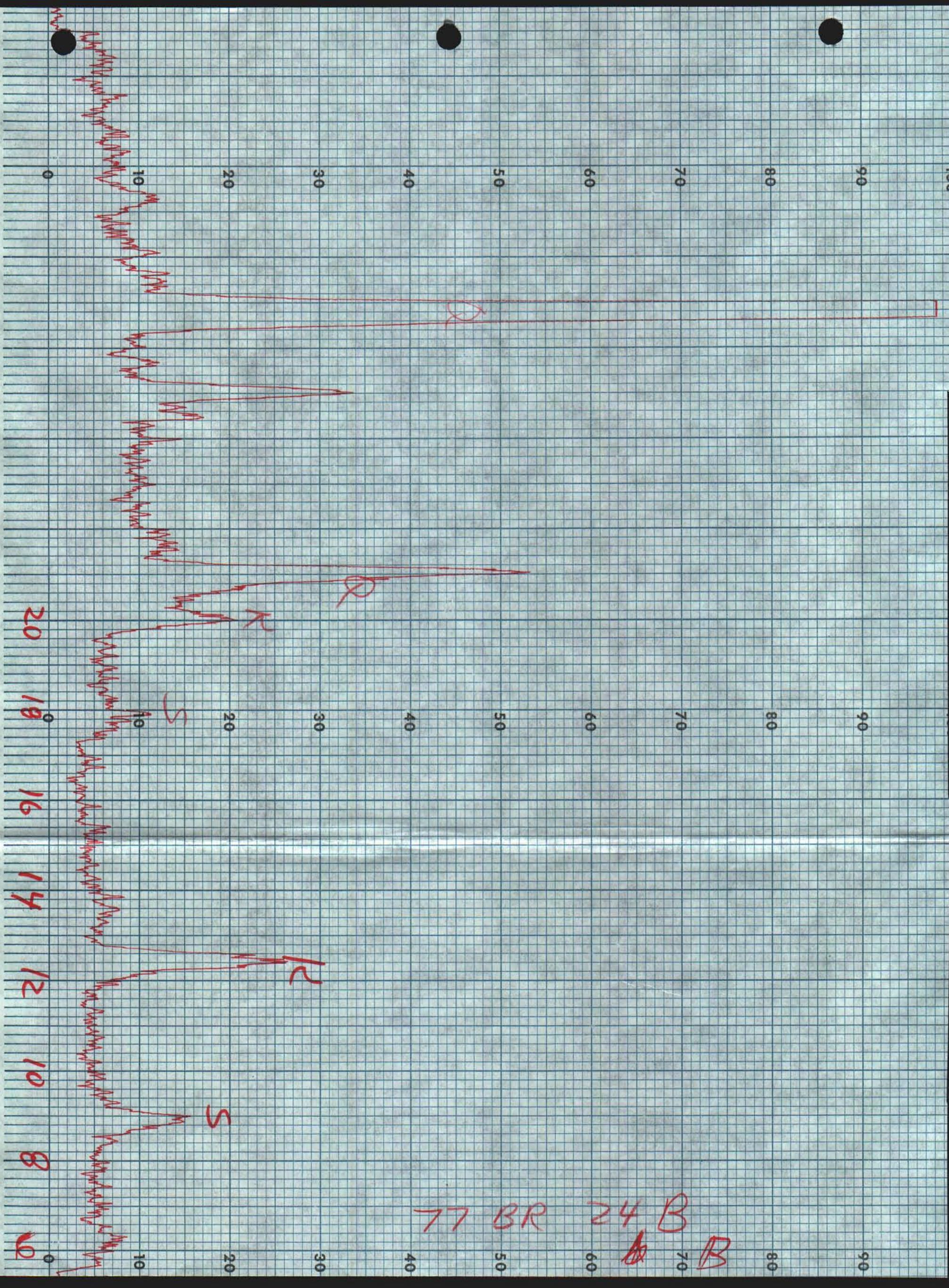




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BC-2

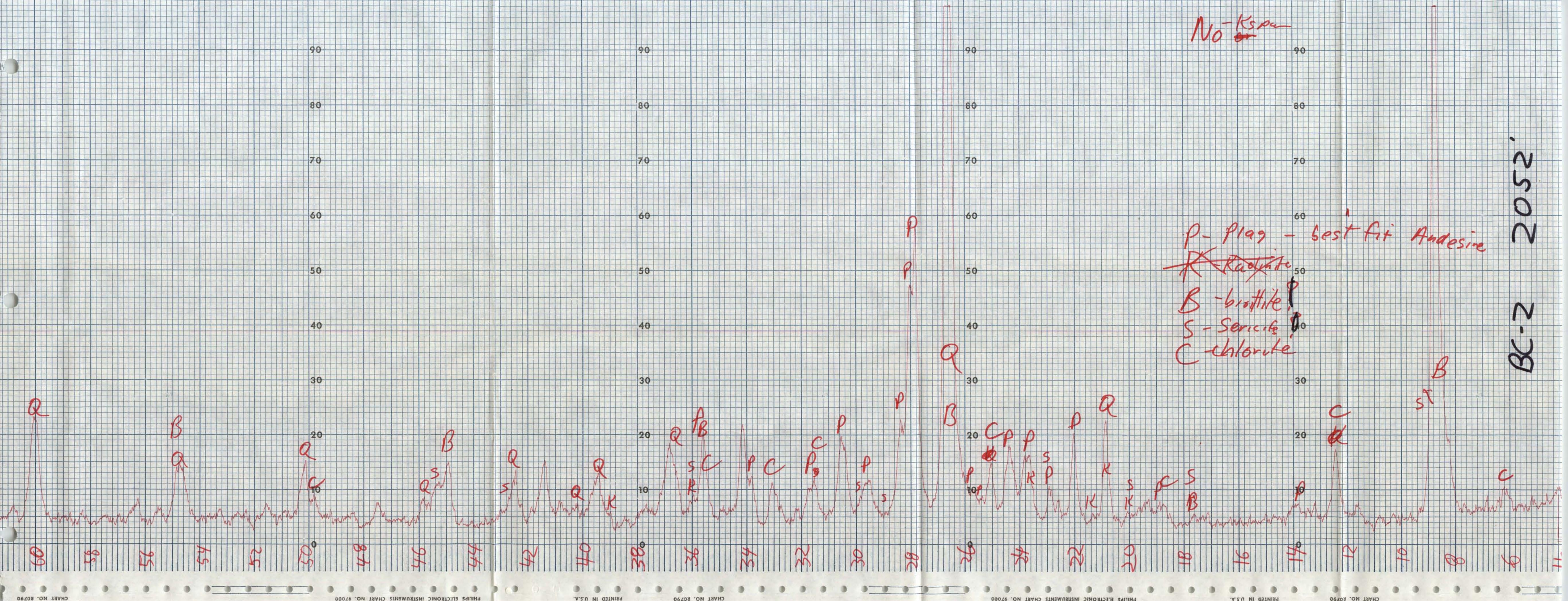
P - Plagi - best fit Andesine

~~R~~ - Ralite

B - brookite

S - Sericite

C - chlorite



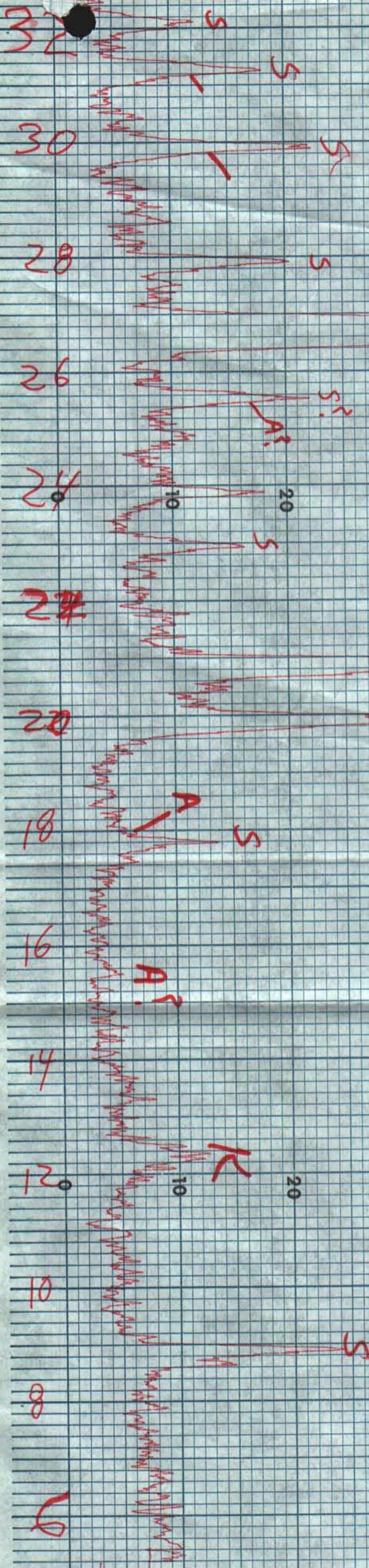
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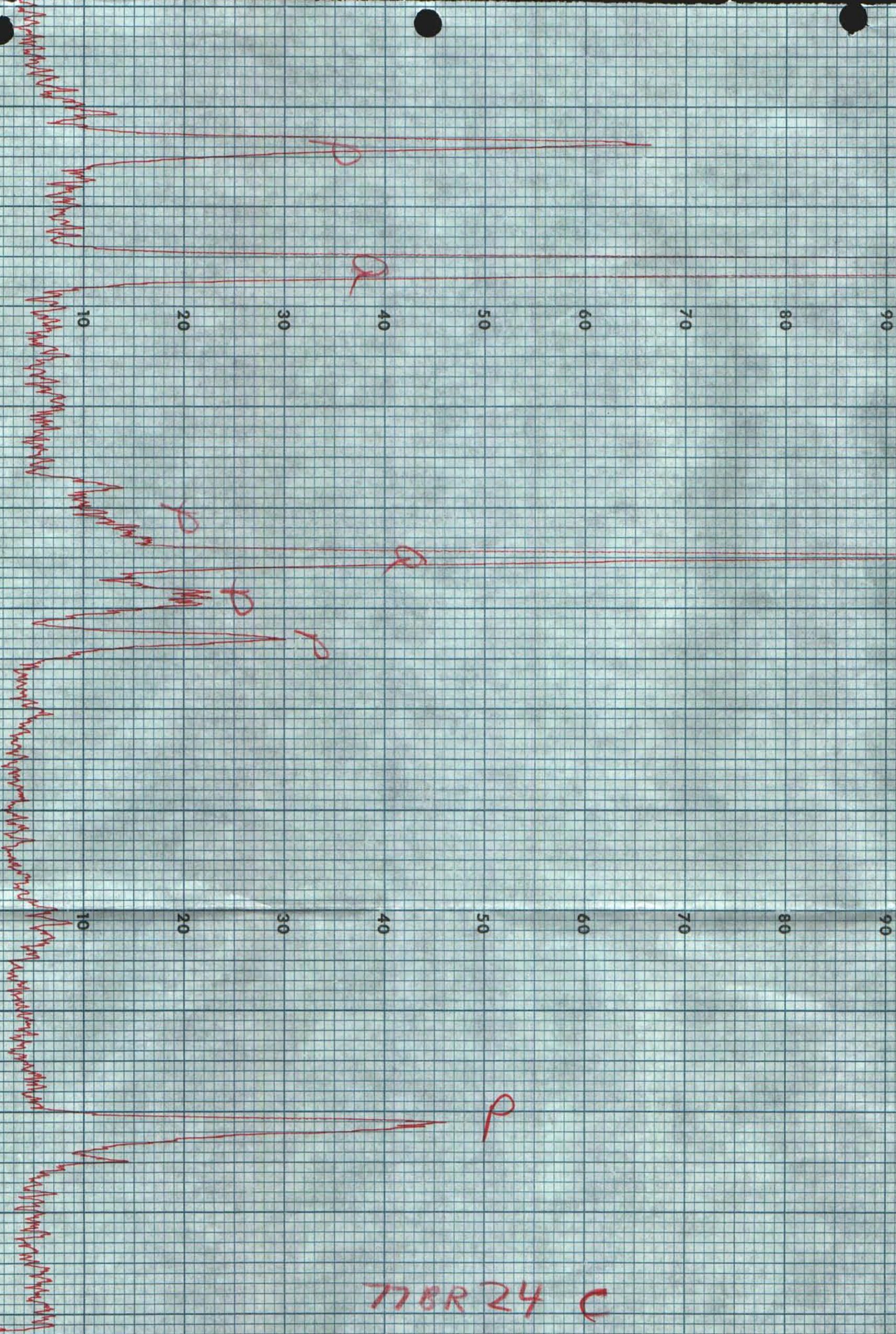
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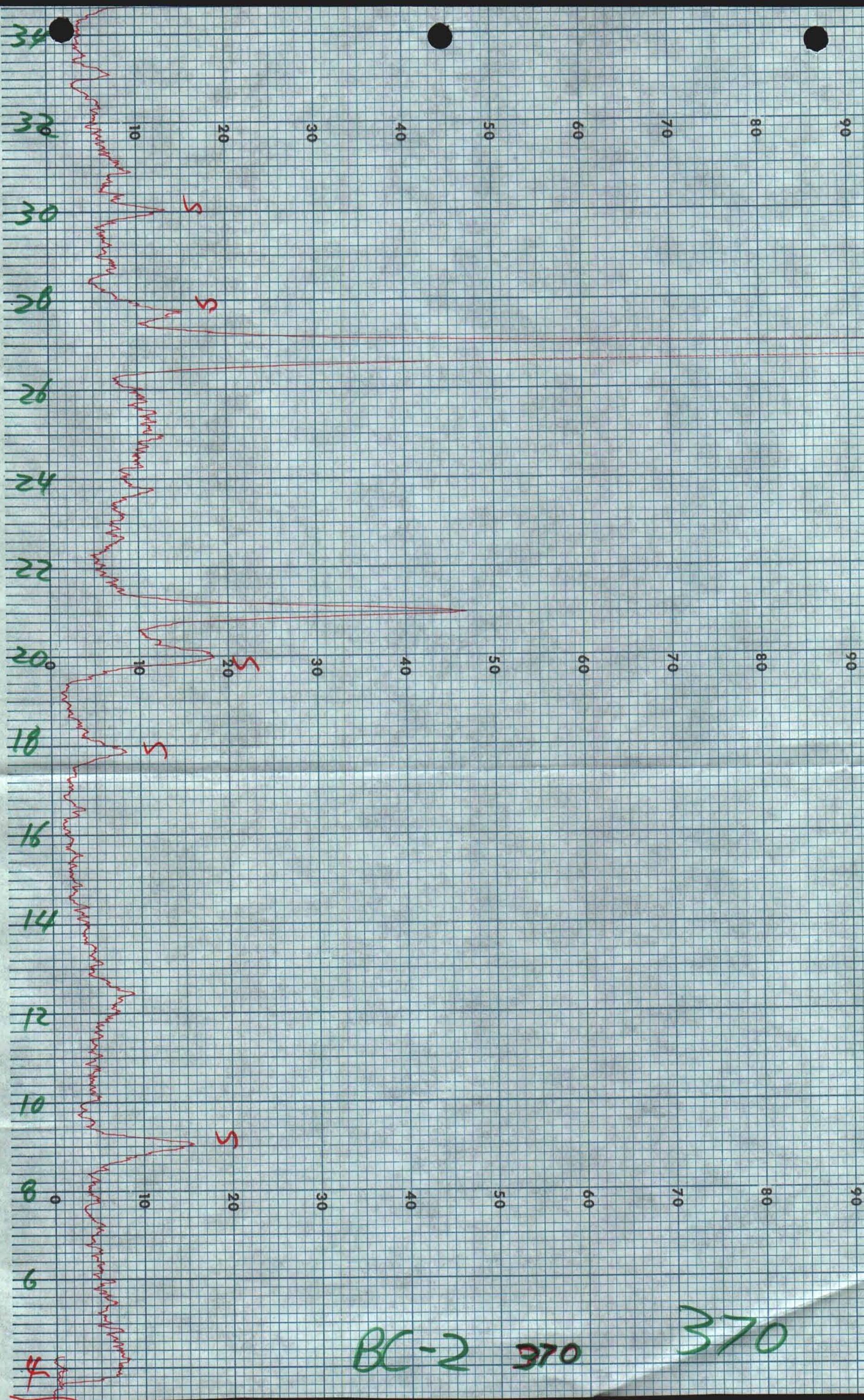
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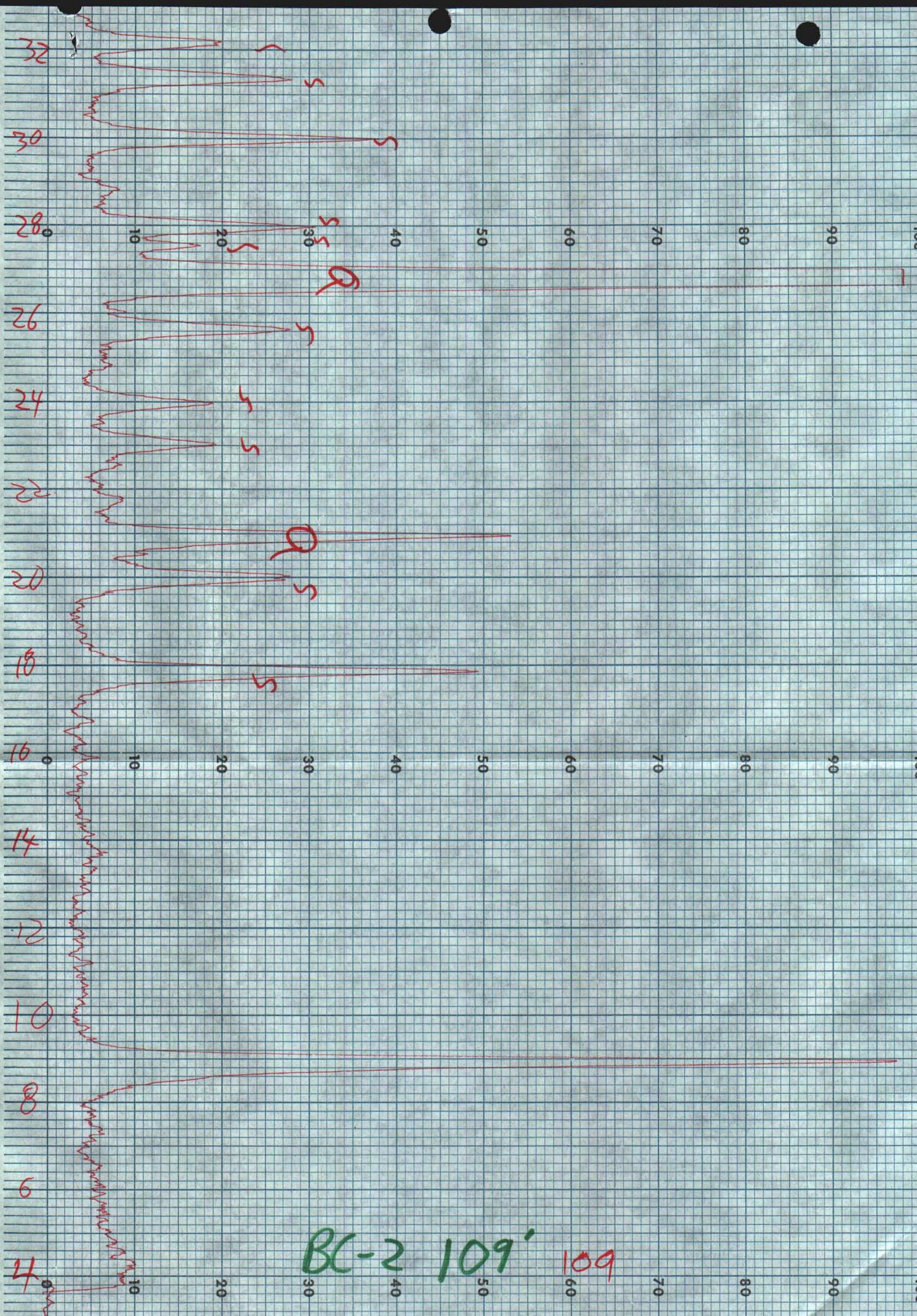
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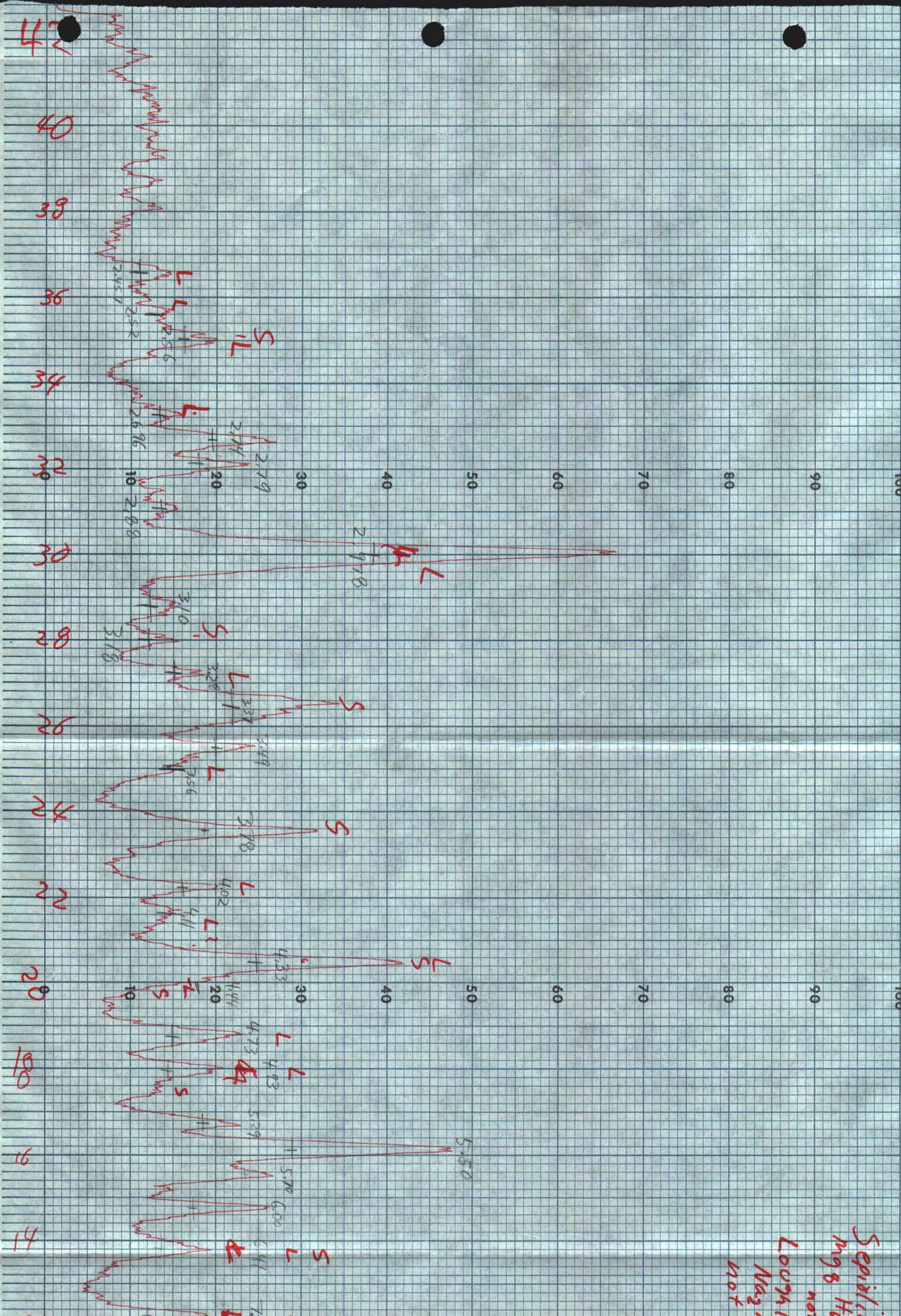


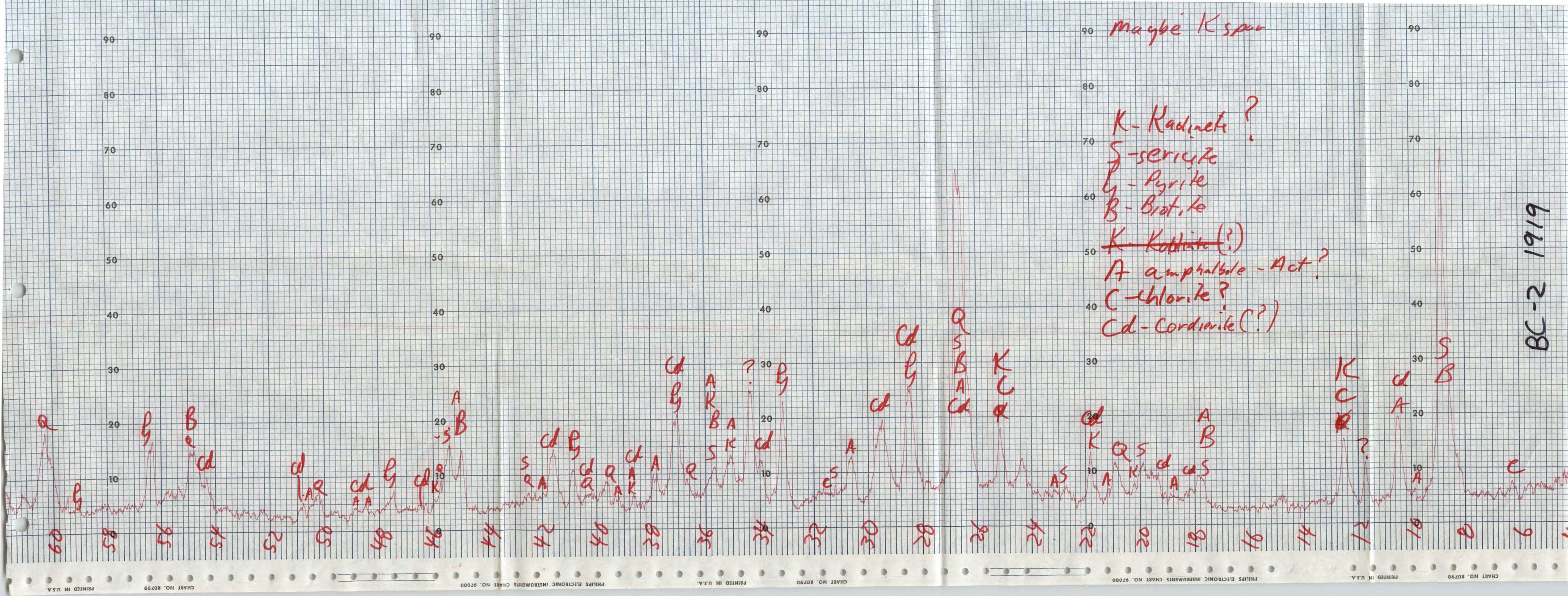


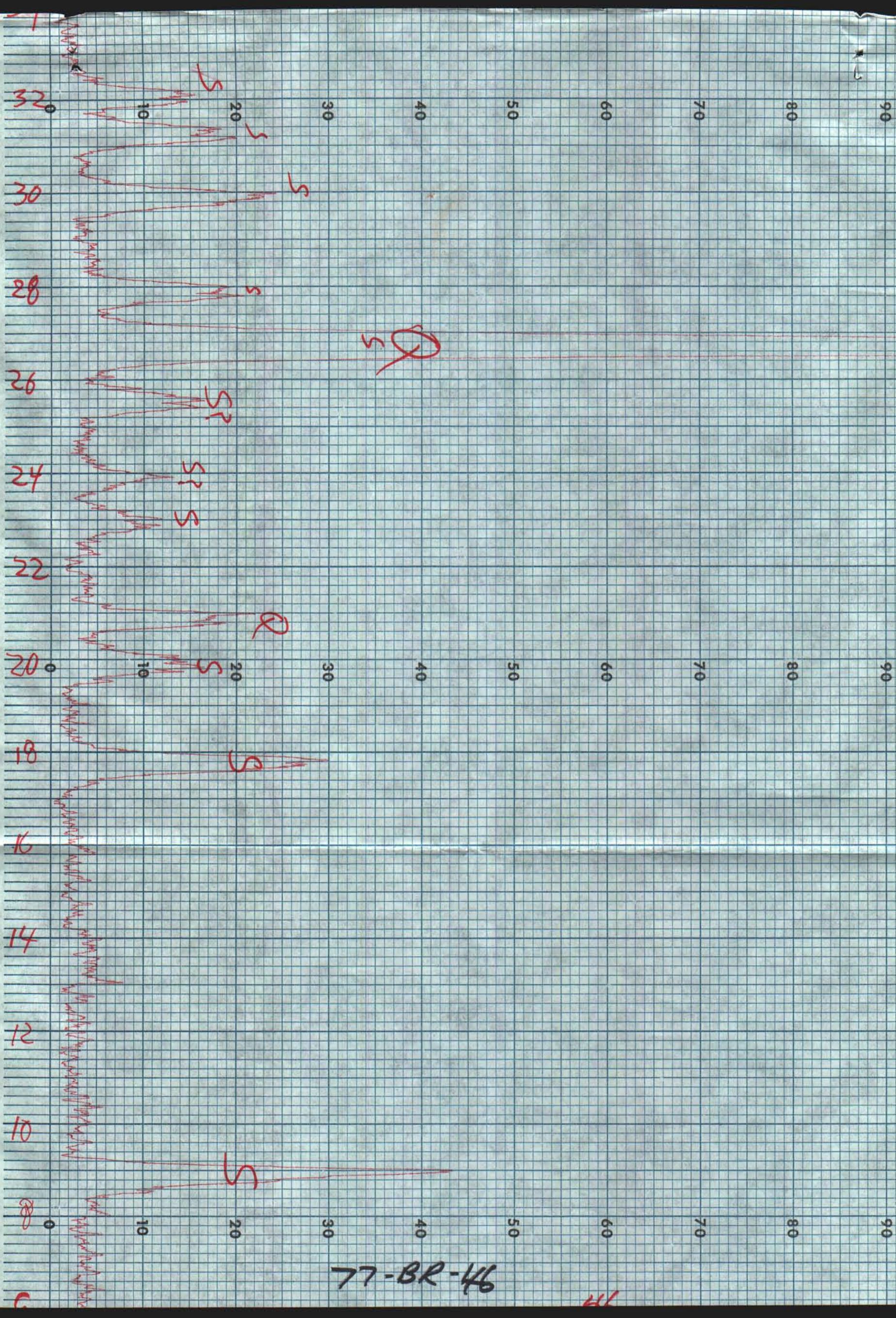






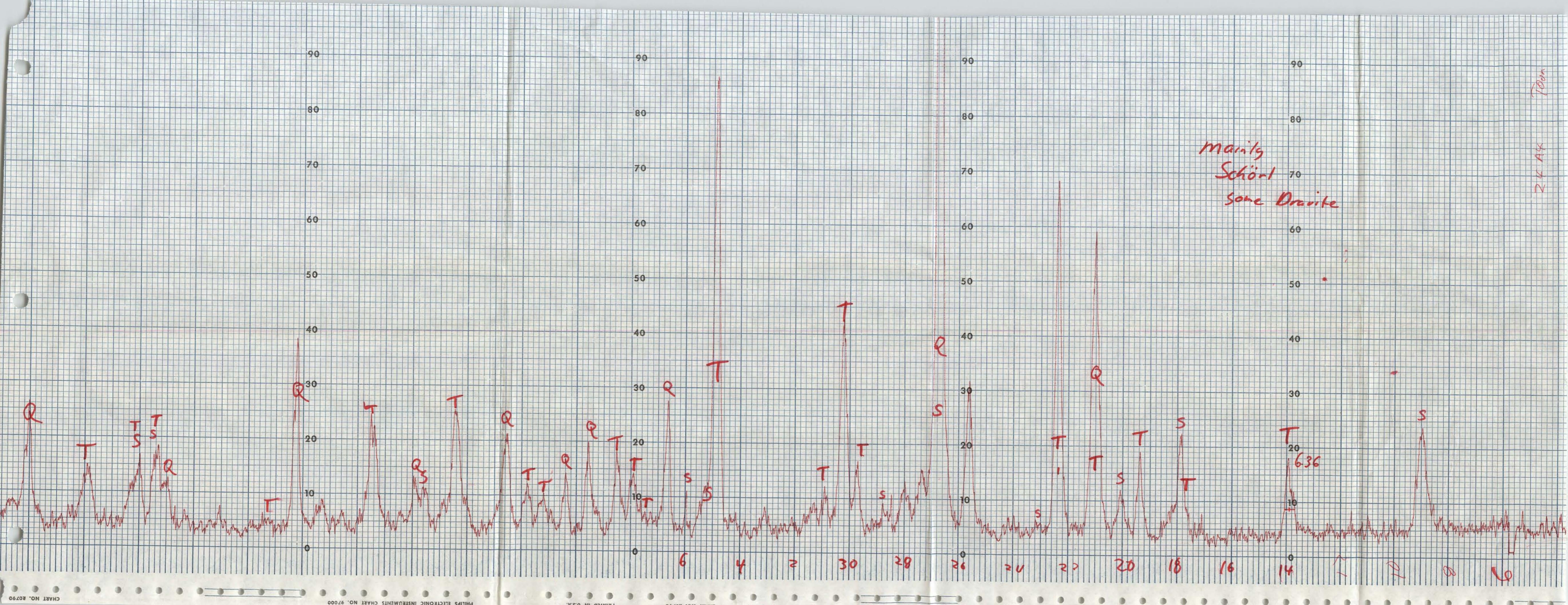


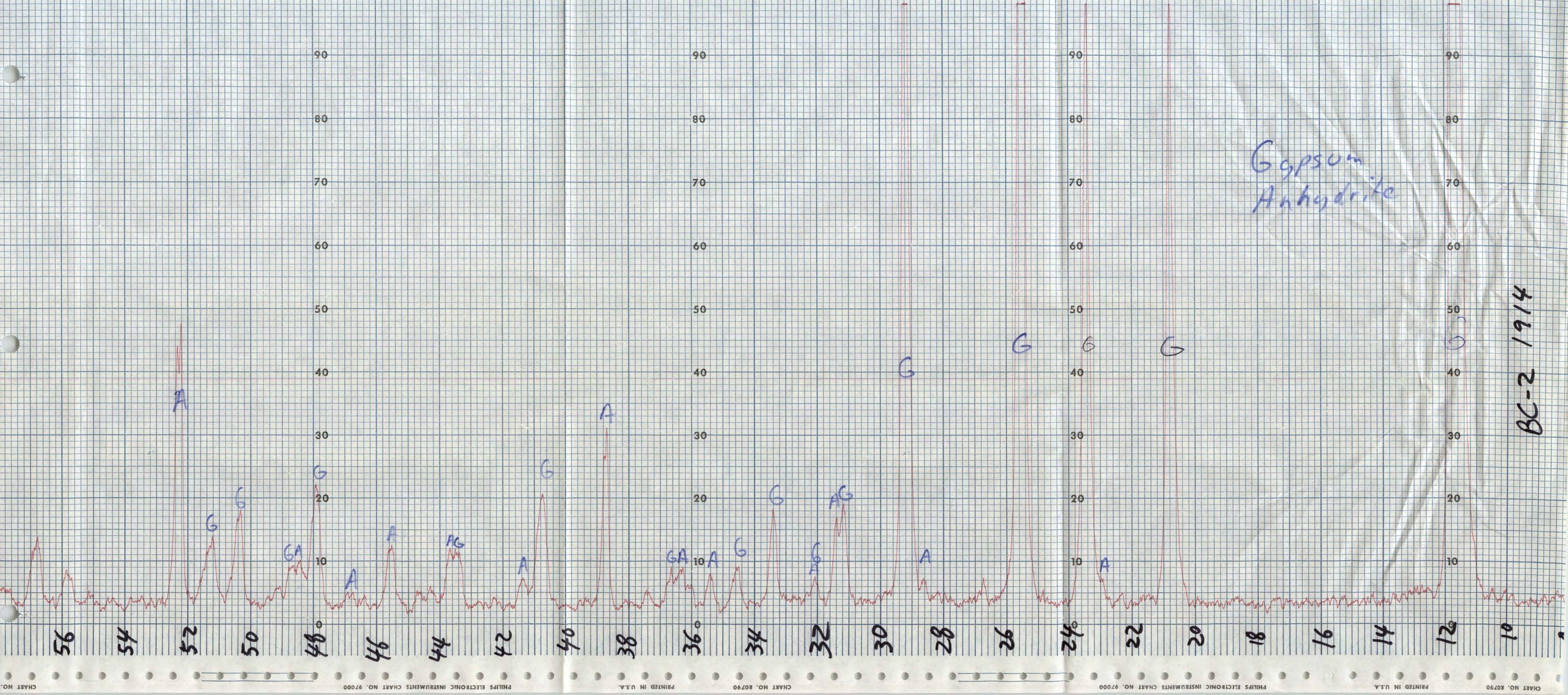




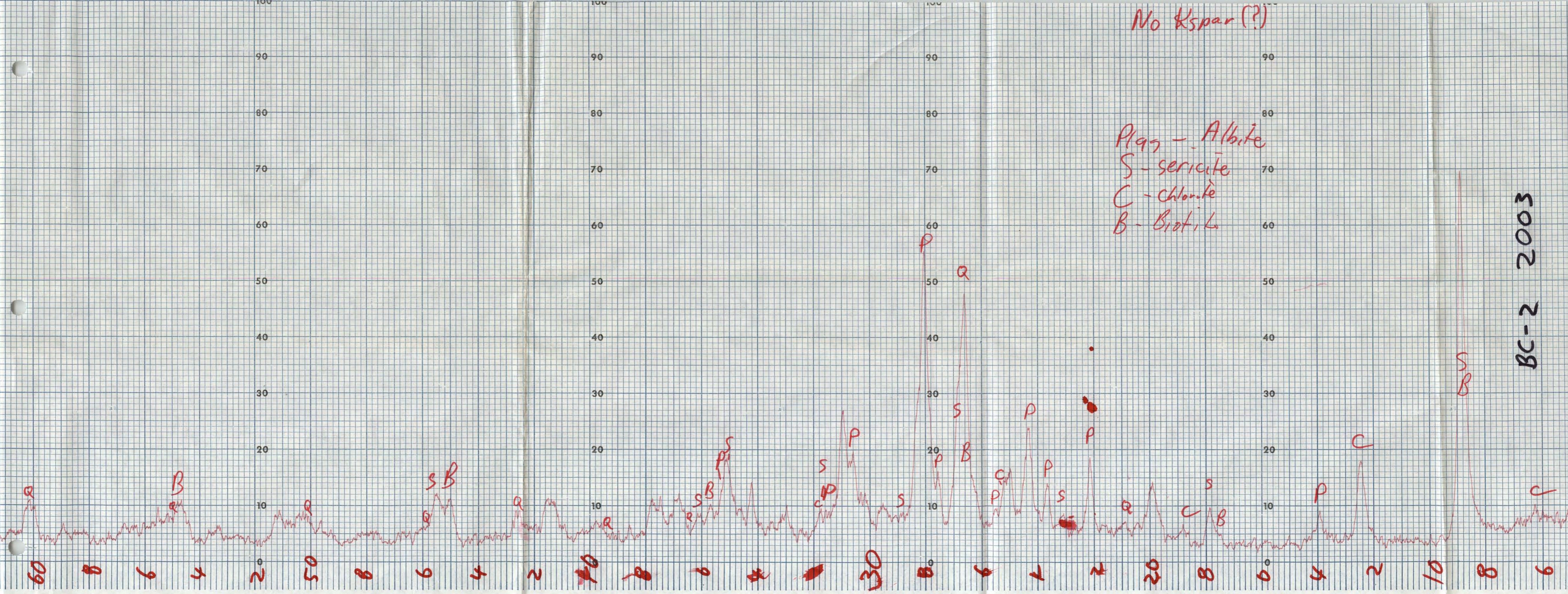
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44





No Kspar (?)



BC-2 1984

SB

No Kspur

✓ Chlorozoisite or epidote?

Plagioclase
~~P-Augite Olig.~~

S - Serricitte
C - Chlorite
B - Biotite
Py - Pyrrite

