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

The following file is part of the Cambior Exploration USA Inc. records

14NW Aguila / Bullard Peak

PHONE CALL

FOR Michel DATE 9/25 TIME 3:05 A.M. P.M.

M Mike SANSONE / Realty Investment Co.

OF Phoenix, AZ

PHONE 602-956-6070

AREA CODE NUMBER EXTENSION

MESSAGE Aguila, AZ - Maricopa

Freeport / Cominco - AZ Geological Survey

Redco Reports / had 12 years - +300 claims

will be putting submittal package together - 1 mo

SIGNED

	PHONED
	RETURNED YOUR CALL
	PLEASE CALL
	WILL CALL AGAIN
	CAME TO SEE YOU
	WANTS TO SEE YOU

TOPS FORM 4003

Reno 10-4-90

MICHAEL C. SANSONE
(2301 EAST OCOTILLO ROAD) P.O. BOX 10402
PHOENIX, ARIZONA 85016 85064
(602) 956-6070

October 2, 1990

CAMBIOR USA, INC.
230 South Rock Blvd, Suite 23
Reno, Nv. 89502-2345

Attn: Patty Smith, Office Manager
> MICHAEL GUSTIN

BULLARD PEAK — AGUILA
Re: 6,000 Acre Gold Lode Claims, Arizona
YAVAPAI COUNTY

Gentlemen:

Last Tuesday, the 25th of September, we talked on the phone about my 6,000 acre block of gold lode claims.

Cominco American Resources, Inc. recently terminated their lease after 1½ years of exploration.

I have enclosed preliminary information which touches upon:

1986-1987 Exploration by Freeport McMoRan Gold.

1988-89-90 Exploration by Cominco American Resources, Inc.

and:

The updated study by Stephen J. Reynolds and Jon Spencer of Arizona Geological Survey.

This week I am meeting with Stephen Reynolds and Jon Spencer to present the resulting data furnished by Freeport and Cominco. This will assist in their update.

Mr. Reynolds has previously voiced his opinion that the 'target area' lies between the Southwestern target of Freeport and the Northeasterly target of Cominco.

I am engaging a geologist to coordinate with Mr. Reynolds and Mr. Spencer for preparation of a recommended target area.

Please note that Mr. Stephen Reynolds and Mr. Jon Spencer are responsible for Arizona Bureau of Geology and Mineral Technology, Open-file Report 84-4. Also note the contributions by Reynolds and Spencer to the enclosed 13 page report on the Harcuvar Mountains and the subject Bullard Peak area (which is part of my 6,000 acres).

By the end of October I will have a detailed package to present to you should you indicate your wish to pursue looking at my proposition.

The material I have to submit will be voluminous and 'one of a kind', so that a personal meeting in Phoenix and/or Aguila would be preferable. However, if meeting at your office would be more suitable, I can oblige by coming there.

* In the event you wish to make a surface examination of the properties I would prefer that you obtain advanced written permission indicating a time period. At that time I would be happy to, personally, fly you and/or your representative to make an aerial investigation. I have an office, home and hangar at my residential airpark (Eagle Roost Airdrome) in Aguila. The subject properties are 11 miles from Aguila.

Hope to hear from you soon.

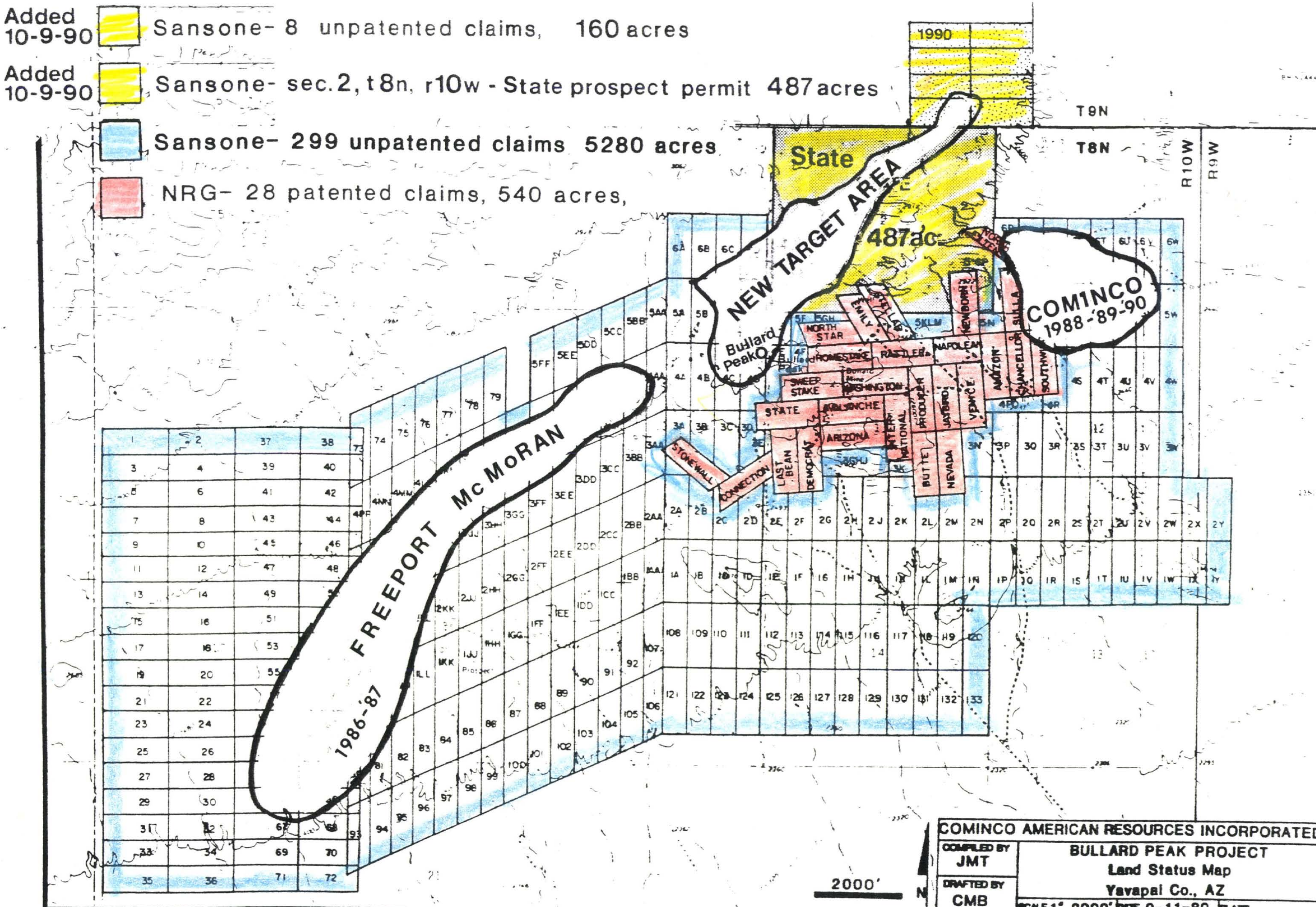
Very truly yours,

Michael C. Sansone

Michael C. Sansone

MCS:kdm

Enclosure



Date Creek Ranch SW, Smith Peak 7.5 minute quads

Revised 10-3-90

(602)956-6070

prepared for: Michael C. Sansone

p.o. Box 10402 Phoenix, Az. 85064

T8N, R9-10W G & SR Meridian

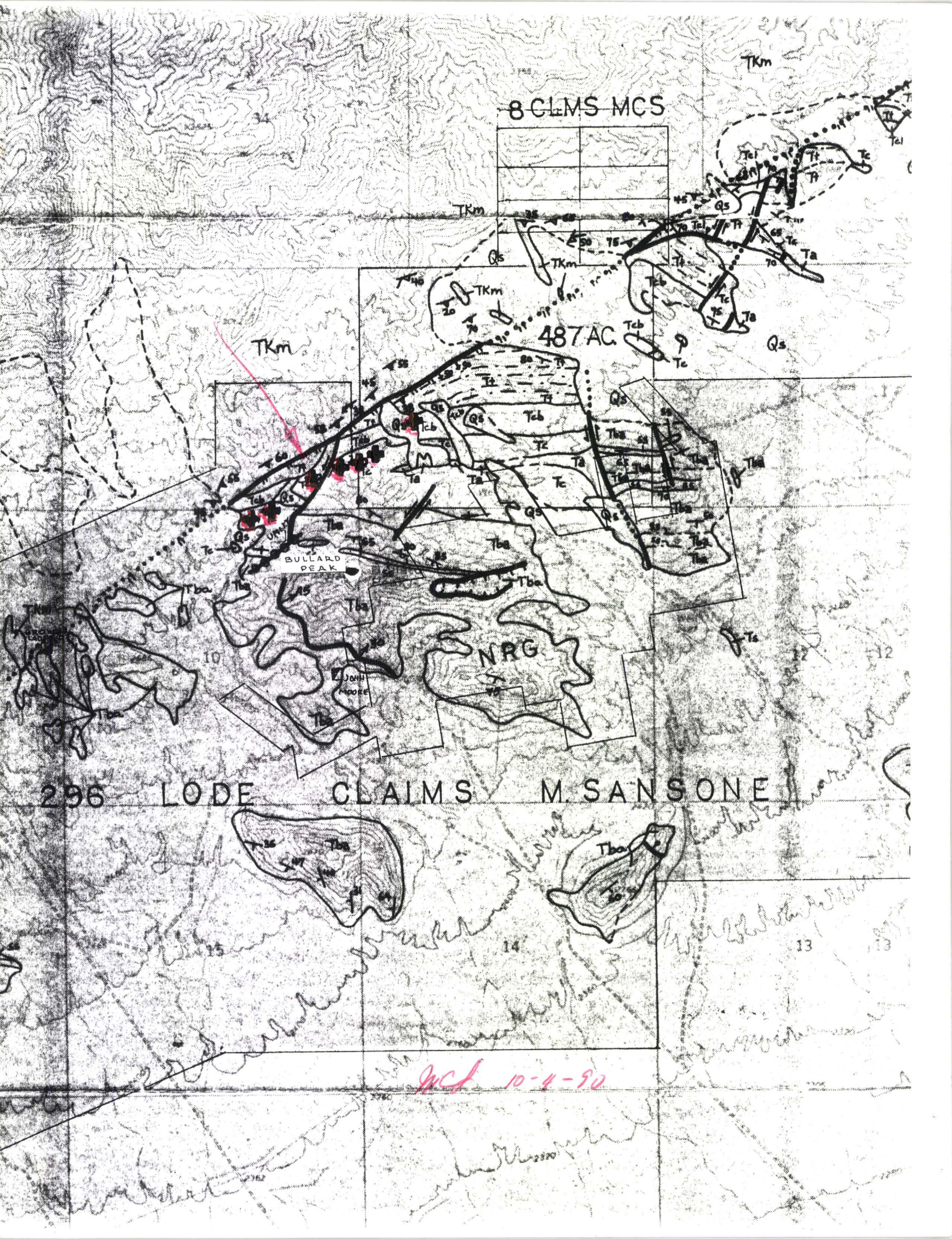
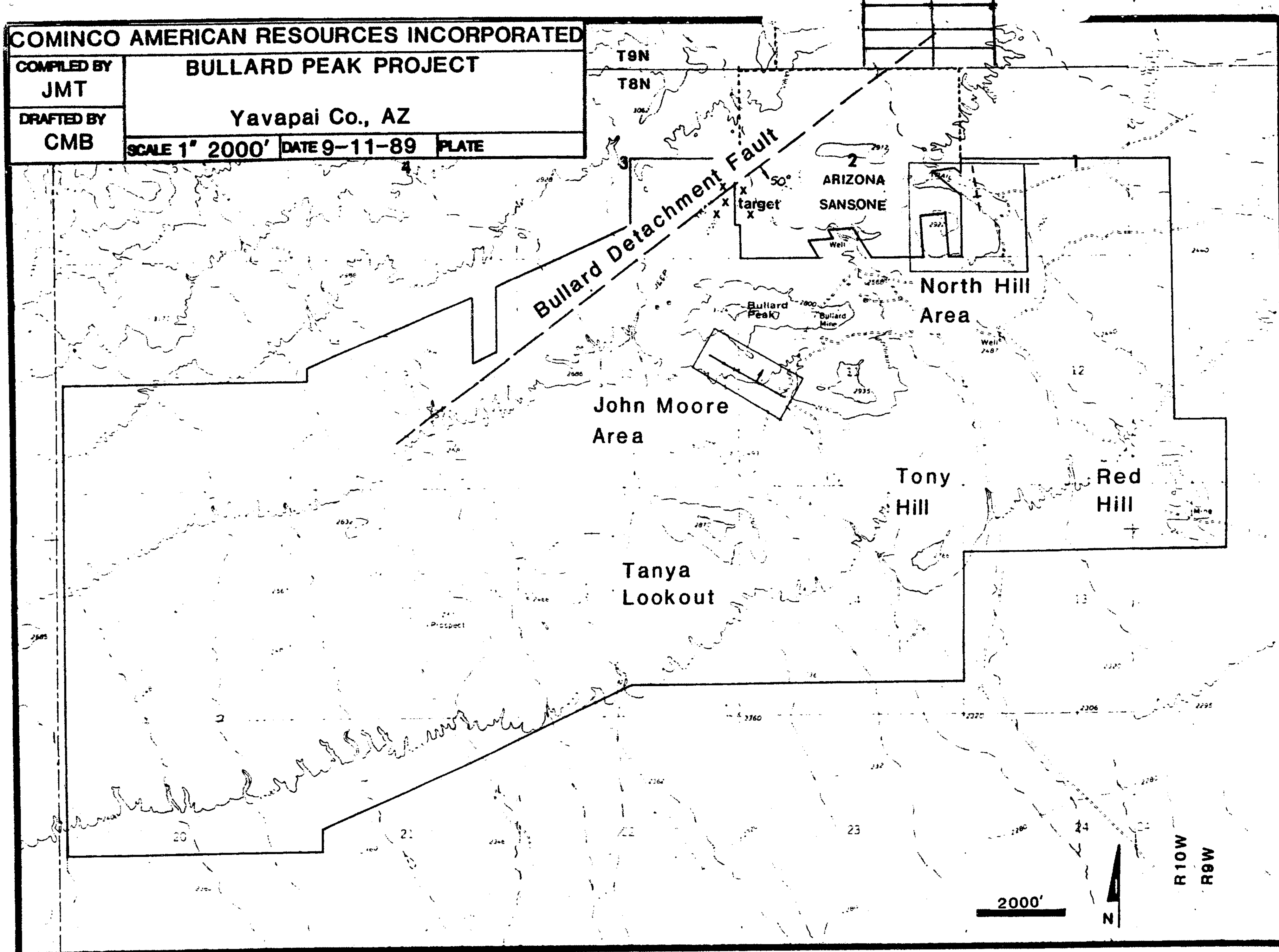
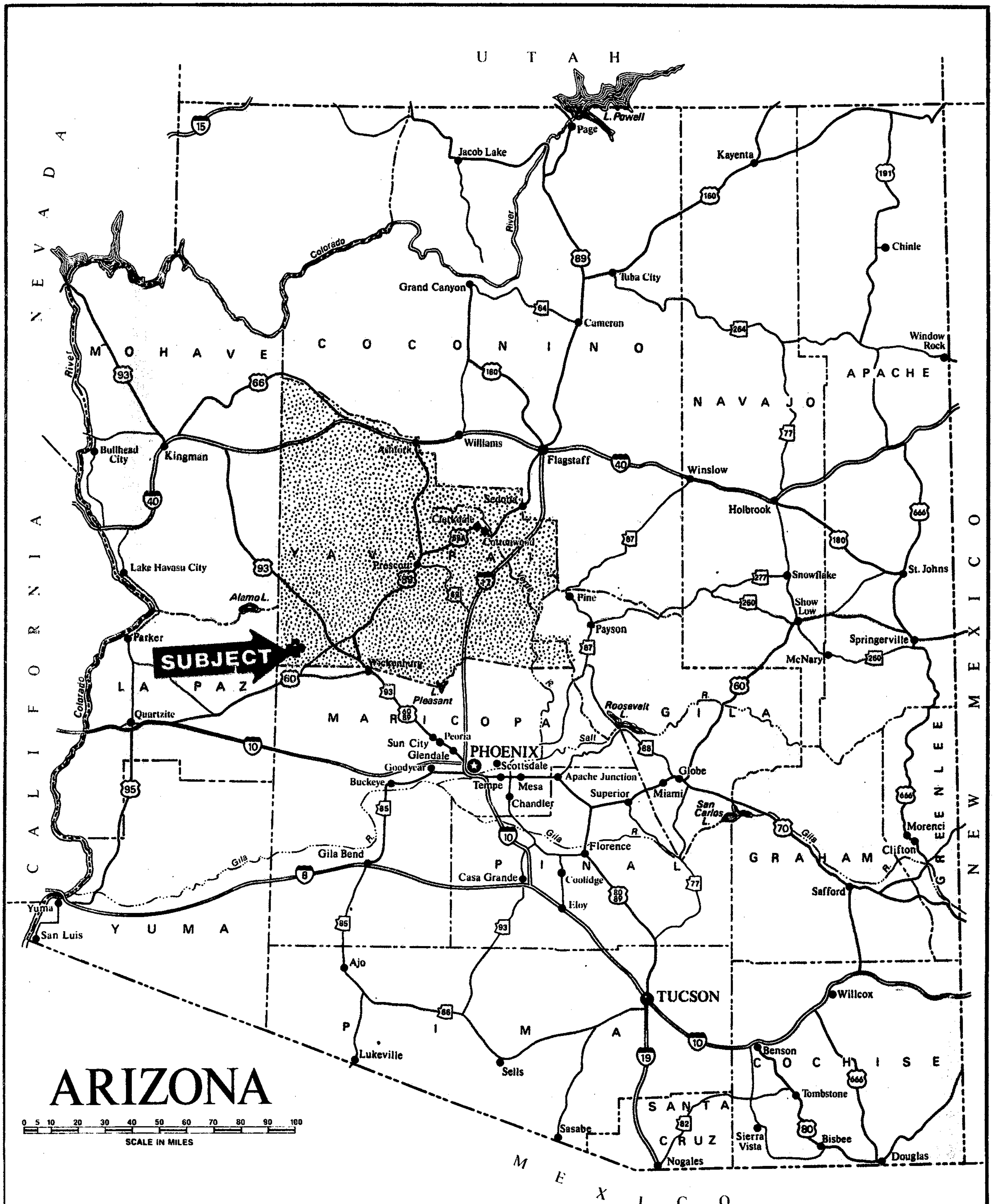

8 CLMS MCS
TKm
487 AC.
Qs
Tcb
Tc
Ta
Tt
Tba
BULLARD PEAK
JOHN MOORE
NRG
296 LODE CLAIMS M. SANSONE
10
12
13
14
15
MCL 10-4-90

Figure 6

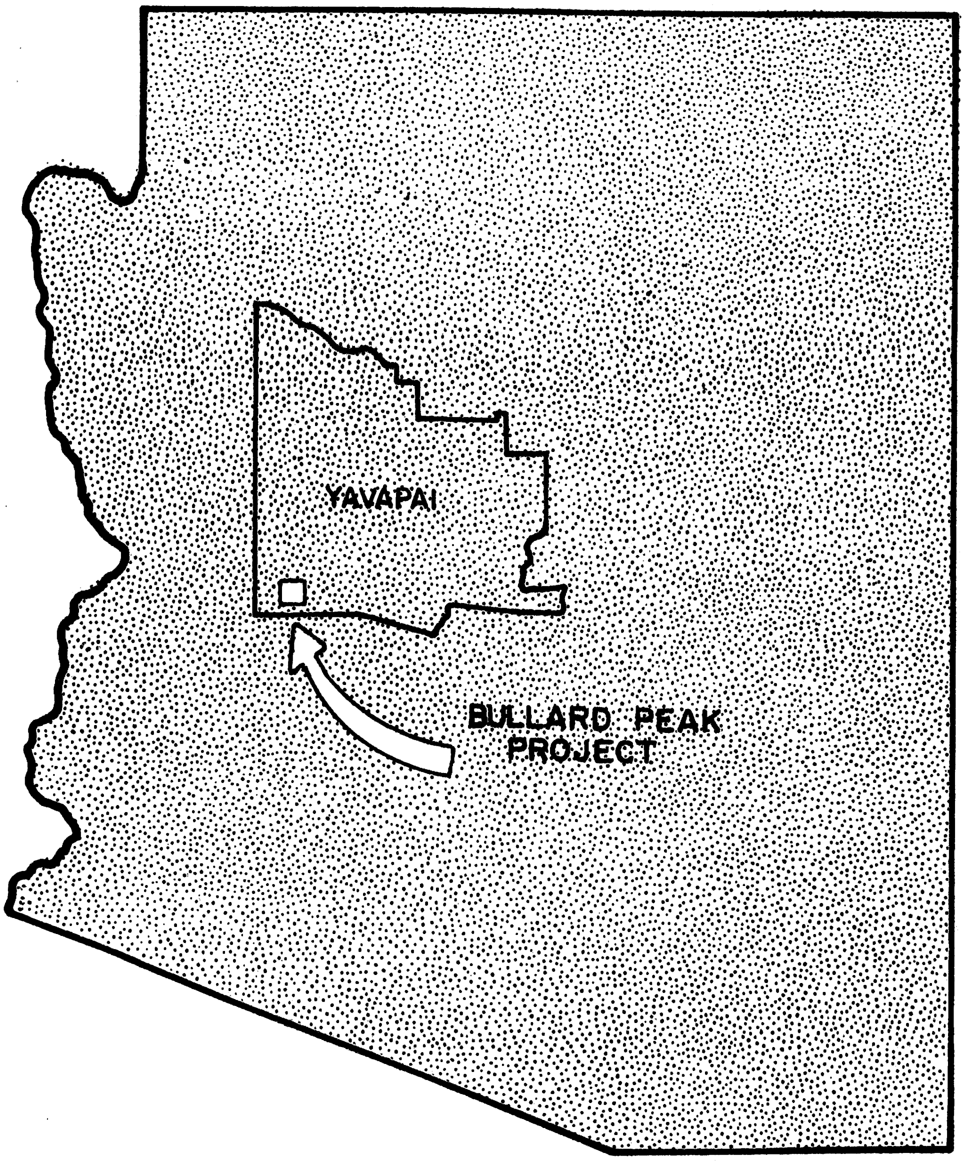


Date Creek Ranch SW, Smith Peak 7.5 minute quads

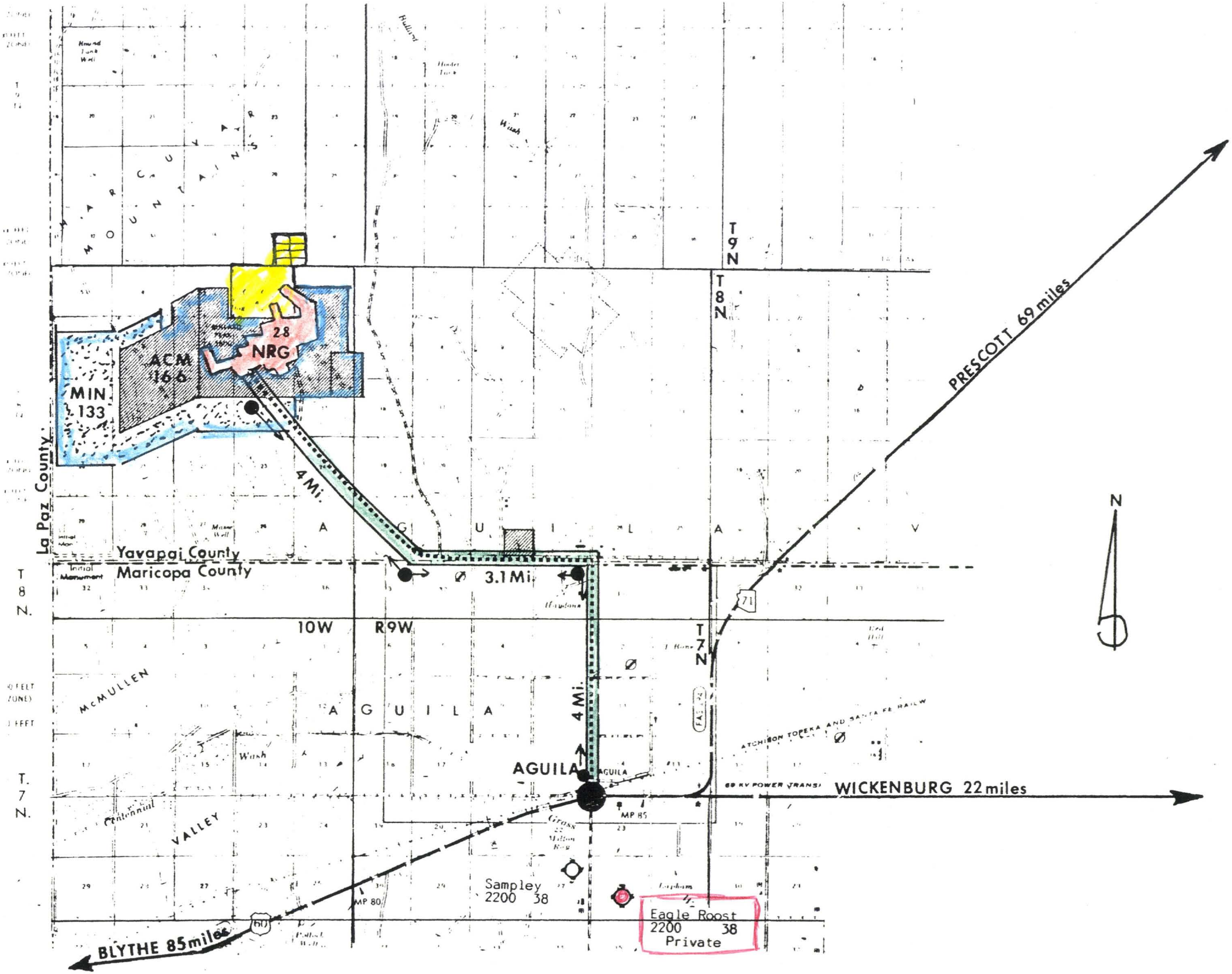
T8N,R10W G&SR Meridian



UTAH
NEVADA
CALIFORNIA
NEW MEXICO
MEXICO
MOHAVE
COCONINO
NAVAJO
APACHE
YAVAPAI
LA PAZ
MARICOPA
GILA
GRAHAM
GREENLEE
PINAL
YUMA
PIMA
SANTA CRUZ
COCHISE
SUBJECT
L. Powell
Page
Jacob Lake
Kayenta
Chinle
Tuba City
Grand Canyon
Cameron
Window Rock
Colorado
River
Bullhead City
Kingman
Williams
Ashfork
Flagstaff
Winslow
Holbrook
Sedona
Clarkdale
Cottonwood
Prescott
Lake Havasu City
Alamo L.
Parker
Pine
Payson
Snowflake
St. Johns
Show Low
Springerville
McNary
Wickenburg
L. Pleasant
Quartzite
Roosevelt L.
Salt
Peoria
Sun City
Glendale
Goodyear
PHOENIX
Scottsdale
Tempe
Mesa
Chandler
Apache Junction
Superior
Miami
Globe
San Carlos L.
Buckeye
Gila Bend
Gila
Florence
Casa Grande
Coolidge
Eloy
Morenci
Clifton
Safford
Yuma
San Luis
Ajo
TUCSON
Willcox
Benson
Lukeville
Sells
Tombstone
Sasabe
Sierra Vista
Bisbee
Douglas
Nogales
ARIZONA
0 5 10 20 30 40 50 60 70 80 90 100
SCALE IN MILES



BULLARD PEAK PROJECT
YAVAPAI COUNTY, AZ


PRESCOTT 69 miles
WICKENBURG 22 miles
BLYTHE 85 miles
N
T 9 N
T 8 N
T 7 N
10W
R9W
Yavapai County
Maricopa County
La Paz County
ACM 166
MIN 133
28 NRG
4 Mi.
3.1 Mi.
4 Mi.
AGUILA
MP 85
MP 80
Sampley
2200 38
Eagle Roost
2200 38
Private
McMULLEN
VALLEY
ATCHISON TOPEKA AND SANTA FE RAILW
69 KV POWER TRANS
71
60

GEOLOGIC MAP OF THE AGUILA RIDGE - BULLARD PEAK AREA, EASTERN HARCUVAR MOUNTAINS, WEST-CENTRAL ARIZONA

Stephen J. Reynolds and Jon E. Spencer
Arizona Bureau of Geology and Mineral Technology

Arizona Bureau of Geology and Mineral Technology
Open-File Report 84-4

1984

POST-DETACHMENT DEPOSITS

Qs - Quaternary surficial deposits

ROCK UNITS ABOVE THE BULLARD DETACHMENT FAULT

Ts - sedimentary rocks (lower Miocene); includes sandstone, siltstone, and conglomerate

Tba - Bullard Andesite (lower Miocene); ss - sandstone interbeds

Ta - andesite (lower Miocene to upper Oligocene); interbedded with or intruded into unit Tc

Tc - upper conglomerate (lower Miocene to upper Oligocene); mostly composed of large, angular clasts of Mesozoic clastic rocks

Tcb - conglomerate and sedimentary breccia (lower Miocene to upper Oligocene); composed of the following units from bottom to top: (1) lower conglomerate of well rounded clasts of quartzite, possibly derived from Precambrian Mazatzal Quartzite of central Arizona; (2) sedimentary breccia and megabreccia landslide blocks of shattered porphyritic granite; and (3) conglomerate composed of clasts of Mesozoic clastic rocks and granitic rocks

Tvc - volcaniclastic and volcanic breccia (upper Oligocene)

Tt - welded ash-flow tuff (upper Oligocene); subdivided on Aguila Ridge into the following units:

Ttu - upper, lithic ash-flow tuff; commonly gray, tan, or buff colored

Ttm - middle, trachytic, welded ash-flow tuff; reddish-brown color; unit includes several distinct welded ash-flow tuffs with local vitrophyres and nonwelded intervals

Ttl - lower, rhyolitic(?) tuff; greenish gray with numerous lithophysae

Tvs - volcaniclastic sandstone (upper Oligocene); locally present between Ttm and Ttu

Tcl - arkosic conglomerate and conglomeratic sandstone (Oligocene?); reddish brown color; composed of granitic and metamorphic pebbles to boulders in an arkosic matrix

d - rhyolite to quartz latite dikes (Upper Cretaceous or Tertiary?)

Tkg - muscovite granite (Upper Cretaceous or Lower Tertiary); medium-grained, equigranular with 2-3 percent muscovite and minor biotite and pale red garnet

Kg - granite and granodiorite (Upper Cretaceous); medium- to coarse-grained, equigranular, with 2-3 percent biotite and minor hornblende; biotite from this unit yielded a late Cretaceous K-Ar age (J. Kirkwood, 1977, oral communication, CONOCO Minerals)

P€g - porphyritic granite (Precambrian); medium- to coarse-grained with 15 to 20 percent K-feldspar phenocrysts 0.5 to 3 cm long in a matrix of plagioclase, quartz, and biotite; commonly foliated

P€m - metamorphic rocks (Precambrian); composed of compositionally banded quartzofeldspathic gneiss and biotite schist; local quartz-rich schist, muscovite-biotite schist, and medium- to fine-grained granofels; crystalloblastic foliation parallel to compositional layering.

ROCKS BELOW THE BULLARD DETACHMENT FAULT

Tcb - chloritic breccia (middle Tertiary); derived from TKm

TKm - metamorphic and mylonitic rocks (Upper Cretaceous to middle Tertiary); derived from Precambrian metamorphic and plutonic rocks and Upper Cretaceous to Tertiary granitic rocks

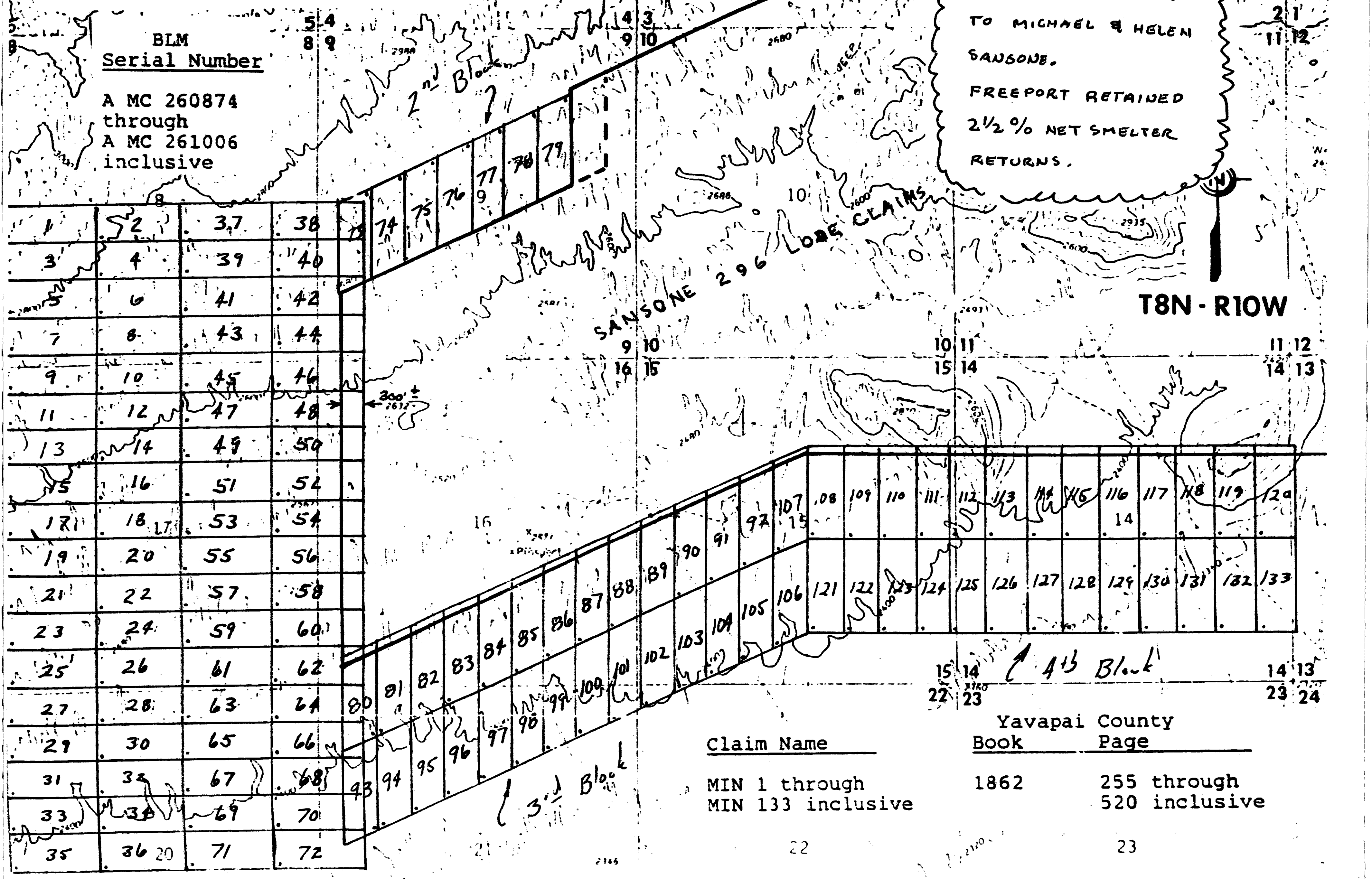
K-metasomatism and detachment-related mi...

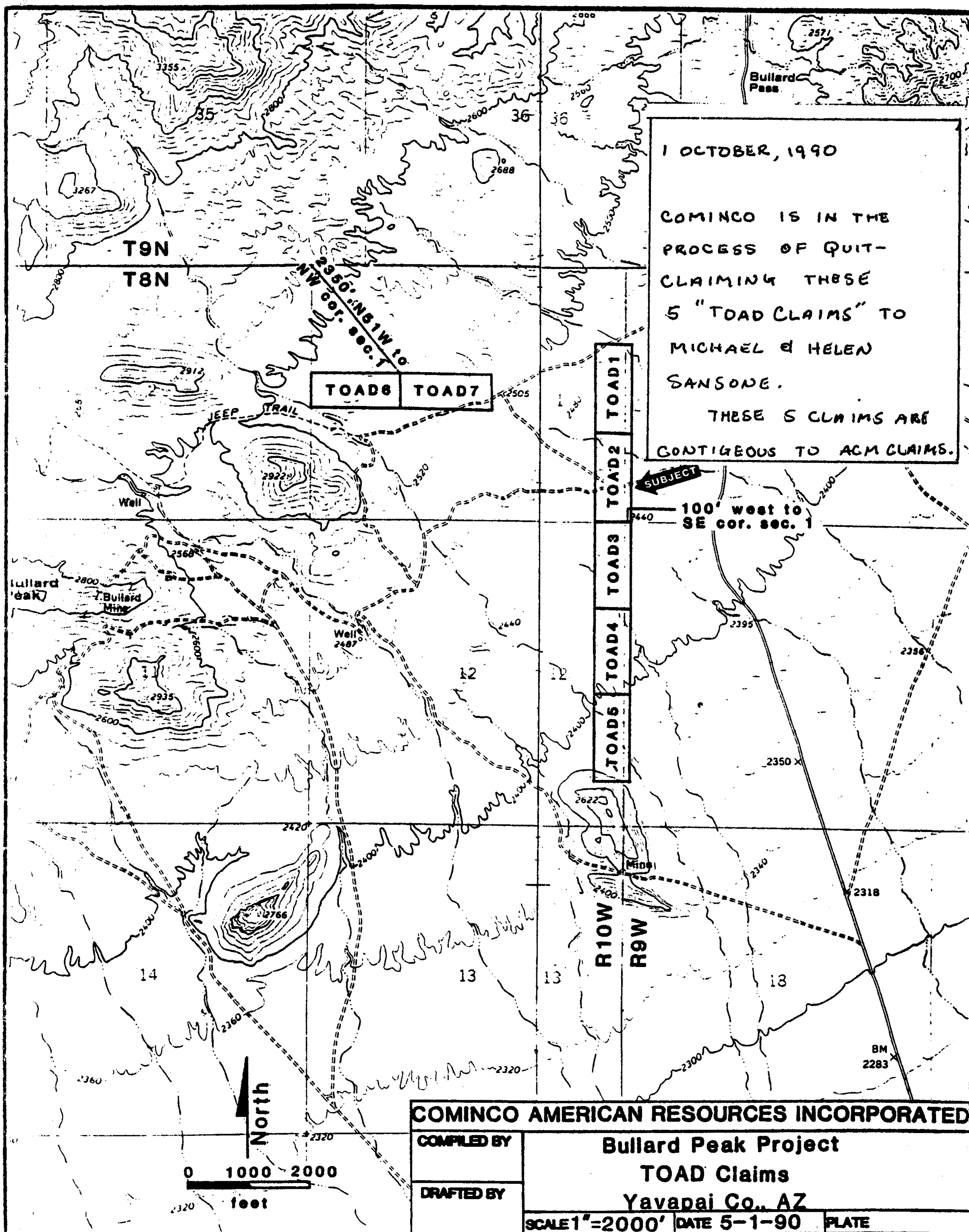
Geological Society of America Bulletin, v. 100, p. 1627–1639, 11 figs., 4 tables, October 1988.

FREEPORT-McMoRan GOLD COMPANY

A Subsidiary of Freeport-McMoRan Inc.

June 1988





1 OCTOBER, 1990

COMINCO IS IN THE PROCESS OF QUIT-CLAIMING THESE 5 "TOAD CLAIMS" TO MICHAEL & HELEN SANSONE.

THESE 5 CLAIMS ARE CONTIGEOUS TO ACM CLAIMS.

COMINCO AMERICAN RESOURCES INCORPORATED			
COMPILED BY	Bullard Peak Project TOAD Claims Yavapai Co., AZ		
DRAFTED BY			
SCALE 1"=2000'	DATE 5-1-90	PLATE	

Reno 11-13-90

MICHAEL C. SANSONE
2301 EAST OCOTILLO ROAD
PHOENIX, ARIZONA 85016
(602) 956-6070

November 9, 1990

Ms. Patty Smith, Office Manager
Cambior USA, Inc.
230 South Rock Blvd., Suite 23
Reno, NV 89502-2345

Re: BULLARD AREA - AGUILA ARIZONA

Dear Ms. Smith:

Possibly my letter and information mailed to you on October 2 failed to be delivered.

I am enclosing an updated package on the Bullard Detachment Fault and its relationship to my properties.

After you have examined the material I would appreciate a response indicating your interest for further investigation.

Very truly yours,

Michael C Sansone

Michael C. Sansone

MCS:kdm

Encl.

POST OFFICE BOX 10402, PHOENIX, ARIZONA 85064

Report on the

Bullard Peak Prospect

October 1990

Prepared for Michael Sansone

by Thomas Weiskopf

Introduction

The following report briefly describes the claimblock and the general geology of the Bullard Peak prospect in western Arizona. Mineralization styles and recent exploration findings are then discussed with an emphasis on elucidating those features relevant to further exploration in the area. Finally, targets for further activity are briefly outlined.

Location

The Bullard Peak property is located off the Eastern portion of the Harcuvar Mountains, in Yavapai County, Arizona (Fig 1). It is ten miles north of the town of Aguila, and is accessible year-round via well maintained dirt roads. The elevation varies from about 2,300' to 3,100'. The area is within the Smith Peak and Date Creek Ranch SW 7.5' USGS Quadrangle maps.

Land Status

The mineralized area is contained within 308 unpatented claims, a state prospecting permit, and 28 patented claims. The former two are controlled by Mike Sansone, and the latter by NRG Resources. All parcels are contiguous and available for exploration (Fig 2).

General Geology

The Bullard Peak property is located in upper-plate rocks above the Bullard detachment fault. This low angle normal fault outcrops along the southeast flank of the Harcuvar Mountains Metamorphic core complex. This northeast-trending fault runs along the northwest portion of the claimblock and the dip is about sixty degrees to the southeast at the Bullard property. The fault formed in an extensional regime and is interpreted to have 40 to 50 kilometers of displacement (Reynolds and Spencer, 1985) (Figs. 3 and 4).

The oldest rocks in the area consist of lower-plate Proterozoic crystalline rocks and Upper Cretaceous to lower Tertiary granitic rocks, which have been overprinted by a Tertiary mylonitic fabric (Roddy et al., 1988). Along the fault these rocks have undergone extensive reaction with hydrothermal fluids as evidenced by brecciation and alteration to a mineral assemblage including chlorite, epidote and local hematite.

The fault is characterized by intense mylonitization, variable silicification, chloritized breccias and local massive iron oxides.

The upper plate rocks consist of upper Oligocene to middle Miocene volcanic and clastic rocks. These strike from N70 E to N90 E and dip steeply to the south. The oldest unit is a sequence of ash flow tuffs. This is overlain by sediments consisting of conglomerates and a sedimentary breccia unit. Overlying the sediments is the Bullard andesite. These are flow rocks which contain interlayered sandstones (Reynolds and Spencer, 1984). These andesites host the Cu-Fe-Au veins which were the source of all of the past production. The volcanics have undergone regional K-metasomatism whereby their mineralogy has been altered to K-feldspar, hematite and quartz (Roddy et al., 1988).

Mineralization

The Bullard district has yielded at least 610,000 pounds of copper, 3,600 ounces of gold, and 6,000 ounces of silver (Keith et al., 1983). The average grade was 1.77% copper, 2.28 opt silver, and 0.21 opt gold (Welty et al., 1985). Production has been from copper and iron bearing quartz veins occupying faults in the brittly deformed upper-plate rocks. These shallowly dipping veins, such as at the Bullard Mine, strike N 55 E and dip 15 to 20 degrees to the south. They also occur as steep faults such as the north-south trending veins at the North Hill area. Faults can be traced along the surface for as much as 2,000 feet along strike. The veins average about one to thirty inches wide, but may be as much as six feet in width as at the Bullard mine. Mineral deposits are present within these faults as lenses and pods with varying amounts of quartz, calcite, hematite, copper oxides and silicates, and manganese oxides.

Chloritic breccia zones with or without silicification also contain gold values. This author has found no record of production from this mineralization style on the Bullard Peak property.

Roddy et al., (1988) have shown that the Cu+Fe +/- Au mineralization postdates K-metasomatism, and that both occurred during detachment faulting. These authors suggest that during K-metasomatism metals were leached from the volcanics and incorporated into the basinal brines. These fluids then ascended along the detachment fault and deposited metals where suitable structural or chemical traps were encountered. Typical traps have been described by Wilkins et al., (1986) and by Spencer and Welty (1989). These include the detachment fault itself, chemically reactive units, chloritic breccias, and a variety of fault types in the upper-plate rocks within the vicinity of the detachment surface (Fig 5). In Western Arizona alone the value of detachment-related mineralization totals over 300 million dollars (Fig 6 and Table 1).

Previous Work

Recent exploration efforts have been undertaken by Freeport-McMoRan Gold Co., in 1986 through 1988, and by Cominco American Resources Inc. in 1989 and 1990. These efforts and their findings will be briefly described. The complete data sets are available to interested parties.

The exploration program carried out by Freeport-McMoRan Gold Co. entailed the collection of about 150 surface rock samples, 10 reverse circulation drill holes, air photo interpretation, and geologic mapping (Fig 7).

Thirteen of the surface samples indicated greater than 1 ppm gold. Of these, nine are associated with high-grade quartz veins containing copper minerals and iron oxides. The other four highly anomalous samples are of chloritic breccias associated with the detachment surface near the Broken Ladder area and to the SW along the fault.

The drilling program targeted three areas (Fig 8). Reverse circulation holes one through four concentrated on the Broken ladder area. Drilling here targeted the chloritic breccia along the detachment surface. No high grade zones were encountered. However, concentrations of gold up to 0.02 opt were detected, indicating the presence of a mineralization style distinct from the upper-plate fault controlled type. The other two targets were moderately dipping veins at the Accident Hill and Owl areas but no significant mineralization was encountered at either site.

In 1988 Cominco American Resources Inc. conducted an exploration program on the Bullard Peak property. The targets included the John Moore and the North Hill areas. Drilling confirmed high grade but narrow and isolated veins at the John Moore prospect. More encouraging were results from the North Hill area. Here, six holes outlined zones thirty to sixty feet wide with significant mineralization, including a twenty-five foot intercept of 0.197 opt gold in hole 15, a thirty-foot intercept of 0.187 opt in hole 14, and a twenty-five foot intercept of 0.078 opt. in hole 17 (Fig 9, 10 and 11). Twenty surface rock samples along the 2,000' length of this vein averaged 0.263 opt gold, and ranged from 0.002 to 0.830 opt.

An expanded reverse circulation drill program in 1990 consisted of twenty-four holes and 11,225 total footage. Two of these drill holes targeted this vein approximately 1,500' south of where the mineralization was encountered. One of these (hole 19) encountered four, five to ten foot intervals, each of about 0.02 opt, between 185' and 585'. The other hole (number 34) encountered a five foot zone of 0.04 opt at 105'depth. The intervening 1,500 remain untested as does the mineralized zone below a depth of two hundred feet. One drill hole apparently intended to intersect this structure 400 feet north of the main intercept did not encounter mineralization. An deflection in the strike of the vein of 5 degrees to the west is one explanation for the lack of an intercept.

The remaining drill holes targeted veins east of the main structure and encountered only spotty mineralization. Cominco American's objectives of "several 50'+ intercepts of .075 opt", were thus not met during the 1990 exploration phase (Telford, 1990).

Mineralization Targets

A gold bearing hydrothermal system ascended along the Bullard detachment fault and invaded structural sites at the Bullard Peak property. Two possible depositional sites occur on the property. One is the faults in the upper plate. These sites are responsible for the metals produced to date and have been the focus of recent exploration programs. Thousands of feet of strike length have gone untested. Particulary attractive are the areas to the north, south and below the mineralization detected in drill holes fourteen through eighteen on the North Hill area.

A second possible site of mineralizing are the porous sedimentary rocks, especially the sedimentary breccia unit. This target has never been explored. A variably dipping fault has been traced from the John Moore prospect, and through the Unity prospect before terminating at the intersection of the sedimentary breccia unit and the Bullard detachment fault. This area warrants detailed mapping and sampling. It should be noted that at Cyprus Copperstone, where 510,000 ounces of gold have been outlined, mineralization occurs within virtually identical sedimentary breccias that are also directly above a detachment fault.

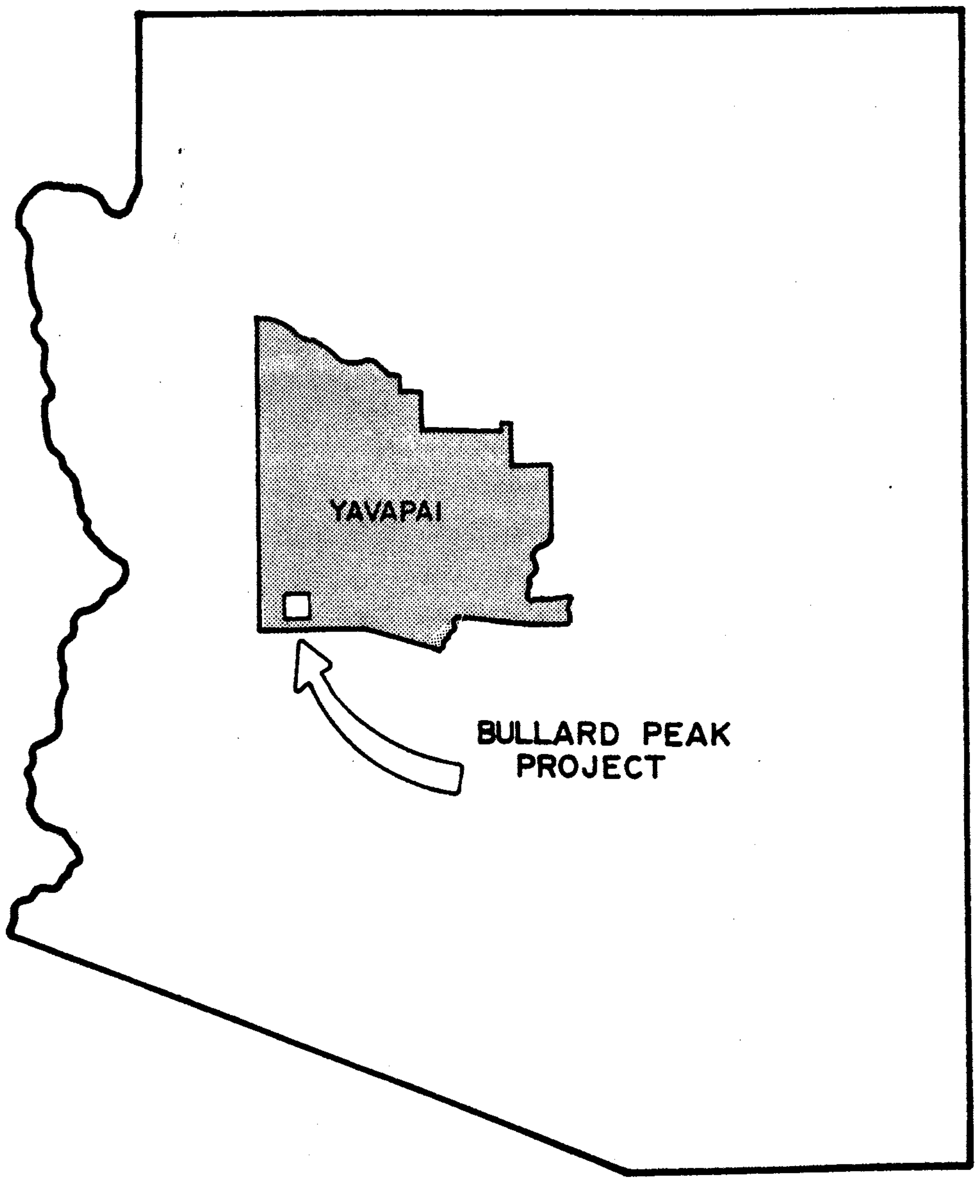
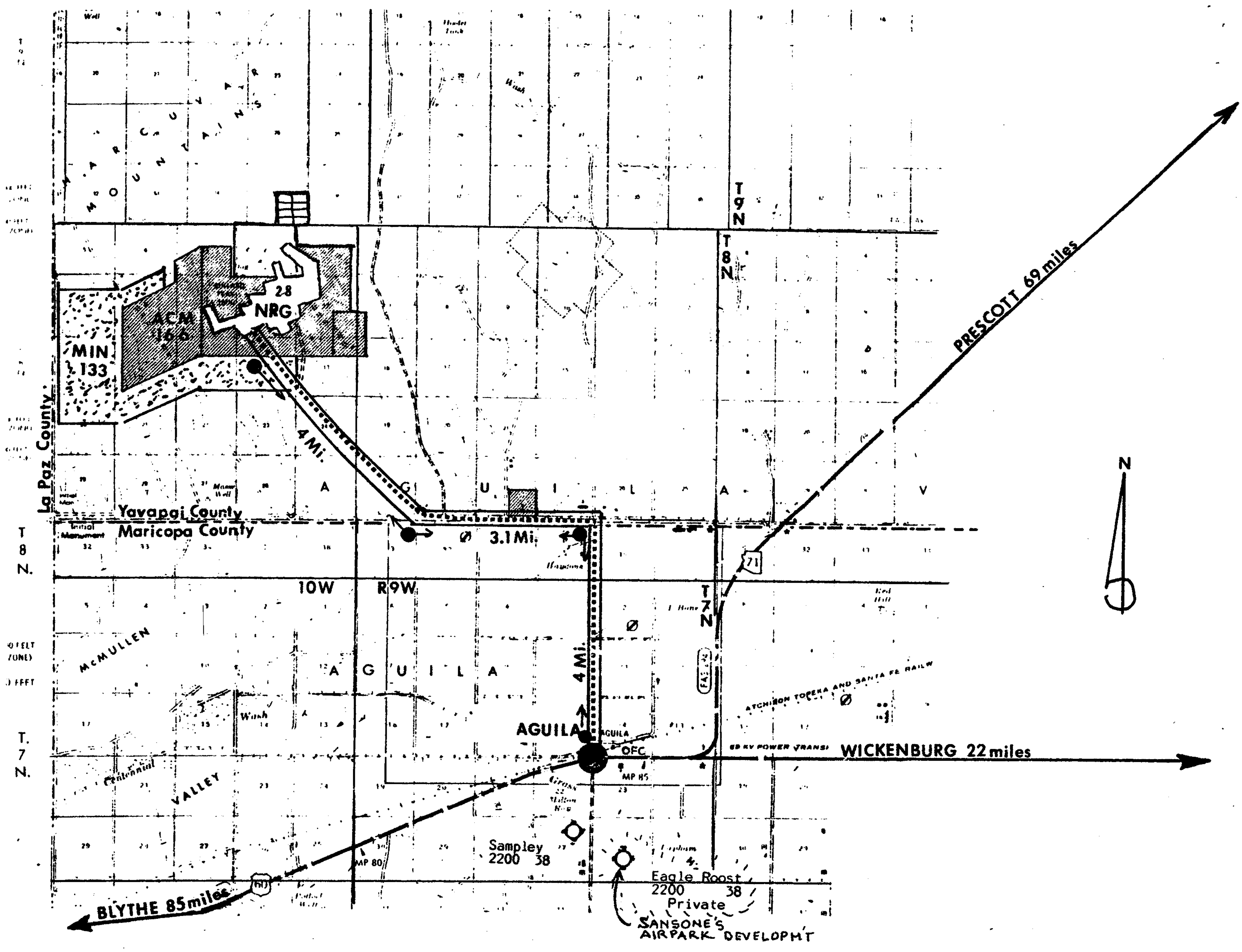
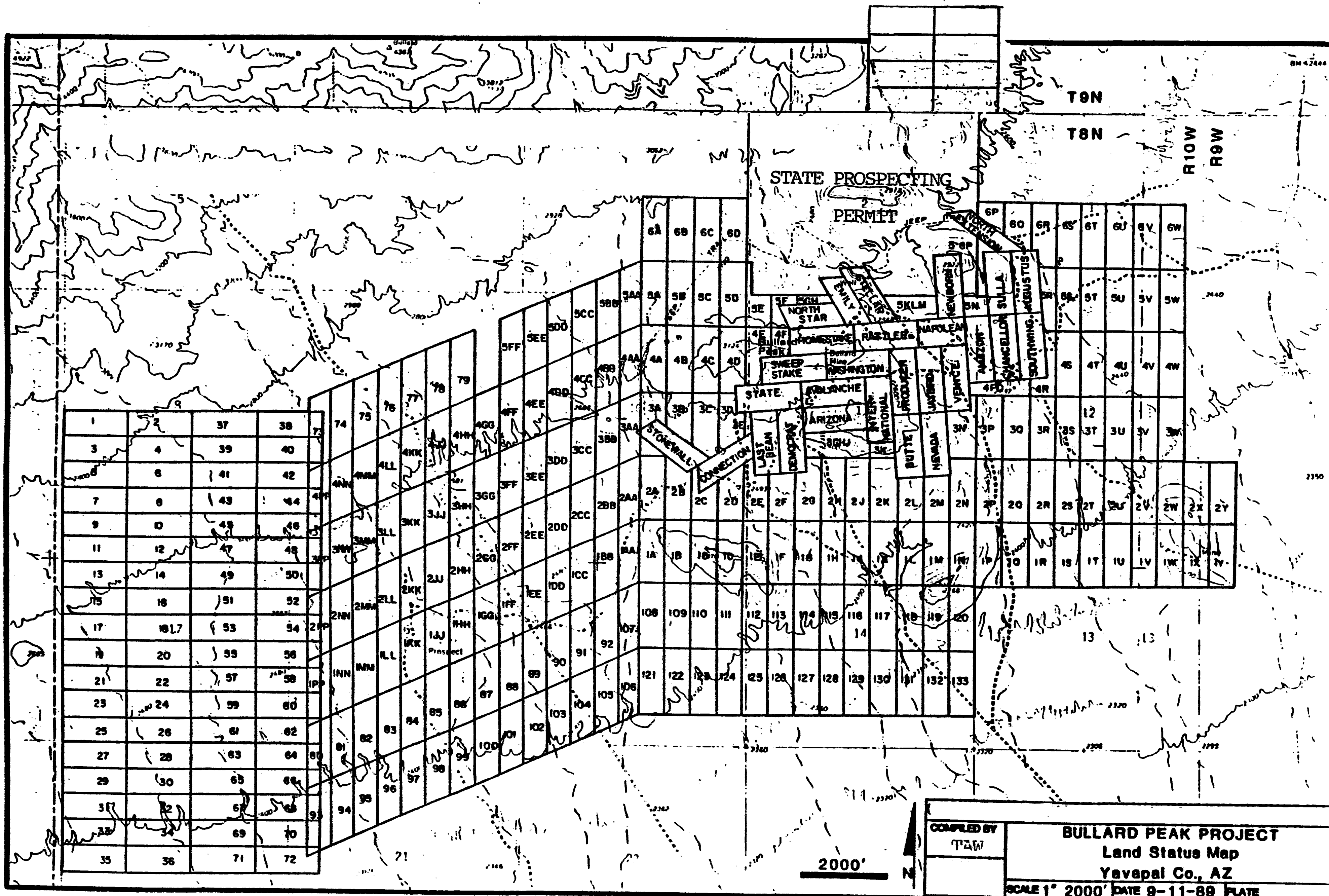


Figure 1
BULLARD PEAK PROJECT
YAVAPAI COUNTY, AZ



McCRACKEN MOUNTAINS
MIN 133
ACM 16.6
2.8 NRG
4 Mi.
La Paz County
Yavapai County
Maricopa County
3.1 Mi.
4 Mi.
T 9 N
T 8 N
T 7 N
10W
R9W
AGUILA
AGUILA
OFC
MP 85
MP 80
McMULLEN
Centennial
VALLEY
Wash
ATCHISON TOPEKA AND SANTA FE RAILW
69 KV POWER TRANS
71
PRESCOTT 69 miles
WICKENBURG 22 miles
BLYTHE 85 miles
Sampley
2200 38
Eagle Roost
2200 38
Private
SANSONE'S
AIRPARK DEVELOPM'T
N



Date Creek Ranch SW, Smith Peak 7.5 minute quads

T8N,R9-10W G & SR Meridian

FIGURE 2

(after Telford 1990)

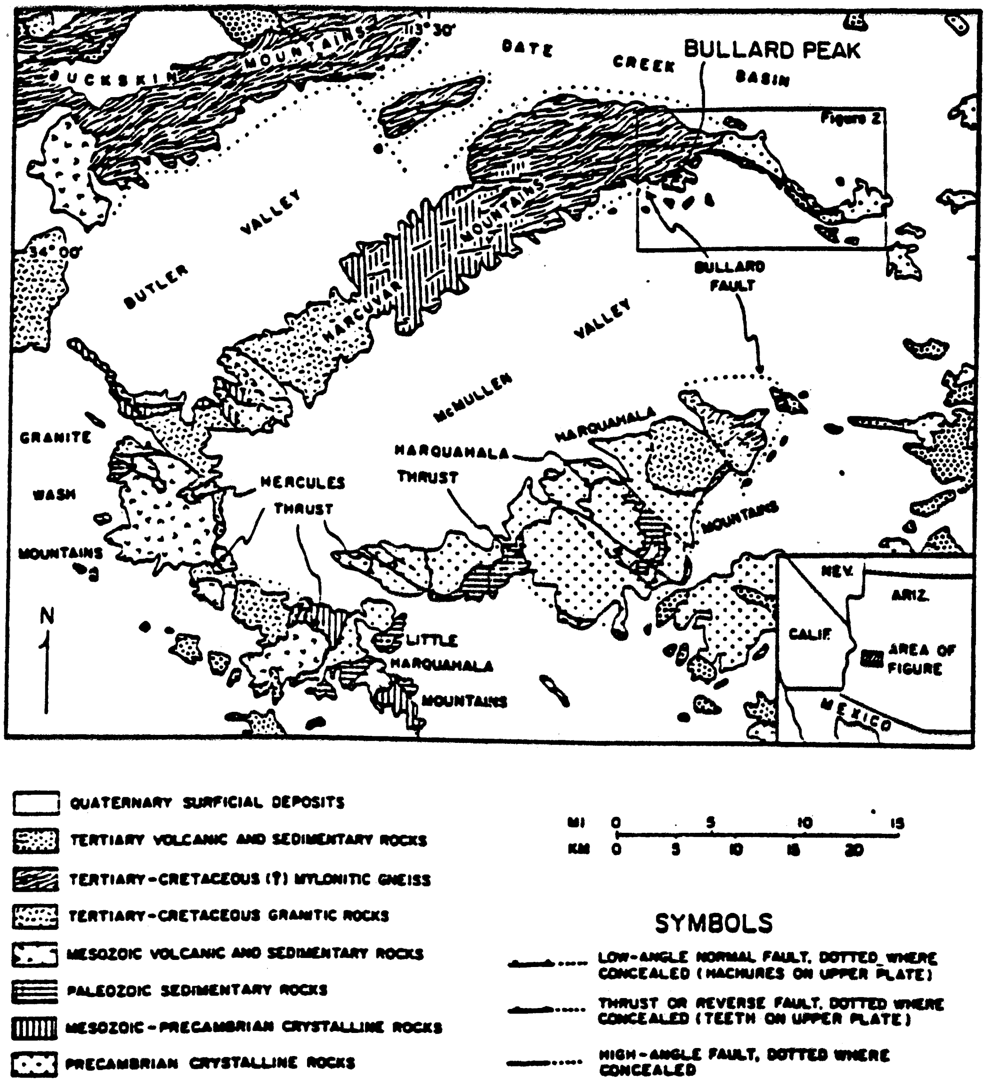


Figure 3. Simplified geologic map of McMullen Valley area. Sources of data include Rehrig and Reynolds (1980), Reynolds (1982), Reynolds and Spencer (1984), and unpublished mapping by S. J. Reynolds, S. M. Richard, and J. E. Spencer.

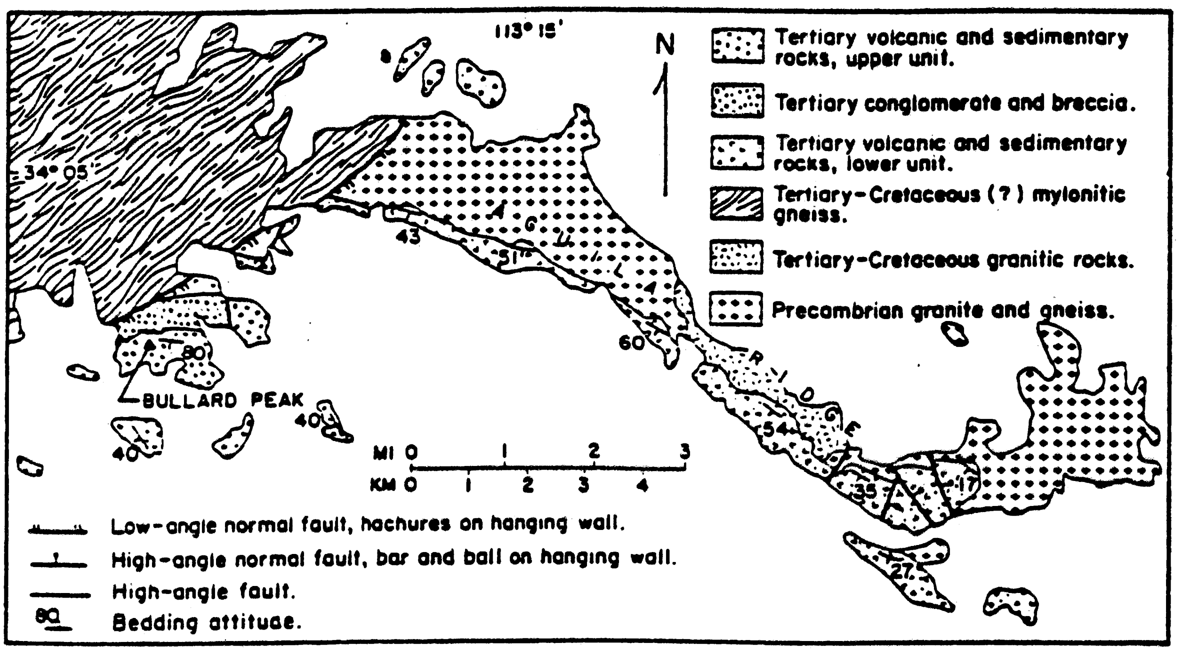


Figure 4. Simplified geologic map of Aguila Ridge, Bullard Peak area, and easternmost Harcuvar Mountains. Areas without pattern are Quaternary surficial deposits. See Figure 1 for location of map area.

REYNOLDS and SPENCER, 1987

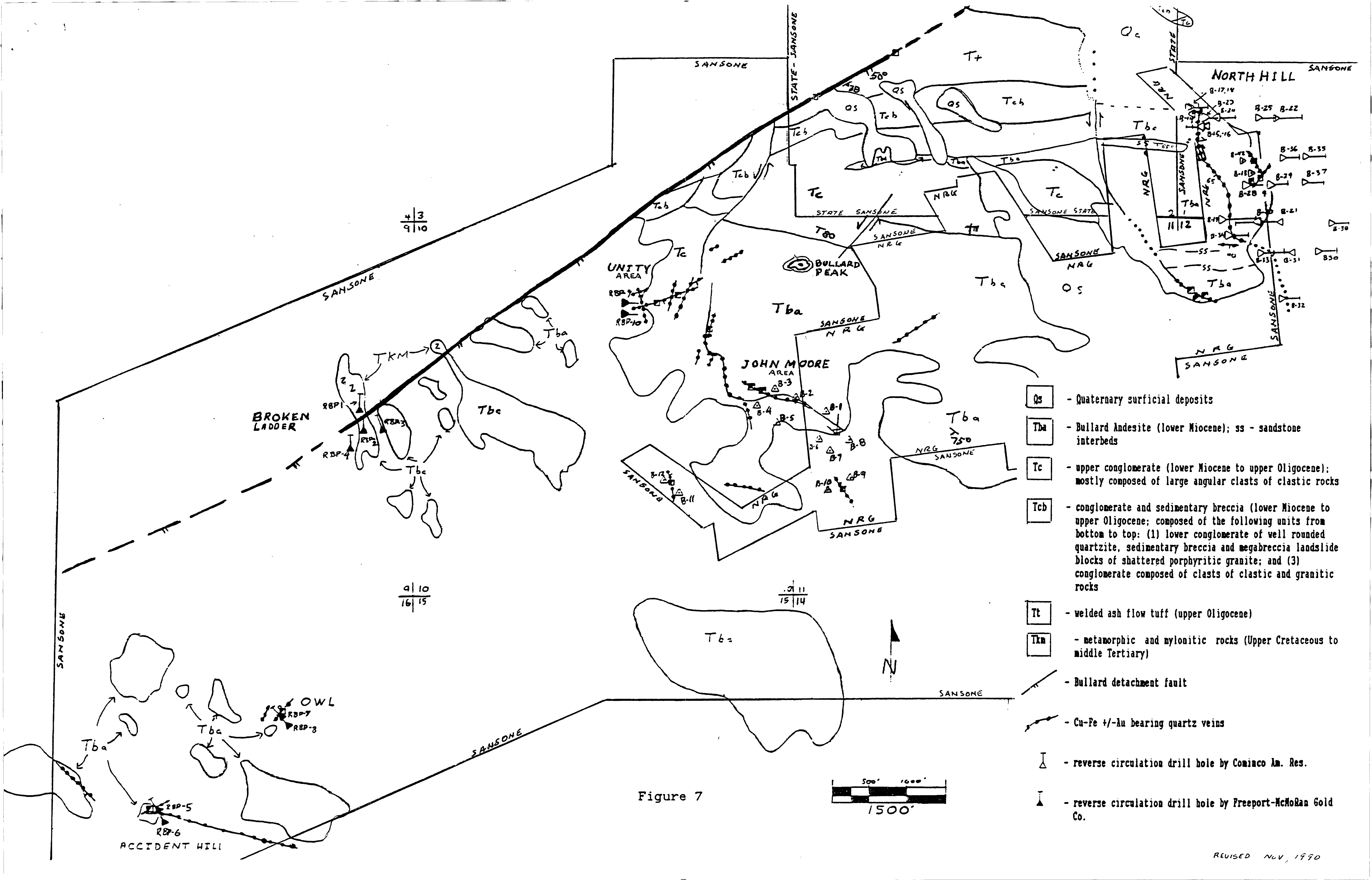

NORTH HILL
SANSONE
STATE
STATE - SANSONE
NRG
BULLARD PEAK
UNITY AREA
JOHN MOORE AREA
BROKEN LADDER
OWL
ACCIDENT HILL
Qs
Tba
Tc
Tcb
Tt
Tkm
Qs - Quaternary surficial deposits
Tba - Bullard Andesite (lower Miocene); ss - sandstone interbeds
Tc - upper conglomerate (lower Miocene to upper Oligocene); mostly composed of large angular clasts of clastic rocks
Tcb - conglomerate and sedimentary breccia (lower Miocene to upper Oligocene; composed of the following units from bottom to top: (1) lower conglomerate of well rounded quartzite, sedimentary breccia and megabreccia landslide blocks of shattered porphyritic granite; and (3) conglomerate composed of clasts of clastic and granitic rocks
Tt - welded ash flow tuff (upper Oligocene)
Tkm - metamorphic and mylonitic rocks (Upper Cretaceous to middle Tertiary)
- Bullard detachment fault
- Cu-Fe +/-Au bearing quartz veins
- reverse circulation drill hole by Cominco Am. Res.
- reverse circulation drill hole by Freeport-McMoRan Gold Co.
N
500' 1000'
1500'
REVISED NOV, 1990

Figure 7

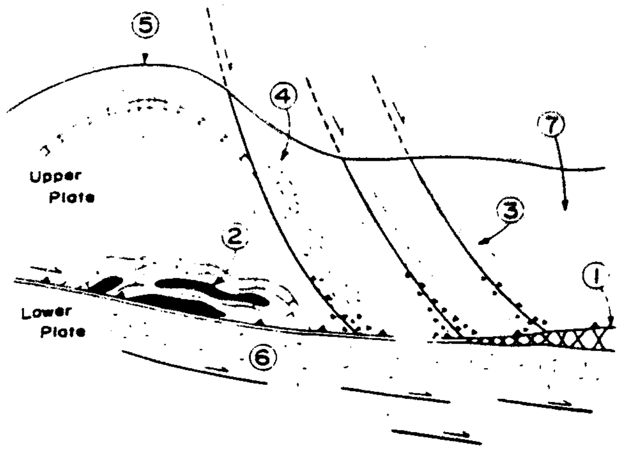


Figure 5. Diagrammatic model of mineralization loci in detachment fault-related deposits. 1. Along fault zones; 2. replacing reactive units; 3. in gash veins; 4. listric fault breccia; 5. fold-axis veins; 6. chlorite breccia; 7. tear faults. After Wilkins and Heidrick, 1982. (from Wilkins et al., 1986)

Table 1. Value of production for commodities from mineral districts in west-central Arizona that are known or suspected to be related to detachment faults. Manganese mineral deposits, although not clearly understood, are suspected to be related to detachment faults. District locations are shown on Figure 1.

District	Commodities*	1986 Value**
1. Copperstone	Au (reserves)	$189,306,900
2. Alamo	Cu, Pb, Ag, Au	72,303
3. Cienega	Cu, Ag, Au	5,571,167
4. Clara	Cu, Ag, Au	3,066,661
5. Lincoln Ranch	Mn	18,960,000
6. Mammon	Cu, Ag, Au	93,913
7. Midway	Cu, Ag, Au	43,743
8. Planet	Cu, Ag, Au	12,771,828
9. Pride	Cu, Ag, Au	37,679
10. Swansea	Cu, Ag, Au	17,471,085
11. Black Burro	Mn	261,490
12. Cleopatra	Cu, Pb, Ag, Au	1,118,459
13. Lead Pill	Cu, Pb, Ag, Au	303,365
14. Mesa	Mn	47,400
15. Owen	Cu, Pb, Zn, Ag	107,561
16. Rawhide	Cu, Pb, Zn, Ag	116,573
17. Bullard	Cu, Ag, Au	1,763,481
18. Burnt Well	(unknown)	(minor)
19. Harris	Mn	79,395
20. Northern Plomosa	Cu, Pb, Ag, Au	2,123,413
21. Artillery	Mn	75,135,320
22. Whipple	Cu, Pb, Zn, Ag, Au	683,550
TOTAL		$329,135,287

* Ag = silver; Au = gold; Cu = copper; Mn = manganese; Pb = lead; Zn = zinc.
** Values do not add to total because of rounding.

(From Spencer et al., 1988)

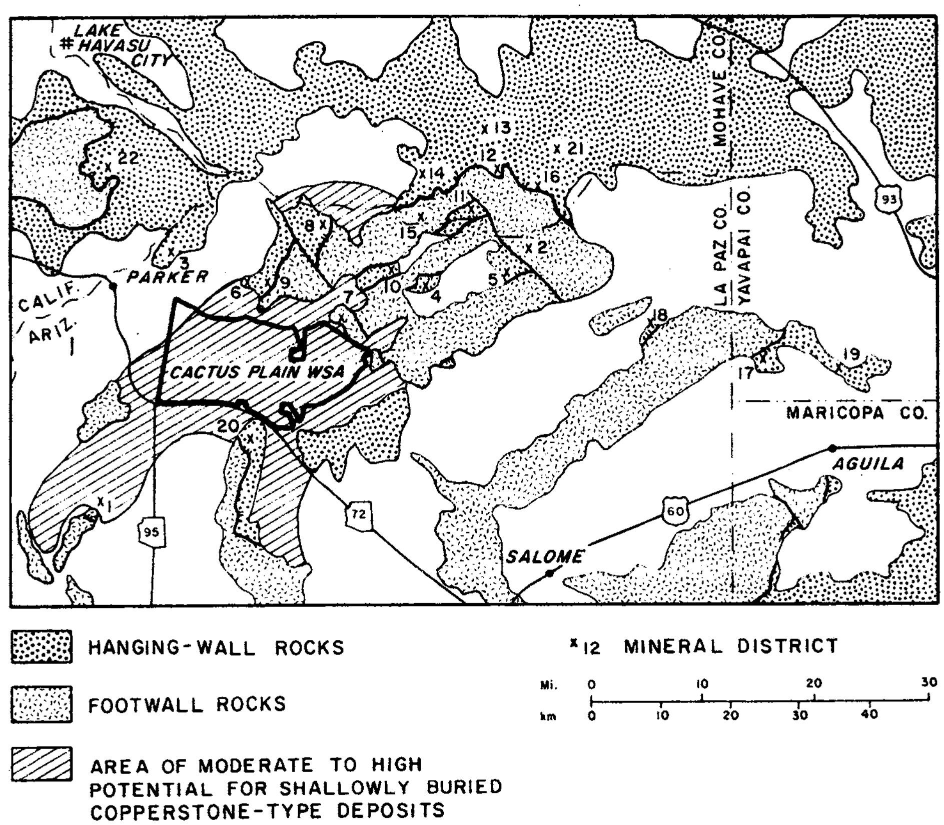
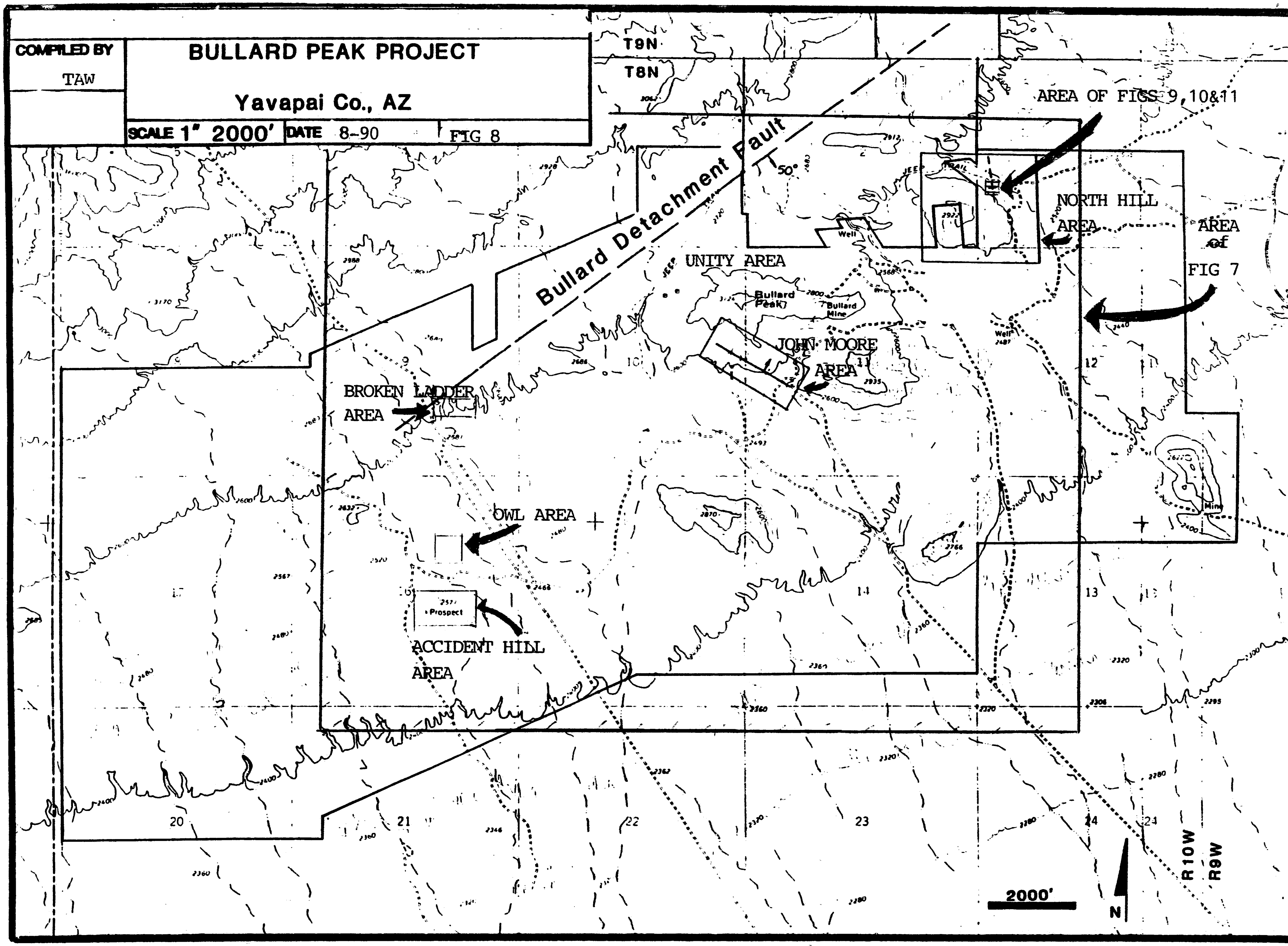


Figure 6 Map of part of west-central Arizona showing mineral districts where mineral deposits are known or suspected to be related to detachment faults. Middle Tertiary and older rocks are divided into hanging wall and footwall rocks, which lie above and below, respectively, regionally northeast-dipping detachment faults. Also shown is the outline of the Cactus Plain and Cactus Plain East Wilderness Study Areas. Numbers refer to mineral districts listed in Table 1. (From Spencer et al. 1988)



Date Creek Ranch SW, Smith Peak 7.5 minute quads

T8N,R10W G&SR Meridian

(after Telford 1990)

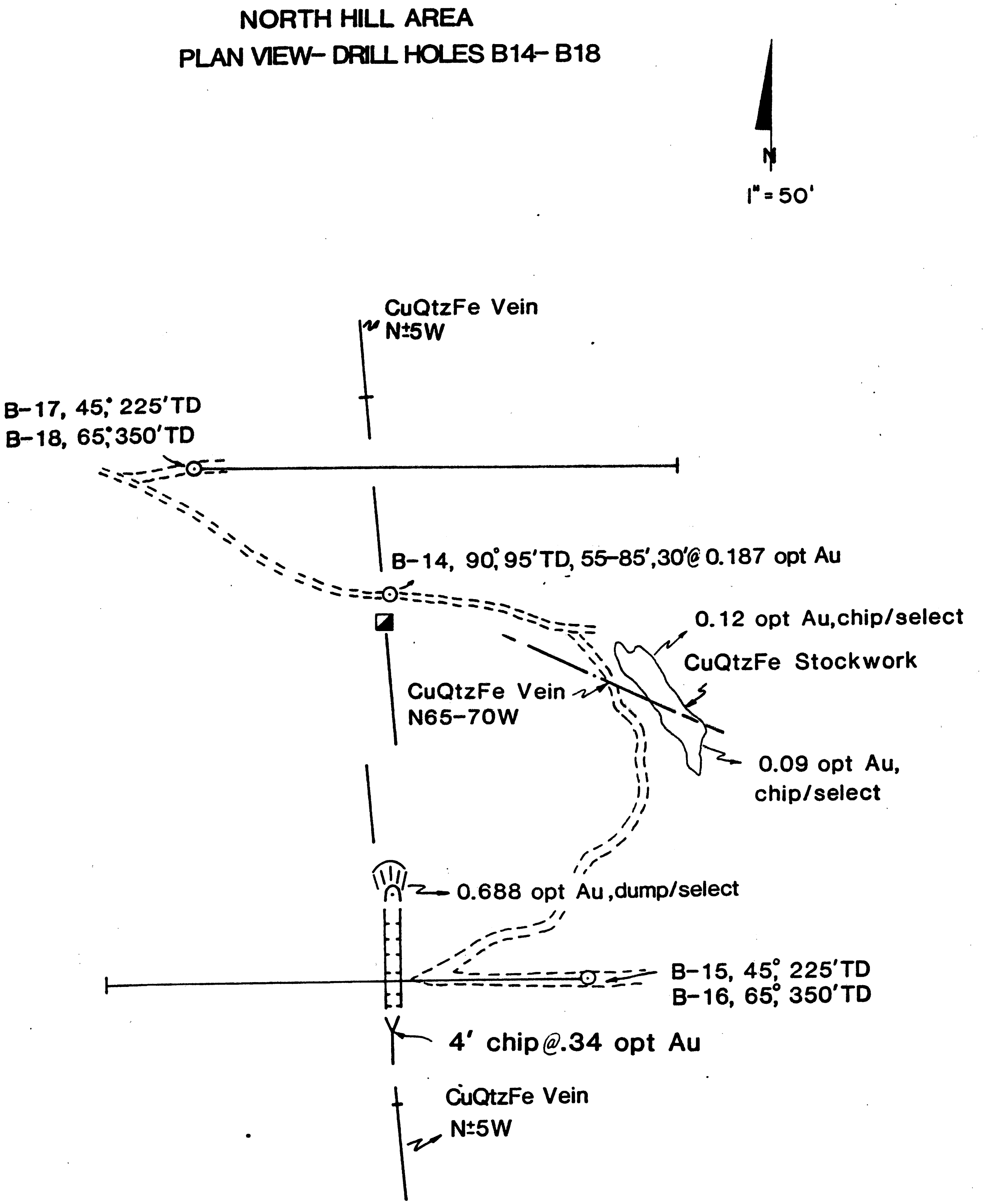


Figure 9. From Telford 1990. See fig 8 for location.

B15 & B16 CROSS SECTION
LOOKING NORTH

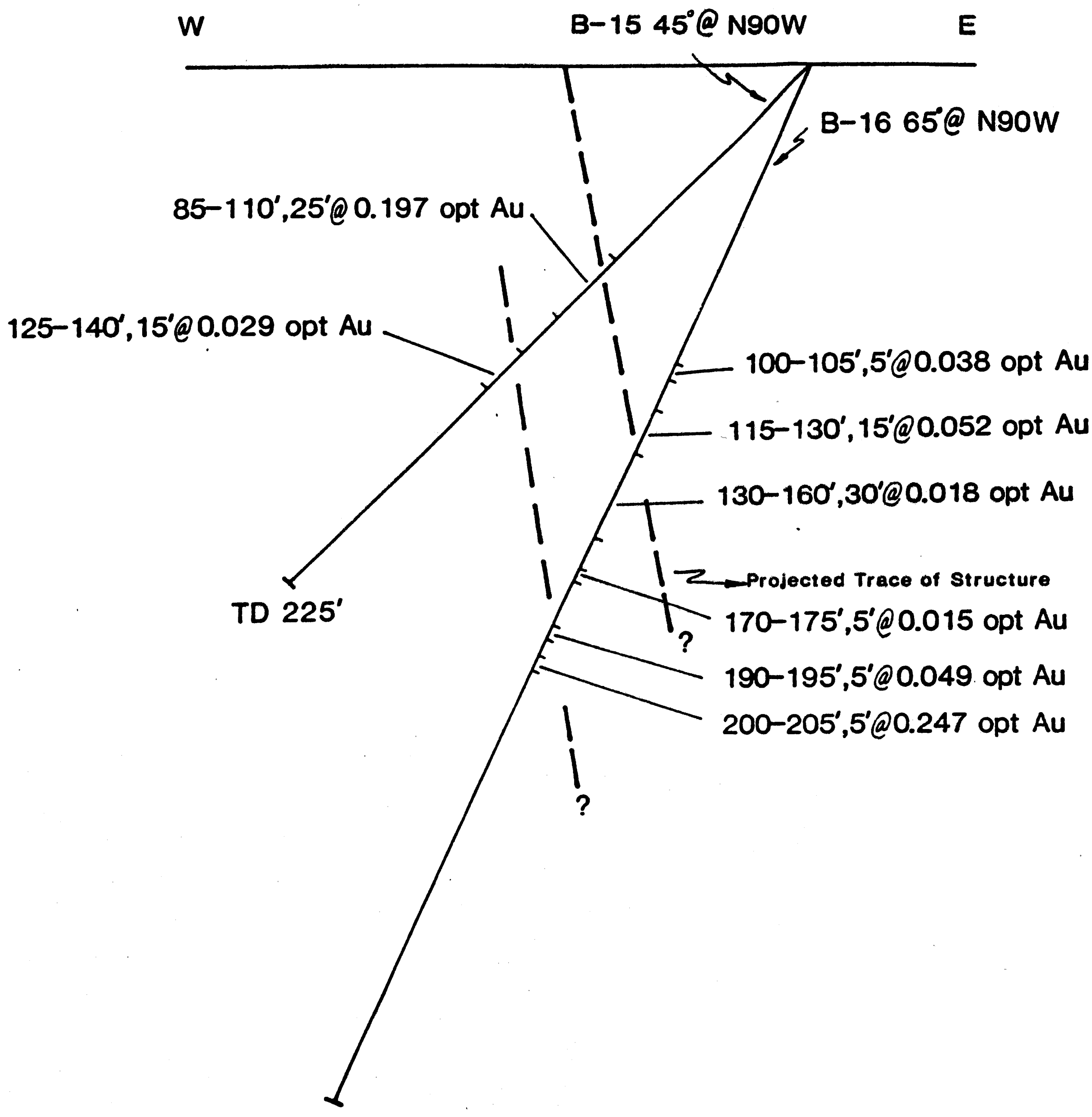


Figure 10. From Telford 1990. See figs 8 & 9 for location.

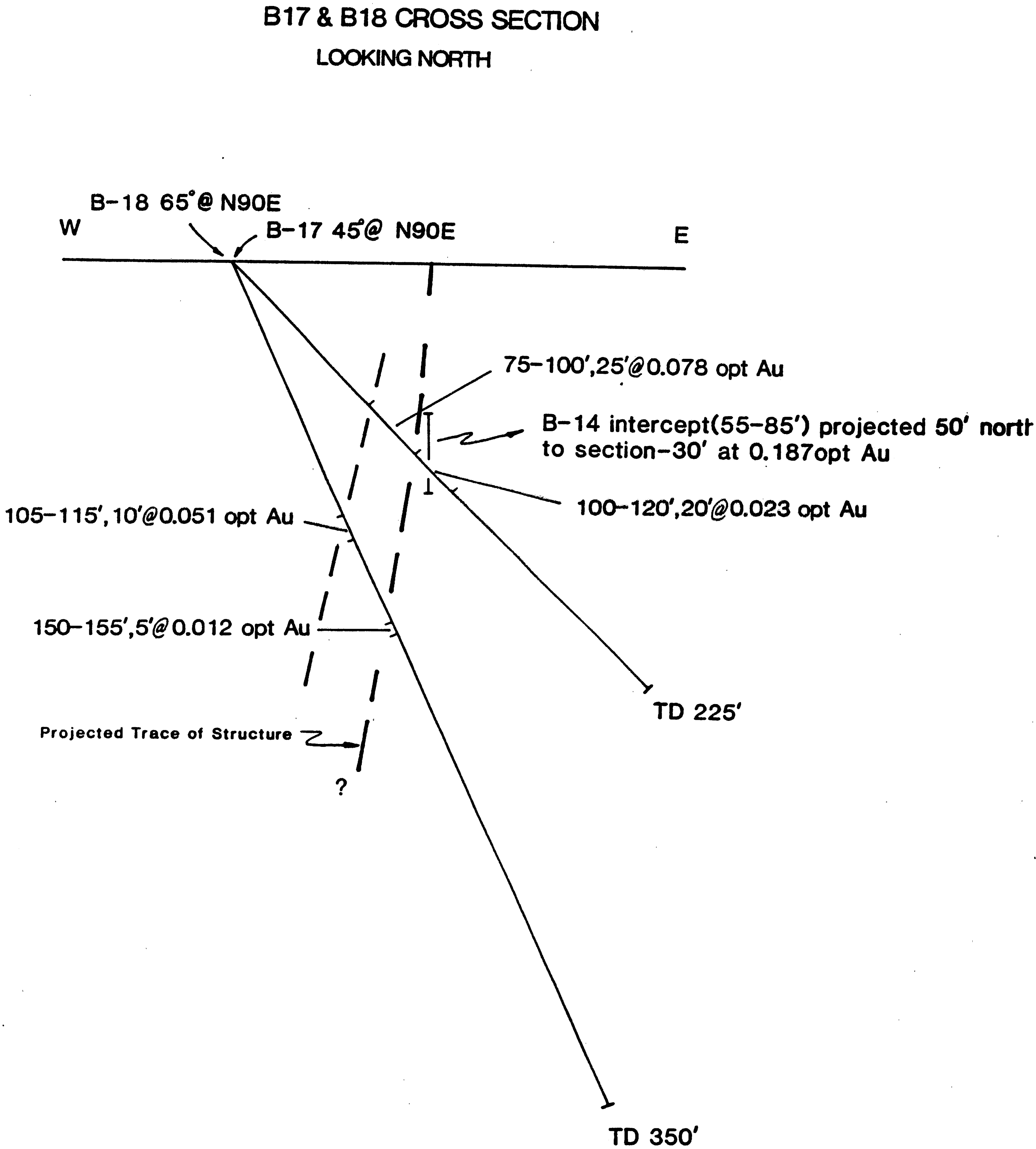


Figure 11. From Telford 1990. See figs 8 & 9 for location.

Bilbiography

Keith S.B., Gest D.E., DeWitt E., Toll N.W., and Everson B.A., 1983, Metallic mineral districts and production in Arizona: Arizona Bureau of Geology and Mineral Technology Bulletin 194, 58 pp.

Roddy M.S., Reynolds S.J., Smith B.M. and Ruiz J., K-metasomatism and detachment-related mineralization, Harcuvar Mountains, Arizona: Geological society of America Bulletin, vol. 100, no. 10, pp 1627-1639.

Reynolds S.J., and Spencer J.E., 1985, Evidence for large-scale transport on the Bullard detachment fault, west-central Arizona: Geology, vol. 13, no. 5, pp 353-356.

Reynolds S.J., and Spencer J.E., 1984, Geologic map of the Aguila Ridge-Bullard Peak area, eastern Harcuvar Mountains, west-central Arizona: Arizona Bureau of Geology and Mining Technology Open-File Report 84-4, scale 1;24,000.

Spencer J.E., Duncan J.T., and Burton W.D., 1988, The Copperstone Mine: Arizona's New Gold Producer: Arizona Bureau of Geology and Mineral Technology, Fieldnotes, vol 18, no. 2, pp 1-3.

Spencer J.E., and Welty J.W., 1986, Possible controls of base- and precious-metal mineralization associated with Tertiary detachment faults in the lower Colorado River trough, Arizona and California: Geology, vol 14. pp 195-198.

Telford J.M. 1990, Bullard Peak Project Yavapai County, Arizona 1989-1990 Final Project Report: Private Report of Cominco American Resources Inc.

Welty J.W., Spencer J.E., Allen G.B., Reynolds S.J., and Trapp R.A., 1985, Geology and Production of Middle Tertiary Mineral Districts in Arizona: Arizona Bureau of Geology and Mineral Technology Open-File Report 85-1, 88 pp.

Wilkins, J.JR., Beane, R.E., and Heidrick, T.L., 1986, Mineralization related to detachment faults; a model, in Beatty, Barbera, and Wilkinson, P.A.K., eds., Frontiers in geology and ore deposits of Arizona and the Southwest: Arizona Geological Society Digest, vol. 16, pp 108-117.

PROFESSIONAL RESUME **THOMAS WEISKOPF**

Home Address: 2621 E. Elm St., Tucson, Arizona 85716
Phone: (602) 881-6683

EDUCATION

1988-Present:	Currently enrolled in the M.S. Economic Geology program at the University of Arizona.
1981-1984:	University of Alaska, Fairbanks. B.S. Geology
1978-1980:	Beloit College, Beloit Wisconsin

WORK EXPERIENCE

1989 June-August	Associate Geologist, Freeport-McMoRan Gold Co. Presently investigating the mineral potential of an old precious and base metal district in southeastern Arizona. This work includes an examination of the district wide zoning in terms of chemical signatures, temperatures of formation, and structural controls. Techniques include statistical analysis of trace element data, fluid inclusion studies, petrographic work, air photo interpretation, and a limited amount of detailed mapping. This work is the basis for my masters thesis.
1988 May-August	Geologist, Nerco Minerals Duties consisted primarily of the logging and sampling of rotary chips during an extensive, development phase, drilling program in a precious metal epithermal system in southwestern Idaho. Lesser duties included surveying, soil sampling and land reclamation.
1987 May-December	Geologist, RAA/Nerco Minerals. Pre-season activities included a literature search and assisting in organizing the logistics of a 100 day, 7 person field season. Field work consisted of helicopter supported regional reconnaissance mapping and sampling as well as more detailed property evaluation. Post-season activities included assisting in preparation of final report and land status research.
1986 June-October	Junior Geologist, RAA/Nerco Minerals. The majority of the field season was spent on a four geologist, helicopter supported crew, performing regional mapping and sampling in an attempt to locate precious metal mineralization in the Alaska Range. Lesser duties included soil sampling and surveying. I also participated in the preparation of the final report.
1985 July-August	Drillers Helper, Wink Brothers Drilling. Duties included assisting the driller during a 1,500' diamond drilling program using a Longyear Hydra-Core 28.
1985 June-July	Geologic field assistant, Discovery Gold Exploration. Duties included assisting in the collection and correlation of surficial geologic data, drilling results, and literature, in assessing the potential of a shale hosted gold vein deposit. Lesser duties included claim staking and the preparation of drill pads.

1984 May-December	Junior Geologist, Mohawk Resources Alaska, Inc. Duties included planning and implementing a detailed geological mapping, sampling and survey program analyzing the mineral potential of an old gold producing property. Responsibilities included locating and logging diamond drill holes, trench mapping, overseeing soil sampling crews, and integration of geology, geochemistry, and geophysics into a geologic model.
1984 October-May	Student Intern, Alaska Department of Geology and Geophysical Surveys, K-Ar Geochronology laboratory. Duties included upkeep of a "clean" lab and separation of K-bearing mineral phases, using petrographic analysis combined with crushing and sieving, as well as heavy liquid and magnetic methods.
1982, 1983 Summers	Junior Geologist, Mohawk Resources Alaska Inc. Duties included performing geochemical, magnetometer and VLF surveys, as well as claimstaking and sample preparation, in an attempt to define a precious metal vein system. The 1983 season primarily involved placer evaluation.

REFERENCES

Ben Porterfield
Senior Geologist

Nerco Exploration Company
8100 N.E. Parkway Drive
Vancouver, Washington 98668
Telephone 208-583-2511

Bruce Cox
Consulting Geologist (Formerly Senior Geologist with Nerco)

601 Main, Suite 200
Vancouver, Washington 98660
Telephone 206-687-3055

Chris Puchner
Chief Geologist

Caithness Alaska Mining Co.
2173 University Ave. South
Fairbanks, Alaska 99709
Telephone: 907-479-9623

Allan Moran
District Exploration Manager

Freeport-McMoRan Gold Company
7400 North Oracle Road
Suite 272
Tucson, Arizona 95704
Telephone 602-797-1393

More references available upon request.

GEOLOGIC MAP OF THE AGUILA RIDGE - BULLARD PEAK AREA, EASTERN HARCUVAR MOUNTAINS, WEST-CENTRAL ARIZONA

Stephen J. Reynolds and Jon E. Spencer
Arizona Bureau of Geology and Mineral Technology

Arizona Bureau of Geology and Mineral Technology
Open-File Report 84-4

1984

POST-DETACHMENT DEPOSITS

Qs - Quaternary surficial deposits

ROCK UNITS ABOVE THE BULLARD DETACHMENT FAULT

Ts - sedimentary rocks (lower Miocene); includes sandstone, siltstone, and conglomerate

Tba - Bullard Andesite (lower Miocene); ss - sandstone interbeds

Ta - andesite (lower Miocene to upper Oligocene); interbedded with or intruded into unit Tc

Tc - upper conglomerate (lower Miocene to upper Oligocene); mostly composed of large, angular clasts of Mesozoic clastic rocks

Tcb - conglomerate and sedimentary breccia (lower Miocene to upper Oligocene); composed of the following units from bottom to top: (1) lower conglomerate of well rounded clasts of quartzite, possibly derived from Precambrian Mazatzal Quartzite of central Arizona; (2) sedimentary breccia and megabreccia landslide blocks of shattered porphyritic granite; and (3) conglomerate composed of clasts of Mesozoic clastic rocks and granitic rocks

Tvc - volcaniclastic and volcanic breccia (upper Oligocene)

Tt - welded ash-flow tuff (upper Oligocene); subdivided on Aguila Ridge into the following units:

Ttu - upper, lithic ash-flow tuff; commonly gray, tan, or buff colored

Ttm - middle, trachytic, welded ash-flow tuff; reddish-brown color; unit includes several distinct welded ash-flow tuffs with local vitrophyres and nonwelded intervals

Ttl - lower, rhyolitic(?) tuff; greenish gray with numerous lithophysae

Tvs - volcaniclastic sandstone (upper Oligocene); locally present between Ttm and Ttu

Tcl - arkosic conglomerate and conglomeratic sandstone (Oligocene?); reddish brown color; composed of granitic and metamorphic pebbles to boulders in an arkosic matrix

d - rhyolite to quartz latite dikes (Upper Cretaceous or Tertiary?)

Tkg - muscovite granite (Upper Cretaceous or Lower Tertiary); medium-grained, equigranular with 2-3 percent muscovite and minor biotite and pale red garnet

Kg - granite and granodiorite (Upper Cretaceous); medium- to coarse-grained, equigranular, with 2-3 percent biotite and minor hornblende; biotite from this unit yielded a late Cretaceous K-Ar age (J. Kirkwood, 1977, oral communication, CONOCO Minerals)

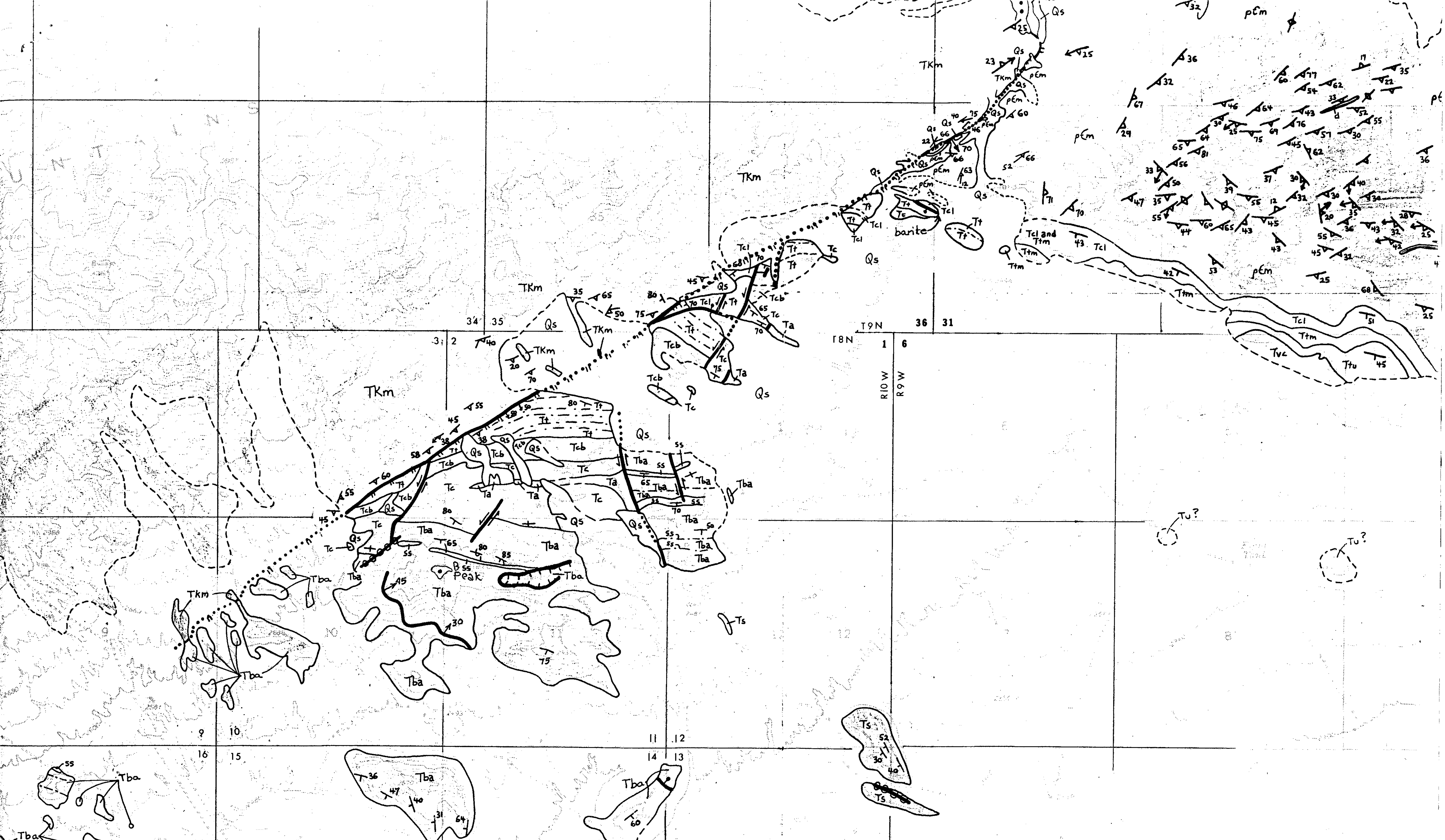
P€g - porphyritic granite (Precambrian); medium- to coarse-grained with 15 to 20 percent K-feldspar phenocrysts 0.5 to 3 cm long in a matrix of plagioclase, quartz, and biotite; commonly foliated

P€m - metamorphic rocks (Precambrian); composed of compositionally banded quartzofeldspathic gneiss and biotite schist; local quartz-rich schist, muscovite-biotite schist, and medium- to fine-grained granofels; crystalloblastic foliation parallel to compositional layering.

ROCKS BELOW THE BULLARD DETACHMENT FAULT

Tcb - chloritic breccia (middle Tertiary); derived from TKm

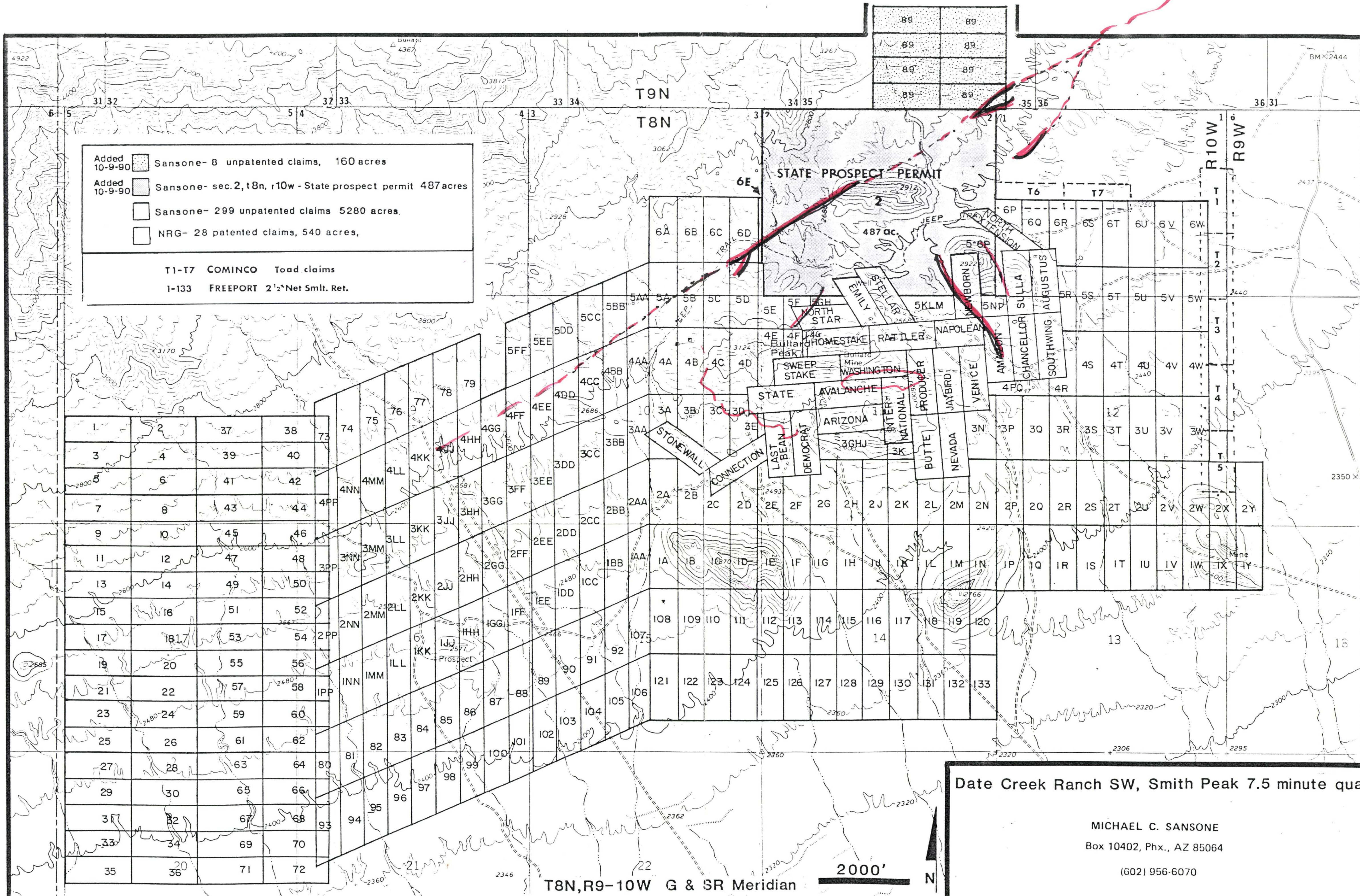
TKm - metamorphic and mylonitic rocks (Upper Cretaceous to middle Tertiary); derived from Precambrian metamorphic and plutonic rocks and Upper Cretaceous to Tertiary granitic rocks



GEOLOGIC MAP of the AGUILA RIDGE - BULLARD PEAK AREA, EASTERN HARCUVAR MOUNTAINS, WEST-CENTRAL ARIZONA

by Stephen J. Reynolds and Jon E. Spencer 1984 Arizona Bureau of Geology and Mineral Technology Open-File Report 84-4

Northern Miner. March 13, 1989



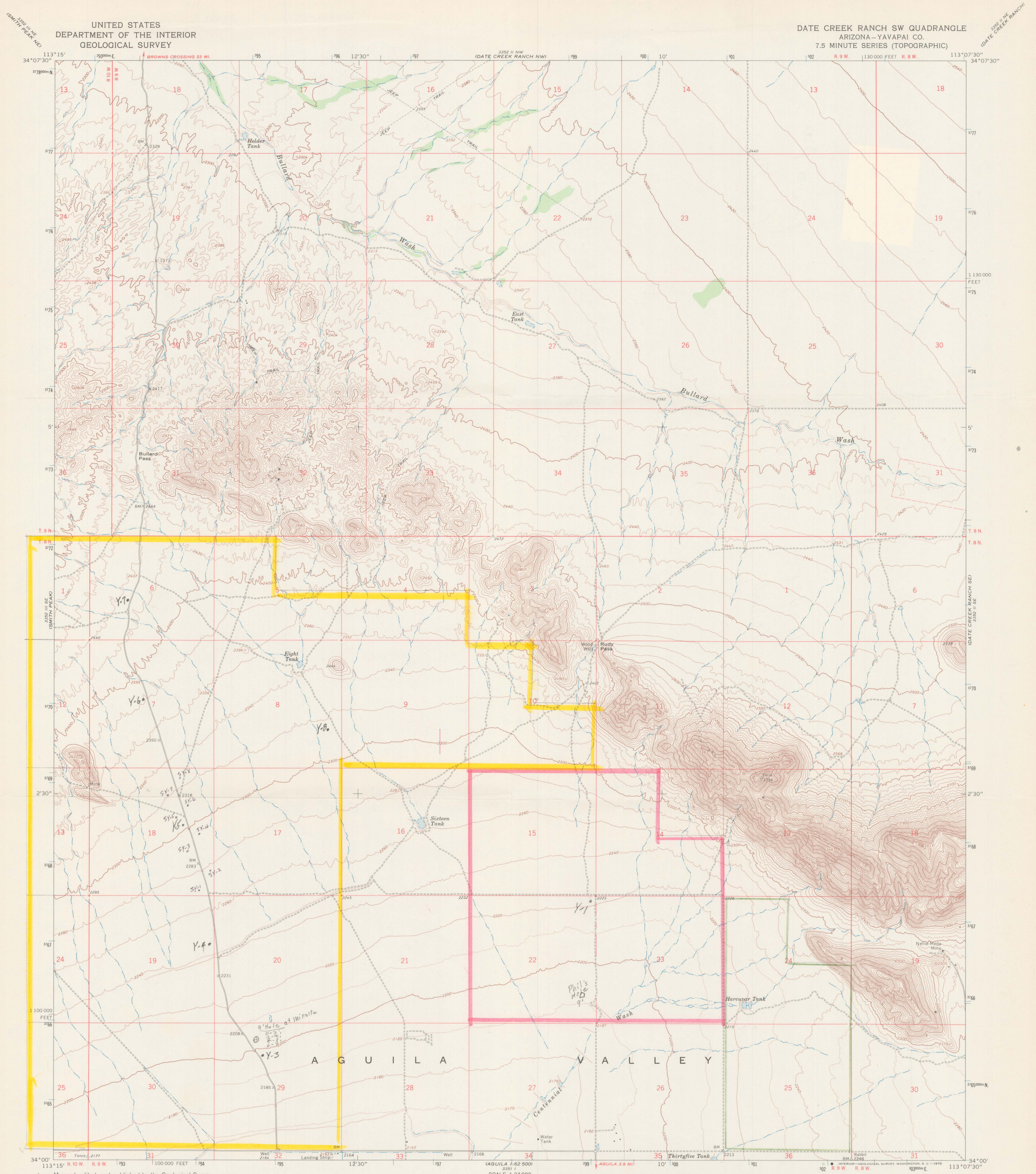
PART OF BULLARD DETACHMENT FAULT SEE OPEN FILE REPORT 84-4 ARIZONA GEOLOGICAL SURVEY

MILS NO.	REF	NO. AKA	MINE NAME	TOWN	RANGE	SEC	QTR	TOPOGRAPHIC MAP NAME	COMMODITY 1	2	3	4	5	6	7
859			LIME CREEK COPPER	8 N	5 E	23	N2								
859			RED ROVER COPPER PAT. CLAIMS	8 N	5 E	23	N2								
859	F	2	RED ROVER MINE	8 N	5 E	23	N2	ROVER PEAK - 7.5 MIN	CU	AU	AG				
1358	F	0	CHINA MINE	8 N	5 W	2	SE	SAM POWELL PEAK - 7.5 MIN	AU						
310			MAGNETITE IRON GROUP	8 N	5 W	6	C								
310	F	1	SANTA MARGARITA GROUP	8 N	5 W	6	C	FLORES - 7.5 MIN	FE	TI	MN				
309	Z	0	K PLACERS	8 N	5 W	9	C	FLORES - 7.5 MIN	AU						
331B			BOX CANYON DEPOSITS	8 N	5 W	12	SE								
331B	F	1	MISTAKE	8 N	5 W	12	SE	SAM POWELL PEAK - 7.5 MIN	MN						
332B	Z	0	IRON CITY	8 N	5 W	13	NE	SAM POWELL PEAK - 7.5 MIN	FE	STN	MN	CA			
332A	F	0	RED ROVER	8 N	5 W	13	NW	SAM POWELL PEAK - 7.5 MIN	UNK						
331A	F	0	MOHAVE MINING AND MILLING	8 N	5 W	14	--	SAM POWELL PEAK - 7.5 MIN	MIL						
1320	Y	0	MOHAVE MINING AND SINTER PLANT	8 N	5 W	19	--	FLORES - 7.5 MIN	MIL						
308	F	0	BURCHFIELD FELDSPAR	8 N	5 W	21	N2	FLORES - 7.5 MIN	FEL	MCA					
311	Z	0	VELVET STAR	8 N	5 W	21	S2	FLORES - 7.5 MIN	AU						
327			FRENCHMAN PATENTED	8 N	5 W	24	NE								
327			MAY PATENTED	8 N	5 W	24	NE								
327	F	3	ORO GRANDE	8 N	5 W	24	NE	SAM POWELL PEAK - 7.5 MIN	AU						
327			PLATNA GRANDE GROUP	8 N	5 W	24	NE								
856	M	0	ADIT 8	8 N	6 E	15	--	CHALK MOUNTAIN - 7.5 MIN	UNK						
857	P	0	GYPSUM AND KAOLIN DEPOSITS	8 N	6 E	21	C	CHALK MOUNTAIN - 7.5 MIN	GYP	CLY					
91B			GOLD LEAF	8 N	8 W	19	NE								
91B	F	2	NELLIE MEDA	8 N	8 W	19	NE	DATE CREEK RANCH SW - 7.5 MIN	AU						
91B			ROBSON'S MINING WORLD RESORT	8 N	8 W	19	NE								
91A	M	0	SHAFT 2	8 N	8 W	19	SE	DATE CREEK RANCH SW - 7.5 MIN	UNK						
1	M	0	PROSPECT 1	8 N	8 W	29	NE	DATE CREEK RANCH SE - 7.5 MIN	UNK						
92	M	0	PROSPECT 3	8 N	8 W	30	N2	DATE CREEK RANCH SW - 7.5 MIN	UNK						
94	Z	0	MCS	8 N	9 W	3	ALL	DATE CREEK RANCH SW - 7.5 MIN	UNK						
95			J HATTON	8 N	9 W	6	NW								
95	Z	1	LAST CHANCE MANGANESE	8 N	9 W	6	NW	DATE CREEK RANCH SW - 7.5 MIN	MN						
96	Z	0	COPPER QUARTER	8 N	9 W	10	S2	DATE CREEK RANCH SW - 7.5 MIN	CU						
97			BADGER	8 N	9 W	13	NW								
97	F	2	HARRIS GROUP EAST OF	8 N	9 W	13	NW	DATE CREEK RANCH SW - 7.5 MIN	MN	BA	CU	F	CA	PB	
97			HATTON	8 N	9 W	13	NW								
108			AMC	8 N	10 W	10	SW								
108	F	1	SANDY MINE	8 N	10 W	10	SW	SMITH PEAK - 7.5 MIN	CU	AU					
109	F	1	BULLARD	8 N	10 W	11	N2	SMITH PEAK - 7.5 MIN	CU	CU	AG	AU	SI	CA	
109			LITTLE GIANT	8 N	10 W	11	N2								
93	F	0	COPPER CHIEF	8 N	10 W	13	NE	DATE CREEK RANCH SW - 7.5 MIN	CU	AU	AG				
110	Z	0	FLEMING CLAIMS	8 N	10 W	16	SE	SMITH PEAK - 7.5 MIN	AU						
790	Z	0	ROY LYNN CLAIM	9 N	1 E	1	E2	BUMBLE BEE - 7.5 MIN	UNK						
836	M	0	CROWN KING 54	9 N	1 W	4	NE	CROWN KING - 7.5 MIN	UNK						
853	M	0	MINNEHAHA 21	9 N	1 W	6	NW	MINNEHAHA - 7.5 MIN	UNK						
837	F	0	ADAK	9 N	1 W	8	C	MINNEHAHA - 7.5 MIN	AG	AU	W				
838			JOHN REVELLO GOLD CLAIMS	9 N	1 W	9	NE								
838	F	1	OLD KENTUCK	9 N	1 W	9	NE	CROWN KING - 7.5 MIN	AU	AU					
852			O'BRIEN	9 N	1 W	9	W2								
852	F	4	PACIFIC	9 N	1 W	9	W2	MINNEHAHA - 7.5 MIN	CU	AU	AG				
852			PATENTED CLAIMS MS 2803	9 N	1 W	9	W2								

BULLARD (PIERCE) DIST.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DATE CREEK RANCH SW QUADRANGLE
ARIZONA—YAVAPAI CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1966. Field checked 1967

Polyconic projection. 1927 North American datum
10,000-foot grid based on Arizona coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue

Fine red dashed lines indicate selected fence lines

UTM GRID AND 1967 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION

Light-duty — Unimproved dirt

QUADRANGLE LOCATION

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR WASHINGTON, D. C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

DATE CREEK RANCH SW, ARIZ.
N3400—W11307.5/7.5
1967
AMS 3352 II SW—SERIES V898

95 LAST
CHANCE
MN
✓BULLARD

Yavapai
County

Yavapai
County