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North Star file

RANDALL COPPER PROPERTIES

PICACHO DISTRICT--PINAL COUNTY--Arizona.

RANDALL COPPER PROPERTIES

The mining properties in this report are situated, in so far as could be ascertained, in the Picacho Mining District, in sections 6 and 7, T. 7 S. R. 10 E., Gila Salt River Meridian in Pinal County, State of Arizona. Florence is the county seat of Pinal County.

The properties are about 25 miles southwest of Florence on Highway 80. Of that distance, 20 miles are paved and five miles are dirt road from the turn off west from Highway 80.

Coolidge, the nearest town, is distant 20 miles by a partly paved and dirt road. An old dirt road, formerly used, until washed out by floods, is distant 10 miles from Coolidge. A few days with a dozer outfit could make it passable again.

The holdings comprise 82 lode claims, held by possessory rights. Five claims are located under the name of North Star Nos. 1 to 5, inclusive; the rest, under the name Cora Nos. 1 to 77, inclusive. Some of the latter claims cover the relative flat plateau area adjacent and are overlaid by a bedding of caliche lime, the thickness as yet undetermined.

The area lies within an ancient inland sea bed, which by successive seismographic disturbances over eons of time, resulted in the depositions of one of the largest known zones of copper bearing ores in existence.

The geology can be interpreted from the surface outcrops and open cuts as a series of quartz-monzonite cross-fissures interposed in a porphyry-rhyolite intrusive; lenticular stratas of the older granitic rocks were noted as evidence of deep seated origin. The older formations were thrust through the upper stratas by successive seismic and subsident actions.

COPY.

At some period of movement, a narrow body of diabase was thrust through the formation. This intrusion bears a north-south strike, whereas the quartz-monzonite fissurings occur at variable angles of strike. The copper ore bearing rocks, in general, occur with few exceptions at the point of contact of the cross-fissures along the fracture planes of the quartz-monzonite and altered adjacent country rock in the line of fracture. As silica is the predominate constituent of the quartz-monzonite and monzonite-porphyry, the greater part of the ores occurs as various forms of copper silicates, of which chrysocolla is the most abundant. Some minute segments of chalcocite were noted, interposed in the lenticular stratas of silicious ores, which undoubtedly are of secondary origin. Minute particles of cuprous oxides and carbonates were noted. The presence of activated limestone being absent accounts for the low contents of the oxides and carbonates of copper.

This zone comprises an area extending westerly to the Picacho uplift, and easterly to the more extensively developed and better known areas as Superior, Miami, Globe, Ray and others within the rim of the basin.

Due to the pronounced surface exposures of the mineralized zones on the easterly horizons of these areas, the earlier prospectors and mining men gave their time and endeavors to these locales, at the neglect of some of the westerly horizons where little or no evidence of outcrops or exposures were evident.

With the present world price of copper, more attention is now being directed to the westerly horizon of the basin; and the properties under consideration comprise a part of this zone.

In my observations of the surface one point stood out clearly: the similarity of the area to the Coronado ore body at Metcalf, Arizona, which I quote:

COPY.

"The Coronado ore body or vein strikes east to northeast and has thrown quartzite against a Pre-Cambrian granite; it is a cementation of breccia on the Coronado fault. The ore body occurs as a quartzite against a Pre-Cambrian granite. A diabase dyke intruded into this fault before movement had ceased.

"The primary mineralization was similar to that of the fissures in the monzonite porphyry, but alterations resulted in the formation of a zone of oxidized ores, and one of secondary sulphides.

"This is in contrast with the deposits in limestone, which were mostly oxidized ores, and those in the monzonite porphyry were mostly sulphide ores. A further contrast was noted in that the reactivated limestone yielded oxidized ores, and the relatively inert monzonite porphyry yielded secondary chalcocite, whereas the intermediate rocks of the Coronado yielded both."

Excerpts from the Arizona Bureau of Mines, University of Arizona. The author was liaison officer and assistant to the George Millar, Superintendent and Mining Engineer of the Coronado Mine, Metcalf Division of Arizona Copper Co., Clifton Arizona, during World War I, 1917-18. Remarks which I quote from information given to me while stationed at Metcalf, Arizona.

During the early years of copper mining in the southwest territories, little attention was given to ground which failed to indicate copper bearing ores on the surface.

The Cornnado vein was one of the many other similar cases in the course of events of that period.

Not until the old Arizona Copper Co. of Morenci, Arizona, a British corporation, erected their smelter at Clifton, Arizona, and surface operations were intensified for a larger source of silicious ore required for their smelter operations, was the Coronado vein discovered as it is known today.

COPY.

The discovery was the result of driving the 7th level northerly to the north portal of said level. In the course of this work, the tunnel cut one side of the vein. Further development resulted in the opening up of one of the largest bodies of silicious ore discovered at that period.

This proved to be a windfall, as the silicious ores needed contained copper and some values in gold and silver within a few miles of their smelter.

The Coronado vein information has been used as a comparative description due to the similarity of the surface croppings.

The present workings have been confined to a limited area, in comparison to the properties as a whole; most of the developments are centered on the North Star group of five claims and are still in the prospective stage. The greatest depth attained is a nearly vertical shaft approximately 45 ft. in depth, following a fracture filled zone of brecciated quartz-monzonite 4 ft. in width, with low copper contents. (This shaft, for clarification in this report, is referred to as the Randall shaft.)

A similar condition was noted in an old, abandoned shaft about 200 ft. southerly from the Randall Shaft. This shaft, which is reported to be 340 ft. deep, and has a water level at 40 ft., was abandoned in the long past and no definite information is available, except the usual bizarre stories connected with old workings. Nevertheless, if the depth corresponds to the statements made, it should be unwatered at a later date, for what information it might lend to the geological data of the area.

Several open cuts of various dimensions have been opened, exposing the formations for study, particularly the faultings and subsidiences and cross faultings and subsequent mineralization as the result of the cross faultings. Apart from the aforesaid surface exploratory work, no work has been performed of any consequence to evaluate the properties below the surface faulted zone.

SUMMARY:

The mineralization zone covers a considerable area and warrants a systematic evaluation of the holdings by one of the various geophysic methods applicable to this type of deposition. If the geophysic findings are favorable, the area should be core-drilled in a grid pattern, as a result of the geophysic map readings, to determine the value of the deeper mineralized zones beyond the zone of the surface faulting.

The surface mineralization so far uncovered is indicative of having originated from a depth below the surface fault zone.

Under the present and future market for copper, a high price is assured for a considerable period of years. The properties have sufficient merit to recommend their development. Another factor in favor of the properties is that they are located in an area adjacent to several commercial copper smelting plants, or if the ores result favorably for leaching, the chemicals essential for a leaching plant are produced and available in the State of Arizona.

Apropos to a leaching plant, a sufficient water supply would be required for this type of operation -- an economic problem that has not been determined at this writing.

COPY.

Submitted by,

COPY.

S. E. Chiapella, M.E.
Member of the American Institute of
Mining & Metallurgical Engineers, 1926

THE GEOLOGY AND GEOCHRONOLOGY OF THE NORTHERN PICACHO MOUNTAINS, PINAL COUNTY, ARIZONA

by

Gary Steward Johnson

A Thesis Submitted to the Faculty of the

DEPARTMENT OF GEOSCIENCES

In Partial Fulfillment of the Requirements
For the Degree of

MASTER OF SCIENCE

In the Graduate College

THE UNIVERSITY OF ARIZONA

1 9 8 1

TABLE OF CONTENTS

TABLE OF CONTENTS--Continued

LIST OF ILLUSTRATIONS

LIST OF ILLUSTRATIONS--Continued

ABSTRACT

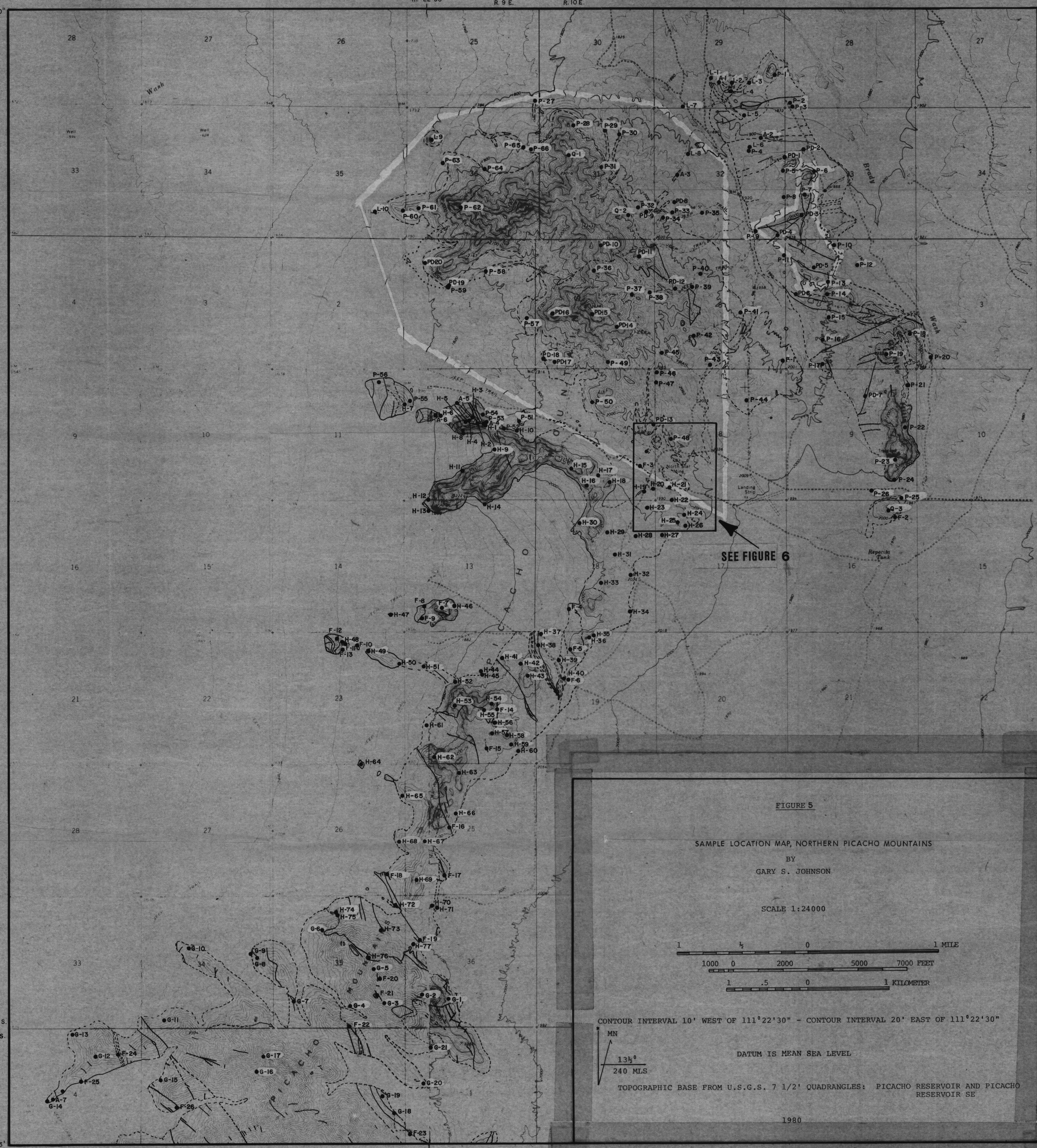
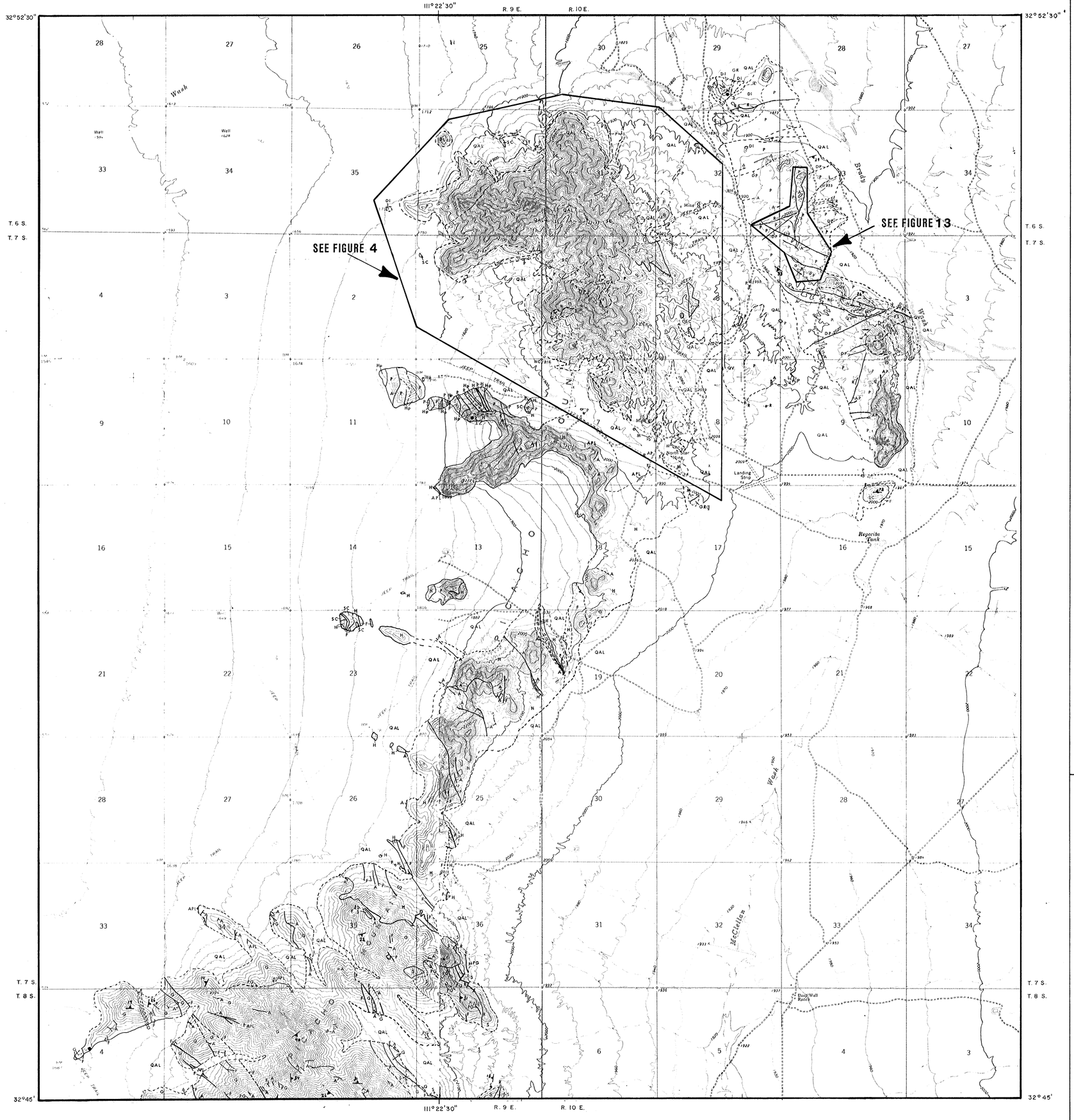


FIGURE 5: SAMPLE LOCATION MAP, NORTHERN PICACHO MOUNTAINS

JOHNSON, GARY S., M.S. THESIS, DEPARTMENT OF GEOSCIENCES, 1981



EXPLANATION

GEOLOGIC TIME	MAP UNITS	
QUATERNARY	QAL	ALLUVIUM, TALUS, CALICHE AND SOIL
MID-TERTIARY	A	NON-PORPHYRITIC ANDESITE & VERY FINE GRAINED DIORITE
	D	DIABASE
	QV	QUARTZ VEIN
	F	FINE-GRAINED INTERMEDIATE IGNEOUS ROCKS
	Hp	HORNBLENDE MONZOGRANITE PORPHYRY
	H	HORNBLENDE MONZOGRANITE TO QUARTZ MONZONITE 24.6 ± 0.5 M.Y. (K-Ar)
	T	TERTIARY DIKE - SEE FIGURE 4
	APL	APLITE
	PG	PEGMATITE
	G	GRANITE GNEISS 23.6 ± 0.5 M.Y. (K-Ar)
	S	SCHIST (LOCALLY GNEISSIC)
EARLY-TERTIARY TO LATE CRETACEOUS	R	RHYOLITE TO RHYOLITE PORPHYRY
	L	PORPHYRITIC LATITE TO LATITE PORPHYRY
	DP	PORPHYRITIC DACITE TO DACITE PORPHYRY
	AP	PORPHYRITIC ANDESITE TO ANDESITE PORPHYRY
	Gk	SECTION 29 GRANITE 67.0 ± 1.4 M.Y. (K-Ar)
	Di	DIORITE
	M	NORTH STAR MONZONITE
	GRg	NORTH STAR GRANITE
PRECAMBRIAN	P	ORACLE GRANITE (LOCALLY GNEISSIC)
	FS	ORACLE GRANITE - FOLIATED AND SHEARED
	SC	PINAL SCHIST (LOCALLY GNEISSIC)

EASTERLY STRIKING FELSIC DIKES

SYMBOLS

CONTACT: SOLID = WELL LOCATED; DASHED = MODERATELY WELL LOCATED; DOTTED = POORLY LOCATED OR BURIED

FAULT: SOLID = WELL LOCATED; DASHED = MODERATELY WELL LOCATED; DOTTED = POORLY LOCATED OR BURIED

STRIKE AND DIP OF FOLIATION

AGE, DATE, SAMPLE LOCALITY

FIGURE 2

GEOLOGIC MAP OF THE NORTHERN PICACHO MOUNTAINS

BY

GARY S. JOHNSON

SCALE 1:24000

1 ½ 0 1 MILE

1000 0 2000 5000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10' WEST OF 111°22'30" - CONTOUR INTERVAL 20' EAST OF 111°22'30"

MN 13½° 240 MLS

DATUM IS MEAN SEA LEVEL

TOPOGRAPHIC BASE FROM U.S.G.S. 7 1/2' QUADRANGLES: PICACHO RESERVOIR AND PICACHO RESERVOIR SE

1980

FIGURE 2: GEOLOGIC MAP OF THE NORTHERN PICACHO MOUNTAINS

JOHNSON, GARY S., M.S. THESIS, DEPARTMENT OF GEOSCIENCES, 1981

ABG & MT
MM 81-A
1 of 3

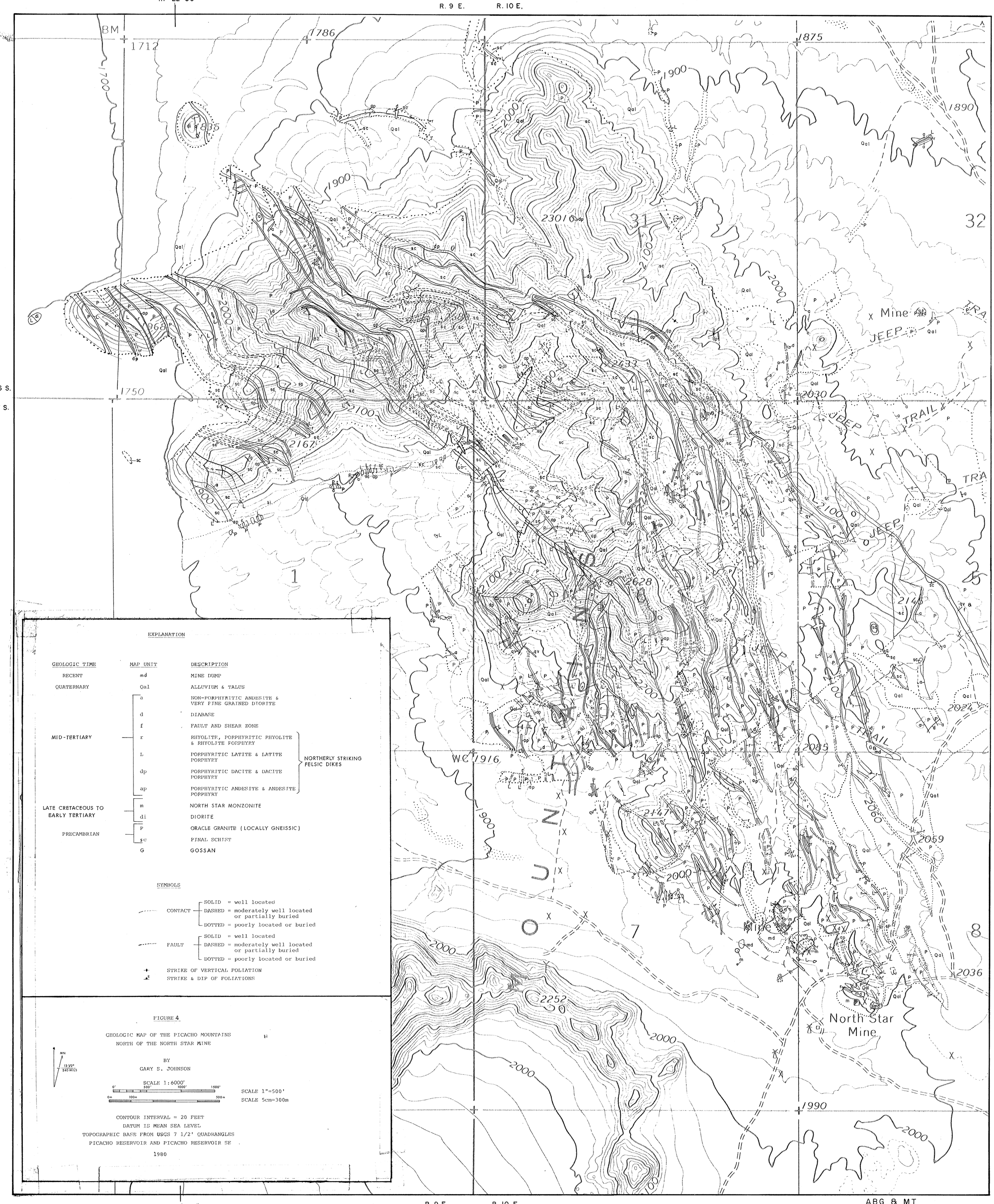
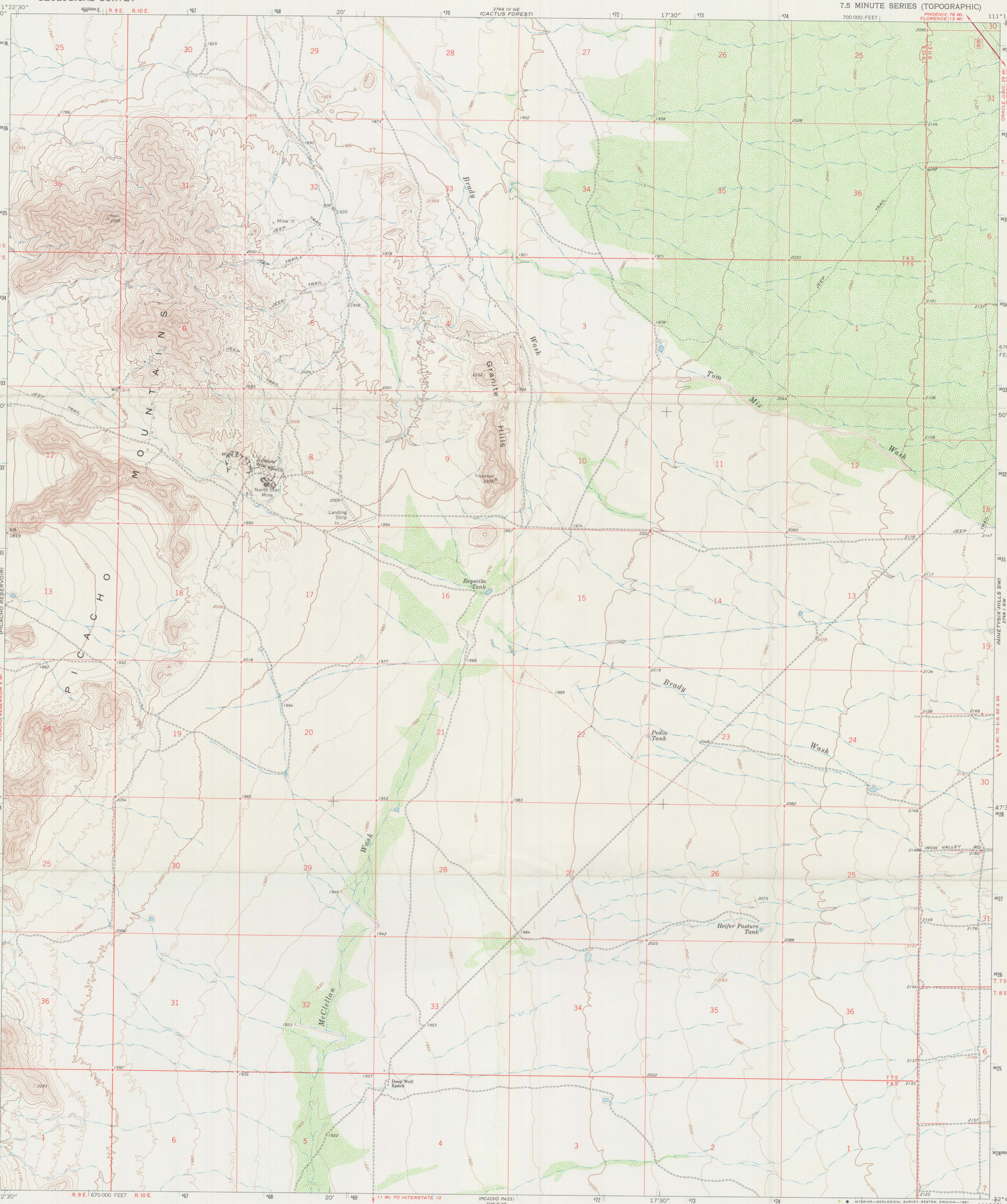


FIGURE 4: GEOLOGIC MAP OF THE PICACHO MOUNTAINS NORTH OF THE NORTH STAR MINE

JOHNSON, GARY S., M.S. THESIS, DEPARTMENT OF GEOSCIENCES, 1981

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PICACHO RESERVOIR SE QUADRANGLE
ARIZONA – PINAL 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 1962. Field checked 1966

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

To place on the predicted North American Datum 1983, move the projection lines 3 meters south and 63 meters east as shown by dashed corner ticks

Fine red dashed lines indicate selected fence lines

GN MN 0°10' 3 MILS 13½° 240 MILS

UTM GRID AND 1966 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ARIZONA
QUADRANGLE LOCATION

ROAD CLASSIFICATION
Heavy-duty — Light-duty
Unimproved dirt
U. S. Route

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1981

PICACHO RESERVOIR SE, ARIZ.
N3245—W11115/7.5
1966
DMA 3749 IV SE—SERIES V898

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine: Northstar Mine

Date: June25, 1962

District: Owl Head District, Pinal Co.

Engineer: Lewis A. Smith

Subject: Interview with Mike Guzman, at Superior June 21, 1962.

Claims: About 100

Location: Approximately 16 miles South of Florence and thence 11 miles W.

Owner: Frank Randall, Coolidge

Operators: Guzmans and Schwartz, of Superior (partnership agreement with Randall).

Work & Geology: Only shallow pits and cuts. The present silica pit is in schist and monzonite (?) intrusions containing veins and small masses of quartz. The quartz is dense, fine-grained, and impregnated by chrysocolla, malachite and some chalcocite altering to cuprite and copper oxidized minerals (mainly chrysocolla). The near surface silicified material runs 1-1½ percent copper and approximately 80-85 percent silica. Several 10-ton truck lots have been delivered to Magma Copper Company, at Superior. The haul is approximately 60 miles. Guzman said that the material, where being worked, had become better with depth and appeared to be widening a little. He stated, also, that unless the copper content can be increased, the operation is a little over marginal.

STATE OF ARIZONA

DEPARTMENT OF MINERAL RESOURCES

MINERAL BUILDING, FAIRGROUNDS

PHOENIX 7, ARIZONA

Tucson, Arizona,
June 18, 1964

MEMORANDUM

To: Frank P. Knight, Director

From: Axel L. Johnson, Field Engineer

Subject: Exploration at the North Star Mine

Field engineer received the following information on June 12, 1964:

The North Star Mine area, 12 miles south of Florence (Sec. 6 - T 7 S - R 10 E) is now being diamond drilled by Magma Copper Co., with Joy Drilling Co. doing the drilling. (1 drill rig).

They are now reported to be drilling the 4 th hole, and the holes are reported to be about 1,000 ft. deep.

Oct. 1962 Active Mine List shows the North Star Mine was operated by Mike Guzman of Superior at that time. (See L. A. Smith for particulars).

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine: Northstar Mine

Date: 9-20-62

District: Owlhead Dist., Pinal Co.

Engineer: Lewis A. Smith

Subject: Conference with Mike Guzman, at Superior, 9-20-62.

Mr. Guzman stated that Guzman and Schwartz were mining copper-silica ore at the Northstar and delivering it to Magma Copper Company's smelter. Mike said they were not making much on a carload a day. The ore runs about 85-87 percent silica with about 1.25 percent or less ~~silica~~. in copper The ore is, with the exception of local chalcocite veinlets or blebs, oxidized to chrysocolla and some malachite.

1/28/60

North Star Mine
Info. H.Clyde Davis

Location In Pinal Co., about 15 miles S. of Florence in the Picacho Range. Turn S. of Highway 80 at the 117 mile post.

Minerals Copper oxides & carbonates.

Past Operations Exploration work was conducted in 1958 & first part of 1959 by S. W. Mining Industries, 1000 N. Mountain Ave., Tucson -- H. Clyde Davis, Mgr. 2,000 ft. of drilling was done by Vought & Cloeter, Ltd., Tucson.

Present Operations
Frank Randall, Black Canyon Road, Phoenix is now sinking a 100 ft. shaft on the vein, acc. to Mr. Davis.

This property active Feb. 1959

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine: Northstar Mine Date: 9-20-62

District: Owlhead Dist., Pinal Co. Engineer: Lewis A. Smith

Subject: Conference with Mike Guzman, at Superior, 9-20-62.

Mr. Guzman stated that Guzman and Schwartz were mining copper-silica ore at the Northstar and delivering it to Magma Copper Company's smelter. Mike said they were not making much on a carload a day. The ore runs about 85-87 percent silica with about 1.25 percent or less ~~silica~~. in Copper. The ore is, with the exception of local chalcocite veinlets or blebs, oxidized to chrysocolla and some malachite.

*GENERAL REFERENCES

REFERENCE 1 F1 < AGGMT-USBM (& DATA

REFERENCE 2 F2 < ADMR NORTH STAR FILE

REFERENCE 3 F3 < USGS MF-778, 1978

REFERENCE 4 F4 < JOHNSON, GARY S., 1981 THE GEOLOGY AND GEOCHRONOLOGY OF THE NORTHERN PICACHO MOUNTAINS, PINAL COUNTY, ARIZONA. UNIV. OF ARIZONA M.S. THESIS.

L110 < RECENT DRILLING 200+ FT BY A MAJOR COMPANY, 1976 REPORT.

#4860

U.S. CRIB-SITE FORM

RECORD IDENTIFICATION

*RECORD NUMBER B10 < , , , , , , , , >
*RECORD TYPE B20 < X, 1, M, >
DEPOSIT NUMBER B40 <
*REPORT DATE G1 < 8 2 ✗ 0 4 > (YR. MO.)
*INFORMATION SOURCE B30 < 1, 2, 3, , >
*FILE LINK IDENT. B50 < USBM-0040210909

*REPORTER(SUPERVISOR) G2 < GEST, DON E. (last, first, middle initial)
(last, first, middle initial)

*REPORTER AFFILIATION G6 < AGGMT >
*SITE NAME A10 < NORTH STAR MINE
*SYNONYMS A11 < LULA, RANDALL COPPER, CORA

LOCATION

*MINING DISTRICT/AREA A30 < NORTH STAR DISTRICT
*COUNTY A60 < PINAL >
*STATE A50 < A, Z >
*COUNTRY A40 < U. S.
*PHYSIOGRAPHIC PROV A63 < 1, 2 ✗ >
*DRAINAGE AREA A62 < 1, 5, 0, 5, 0, 1, 0, 0, ✗ >
*LAND STATUS A64 < 4, 9, ✗, , ✗, (, 1, 9, 7, 9,) >
*QUADRANGLE NAME A90 < PICACHO RESERVOIR SE (, 1, 9, 6, 6,) >
*QUADRANGLE SCALE A100 < 2, 4, 0, 0, 0, , >
*SECOND QUAD NAME A92 < (, , , , ,) >
SECOND QUAD SCALE A91 < , , , , , , , >
*ELEVATION A107 < , 2, 0, 0, 0, ✗, F, T, >

UTM

*NORTHING A120 < 3, 6, 3, 1, 7, 7, 0, >
*EASTING A130 < 4, 6, 7, 9, 5, 0, >
*ZONE NUMBER A110 < +, 1, 2, >

*ACCURACY

ACCURATE (ACC) (circle)
ESTIMATED EST <

GEODETIC

*LATITUDE A70 < , , - , , - , , N, >
*LONGITUDE A80 < , , - , , - , , W, >

CADASTRAL

*TOWNSHIP(S) A77 < 0, 0, 7, S, : ✗, , , , : ✗, , , , : ✗, , , , >
*RANGE(S) A78 < 0, 1, 0, E, : ✗, , , , : ✗, , , , : ✗, , , , >
*SECTION(S) A79 < 8 : ✗, : ✗, : ✗, >
*SECTION FRACTION(S) A76 < NW OF SW >
*MERIDIAN(S) A81 <

*POSITION FROM NEAREST PROMINENT LOCALITY A82 < 1 1/2 MILES WEST OF TREADWAY MOUNTAIN (2305 FT), GRANITE HILLS >
*LOCATION COMMENTS A83 < MAIN SHAFT USED, OUT WORKINGS AND CLAIMS EXTEND NORTH AND EAST INTO THE EAST EDGE OF SECTION 7 AND E SECTION 6 >

*ESSENTIAL INFORMATION
ESSENTIAL SOMETIMES OR HIGHLY RECOMMENDED

COMMODITY INFORMATION

*COMMODITIES PRESENT C10< C.U. A.G. A.U. S.I.L. >
*ORE MINERALS C30< CHRYSOCOLLA, MALACHITE, CHALCOCITE, CHALCOPYRITE, TENORITE >
COMMODITY SUBTYPES C41< >
*GEN. ANALYTICAL DATA C43< >
COM. INFO. COMMENTS C50< CHRYSOCOLLA BY FAR MOST COMMON MINERAL >

* SIGNIFICANCE

PRODUCER

MAJOR PRODUCTS MAJOR< C.U. S.I.L. >
MINOR PRODUCTS MINOR< A.G. A.U. >
POTENTIAL PRODUCTS POTEN< >
OCCURRENCES OCCUR< >

NON-PRODUCER

MAIN COMMODITIES PRESENT C11< >
MINOR COMMODITIES PRESENT C12< >
OCCURRENCES OCCUR< >

*PRODUCTION

PRODUCER

PRODUCTION [✓ YES] (circle) PRODUCTION SIZE [✓ SML] MED LGE (circle one)

NON-PRODUCER

PRODUCTION UND NO (circle one)

EXPLORATION OR DEVELOPMENT

*STATUS

PRODUCER

STATUS AND ACTIVITY A20< 4 >

NON-PRODUCER

STATUS AND ACTIVITY A20< >

*DISCOVERER L20< >
*YEAR OF DISCOVERY L10< > *NATURE OF DISCOVERY L30< B > *YEAR OF FIRST PRODUCTION L40< 1949 > *YEAR OF LAST PRODUCTION L45< 1970 >
*PRESENT/LAST OWNER A12< FRANK RANDALL, 1972 >
*PRESENT/LAST OPERATOR A13< >
EXPL./DEV.COMMENTS L110< OPERATORS INCLUDED GUZMAN AND SCHWARTZ, 1962 DIETZ AND STONE, G.W. MINCLAY, D. DANIELS, AND EARNEST RAND ON CORA CLAIMS, 1956. 82 UNPATENTED CLAIMS, NORTH STAR AND CORA GROUPS

DESCRIPTION OF DEPOSIT

*DEPOSIT TYPE(S) C40< VEIN >
DEPOSIT FORM/SHAPE M10< >
*DEPTH TO TOP M20< > *UNITS M21< > *MAXIMUM LENGTH M40< 2 > *UNITS M41< METERS >
*DEPTH TO BOTTOM M30< > *UNITS M31< > *MAXIMUM WIDTH M50< 0.5 > *UNITS M51< METERS >
*DEPOSIT SIZE M15< [✓ SMALL] > M15<MEDIUM> M15<LARGE> (circle one) *MAXIMUM THICKNESS M60< > *UNITS M61< >
*STRIKE M70< N 40-60 W > *DIP M80< 30-40 SW >
*DIRECTION OF PLUNGE M100< > *PLUNGE M90< >
*DEP. DESC. COMMENTS M110< DIMENSIONS GIVEN ARE FOR INDIVIDUAL VEINS

DESCRIPTION OF WORKINGS

*Workings are: SURFACE M120 UNDERGROUND M130 BOTH M140 (circle one) *OVERALL LENGTH M190< > *UNITS M191<
*DEPTH BELOW SURFACE M160< 340 > *UNITS M161< FT > *OVERALL WIDTH M200< > *UNITS M201<
*LENGTH OF WORKINGS M170< > *UNITS M171< > *OVERALL AREA M210< > *UNITS M211<
DESC. OF WORK. COM. M220< UNDERGROUND WORKINGS FOR COPPER, OPEN PITS AND CUTS FOR SILICA (1962) DEEPEST SHAFT 340 FT, BUT IN 1962, 45 FT WAS DEEPEST BEING WORKED >

GEOLOGY

*AGE OF HOST ROCK(S) K1< C.R.E.T.-P.A.L.E.O. >
*HOST ROCK TYPE(S) K1A< BIOTITE GRANODIORITE, OR MONZONITE (JOHNSON, '81) >
*AGE OF IGNEOUS ROCK(S) K2< C.R.E.T.-P.A.L.E.O. ALSO PREC GRANODIORITE >
*IGNEOUS ROCK TYPE(S) K2A< HORNBLENDE - BIOTITE GRANODIORITE; DACITE PORPHYRY, ANDESITE PORPHYRY, MONZONITE DIKES >
*AGE OF MINERALIZATION K3< C.R.E.T.-P.A.L.E.O. >
*PERT. MINERALS (NOT ORE) K4< QUARTZ, ABUNDANT HEMATITE AFTER PYRITE, CHLORITE >
*ORE CONTROL/LOCUS K5< DIKES AND FAULTS CONTROL VEIN LOCATIONS, ORE FILLS JOINTS AND FRACTURES >
*MAJ. REG. TRENDS/STRUCT. N5< ... NW TRENDING FAULT FORMS VALLEY S OF MINE, OTHER ADITS ALSO ALONG THIS FAULT ZONE >
*TECTONIC SETTING N15< >
*SIGNIFICANT LOCAL STRUCT. N70< >
*SIGNIFICANT ALTERATION N75< SUPERGENE HEMATITE AFTER PYRITE, PROBABLY SUPERGENE CHRYSOCOLLA >
PROCESS OF CONC./ENRICH. N80< >
FORMATION AGE N30< >
FORMATION NAME N30A< >
SECOND FM AGE N35< >
SECOND FM NAME N35A< >
IGNEOUS UNIT AGE N50< P.R.E.C. >
IGNEOUS UNIT NAME N50A< ORACLE GRANITE >
SECOND IG. UNIT AGE N55< C.R.E.T.-P.A.L.E.O. >
SECOND IG. UNIT NAME N55A< NORTH STAR MONZONITE (JOHNSON, 1981) >
GEOLOGY COMMENTS N85< CONTACT BETWEEN YOUNGER GRANODIORITE AND PREC GRANODIORITE IS UNCLEAR >

GENERAL COMMENTS

GENERAL COMMENTS GEN< >

NORTH STAR MINE PINAL COUNTY

To North Star Mine (turnoff at mile post 117½ West) - watchman at mine - Randall on his placer claims near Black Canyon - no activity at mine camp. Watchman said some outfit from Tucson was going to examine the mine. FTJ WR 4-18-69

Calumet Silver Mining Corp. of Albuquerque has the North Star near Florence, another property at Tombstone. Also a property in the Chiricahua's. GWI Note 9-12-69

Went to the North Star Mine and met Frank Randall - the owner. He and three other men were getting out a carload of high-grade oxidized copper ore to be sold at Hayden. This property was optioned about a month ago to Essex-International Wire Co. of Michigan, who has Heinricks of Tucson doing the evaluation. Mr. Randall also has a property in Bloody Basin know as the Brooklyn where he has previously mined about 250 tons of Cu, Ag, Au ore and will go there soon to rebuild the road so the ore can be hauled out. He also has another oxide copper prospect on State land about 12 miles south of the North Star which he is trying to sell to Essex. GW WR 7-17-70

Frank Randall has quit working the North Star mine. So has Heinricks. The watchman didn't know if Essex Wire & Cable Co. had dropped their option or not. Mr. Randall is now working his mine in Bloody Basin but is living at Bumble Bee. Randall shipped 30 tons of 10.5% Cu to the Magma smelter. Heinricks drilled seven 150'-200' holes with a dry rotary rig. GW WR 10-26-70

Went on down to Frank Randall's North Star Mine. The watchman said Mr. Randall has contacted several companies with regard to mining his deposit of copper, but none have made a deal as yet. He also stated that Mr. Randall was doing considerable prospecting at the old Brooklyn Mine in Bloody Basin where 3 men are employed. GW WR 5-10-71

Went to the North Star mine of Frank Randall where the watchman said they were contemplating a small leaching operation but would first try to get some capital from a placer operation near Bumble Bee, where Mr. Randall now lives. GW WR 4/3/72

RRB WR 4/22/80: Discussed leaching of copper ores with Norman Adams, 708 South Jones, Mesa, Arizona 85204. He is considering buying or leasing the North Star Mine south of Florence, Pinal County, and setting up some type of leaching operation. He has been in the sand and gravel business but knows nothing of the metallurgy involved. He is also interested in finding a small sufide copper property to operate.

RRB WR 4/25/80: Visited North Star property south of Florence (Pinal County). No one was there but a visitor who knows the caretakers--William Teigen 885-5917. He showed me around the property. There were several open cuts and some old shafts that showed copper mineralization. Principally chrysocolla and malachite in granite.

A heap leaching and "tin" can cementation operation had been tried on a small scale at sometime in the past. The ore appears amenable to this type of operation if it is in sufficient quantity. Also stopped at an adit approximately a mile away that was run on a narrow vein containing considerable chrysocolla. It may be a part of this property.

NORTH STAR MINE PINAL COUNTY

RRB WR 8/29/80: Bonnie Mochizuki, P.O. Box 416, Cottonwood, Arizona 86326, was in to discuss the North Star Mine, south of Florence in Pinal County. She reports that there is no record of it in Florence or at the BLM. Says it is not patented and there is no record of assessment work or refiling.

RRB WR 10/17/80: Norman Adams, 883-8857, was in to look at the North Star and Little Hill Mines in Pinal County. He is considering a copper leaching operation at one or both of them.

RRB WR 2/15/85: Visited the North Star Mine, Sec 8, T7S R10E, Picacho Mtns. Pinal County. Russell Stewart, who is living on the property, reports that Pearce Trucking of Casa Grande is removing the overburden, running it through a crushing and screening plant and providing sand and gravel to the CAP can site. He didn't say what financial arrangements were made but seemed very pleased to get stripping done while the price of copper is so low.

CAMBIOR USA, INC.

FAX ☎ 1-303-773-0733
Facsimile Transmittal Sheet

TRANSMISSION TYPE (✓ One)

☐ NORMAL

☐ PRIORITY

☐ CONFIDENTIAL

NUMBER OF PAGES (Including Transmittal Sheet) 5

DATE 1/28/91 ⏲

TO ☞ Mark Thomas **COMPANY** Westmont Mining

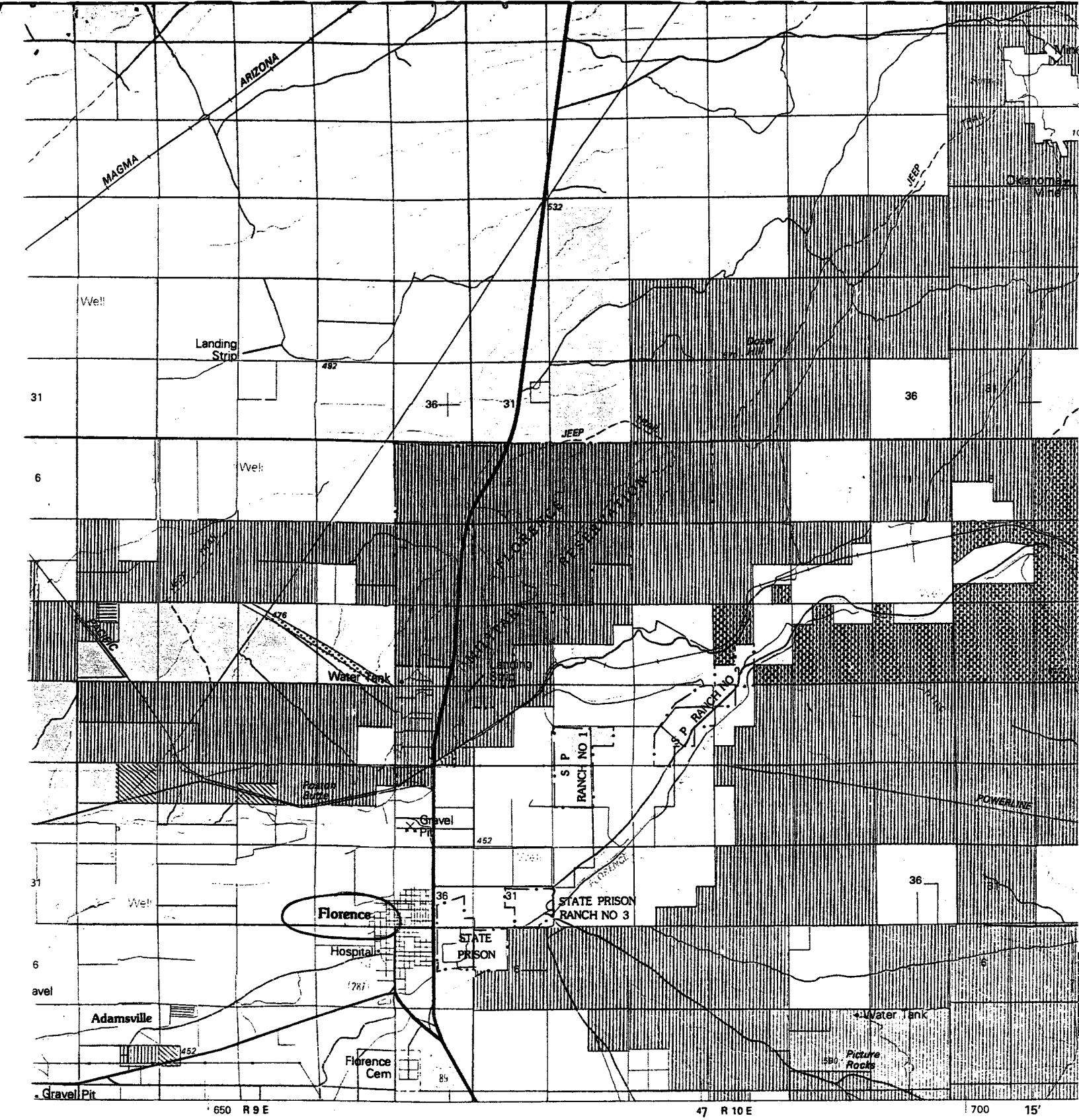
FAX ☎ № (602) 425-5741

FROM ☞ Gary Parkison - Westmont / Cambior

MESSAGE Mark, per our conversation last night, here is some info on the copper occurrences in the North Star Dist. in the northern Picacho Mtns. If you get a chance, you might want to swing by and take a look, it is accessed off of the Road between Florence and Tucson. I will call you tonight to talk about this. Also, please send me any info you have in your files about the Burkhardt (Jan Juan claims) we talked about. Thanks!

Gary

Please call (303) 694-4936 if any problems with this transmission and ask for _____



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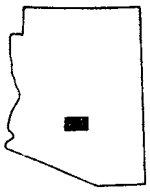
ARIZONA



QUADRANGLE LOCATION

Tv TRACHYANDESITE--Purplish-red, dense, altered, with rounded phenocrysts of quartz and feldspar generally 1-3 mm in diameter; matrix shows flow structure; exposed in two very small outcrops in the southern part of the map area, one capping schist and the other as an isolated hillock surrounded by alluvium. These volcanic rocks together with similar types exposed to the south in the Picacho Peak area have recently been studied by Shafiqullah and others (1976)

DIKES AND QUARTZ VEINS--Rhyodacite porphyry, andesite porphyry, rhyolite, rhyolite porphyry, quartz porphyry, basalt, and diabase(?) dikes and quartz veins intrude rocks of all ages except the Miocene volcanic rocks and Quaternary alluvium. The dikes and veins are most prevalent in the Precambrian(?) rocks in the northern part of the Picacho Mountains. The dikes are so numerous in this area that it is quite commonly difficult to find exposures of the host rocks. The mapping scale did not allow the mapping of all the dikes, but a representative group is shown. Typically the dikes and veins strike northwest, dip 30°-60° SW., and are less than 15 feet (4.6 m) thick

The dikes in the granodiorite (Tg) south of the North Star mine are generally more mafic than those north of the mine

Small cross faults not shown on the map occasionally offset the dikes 20-50 feet (6-15 m)

Copper mineralization is associated with the dikes and quartz veins north of the North Star mine and it is assumed that the bulk of these dikes are Laramide in age. The dikes south of the North Star mine are probably post-Laramide in age

Tg GRANODIORITE--Hornblende-biotite granodiorite rarely foliated, medium-grained, small subhedral to euhedral sphene grains generally present. Xenoliths of schist and the irregular contacts with the metamorphic rocks clearly indicate that this rock has intruded the granitic gneiss (Tgn) and schist (Ts) exposed throughout the southern half of the Picacho Mountains. The nature of the northern contact with the Precambrian Y(?) rock (Yg) in the vicinity of the North Star mine is not clear. Extensive hydrothermal alteration, diking, and shearing are all present in this area and more detailed mapping is necessary to work out the complications. It is suspected that a major northwest-trending fault may be present here (mapped as a concealed fault); perhaps an extension of the northwest-trending Mogul fault identified and mapped in the Mammoth quadrangle south of Oracle, Ariz. (Creasey, 1967). The geomorphology with a strong linear drainage development suggests such a fault, as does the regional geology

Tgn GRANITIC GNEISS--Moderately coarse grained, fresh; forms bold, rugged outcrops in the southern high parts of the Picacho Mountains; foliation ranges from strong to obscure and is flat or low angle; strongly lineated with strike of lineation consistently N. 45°-80° E.; jointing is common; hornblende augen gneiss with "eyes" up to one-half inch in diameter is sporadically present as is greenstone. Dikes of aplite and pegmatite are ubiquitous; less common are quartz veins that range in width from 1 inch to 8 feet (2 cm-2 m) and locally contain chrysocolla and (or) hematite. The gneiss seems to grade into schist (Ts) in the few isolated localities where the schist caps the highest and eastern parts of the mountains. The granitic gneiss and the schist have been assigned a Tertiary(?) age because they possess lithologic and structural characteristics similar to Tertiary dated rocks in the Santa Catalina Mountains to the southeast (Creasey and others, 1976). They are shown on the state and geologic maps as Precambrian in age although the strongly lineated fabric of most of these rocks is unlike that of other metamorphic rocks in Arizona that are well documented as Precambrian in age. Possibly some of the schist and gneiss in the southern half of the Picacho Mountains were derived from sedimentary and igneous rocks that range in age from Precambrian through Cretaceous

Ts SCHIST--Quartz-mica schist, medium- to coarse-grained with schistosity commonly contorted; generally dips less than 30°; occasionally strongly lineated; also includes quartzite, quartzitic schist, greenstone schist, and rarely siliceous slate and amphibolite schist; some of these rocks are clearly metasedimentary

TKd DIORITE--Medium-grained, equigranular, hornblende and biotite in near equal amounts, quartz rare; rare coarse-grained hornblende--rich segregations; forms moderately bold outcrops as three outlying low hills--the most northerly exposed bedrock in the map area; contains several copper prospects where chrysocolla is present along fracture surface; appears to intrude granodiorite gneiss (Xgn) where the two units are in contact in the extreme northerly part of the map

Yg GRANODIORITE--Biotite granodiorite, coarse-grained, porphyritic with feldspar phenocrysts as much as 2 inches (4 cm) across; the feldspars have commonly been altered to clay minerals. The rock has been pervasively intruded by dikes which are more resistant to weathering than the host granodiorite. A bright red-orange gossan is present in the vicinity of the North Star mine; also present are concentrations of chrysocolla along fault and fracture zones

Xs SCHIST--Quartz-mica schist, medium-grained; dips (40°-80°) are steeper than in the younger schist (Ts) exposed in the southern half of the Picacho Mountains. This unit is exposed only north of the North Star mine. Dikes and quartz veins, generally paralleling the schistosity, are common intruding this unit

Xgn GRANODIORITE GNEISS--Foliated with light-colored, medium-grained, quartzofeldspathic-rich layers alternating with fine-grained, greenish-black chlorite and biotite-rich layers; minor amounts of hornblende and epidote; feldspars commonly altered; present only in the northern part of the mountains where it forms subdued, gently sloping topography; intruded by numerous dikes; mineralized quartz veins 1-2 feet (0.3-0.6 m) thick are common, and numerous associated copper prospects are present

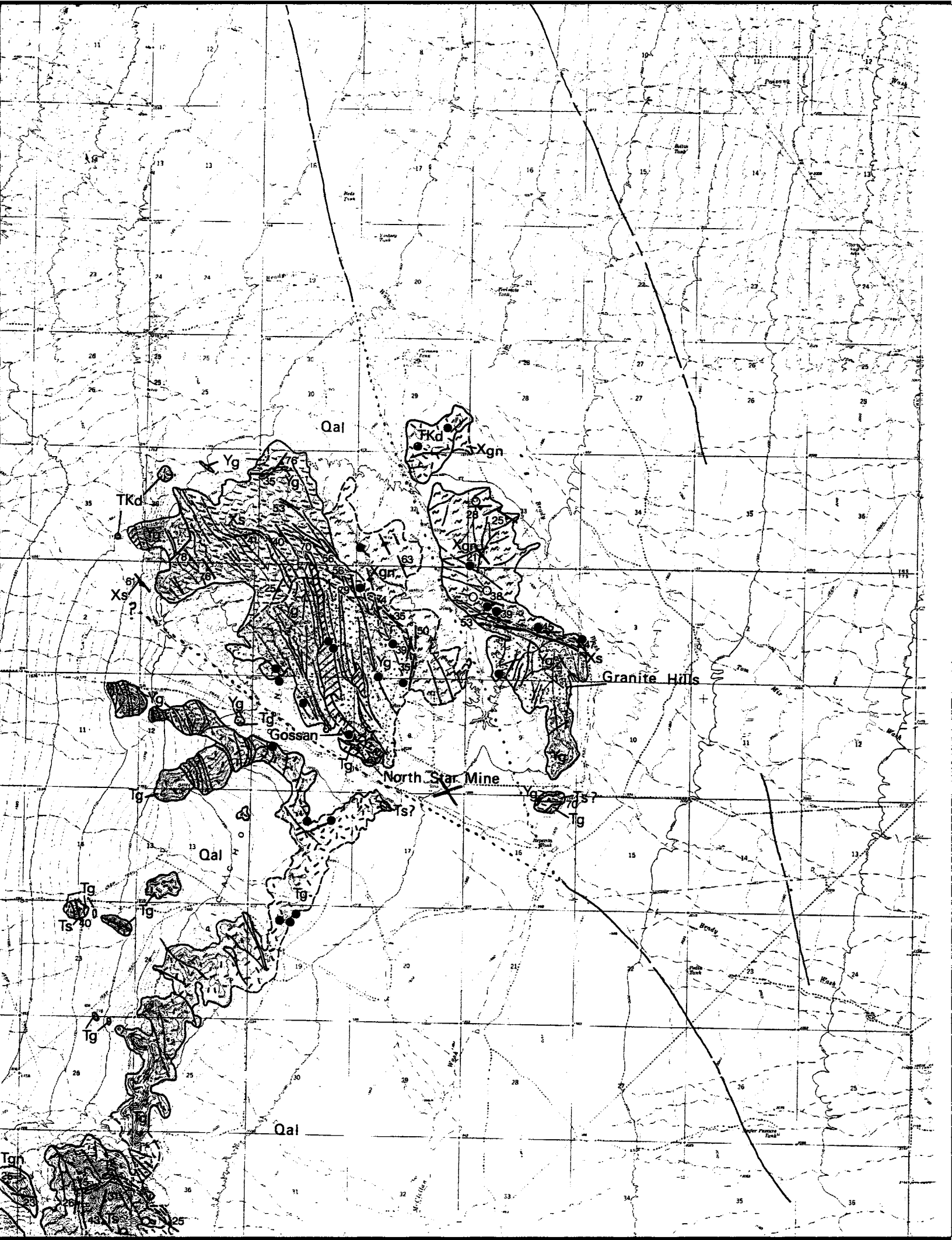
REFERENCES

Briscoe, J. A., 1967, General geology of the Picacho Peak area, Arizona: Arizona Univ., Tucson, Ariz., M.S. thesis, 52 p.

Creasey, S. C., 1967, General geology of the Mammoth quadrangle, Pinal County, Arizona: U.S. Geol. Survey Bull. 1218, 44 p.

Creasey, S. C., Banks, N. G., Ashley, R. P., and Theodore, T. G., 1976, Middle Tertiary plutonism in the Santa Catalina and Tortolita Mountains, Arizona: U.S. Geol. Survey Open-File Rept. 76-262, 20 p.

Feth, J. H., 1951, Structural reconnaissance of the Red Rock quadrangle, Arizona: U.S. Geol. Survey open-file report.


Qal
TKd
Xgn
Yg
Xs
Granite Hills
Gossan
North Star Mine
Tg
Ts?
Ts
Tgn

Zonia	ZNA-01	Rep grab from blasted (in-situ) area, has been under leach - schist w/ CuOx
"	ZNA-02	Grab from N side, central part of main pit - schist w/ CuOx
"	ZNA-03	" " " - schist w/ CuOx
North Star	NS-01	main quarry area, coarse crush stockpile, mix of PE Oracle granite and latite porp w/ CuOx, FeOx, grab selective to CuOx
	NS-02	North Star Mine area = large trench ~~Trend~~ N-S thru mine area, ~~Cu~~OX, FeOx along fracts. in Oracle granite
Copper Giant	CG-01	Grab from trench spoils at E. trench at CG South, as described in USBM R.I. - in Tlf, CuOx along fracts, in matrix; matrix fairly muddy
	CG-02	Grab from trench closest to road, CG North Area, CuOx, lesser FeOx, in granitic detritus of Tfl

ORDER FOR ANALYTICAL SERVICES

VKU 107
3-2-92
Me delivered

Samples Sent to:

SKYLINE LABS, INC.
1775 W. SAHUARO • P.O. BOX 50106
TUCSON, ARIZONA 85703
(602) 622-4836 FAX (602) 622-6065

(Report and invoice in duplicate will be sent to address below unless otherwise instructed)

Address Report To: Cambior USA Inc
7949 S. Syracuse #4200
Denver CO 80237
Attn: Gary Parkison
TEL 303) 694-4936 FAX 303) 773-0733

PROJ. NO.
P.O. NO.:
SHIPMENT NO.:
DATE SHIPPED:
SHIPPED VIA:
NO. OF CARTONS:
NO. OF SAMPLES: 7
(Information above helps us trace lost shipments)

Send Invoice To: Same As Above

Send Copy of Report To:

LIST SAMPLE NOS.	DESCRIBE MATERIAL* (ROCK CHIP, SOIL, WATER, DRILL CORE, ETC.)	Au & Ag STANDARD FIRE ASSAY (OZ/TON) Au .002	Au & Ag STANDARD FIRE ASSAY (OZ/TON) Ag .01	Au FRE ASSAY AA FINISH (PPM) Au .002	Au FRE ASSAY AA FINISH (PPM) Au .01	Au GEOCHEM AA (PPM) Au .002	Au GEOCHEM AA (PPM) Au .02	✓ Appropriate Box For Au and Ag Analysis LIST ADDITIONAL ELEMENTS TO BE DETERMINED (Give anticipated range of values, if possible)	Indicate Method of Analysis** (*See Below)	✓ If 31 — Element Emission Spec Scan Desired
ZNA-01	ROCK							Cu-Assay, Total %, Cu-Assay, N.S. %		
ZNA-02	"							" "		
ZNA-03	"							" "		
NS-01	"							" "		
NS-02	"							" "		
CG-01	"							" "		
CG-02	"							" "		
								3009		

PAYMENT FOR SERVICES REQUESTED MUST ACCOMPANY ORDER UNLESS CREDIT ARRANGED

Signature of person authorizing work:

(Use Continuation Sheet If Necessary)

INSTRUCTIONS

If other than standard preparation is desired, please advise.

METHOD OF ANALYSIS FOR ADDITIONAL ELEMENTS:

G - Geochem, A - Routine Quantitative Assay

SAMPLE STORAGE: Pulps stored 90 days pending instructions, bulk rejects stored 30 days pending instructions.

Yellow original with samples, send white copy by mail, retain pink copy. White will be returned to shipper as an acknowledgement that shipment has been received.

ACKNOWLEDGEMENT

INDICATE DESIRED DISPOSITION OF SAMPLES AFTER ANALYSIS	Bulk Rejects	Pulp
Return at customer's expense via:		
Store temporarily pending instructions†	✓	✓
Discard immediately		

SKYLINE LABS, INC.
1775 W. Sahuaro Dr. • P.O. Box 50106
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. VKU 107
March 10, 1992
ZNA-01 TO CG-02

CAMBIOR U.S.A., INC.
Attn: Mr. Gary Parkison
4949 S. Syracuse St., Suite 4200
Denver, CO 80237

Analysis of 7 Rock Chip Samples

ITEM	SAMPLE NO.	Cu (%)	nsCu (%)
1	ZNA-01	.18	.16
2	ZNA-02	1.71	1.54
3	ZNA-03	1.28	1.13
4	NS-01	1.09	.98
5	NS-02	.55	.53
6	CG-01	2.21	1.98
7	CG-02	2.24	2.02

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK ARIZONA

William L. Lehmbeck
Manager

3/10/92

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine: GIBSON CLAIMS

Date: September 27, 1957

District: PINAL COUNTY. West side of Newman Peak, Picacho Mountains - T8S R9E, Sec. 21

Engineer: Lewis A. Smith

Subject: Picacho Dist. (154 B.M)

Owners: Luther Hoffman
Nelson Gibson
Leonard Millsap

Agent: Luther Hoffman
6101 N. 35th Drive, Phoenix, Arizona.

Claims: 12

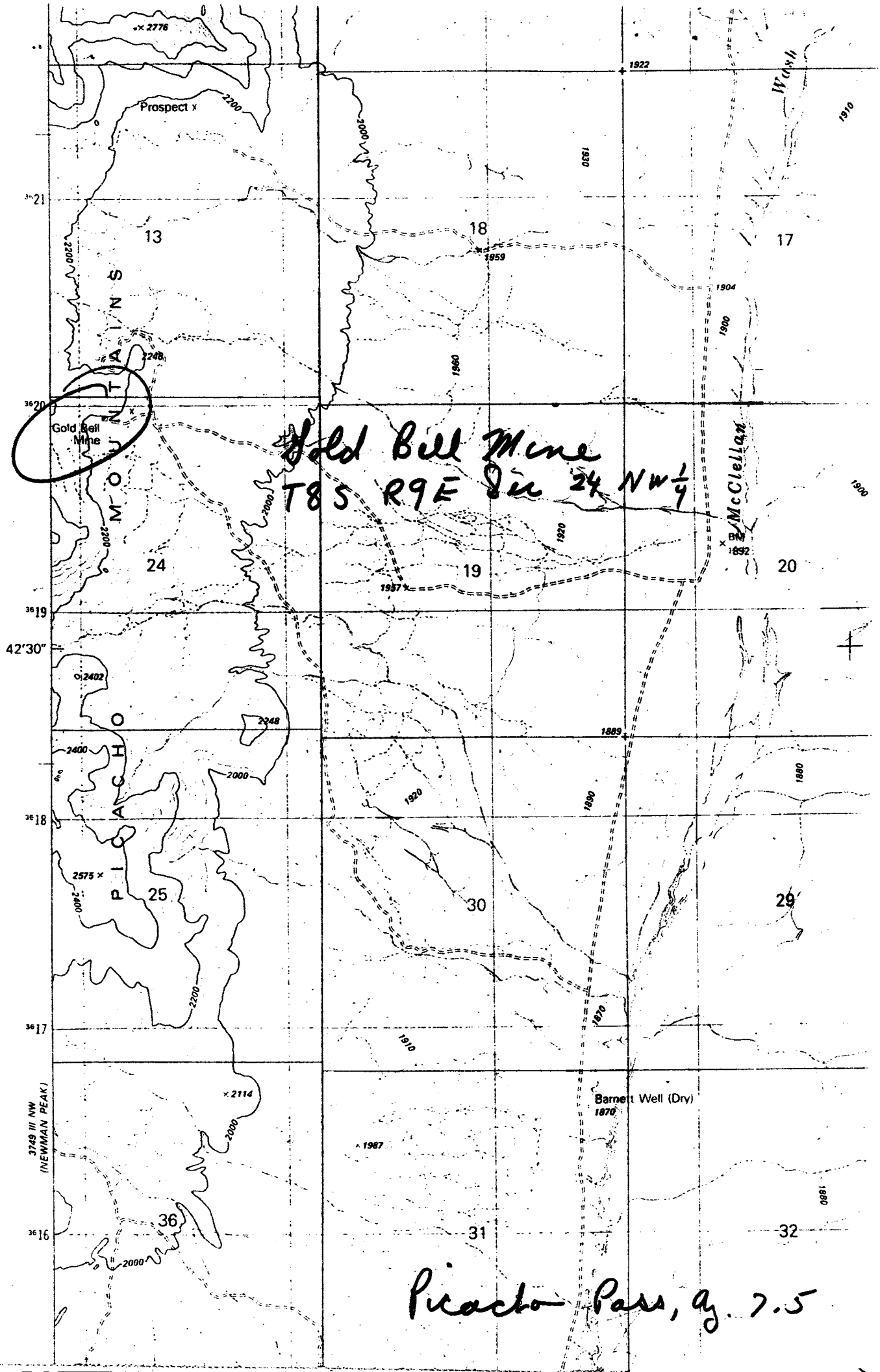
Geology: Silicified and brecciated granite porphyry with pyritic dissemination and limonite. The pyrite is extensively pitted showing removal of enrichment sulphides. Limonite shows high-pyrite and low copper ratio but is well distributed in fractures. Some portions are tight, preserving some of the pyrite, while other looser sections show complete oxidation of the pyrite. The gangue appears to be, in the main, chemically neutral. Some veins are present and these show local chalcocite and less common chrysocolla. The area of shattering is reported to cover about 1/4 mile in diameter. Some limonitic boxes show characteristics derived from chalcopyrite or bornite, although neither of these minerals now remain in the boxes. In some respects the capping resembles that found at Silver Bell.

Development work consists of the work necessary for assessment work, namely, trenches and pits.

This information was derived from Mr. Hoffman and from a study of a suite of capping specimens that he brought in.

GIBSON CLAIMS PINAL COUNTY

Gibson mine near Casa Grande reportedly sold to syndicate headed by El Paso Natural Gas Co. for $1,000,000. CLH WR 2-24-68


Prospect
Gold Bell Mine
Gold Bell Mine
T8S R9E Sec 24 NW 1/4
McClellan
Barnett Well (Dry)
3749 III NW (NEWMAN PEAK)
42'30"
13
18
17
24
19
20
25
30
29
36
31
32
Picacho Pass, Ag. 7.5

GOLD BELL MINE 10/84 PINAL COUNTY
T8S R9E Sec 24 NW¼

MILS Pinal Index #633

USGS, 1973 CRIB Mineral Resources File 12, Record 1912, p. 4850

Johnson, M. G. , 1981, "The Geology and geochronology of the northern Picacho Mountains, Pinal County" thesis, unpublished

Geology File - Geoexplorers International Vol I (included in file)

Picacho Pass, Az. 7.5 (included in file)

(This property is apparently on State land)

GOLD BELL MINE PINAL COUNTY

GW WR 5/8/76: Accompanied Walter Rogers to the Gold Bell mine in Sec 24, T8S R9E, in the Picacho Mtns, about 4 miles north of Picacho Peak. Here is 4-6 ft. vein of quartz in granitic gneiss trends N25°W and dips 75°E. There is a vertical shaft at the foot of the ridge sunk cross-wise of the vein; its reported to be 300 ft. deep with several hundred feet of drifts. The volume of dump doesn't substantiate that statement. The vein is traceable 7-800 ft. NW where it ranges from 2-8 ft. in width. It consists mainly of "bull" quartz with considerable hematite and sparce Cu oxide minerals. Frank R andall of Bumble Bee holds a 20 year State lease on 20 acres of this property.

154. Better Pay
Location: Sec. 22, T9S, R9E
Location very approximate
Commodity: Pb
Production: 27 tons of ore shipped in 1940.
References: Arizona Bureau of Mines Bull. 180, 1969.

Known Prospects, Mineralized Areas, and Geothermal Resources With No Recorded Production

1. Unnamed Prospect
Location: 32°31'9"N, 111°40'46"W
Sec. 30, T10S, R7E
Commodity: Cu
Ore Materials: Malachite, chrysocolla, chalcocite (?), limonite.
Deposit Description: Vein, with sericitic alteration, small body 10-20 feet in width, striking N75°W.
Geology: Quartz vein cutting Precambrian granite.
Production: Unknown.
References: USGS, 1979, CRIB Mineral Resources File 12, Record 1666, p. 4316-4317.

2. North Star Mine
Location: 32°49'31"N, 111°20'32"W
Sec. 7, 8, T7S, R10E
Commodity: Cu
Ore Materials: Chrysocolla, malachite, chalcocite, chalcopyrite.
Deposit Description: Small, striking N40° to N60°W, dipping 30-40°SW.
Geology: Granite, dikes, sills of monzonite, dacite, and andesite porphyry.
Production: Unknown.
References: USGS, 1972, CRIB Mineral Resources File 12, Record 1746, p. 4483-4484, Johnson, 1981.

3. Sundown
Location: Sec. 3, T10S, R11E
Commodities: Cu, Ba
Ore Materials: Tenorite, Azurite, malachite, chalcopyrite, chrysocolla, barite.
Deposit Description: Vein.
Geology: Quartz barite veins in Tertiary sediments.
Production: Unknown.
References: USGS, 1976, updated 1981, CRIB Mineral Resources File 12, Record 1855, p. 4737-4738.

4. Gold Bell
Location: 32°43'7"N, 111°22'19"W
NW1/4 NW1/4 sec. 24, T8S, R9E
Commodities: Unknown, may be copper.
Production: Unknown.
References: USGS, 1973, CRIB Mineral Resources File 12, Record 1912, p. 4850, Johnson (1981).