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

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EL TORO MINES, INC.

SANTA CRUZ COUNTY, ARIZONA

P. O. Box 736
Patagonia, Arizona

LOCATION OF EL TORO MINES, INC.

EL TORO MINES

Santa Cruz County, Arizona

INTRODUCTION:

The El Toro property located approximately nine miles northwest of Patagonia, Arizona is owned by the Bond Mining Trust, El Toro Mines, Inc., P. O. Box 736, Patagonia, Arizona has entered into a lease and purchase agreement to acquire the property from the Bond Mining Trust.

LOCATION AND ACCESS:

The El Toro property consists of 117 mining claims and is comprised of about 2500 acres.

The property is located in Sections 33, 34 and 35, T.20S., R.14E., Sections 1, 2, 3, 4, 10, 11 and 12, T.21S., R.14E. and Section 6, 7 and 18 T.21S., R.15E.

TYNDALL MINING DISTRICT (from Univ. of Ariz. Bul. 191, Kieth 1975)

The Tyndall mining district covers a large area along the west flank of the southern Santa Rita Mountains, extending from the border with Pima County and the Old Baldy district to the north to Sonoita Creek to the south. The eastern boundary with the Wrightson district is along the general crest of the mountains and the western edge is an arbitrary line along the base of the western foothills, including the Governor Hills. The southern part of the district was at one time called the Aztec district from an early mine of that name. The origin of the name Tyndall is unknown but the district was organized in November 17, 1876 when the Tyndall Mining Company was operating the Abercon mine (location unknown).

The topography of the northern part of the district and the cast side is mostly very rough with steep rocky slopes, sharp ridges, and deep canyons. The high peaks of Mt. Hopkins and Mt. Wrightson are at the northeast corner. To the south the topography is more subdued and rolling but locally rough. The western slope is broken into irregular bench-like foothills separated by numerous canyons.

The geology of the district has been mapped and studied in some detail by Drewes (1971a, 1971b, 1972a, 1972b) and locally by university students. Some erosional exposures of Precambrian gneiss occur at the base of the western foothills and thrust-faulted blocks and strips of Paleozoic sediments occur in the northwestern section. Most of the district is underlain by Mesozoic and Tertiary volcanics and continental sediments that have been domed up and partly eroded away over a central core of Laramide

quartz diorite to quartz monzonite intrusives. An intricate pattern of strong northwest and north striking thrust and block faults and swarms of quartz latite and rhyolite dikes cut across the district. Similarly swarms of irregular, lensing quartz veins locally occupy eastwest to northwest striking fissure or fracture zones. The strong major fault structures appear to be deep-seated and to have been active over a long geologic period, possibly extending back into the Mesozoic and thus were guiding controls on igneous intrusion and mineralization.

Two general types of mineralization occur in the district. Most prevalent are the irregular and lensing quartz fissure veins containing spotty argentiferous lead, zinc, and copper minerals with some pyrite, barite, and calcite. These veins, often in swarms, cut the Mesozoic volcanics, interbedded arkose, and the granitic intrusions in a westerly to northwesterly direction. The second and more localized type of mineralization is the largely oxidized replacement deposits of argentiferous lead, zinc, and minor copper in the strongly faulted and folded blocks of Paleozoic limestone in the northwest part of the district. Oxidation has produced rich silver values in the upper parts of both types. The gold content is very low.

Mining in the Tyndall district dates back to the arrival of the Jesuit Fathers in the Santa Cruz valley in the 1680's. With Indian labor they discovered and mined numerous vein outcrops for oxidized and enriched argentiferous lead. The ore was smelted and the silver recovered in crude adobe furnaces near the missions. Several deposits in the Salero and Alto areas continued to be worked up to the time of the Mexican Revolution. At the time of the Gadsden Purchase in 1853 they had long been abandoned due to unrestricted Apache raids. By 1856, Americans prospectors and exploration companys moved in, taking over the old mines and looking for additional deposits. Most prominent were the Sonora Mining & Exploration Co., the Arizona Mining Co., and the Santa Rita Mining Co. The early account by Pumpelly (1870) gives a vivid account of the difficulties of mining operations in those early years. With the start of the Civil War and the withdrawal of military protection, the mines were forced to close down due to renewed Apache attacks. In the early 1870's it was again possible to start up mining activities in the district and considerable shallow, oxidized, and enriched lead-silver ore was extracted. In the Salero and Alto areas, lengthy litigation over the title to the claims with the owners of the Luis Maria Baca Land Grant No. 3 interrupted or delayed many operations. The Grant had been incorrectly surveyed in 1866 and final settlement was not reached for many years. Mining operations at any one property has been intermittent with few years when more than a few hundred tons of ore were shipped. The most productive years on record for the vein mines were in 1913-1914, 1923 through 1928, 1942, and 1948 when the Jefferson mine in the Alto area was the major operation. In 1952 through 1959, 1965-1966, and in 1972, the Glove mine, operating on the oxidized replacement deposits in limestone, produced from one thousand to over five thousand tons of ore per year. There has been little or no recent production from other mines in the district.

The total estimated and recorded production of base and precious metals from the Tyndall district through 1972 would be some 56 thousand tons of ore containing about 9.4 thousand tons of lead, 2.8 thousand tons of zinc, 480 thousand ounces of silver, 1,260 ounces of gold, and 500 tons of copper for a total value of some 3.6 million dollars.

The more obvious surface indications of economic mineralization in the Tyndall district have been prospected or worked over many years. What may remain in the vein-type deposits is of doubtful economic value and the replacement deposits in Paleozoic limestone appear to be limited. However, the strong northwestward alignment of faults and quartz vein swarms extend outward from Red Mountain which appears to be a center for more intense copper mineralization and suggests that a careful geologic study of this structural zone might indicate favorable loci for deeper economic deposits. Drewes (1973) has shown geochemical anomalous areas in the district which should be further investigated.

WANDERING JEW MINE (from U.S.G.S. Bul. 582, Schrader 1915)

The Wandering Jew mine is located half a mile north of the Alto mine, in the upper north side of Apache Gulch, which separates Alto Hill from the mountains on the north, at an elevation of about 5,500 feet. The camp is on the opposite side of the gulch, one-third of a mile to the southwest. The property comprises a goup of eight claims. It is developed to a depth of 100 feet by two shafts 300 feet apart, drifts, tunnels, and corsscuts aggregating about 2,000 feet of work, as shown in part in figure 23.

The country rock is gray diorite intruded by granite porphyry and latite. The property contains five or six veins or ledges, but the deposits are contained principally in the Wandering Jew vein varies from six inches to four feet in width and dips 50^{0} N., into the mountains. The gangue is principally quartz. Between and adjoining the two principal shafts the vein is uncovered by a trench, and for a distance of about 400 feet it shows principally sulphide ore of the same character and grade as that found in the shafts, which are reported to contain ore all the way down and to be all ore from the 40-foot level to the bottom. From this statement the ore body, having a known horizontal extent of nearly 400 feet on the surface, seems to be a continuous sheet of argentiferous steel galena at least 100 feet in depth. Where the width of the ore body does not much exceed 1 foot the ore is said to be very pure. It is estimated that about half of the deposit is shipping ore, and the rest is good-grade concentrating ore. The ore is argentiferous lead ore and is essentially sulphide or galena from the surface down, but in places it contains a little copper carbonates and some chalcopyrite. The quartz croppings rise boldly eight feet or more above the surface, and toward the east the vein seems to be offset by a fault having a lateral throw of 60 feet.

The M. and S. claim, adjoining the Wandering Jew ground on the southeast and opened by a 100-foot shaft, is said to contain a large body of good-grade argentiferous zinc ore.

TOLUACHI GROUP (from U.S.G.S. Bul. 582, Schrader 1915)

The Toluachi group, owned by Josiah Bond, whose camp is 1¼ miles north of Alto, comprises 19 claims lying north and east of the camp. The country rock is somewhat tuffaceous latite of dark green color. Along its eastern border, however, the formation contains so much granite porphyry, apparently in the form of included bowlders and pebbles, that it has been mapped as granite porphyry. The rock is cut by a large number of small fissures which trend about east, the principal strike being N. 85° W. As many as 50 small veins were noted in a distance of three-fourths of a mile north from Bond's cabin. The quartz veins are mostly rather small but range up to 4 feet in width. They are stained with iron and manganese and in places show copper carbonates at the surface. Some of the claims are said to be bonded to eastern people. Among the principal prospects are the Jersey Girl, Silver Sally, and Merry Widow.

The Jersey Girl prospect is located just east of Bond's cabin on a 5-foot lode which at the surface dips 80° S., in latite breccia, and occupies a well-defined fissure four to six feet wide, filled mostly with gouge and crushed rock. Toward its middle, however, it contains two small veins or pay streaks from two to zero inches in width, composed principally of a quartz-calcite-siderite gangue with a little rhodochrosite and rhodonite. The filling of the lode in general, not including the two quartz veins or pay streaks, is said to average $20 to the ton in copper and silver. One of the veins or pay streaks is composed chiefly of copper and lead stained quartz showing galena and seemingly a little gray copper. Some of it is banded, but postmineral movement has crushed it. The principal ore minerals are galena, proustite, tetrahedrite, horn silver, embolite, bromyrite, chalcopyrite, chalcocite, malachite, azurite, cuprite, argentite, and tennantite.

The richest ore is said to occur on the 80-foot level, where the two pay streaks join or intersect. Some of its carries 10 per cent in copper, 30 percent in lead, and 120 ounces to the ton in silver. On the north wall the ore contains much white mica. Between the two pay streaks sericitic mica still remains but the filling is mostly quartz, and it is stained with manganese and iron. On the 90-foot level chlorite is associated with the sericite. On the south wall, where also the material is much iron stained, it apparently runs higher in silver.

The Silver Sally prospect is on a vein which strikes N. 60° W. and is opened by a 280-foot shaft and a 100-foot drift to the east on the 220-foot level. The vein is 15 feet or more in width. It consists principally of iron-stained silicified diorite, which, however, contains a 4-foot

band of iron and lead stained quartz that carries galena and sphalerite. Some of the ore, which probably contained horn silver or cerargyrite, is said to have averaged 50 ounces in silver to the ton.

The Merry Widow prospect is located in Bond Canyon at an elevation of 4,970 feet, on the Merry Widow-Badger vein, which dips steeply to the south in andesite breccia and is opened by a 100-foot shaft, from the bottom of which a 45-foot drift has been run to the west with a 20-foot winze sunk at the face. The vein contains ore, of which a shipment of 5 tons is said to have averaged 8 per cent of lead and 72 ounces to the ton in silver. The ore also contains some copper and zinc, and for the latter mineral the shipment was penalized. The ore minerals are principally galena, sphalcrite, and chalcopyrite, contained in a quartz-calcite gangue.

ARIZONA-PITTSBURG MINE (from U.S.G.S. Bul. 582, Schrader 1915)

The Arizona-Pittsburg mine is located 3½ miles north of Salero and about a mile northeast of the Jersey Girl prospect, on the south fork of Bond Canyon, at an elevation of 5,550 feet. The vein on which it is located has been known for many years and is said to have been worked in the nineties. In 1905 J. M. Orosco relocated the property and sold it to Frank Reichert, who called the two principal claims the Black Hills Nos. 1 and 2. In 1908 the present owners, the Arizona-Pittsburg Mining & Smelting Co., of Pittsburgh, Pa., bought the property.

The property comprises a group of five claims. It is developed by a 185-foot shaft and a 25 feet of drift to the west on the 125 foot level.

The topography is rough (pl. I, in pocket). The country rock is diorite, and the deposits are contained in a 9-foot quartz vein which dips 87° N. This vein extends a mile or more to the east and is thought to be the vein on which Augusta or Hosey and American Boy mines are located, respectively about one mile and two miles to the east, on the opposite side of the divide in the Wrightson district.

The quartz in general is stained with iron and manganese and a little azurite and malachite. The ore minerals it contains are galenite, pyrite, and chalcopyrite. Some galenite occurs in the surface ore, but sulphides are not abundant above the 70-foot level. From that level down, to judge from the material seen on the dump, the ore consists largely of galenite in a silicified brecciated diorite gangue, and there is a marked increase in pyrite and chalcopyrite in the lower part of the mine, where the ore seems to contain also some tetrahedrite.

EL TORO MINES

K.R. James 1979

Who is James?

GEOLOGY

Included there are two Geologist's reports based on brief preliminary examinations of the property, which is a shear zone with 92 known vein-type structures (an old Schrader report mentions 150 - plus in an area covering approximately ½ of present claims). There is also an abundant amount of cross-cutting by smaller veins or veinlets. The property is in the Laramides and is a complex system of contact zones with several different rock types.

MAPS

We have blown-up topogs with soil samples and surface and underground samples logged. These also show the 12 drill-hole locations. Geological maps showing rock types are available.

UNDERGROUND

There are accessible underground workings on six of the major veins. In addition to these, there are 14 shafts. All of these are in poor shape but could be accessible for part of depth. Some are flooded and would have to be pumped out.

CLAIM STATUS

The claims group consists of 121 claims, of which three are patented. The majority are old claims filed between 1900 and 1937. Some are new ones, mostly covering fractions and perimeter holes. The claims belong to the Bond Mining Trust. (Josiah Bond was a mining engineer at the Butte, Montana Mine). El Toro Mines, Inc. has a 50-year lease on a royalty basis and has negotiated a purchase agreement in conjunction with the lease that eliminates all former royalties to the Bond Mining Trust.

TONNAGE AND GRADE

At present, as with all large prospects, little is known as to the total tonnage and grades, however, this property has produced ore in the past. (High grade and cobbed ore was packed and hauled out to smelters.)

We also have eleven diamond-drill holes for three of the larger ore-chutes and one drill hole two miles south on the drilled strikes. One ore-chute, with only three holes, has an extimated 1,500,000 tons of which approximately 30% is vein material with indicated ore grade as follows: ?

Gold - .02 oz. per ton
Silver - 10.5 oz. per ton
Copper - .50%
Lead-Zinc - 5-6%

The remaining million tons is in a brecciated-zone with an indicated grade of:

Gold - .01 oz. per ton
Silver - 3.02 oz. per ton
Copper - .10%
Lead - .4%
Zinc - .25%

The brecciated-zone has a large area of 6.7 oz. of silver, probably 1/3 of the estimated tonnage. This is based on a vertical column of 400', which is the actual depth of the drill penetration to date and does not interpolate any additional depth, and although the strike is clearly visible with massive outcrops for 1000' in length, it does need a few more holes to firm up the calculations. The estimated tonnage for the major ore chutes is 15 million tons on 300' of vertical column. The possibility of a copper-molybdenum target has been hypothesized by geologists, but this would probably be quite deep. However, this would increase the probable depth of the large vein structure and double and triple the estimated tonnage.

MINING PROBLEMS

The nature of the structure and the availability of data suggests that the property probably would have to be worked underground. However, the nature of the country rocks would lend itself to reasonable mining costs. The tightness of the vein and breccia material (100% core recovery) and the excellent walls and consistency of the wall rocks would make excellent shrinkage stopes or a possible block and cave-type operation. Coupled with the 400' - 600' of vertical relief, this could produce some low-cost underground tonnage. An estimated two mile cross-cut would give 400'- 600' of backs on 10 major veins in the 20' - 50' width average with a possible 20-plus million tons. In addition to these, there are 20-plus veins of 6'- 8' widths, which would add considerably to the tonnage reserves.

WATER

The high country adjacent to the prospect has a very high annual rainfall and one stream on the property runs year-round. The major structures with shafts are flooded and the adits all make some water, yielding ample water for a good-sized mill. An artesian vein was discovered while drilling.

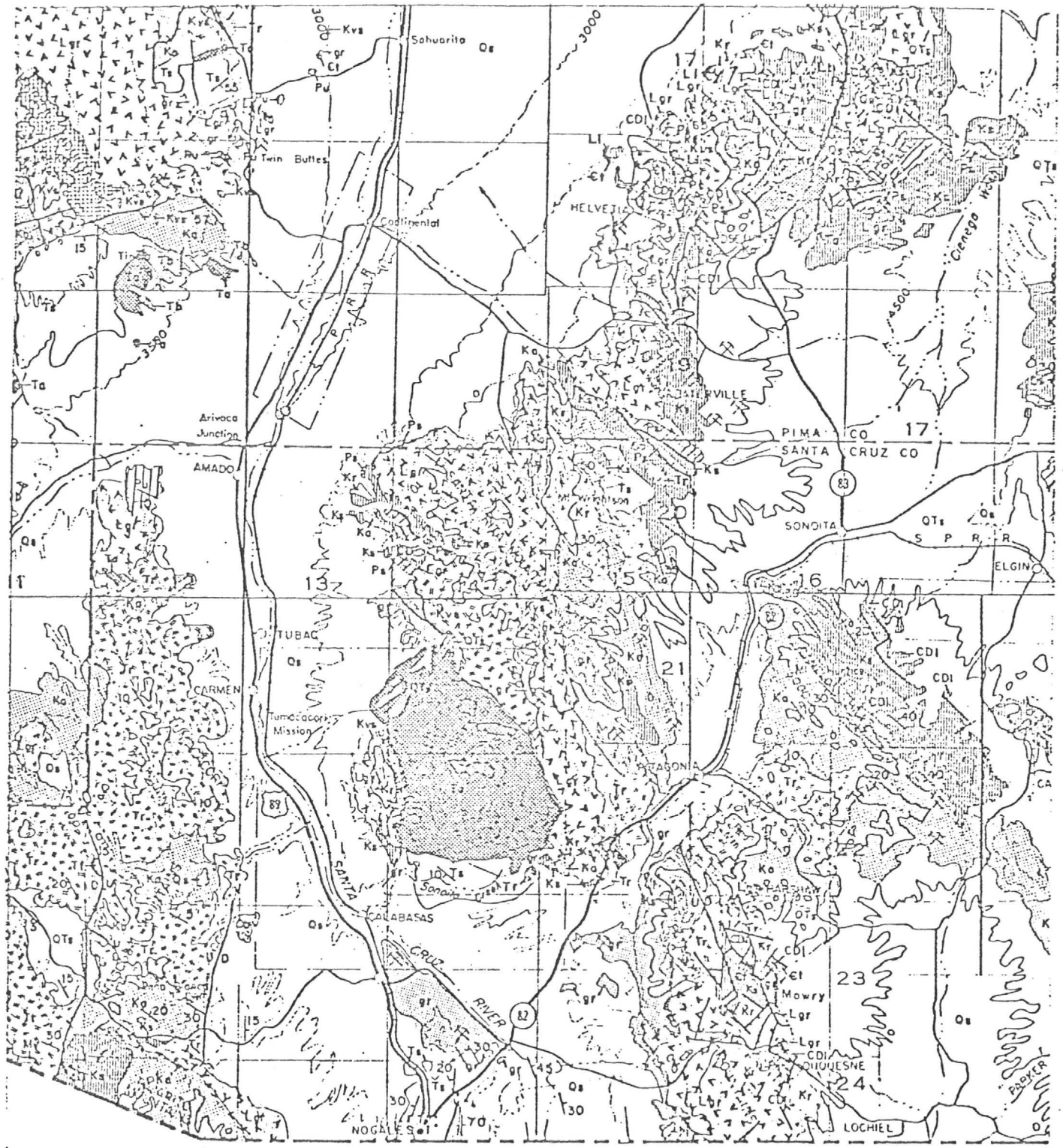
ACCESS

The property is on either side of a Santa Cruz County secondary road, which they maintain, thus making access into the property easy. All the roads off

this road into the workings are in, but need to be worked on from time to time because of the rain. There are no problems with the Forest Service.

POWER

The closet power is available in two directions each eight miles away.

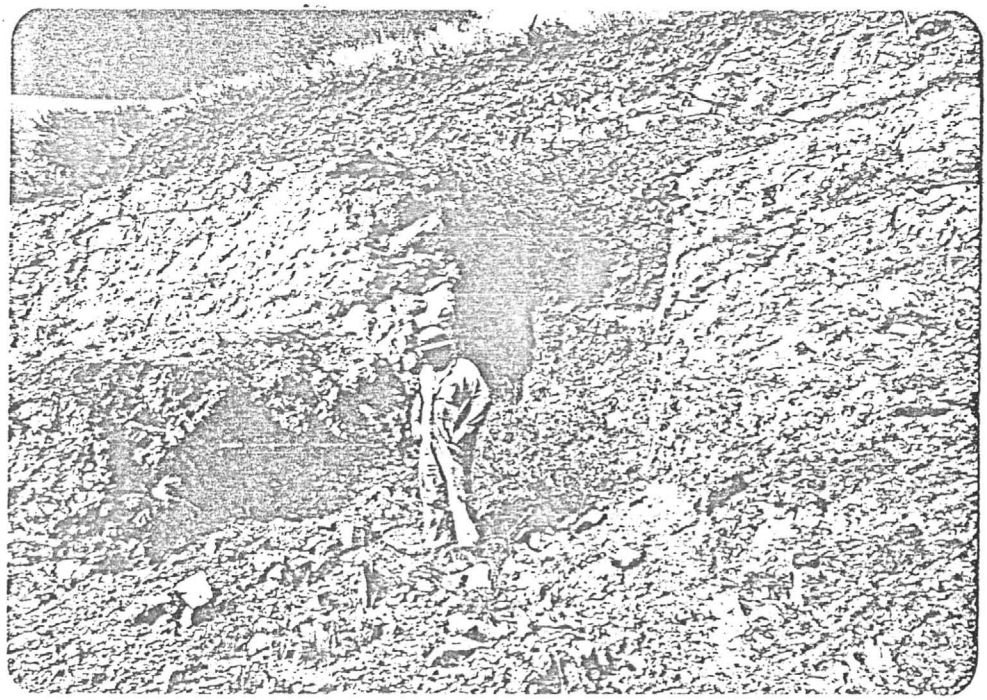


GEOLOGIC MAP

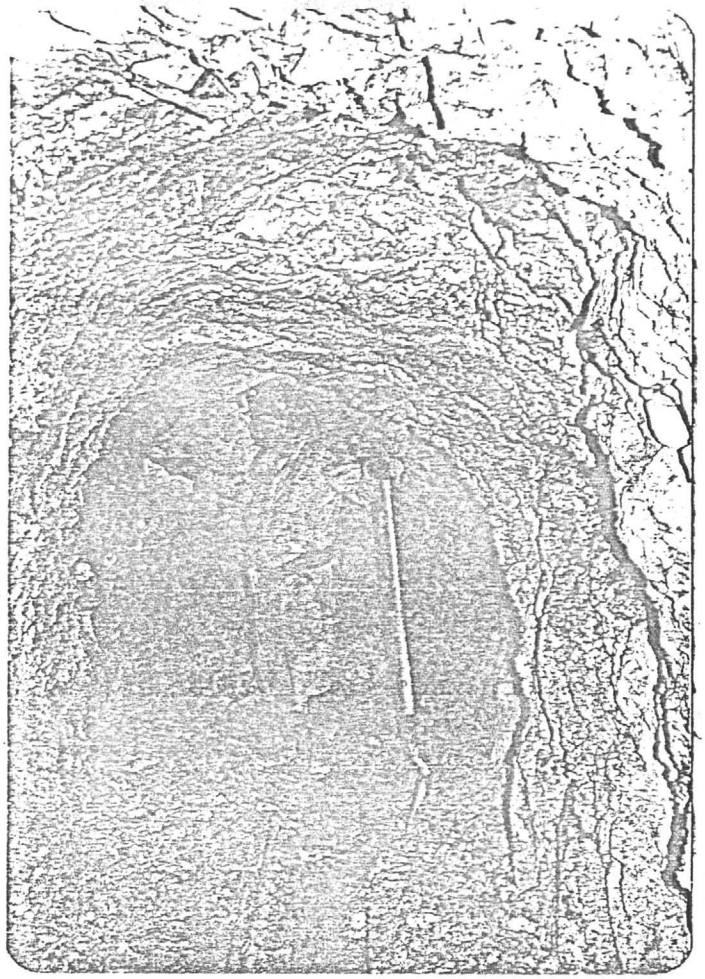
Reproduced from:
Arizona Bureau of Mines Map
Tuscon, Arizona 1960

MINE CAMP AND MT. WRIGHTSON

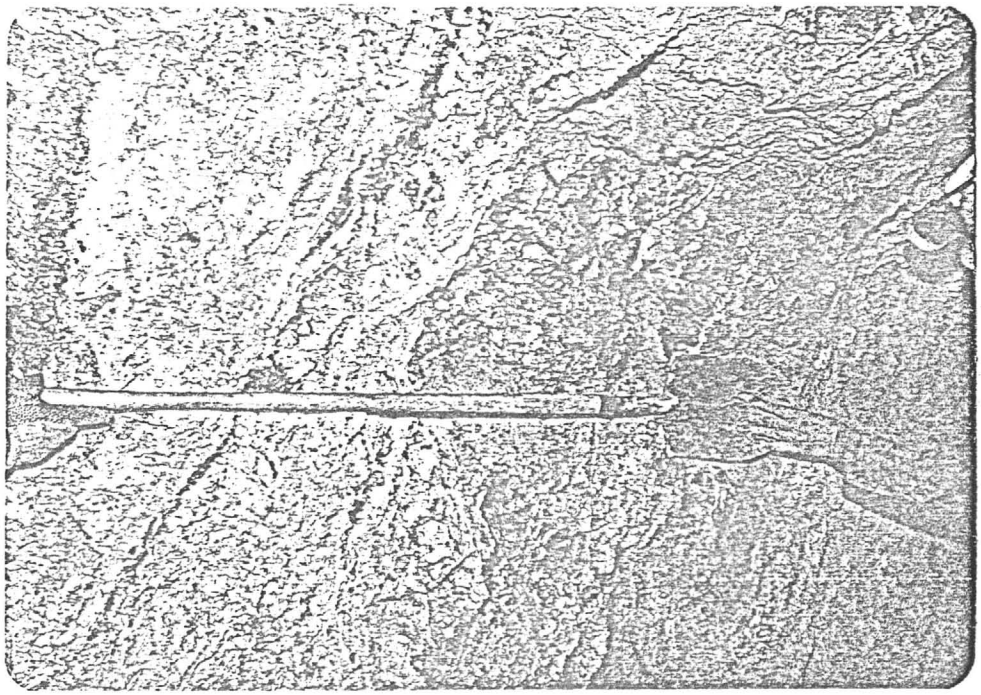
BONANZA A AND B LEVELS



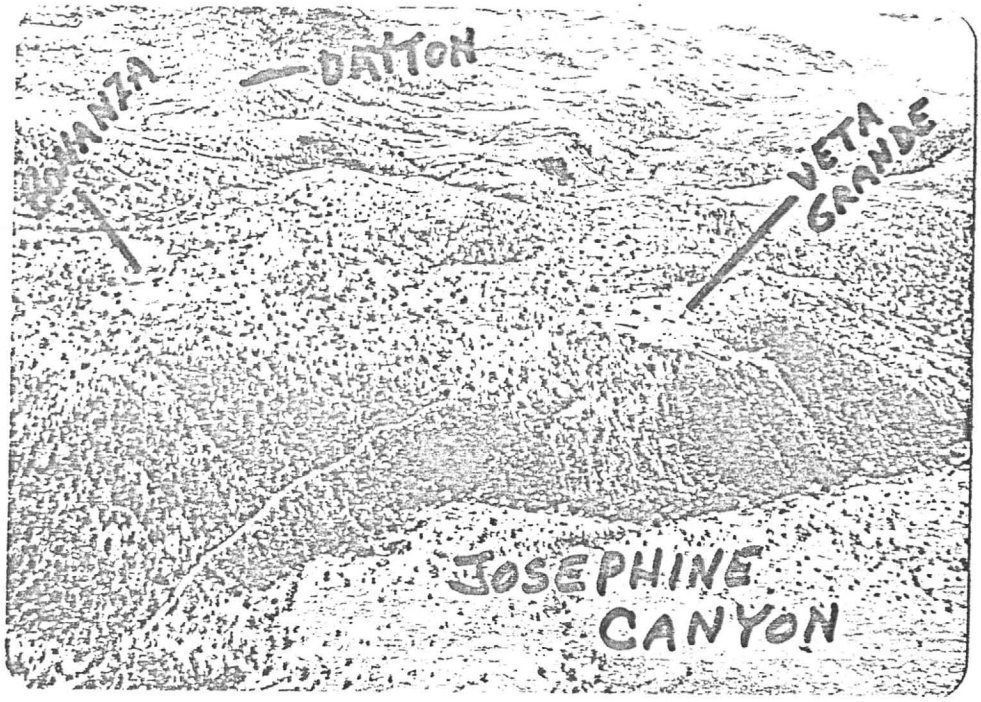
M & S VEIN



VETA GRANDE X-CUT



VETA GRANDE ORE INTERCEPT



VETA GRANDE

VETA GRANDE

DUVAL CORPORATION

REPORT OF PROPERTY EXAMINATION

Date of Report: July 19, 1977
Date of Exam: July 9, 1977
Commodity: Base Metals
Examined by: D.M. Aiken
Sierrita Geology

Name of Property: Part of Old Bond Claims, Josephine Canyon.

Summary of Conclusions and Recommendations: I recommend that Bob Mete's group at Duval Exploration be given the opportunity to evaluate this property and to establish an exploration program they deem necessary for evaluation.

I GENERAL:

Location: General - Mt. Wrightson 15' quadrangle roughly 4 miles south of Mts. Wrightson and Hopkins, 8 miles northwest of Patagonia.
State - Arizona County - Santa Cruz Min. Dist. - south Santa Rita Mountains

Sec. - 1 and 2, 11 and 12 (vicinity) T21S R14E

Accessibility: Access is most readily provided by taking state highway 82 south from Patagonia, Arizona, about 2 miles to a point just before a sign reading "Rest Area - 1 mile". An unmarked road takes a tight jog northward off the highway here and is continuous with Forest Service 43. This road runs about 17 miles up in the Josephine Canyon deposits. An alternate route comes in from Amado to the west, a 14 mile long 4-wheel drive jeep trail.

Size of Property: The immediate property includes 34 Federal claims and 2 patented claims. Additional property of interest constitutes about 42 claims in the immediate vicinity. These are being developed by Swede Ellefson, but their status or availability is unknown.

Legal Status of Property: The 123 claims plus the 42 claims of Ellefson as noted above, originally to Josiah Bond and made up of a larger group numbering 78 claims. Bond died without opening the group of claims to outside prospecting. His property apparently went into the Bond family trust which granted a lease of 50 years for

Ownership of Property: El Toro Mines, Inc., an Arizona corporation.

Owner's Proposed Terms: I did not ask for proposed terms. It seemed premature because the company's area of interest and possible objectives have not been defined or explored yet. Further, the current developers have short term development plans whose completion would likely affect proposed terms.

Geographic Setting: The claims are set at about 5500 elevation in the rugged topography four miles south of Mt. Hopkins and Mt. Wrightson in the Santa Rita Mountains about 13 miles northwest of Red Mountain. Vegetation is transitional between upper Sonoran and scrub oak life zones.

History and Production: The original staking and development of claims was reportedly begun in the late 1800s by a mining engineer named Josiah Bond. Bond built his adobe home in the immediate vicinity, which incidentally was cracked during the San Francisco earthquake. Ore tonnages were high graded from numerous mines within the Bond holdings, by Bond and Ellefson. Carloads of ore carrying values up to 4 to 7 % zinc, 2 1/2 to 3 1/2% copper, 2 1/2 to 6 oz. of silver and spotty lead pays were reported. Production has come within the claims from the Arizona, Pittsburgh, Bonanza and Vita Grande mines, as well as deposits in the immediate vicinity, i.e. M&S, Apache, Wandering Jew and Arkansas. Development has been restricted to numerous underground and surface workings in oxide and sulfide ore. The first level of the Bonanza mine, for example, is 125' below the surface and 550' long. This is A level. B level is 80' below A; C level is 25' below B level. B level is 800' long and C level is 500' long. A raise extends from B level to A level, a winze from B to C level. This is generally representative of the type of underground works which have been undertaken.

II GEOLOGY:

Regional Geology: Pk units common in the region include Mesozoic volcanic rocks composed of rhyolitic to andesitic flows and pyroclastic rocks locally interfingering shale, sandstone and conglamerate (MzV)*, Triassic and Jurassic granite, quartz monzonite and granitic to monzonitic porphyries; (JRg)* intercalated Cretaceous sedimentary and rhyolitic to andesitic volcanic rocks (Kvs) as well as quartz latite porphyry (Tqp)** and diorite (TKdi)*.

* Unit descriptions and symbols from geologic map of Arizona, Wilson, Moore and Cooper, 1969.

** Unit description and symbol from company map on file, Sierra Geology(author?)

Geology of the Deposit: Rock Types - Rocks present in the general mine area include trachy - andesite porphyry (field name) characterized by 40% of 1/16" to 1/4" blocky to lath-like euhedral pink orthoclase phenocrysts, and 5% of 1/32" to 1/16" chloritized biotite phenocrysts set in a forest green ground mass with azurite and malachite stringers (see sample A). This unit caps the hill penetrated by the Veta Grande workings and hosts the main deposit vein here. It may be a chill zone facies marginal to a larger intrusive mass. Volcanic breccia and lithic crystal lapilli tuff (sample B) are prominent on the west side of the Bonanza mine's A level entrance and crop out on the upper east flank of the hill. On the immediate east side of A level entrance, pink spottily epidoitized medium fine grain sandstone (possibly white-colored outside the alteration area as suggested by float) and rhyolitic rocks cropout. Rhyolitic rocks contact the lapilli tuff on the south, near high grade sulfide occurrences (sample C). Quartz latite porphyry was encountered on this hill and may be displaced from dike related to a QLP mass noted to the west on a company map in the geology department. Well silicified, strongly mineralized black chalcopyrite - sphalerite - galena? (sample D) is exposed in adits of the Bonanza mine. Limestone was mentioned as occurring elsewhere on the property but I did not see the occurrence during my visit.

Structure and Alteration - The principal mineralized feature on the property is a linear vein trending roughly N60'W-67 ^{0} SW at the Veta Grande (big claim) mine, and maintains a similar bearing across the Bonanza workings which are across a small valley southward and up the hill beyond. The vein strikes for a distance of at least 3 1/2 miles and the claims cover the vein for about 17 claims length on either side. The vein may change dip from SW to NE at certain points in its extent, and appears tentatively to have been offset several hundred feet left laterally in the valley south of the Bonanza workings. The vein is from about 15'to 20' wide in upper workings and surface cut of the Veta Grande mine to a reported width of 60' to 70' in x-cuts within the vein at depth in the Veta Grande. The vein is composed of

massive to vuggy quartz (sample E) which locally breaks into 1 to 1 1/2" stringers within highly altered country rock. These veins appear to run typically along the main trend but are also observed to shoot off that trand, forming mined out vein pockets marginal to the central vein. It was noted by the owner that many of the high grade ore stringers within the vein trended diagonally across the quartz mass. This is perhaps in alignment with a thin active joint set. The owner reported over 65 mineralized structures in the area, which are represented in part by the numerous workings in the district. Fracture density and friability is widely variable. Serizite-clay(?) alteration with trachy-andecite porphyry in the Veta Grande mine produces pulverulent to crumbly rock material. Silicified and quartzose zones encountered within the Bonanza and Veta Grande were typically hard and may be dense. Some caving has occurred in the Bonanza, suggesting adverse structures or high fracture density. The sericite zone peripheral to the quartz vein at the Veta Grande is about 10' wide on either side, in which is developed fairly extensive and pervasive alteration of phenocrysts and ground mass. The zone gives way to trachy-andesite porphyry characterized by pervesive chloritized phenocrysts and accompanying variably prophylitzed ground mass with spotty disseminated pyrite and chalcocite (?) with light malachite and azurite fracture fillings (sample A).

Estimate of Reserves: The owner figures there are 3 million tons proven and indicated oxide ore in the deposit, taking an average vein width of 20 feet and depth of at least 150 feet based on the depth of workings at the Veta Grande and Bonanza, with a strike of 3 1/2 miles or 18,840 feet, the total cubic footage of ore would be 55,440,000. Estimating a weight of 150 pounds for each cubit foot of ore, a potentially mineralized tonnage may approach 4,158,000 tons. ? ?

This oxide body would not be the major target of a serious exploration. Such an effort would, presumably, attempt to identify a deeper large tonnage deposit.

III ECONOMIC CONSIDERATIONS:

Mining Methods Indicated: For the supergene ore body in situ, leaching appears to be a potential mining technique. The secondary ores, as identified, are located on hills. A possible hypogene ore body has yet to be discovered. !

Reserves: See previous section.

Improvements and Equipment:

Power and Water Supply: Water table is possibly stable due to the close proximity of Mts. Wrightson and Hopkins, which receive about 25 inches of precipitation a year. Standing water in an 85' shaft on the Bonanza is about to the level of the adit. Other workings are also flooded.

Marketing Conditions:

IV CONCLUSIONS and RECOMMENDATIONS: A prospective ore body appears to be effected by five factors:

1. The central vein, its width and unproven depth.
2. Ore shoots off the main vein, which include material in the surface cut on the NE side above the Bonanza A level (see sample C; stringers 45° off the main trend, as at the Veta Grande surface cut; veins jogging off

the main structure, as in the A level of the Bonanza; and the other shoots as may be observed by surface and underground mapping.

3. Mineralized country rock, including oxide and sulfide shows (see Sample A) related to the main vein, such as may be proved by alteration studies, geologic mapping, geochemical surveys and geophysical tools.

4. The distribution of the nearby vein type deposits such as the Arkansas and Wandering Jew, which may have common sources with the Bonanza et al, and which may represent the top of a mineralized system of large dimensions.

5. The distribution and grade of mineralization, its lateral and vertical continuity, such as may be determined by a diamond drilling program.

(I recommend that Bob Metz's group of Duval Corporation be given the opportunity to evaluate the property; to assess possible relationships which may exist between Red Mountain and this terrain, such as similarities in the depths of the sulfide systems.)

A SUBSIDIARY OF OCCIDENTAL PETROLEUM CORPOR N

IRONGATE BUILDING 4
777 SOUTH WADSWORTH BOULEVARD
LAKEWOOD, COLORADO 80226 U.S.A.

OXY

TELEPHONE (303) 988-2700
TELEX 45 819 OXYMIN DVR
CABLE: OXYMIN DENVER, COLO.
DEX 580

4500 East Speedway, Suite 26
Tucson, Arizona 85712
(602) 327-5783

PROSPECT EXAMINATION INFORMATION SHEET

PROSPECT NAME: El Toro Mines - Bob James

OWNER(S): The Bond Mining Trust
P. O. Box 123
Sonoita, Arizona 85637

LEASEE: El Toro Mines, Inc. - Kenneth Robert James, President
P. O. Box 736
Patagonia, Arizona 85624

LOCATION AND ACCESS: Approximately 6 miles northwest of Patagonia Mountains in Tyndall Mining District, Santa Cruz County, Arizona (Fig. 1). Access is via graded dirt road originating 2.5 miles southwest of Patagonia on Highway 82.

LAND STATUS: Land holding consists of 123 unpatented lode claims and 3 patented lode claims located in Sections 1, 2, 3, 11 and 12, T21S, R14E, and Sections 35 and 36, T20S, R14E. All claims are legal as far as assessment work being filed. (Fig. 2).

COMMODITIES: Cu, Pb, Zn, Ag. Proposed average grade estimated to be 2.5% Cu, 10-15% combined Pb-Zn, and 8-10 oz/Ton ag.

HISTORY, PAST PRODUCTION AND EXPLORATION: Mining in the Tyndall district dates back to the arrival of the Jesuit Fathers in the Santa Cruz Valley in the 1680's. Indian labor was used to mine shallow deposits of oxidized and enriched argentiferous galena. By 1853, the mines had long been abandoned due to unrestricted Apache raids. American prospectors and exploration companies moved in, in about 1856 taking over the old mines and exploring for additional deposits. With the start of the Civil War, and the withdrawal of military protection, the mines were forced to close down due to renewed Apache attacks. In the early 1870's, it was again possible to start up mining activities in the district and considerable shallow,

oxidized and enriched lead-silver ore was extracted. Litigation in some areas over the title to the claims with the owners of the Luis Maria Baca Land Grant No. 3 interrupted or delayed many operations. The Grant had been incorrectly surveyed in 1866 and final settlement was not reached for many years.

Most productive years on record were 1913-1914, 1923 through 1928, 1943 and 1948. Estimated production for this district would be 56 thousand tons of ore containing 9.4 thousand tons of lead, 2.8 thousand tons of zinc, 480 thousand ounces silver, 1,280 ounces of gold and 500 tons copper. Total value from shallow oxide deposits at today's prices ($.64 Cu; $.33 Pb; $.29 Zn; $5.40 Ag; $184 Au) equals $11,280,000 with average grade per ton of .89% Cu, 16.78% Pb, 5.0% Zn, 10.37 oz/ton Ag, and .021 oz/ton Au.

Exploration since 1948 has been nil and strictly related to the shallow oxide ore. Bob James, during the past two years has consolidated the district and done some exploration. The most important aspect of this work is a cross-cut driven on the Veta Grande vein. This cross-cut was placed approximately 60 vertical feet below vein outcrop and approximately 10-15 feet below the zone of oxidation. Mr. James cut the structure in the sulfide zone finding a foot wall and hanging wall vein totaling about 15 to 16 feet. The interior of the vein, approximately 8 feet is mineralized with stockwork of Cu, Pb, Zn ore. A sample in the face of this drift on the hanging wall vein (Plate 1) returned an assay of 1.23% Cu, 7.9% Pb, 11.9% Zn, <.006 oz/Ton Au, and 7.23 oz/Ton Ag. A study of the veins at depth (60-80 feet below outcrop) where possible shows much better mineralization than is indicated by outcrop. Another important feature is the widening of the vein structures at depth.

GEOLOGY AND STRUCTURE: The rock in the area of interest are composed of Mesozoic (Jurassic-Triassic?) volcanics. Two rock types dominate this sequence, rhyolite and dacite with the former being somewhat more abundant. Tuff and tuffaceous quartz sandstone lenses are common in the rhyolite unit where it overlies or intertongues with the dacite. This Mesozoic volcanic sequence has been sucessively intruded by coarse-grained quartz monzonite and medium to coarse-grained granite during Mesozoic times and is considered to be the plutonic equivalent of the Mesozoic extrusive rocks. Alteration by these and subsequent intrusives, of the Mesozoic volcanics has been intense.

Unconformably overlying the Mesozoic sequence of volcanics and intrusives is a sequence of andesitic and rhyolitic flows, pyroclastic and clastic sedimentary rocks believed to be Paleocene in age. A later intrusion (Paleocene-Eocene) of granodiorite is found to the north and west of the area and could be considered the core of the Santa Rita Range.

An intricate pattern of strong northwest and northerly striking thrust (?) and block faults and swarms of quartz latite and rhyolite dikes cut across the district. Similar swarms of quartz veins occupy east-west to northwest striking

fissure or fracture zones (Fig. 3). These strong major fault structures appear to be deep-seated and to have been active over a long geologic period, possibly extending back into Mesozoic times and thus were guiding controls on igneous intrusions and more importantly formed channelways for mineralization.

MINERALIZATION: Economic mineralization is believed to be present in fissure-veins ranging in width of from 6 feet to 40 feet ? (Plates 2 & 3). The structures examined appeared to have the common foot wall and hanging wall veins, but unlike most, the intervening material is mineralized. If this proves to be the case with depth, then economic reserves could conceivably reach the multi-million ton figure. Vein widths are good and there is no evidence at this time that would indicate mineralization cutting off at a shallow depth. An added potential for this area is the possibility of wallrock replacements as indicated by this quote from Schrader, F. C., 1915, USGS Bull. 582 regarding the Joplin Mine which extends onto the property.

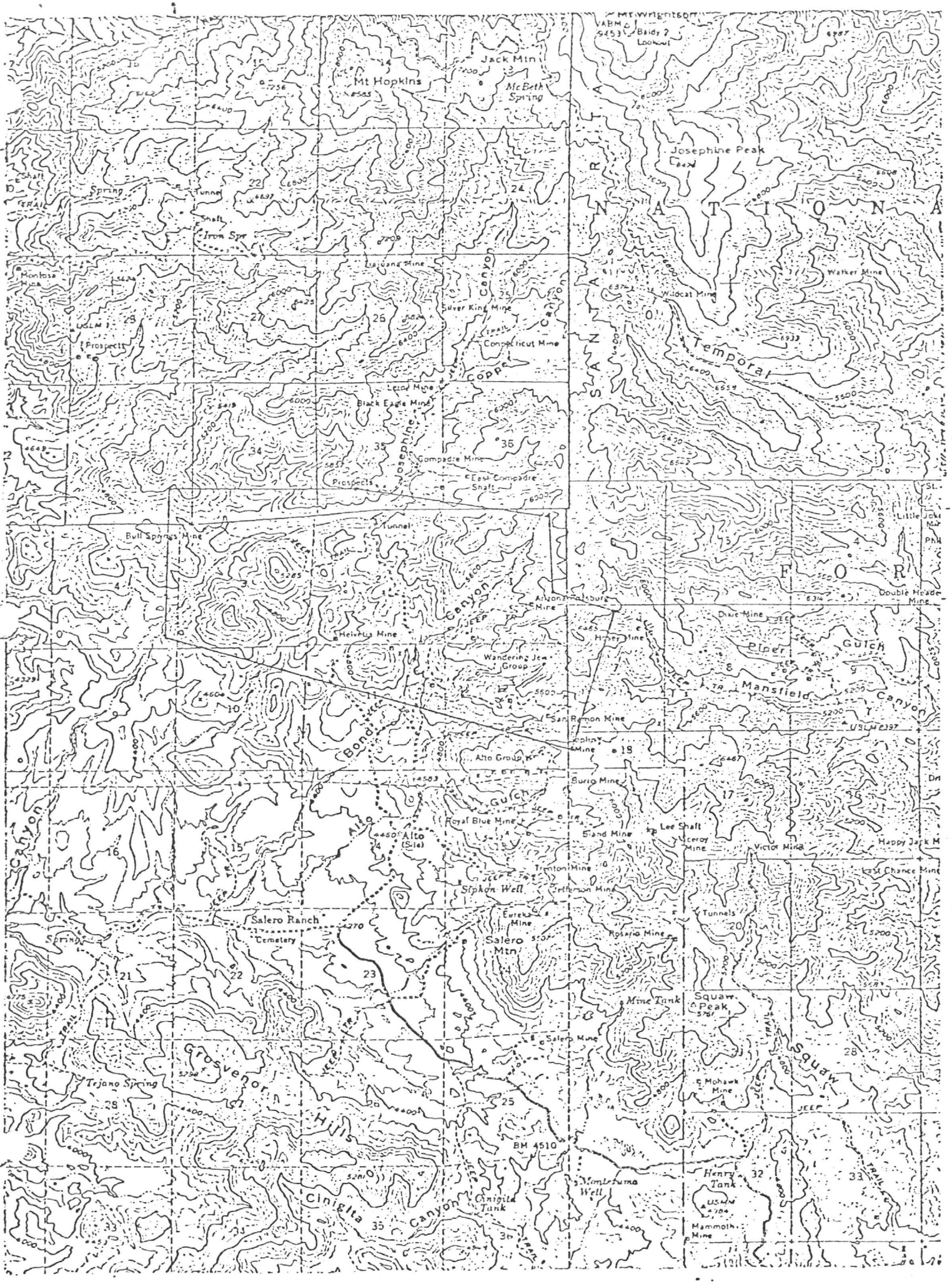
> "The country rock, as shown by the cross-cut tunnel extending 100 feet beyond the vein, is impregnated with disseminated sulphides and in places contains also good ore."

This potential is in evidence on the Veta Grande vein and in the cross-cut tunnel driven by Mr. James. Plate 4 shows the fracturing on the surface which at depth carries Cu, Pb, Zn, Ag mineralization.

RECOMMENDATION: It is my opinion that this area justifies a detailed exploration program. Veins appear to be good width and grade of mineralization economic. It is felt that within a very short time period, and with moderate expenditures, several veins could be tested by angle drilling to determine if potential is real. Assay returns from initial sampling (attached) indicate that silver is of sufficient grade to make this area much more interesting.

OXYMIN can enter on a lease allowing them minimum payment for the first year. During the first year it would be possible to determine if further effort were warranted. A program for exploration is envisioned as being relatively simple and of approximately 4 to 6 months duration unless carried on due to very encouraging results. It is my opinion that this area is a "sleeper" and is relatively virgin as far as any well organized exploration programs being carried out in the past.

I recommend that OXYMIN go with El Toro Mines on the terms of the attached lease agreement and test the potential which all indications show to be there.



LOCATION OF CLAIMS

EXHIBIT A

The following-described unpatented lode and placer mining claims and tunnel sites situated in the Tyndall Mining District, Santa Cruz County, Arizona, the names of which and books or dockets and pages or recording of the location notices of which in the office of the Santa Cruz County Recorder are as follows:

NAME OF CLAIM	BOOK OF MINING LOCATIONS	PAGE
Afterglow	10	83
Agua	16	233
Alabama Maid	25	132
Allegheny King	18	371
Apache Hill Tunnel and Tunnel Site	25	109
Amended	25	133
Arkansas Traveler	18	369
Art Goebel Loke	22	381
Ashurst	14	154
Badger	10	80
Black Fox	12	437
Bohlinger	22	342
Bonanza B	18	215
Bonanza "C"	18	336
Black Bonanza	18	340
Bonanza "D"	18	370
Bonanza "E"	18	459
Bond Tunnel and Tunnel Site	18	455-456
Bonite	7	396
Buena Ventura	16	99
Burgoon No. 1	6	173
Burgoon No. 2	6	175
Burgoon No. 3	6	176
Burgoon No. 4	6	178
Burnt Ore No. 1	17	323
Calcite	11	59
Carl Hayden	16	98
Catherine	22	290
Cobre	11	431
Cobre Josefina	12	432
Cobre Abajo	11	433
Cobre de Agua	16	53
Cobre Grande	11	429
Cobre Grandissimo No. 1	12	434
Cobre Grandissimo No. 2	12	436
Commander Byrd	18	461
Covellite	18	322
Cuprite	7	395

NAME OF CLAIM	BOOK OF MINING LOCATIONS	PAGE
Dayton "B"	25	106
Esperanza	16	139
Eveready	18	373
Favor Del Cielo	22	181
Flag	16	142
Florida	18	214
Frank Luke	18	460
George Wilkins	22	380
George Wilkins (Relocation)	25	108
Girasol	16	143
Graking	18	396
Graib	16	328
Harlequin	16	144
Hoe Cake	7	421
Hope Bond	16	500
Hubert Wilkins	25	131
Las Jarias	16	141
Jersey Girl No. 1	6	165
Jersey Girl No. 2	6	167
Jersey Girl No. 3	6	169
Jersey Girl No. 4	6	170
Jersey Girl No. 5	6	172
Last Dollar	16	495
Last State	14	331
Lone Eagle	18	449
Lucky Lindbergh	18	450
Lucky Lulley	22	341
Majestic	18	456
Mark Smith	14	144
Menilite	16	145
Merry Widow	10	82
Minnie Bond	18	275
Mulatto Quartz	16	644
McDoking	18	395
McDonald (Mc Lanqued)	16	319
Orosco "A"	18	457
Orosco "B"	18	458
Opal	16	147
Opaline	16	144
Otter	11	62
Pitlanque	11	60
Pittsburgh Tunnel and Tunnel Site	25	134
Pittsburgh King	18	365
Promontoiro	16	140
Quemason	14	146
Quemazon No. 2	14	152
Razor Back	7	422

NAME OF CLAIM	BOOK OF MINING LOCATIONS	PAGE
Red Fox	11	64
Red Fox No. 1	25	122
Red Fox No. 2	25	123
Red Fox No. 3	25	123
Riqueza	16	443
Ruby Silver	16	645
Red Warrior	10	85
Iris	16	146
Son of David	22	341
Sqirrel	12	439
Stephanite Saddle	25	105
The Red School House	18	125
Smith	14	562
Tennantite	18	366
Tiswin	16	115
Toluachi	7	585
Tom Pulliam	18	128
Veta Grande Tunnel and Tunnel Site	25	135
Veta Grande	22	180
The Wandering Jew	22	342
Wolverine	10	79
Sister Susie	18	23
Silver Sadie	18	37
+T	11	57
June Schmitz	231	60
K.R.J.	231	61
Swede	231	65
Mary Michelle	231	63
Dandy Randy	231	460
Kraut	231	62

OCCIDENTAL MINERALS CORPORATION
A SUBSIDIARY OF OCCIDENTAL PETROLEUM CORPORATION

IRONGATE BUILDING 4
777 SOUTH WADSWORTH BOULEVARD
LAKEWOOD, COLORADO 80226 U.S.A.

TELEPHONE (303) 988-2200
TELEX 45-819 OXYMIN DVR
CABLE: OXYMIN DENVER, COLO.
DEX 580

El Toro Mines, Inc.
P. O. Box 736
Patagonia, Arizona 85624

Re: Notice of Termination - 5/23/78 Mining Sublease between El Toro Mines, Inc. and Occidental Minerals Corporation

Gentlemen:

This letter shall serve as notice, pursuant to Section 9(c) of that certain Mining Sublease and Option Agreement dated May 23, 1978 between Occidental Minerals Corporation and El Toro Mines, Inc., that Occidental hereby elects to terminate said Mining Sublease and Option Agreement in its entirety effective 30 days from the date as provided in Section 10. A recordable release required pursuant to Section 6(h) is enclosed.

We appreciate the opportunity you have extended to Occidental Minerals Corporation to examine the property and wish you success in your future efforts with respect to the property.

DATED AND MAILED this 15th day of February, 1979.

OCCIDENTAL MINERALS CORPORATION

By _____
Frederick B. Park
Vice President

fbp/SM

cc: Joseph P. Wise

CERTIFIED MAIL #243122
RETURN RECEIPT REQUESTED

With Xerox Copy To:

El Toro Mines, Inc.
805 North 19th
Boise, Idaho 83702

CERTIFIED MAIL #243128
RETURN RECEIPT REQUESTED

OCCIDENTAL MINERALS CORPORATION
A SUBSIDIARY OF OCCIDENTAL PETROLEUM CORPORATION

IRONGATE BUILDING 4
777 SOUTH WADSWORTH BOULEVARD
LAKEWOOD, COLORADO 80226 U.S.A.

TELEPHONE (303) 988 2700
TELEX 45 819 OXYMIN DVR
CABLE: OXYMIN DENVER, COL
DEX 700

June 21, 1979

El Toro Mines, Inc.
P. O. Box 736
Patagonia, Arizona 85624

Re: Annual Assessment Work
Year Ending 8/31/79

Gentlemen:

Enclosed is the original recorded Affidavit of Labor Performed and Improvements Made for your unpatented claims included in the Sublease between El Toro Mines, Inc. and Occidental. The affidavit is for the assessment year commencing September 1, 1978 and ending August 31, 1979.

Sincerely yours,

OCCIDENTAL MINERALS CORPORATION

Susie Mason
Land Contracts Supervisor

SM/sm
Enclosure - Original Affidavit

cc: Joseph P. Wise (w/encl.)

CERTIFIED MAIL #242158
RETURN RECEIPT REQUESTED

RECOMMENDED EXPLORATION AND DEVELOPMENT PROGRAM

Phase I.		
Construct access roads and work area	$ 7,500	
Detailed geologic survey and mopping of area	2,500	
Drilling-initially five holes averaging 650 feet in depth	81,250	
Miscellaneous expense	8,750	
		$ 100,000
Phase II.		
Mining equipment purchase	150,000	
		$ 150,000
Phase III.		
Cross-cut and haulage way excavation	400,000	
		$ 400,000
Phase IV.		
Raise and sublevel development	150,000	
		$ 150,000
Phase V.		
Initial mine production	200,000	
		$ 200,000
TOTAL		$1,000,000

E STARTED 10/11/78

E COMPLETED 10/15/78

-45°

DIAMOND DRILL ASSAY LO

Arizona Pittsburg

HOLE NO. TD-10

ORDINATES _____ _____

COLLAR ELEVATION 5,505 BEDROCK ELEVATION 5,505

Footage From	Footage To	Interval	Measured Core Recovery	% Recovery	Hole Size	S.G.	Sample No.	Au ppm	Ag oz/T	Cu %	Pb %	Zn %			
6.0	157.2	1.2	1.2	100	NX	✓	TD 10-1	.12	13.71	.44	4.80	.82			
7.2	159.8	2.6	2.6	100	NX	✓	TD10-2	.16	1.70	0.05	.11	.17			
9.8	161.5	1.7	1.7	100	NX	✓	TD10-3	.25	7.73	.16	2.45	.88			
1.5	164.3	2.8	2.8	100	NX	✓	TD10-4	.16	6.03	.18	.54	.30			
4.3	170.0	5.7	5.7	100	NX		TD10-5	.32	.82	0.03	.17	0.08			
0.0	174.0	4.0	4.0	100	NX	✓	TD10-6	.18	10.50	.10	.31	.49			
1.0	178.1	4.1	4.1	100	NX	✓	TD10-7	.60	3.72	0.06	.74	.38			
8.1	180.8	2.7	2.7	100	NX	✓	TD10-8	.30	3.60	0.07	.11	.60			
5.8	185.7	4.9	4.9	100	NX		TD10-9	.24	.47	0.02	0.03	0.02			
0.7	190.0	4.3	4.3	100	NX		TD10-10	.36	.56	0.02	0.04	0.02			
3.0	197.2	7.2	7.2	100	NX		TD10-11	.16	1.58	0.06	.17	.11			
3.2	205.0	7.8	7.8	100	NX	✓	TD10-12	.30	5.51	.19	.17	.19			
5.0	210.8	5.8	5.8	100	NX		TD10-13	.12	1.3	0.04	.12	.11			
.8	217.0	6.2	6.2	100	NX		TD10-22	.24	0.09	108 ppm	274 ppm	680 ppm			
.0	218.0	1.0	1.0	100	NX		TD10-14	.12	.61	.11	.43	.97			
.0	225.0	7.0	7.0	100	NX		TD10-15	0.04	.18	181 ppm	192 ppm	.11			
.0	228.5	3.5	3.5	100	NX		TD10-23	.26	5 ppm	136 ppm	390 p	0.09			
3.5	232.0	3.5	3.5	100	NX		TD10-16	0.04	.70	.14	.21	.28			
2.0	233.0	1.0	1.0	100	NX		TD10-17	.36	.82	.12	.13	.29			
	238.0	5.0	5.0	100	NX		TD10-24	.14	2 ppm	114 p.	50 p.	390 p.			
	243.0	5.0	5.0	100	NX		TD10-25	.25	10.	126 p.	40 p.	380 p.			
.0	249.0	6.0	6.0	100	NX		TD10-26	.30	2 p.	112 p.	182 p.	480 p.			
.0	255.0	6.0	6.0	100	NX		TD10-27	.22	4 p.	162 p.	132 p.	390 p.			
.0	259.5	4.5	4.5	100	NX		TD10-28	.30	9 p.	116 p.	102 p.	284 p.			
.5	265.0	5.5	5.5	100	NX	✓	TD10-18	.60	17.65	.40	.44	1.95			
.0	270.0	5.0	5.0	100	NX		TD10-29	.18	5 ppm	142 p.	222 p.	550 p.			
.0	276.0	6.0	6.0	100	NX		TD10-19	.32	1.60	.11	.38	.56			
.0	279.0	3.0	3.0	100	NX		TD10-30	.30	.93	0.07	0.08	.16			
.0	283.0	4.0	4.0	100	NX	✓	TD10-20	.80	15.60	.74	1.60	2.00			
.0	291.0	8.0	8.0	100	NX	✓	TD10-21	.48	2.42	.11	.19	.22			
							TD10-18	.01	20.1	.36	.50	2.15	Duplicate		
							10-20	.01	15.7	.85	2.50	2.90	Duplicate		

PROJECT Tocoi — START 10-11-78. DIP -45°

HOLE NO. TD-10 STOP 10-15-78 DIRECTION N30°W.

LOGGED BY Roy Roripaugh SIZE NX

DEPTH 310 COLLAR ELEVATION 5,505 COORDINANCE N, E

Stage	Geologic Description	Assay Cu	Pb	Zn	Au	Ag
	Fine equigranular diorite (Monzonite phase) 1-2% epidote - pink w/ biotite & chlorite					
5	Calcite, epidote vnlt.					
	Calcite vnlts. Jos. Diorite .5% epidote, Mon. phase?					
5	Calcite, ep. vnlt. minor qtz + calcite vnlts. V. minor epidote.					
0	Xenolith of dk. Jos. Diorite? Monzonite phase?					
	epidote increases					
	Fracture					
	Calcite str.					
	Chlorite along fracture ep. ~1% in monzonite					
	Monzonite					
	Argillic alteration, minor ep. ~5% in places					
	Calcite vnlts.					
	vnlt. w/ sulfides mostly py. no argillic alteration, epidote .5-1% - Qtz + calcite, chlorite, py.					
	Argillic alteration, minor, ep., chlorite					

HOLE NO. TD-10 STOP DIRECTION N30°W

LOGGED BY Ray Roripaugh SIZE NX

DEPTH COLLAR ELEVATION 5,505 COORDINANCE N,

Footage	Geologic Description	Assay	Cu	Pb	Zn	Au	Ag
	py, galena wkly min	Assay 160—164					
		Assay 164 → 174					
	horse mostly py						
		Assay 174 → 179					
		Assay → 179 → 188					
	galena minor chalcopy, marmatite, sphalerite? py						
	Veinlts. wkly min PbS; min. chalco, zinc?						
		Assay 188 - 192					
		Assay 192 — 196					
	Qtz vnlts in compl. altered monzonite or diorite lgt. green cast cp & ch? py and dark gray Qtz PbS? Tet?						
	Qtz stringers, dk. gray	altered diorite or monzonite					
	½" vnlt. H. min., py, minor galena, marmatite?						
	Qtz str. white Qtz., v. wkly. min., py						
	Qtz vnlts. - diorite almost comp. replaced by silica.						
	py, wkly. min. galena, sphalerite, marmatite?, Tet?						
	Qtz vnlts, vuggy, and comb.	Assay 196—206					
	Qtz. vnlts. wk. min., py, galena?	Assay 206—211.5					
	dk gray Qtz. Tet? Marmatite?						
	Altered monzonite or diorite, chl. Many Qtz vnlts, v. wkly, min.						
	8" Qtz vnlt. wkly min						
	Altered diorite or monzonite	Geo Chem 211.5 - 222					
	Qtz vnlts, v. wkly, min. py in altered country.						
	4" vnlt, py, chalcopy, Tet? galena, marmatite?						
		Assay 222 - 224					
	Qtz vnlts v. wkly min	Geo Chem 224 → 231.5					
	2" vnlt. galena, chalcopy, marmatite? Tet?						
		Assay 231.5 → 233.5					
	1.5" Qtz vein, 1-2% chalcopy, galena, marmatite tet?	Geo Chem 233.5 → 243					
	Altered diorite or monzonite Many Qtz vnlts. v. wk. min.						

PROJECT _____ START _____ DESTINATION _____

HOLE NO. TD-10 STOP _____ DIRECTION N30°W

LOGGED BY Ray Roripaugh SIZE NX

DEPTH ____ COLLAR ELEVATION 5,505 COORDINANCE _____ N, _____

Depth	Geologic Description	Assay Cu	Pb	Zn	Au	Ag
	Argillic Alteration					
	1% vnlt. w/ chlorite — Chlorite-epidote					
	Monzonite, w/ epidote, bio → chl.					
1	Calcite, ep.					
	Monzonite 1% ep.					
	py, chlorite — Monzonite					
	qtz vnlt w/ py. minor argillic alt. epidote					
	Calcite vnlts. chlorite on vnlts					
	Calcite vnlts. — Monzonite phase of Josephine diorite?					
	Argillic alt. (minor)					
	Calcite vnlts. Dip on vnlts becomes steeper					
	Calcite, qtz. vnlts.					
	Bleaching becomes pronounced, silicification, epidote along qtz, calcite vnlts.					
	Bleached, light green coloration, ep.? Argillic Alteration					
	gouge — ASSAY 156-160					
	Sulfides, gal, py, minor chalcopy, sphalerite? about 1% Pb?					

Tucson
Tex-o

5,505

N30°W
-45°

Wesdrill No 60
Core

10-11-78
1" = 10'
by Ray Lorigesh

	Lithology & Structure	Mineralization & Alteration		± S	Au	Ag	Cu	Pb	Zn
243	Altered Josephine Diorite or the Monzonite phase - silicified	Chlorite and py.	Geo Chem	243					
		QTZ VNLTS. V. Minor ore minerals		252					
252	Altered dio. silicified, chlorite	QTZ VNLTS. V. WKLY MIN. py in altered diorite	Geo Chem						
Box 27									
Box 28	VUGLY, MILKY QTZ	Vuggy QTZ VNLT WKLY MIN. ~ .25% Cu, Minor covellite Pbs?, Sph.? py	Assay	259.5 ↓ 265.5					
Box 29		Chalcopy, Sphalerite, Galena py ~ 1% SULFIDES	Geo Chem	265.5					
270	altered diorite or Monzonite dissp ~ 5%		Assay	270 ↓ 280					
	QTZ Vn. and altered diorite Vuggy quartz	Minor Chalcopy, galena, marm. py, Tet?							
280	Quartz vein, vuggy QTZ	280 - 282 5% comb. SULF. Tet? Chalcopy, galena, sphalerite	Assay	280 ↓ 282					
			Assay	↓ 289					
	gray quartz, vugsen		Assay	↓ 291					
289									
293	quartz								
	Altered diorite calcite, quartz vnlts								
298	Altered diorite calcite becomes dominant vein filling,	Argillic alteration, py, minor silicification Chlorite Tourmaline?							
307									
310	Bottom diorite becomes less bleached								

Lithology & Structure	Mineralization & Alteration		%	Au	Ag	Cu	Pb	Zn
Altered Josephine Diorite or the Monzonite phase - silicified	Chlorite and py.	Geo	243					
	QTZ VNLTS.	Chem						
	V. Minor ore minerals		252					
Altered dio. silicified, chlorite	QTZ VNLTS. V. WKLY MIN.	Geo Chem						
	py in altered diorite							
VUGLY, MILKY QTZ	Vuggy QTZ VNLT WKLY MIN. ~ .25% Cu, Minor tetrahedrite Pbs?, Sph.? py	Assay	259.5 ↓ 265.5					
	Chalcopy, Sphalerite, galena	Geo Chem	265.5					
altered diorite or Monzonite	py ~ 1% SULFIDES		270					
dispy ~ 5%		Assay	↓ 280					
QTZ Vn. and altered diorite	Minor Chalcopy, galena, marm.							
Vuggy quartz	py, Tet?							
Quartz vein, vuggy QTZ	280 - 282	Assay	280					
	5% comb. SULF.		↓ 282					
	Tet? Chalcopy, galena sphalerite	Assay	↓ 289					
gray quartz, vugsen		Assay	↓ 291					
quartz								
Altered diorite								
calcite, quartz VNLTS								
Altered diorite	Argillic alteration, py,							
calcite becomes dominant	minor silicification							
vein filling,	Chlorite							
	Tourmaline?							
Bottom diorite becomes less bleached								

243 — 252 — 260.5 — 270 — 280 — 289 — 298 — 307 — 310

Box 27 Box 28 Box 29

Arizona

SHEET NO. 1

DATE STARTED 10/15/78

DATE COMPLETED 10/25/78

-60°

DIAMOND DRILL ASSAY G

Pittsburgh

HOLE NO. TD-11

COORDINATES _____ _____

COLLAR ELEVATION 5,505 BEDROCK ELEVATION 5,505

Footage From	Footage To	Interval	Measured Core Recovery	% Recovery	Hole Size	S.G.	Sample No.	Au PPM	Ag oz	Cu %	Pb %	Zn %			
241.0	246.0	5.0	5.0	100	NX		TD11-1	-0.02	0.03	147 p.	24 p.	176 p.			
46.0	250.0	4.0	4.0	100	NX		TD11-2	0.04	.50	148 p	378 p.	660 p.			
250.0	257.5	7.5	7.5	100	NX		TD11-3	-0.02	0.03	222 p.	48 p.	180 p.			
57.5	263.5	6.0	6.0	100	NX		TD11-4	0.04	.23	140 p.	200 p.	336 p.			
63.5	268.5	5.0	5.0	100	NX		TD11-5	.16	.61	239 p.	640 p.	400 p			
68.5	274.5	6.0	6.0	100	NX		TD11-6	.40	.50	440 p.	40 p	.15			
74.5	279.5	5.0	5.0	100	NX		TD11-7	.44	.29	250 p.	244 p	880 p.			
89.5	293.5	4.0	4.0	100	NX		TD11-8	.10	Nil	140 p	100 p.	500 p.			
01.0	307.2	6.2	6.2	100	NX		TD11-9	-0.02	0.029	156 p.	450 p.	.11			
07.2	309.3	2.1	2.1	100	NX		TD11-10	0.08	.67	.90	.52	0.066			
09.3	318.0	8.7	8.7	100	NX		TD11-11	-0.02	0.03	112 p.	53 p.	400 p.			
18.0	327.5	9.5	9.5	100	NX		TD11-12	-0.02	0.03	79 p.	52 p	292 p			
27.5	331.5	4.0	4.0	100	NX		TD11-13	-0.02	0.03	36 p.	140 p.	550 p.			
31.5	335.5	4.0	4.0	100	NX		TD11-14	-0.02	0.03	77 p.	70 p.	180 p.			
35.5	343.5	8.0	8.0	100	NX		TD11-15	-0.02	0.03	100 p.	91 p.	219 p.			
43.5	348.0	4.5	4.5	100	NX		TD11-16	0.04	.12	154 p.	206 p	.13			
48.0	356.0	8.0	8.0	100	NX		TD11-17	-0.02	.15	136 p.	600 p.	.16			
56.0	360.0	4.0	4.0	100	NX		TD11-18	-0.02	.09	90 p.	656 p	.11			
[illegible]	372.0	12.0	12.0	100	NX		TD11-19	-0.02	.09	111 p.	462 p	.11			
	376.5	4.5	4.5	100	NX		TD11-20	-0.02	.32	466 p.	.14	.16			
76.5	380.5	4.0	4.0	100	NX		TD11-21	-0.02	.79	0.07	.28	.39			
80.5	383.5	3.0	3.0	100	NX		TD11-22	-0.02	1.40	0.05	.41	.57			
83.5	388.5	5.0	5.0	100	NX		TD11-23	-0.02	7.45	.19	.65	1.75			
88.5	392.0	3.5	3.5	100	NX		TD11-24	-0.02	19.90	.34	2.60	3.80			
92.0	396.3	4.3	4.3	100	NX		TD11-25	0.025	6.25	1.39	1.15	1.45			
96.3	402.2	5.9	5.9	100	NX		TD11-26	-0.02	.61	.16	.14	.22			

1435 S. 10th AVE.
~~P.O. BOX 1112~~

Jacobs Assay Office

Registered Assayers

TUCSON, ARIZONA 85702

PHONE 622-0813

DUPLICATE

Certificate No. 6C 11.6.

13 Dec 21 1975

Sample Submitted by Mr. Cardinal Minerals

SAMPLE MARKED	GOLD Ozs. per ton ore	GOLD Value per ton ore $	SILVER Ozs. per ton ore	COPPER Per cent Wet Assay	LEAD Per cent Wet Assay	ZINC Per cent Wet Assay	Per cent Wet Assay
TD 11-24	Trace	—	14.90	0.34	2.60	3.80	
TD 11-25	0.035	—	6.25	1.29	1.15	1.45	

• Gold Figured $100.00 per oz. Troy

341-451

Assay $ 23.00

Very respectfully,

HOLE NO. TD-11 STOP _____ DIRECTION N30° W

LOGGED BY Ray Roripaugh SIZE NX

DEPTH COLLAR ELEVATION ~~5,530~~ 5,505 COORDINANCE _____ N, _____ E

Stage	Geologic Description	Assay Cu	Pb	Zn	Au	Ag
	ROTARY					
	40'					
	Josephine diorite					
	epidote veins					
	calcite veins					
	Calcite veins epidote Josephine diorite bluish color					
	epidote, calcite, chl? Monzonite phase? pinkish color, slightly coarser texture					
	Monzonite phase? (pinkish-K-spar?) epidote					
	epidote 1-2% product of alteration? epidote-QTZ K-spar					
	calcite veins					
	Monzonite phase? epidote replacing K-spar.					
	calcite veins					
	chlorite, veins					
	epidote, calcite veins					
	calcite veins					
	chlorite veins					
	dk. fine grained Jos. Diorite chl, epidote? + Potassic alte. K-spar calcite veins. v. minor, Marmatite, chalcopy, galena in calcite gangue v. minor py on veins					
	Jos. Diorite - Diorite is fine-grained and dk. except where cp. veins solutions have altered calcite veins					
	Jos Diorite dk. calcite veins: altered veins look like Monzonite phase Monzonite phase prob just altered Jos. Diorite					
	Jos. diorite altered - lots of epidote 610 chert py, v. minor marmatite and galena. Acc. w/ epidote and silicification 79.5 82.5					

OCCIDENTAL - MINERALS CORPORATION OXY

Project TORD Hole No. TD-11 page 2 of

DEPTH	ROCK TYPE	DESCRIPTION: Lithology & Structure	DESCRIPTION: Mineralization & Alteration	ASSAYS: INT.					
87 88	Jos: Diorite	Fine grained equigranular minor epidote, silicification, bleaching. Biotite → chlorite minor	87-88 2-3% epidote 88 on epidote drops off. Bleaching along VNLTS.						
Box 10 96		Calcite VNLT Jos: Diorite							
Box 11		Calcite VNLT							
106		Calcite VNLTS.							
Box 12		Calcite, chlorite VNLTS chlorite shows bleaching along VNLTS.	Bleaching along VNLTS.						
116		Chlorite on VNLT., calcite, minor px. Fine equigranular, biotite, QTZ K-spar, plag. Jos. Diorite	Bleaching along calcite, chlorite VNLT						
3									
124		Chlorite, calcite, minor px on VNLT.	epidote - propylitic alt K-spar? - potassic alt?						
14									
133		Chlorite, minor px on VNLTS.	epidote Chlorite bleaching along fractures, pot? alt.						
15			Jos. Diorite is bleached - xls are larger, epidote						
142		Chlorite, QTZ, calcite, px 1/4" VNLT							
Box 16		Chlorite, clay along VNLT.							
151	D	Xenoliths of fine-grained-rk. Ferro-Mag rich, Fracture w/ chlorite 20° off 90°							
Box 17		Jos. Diorite, pink. minor epidote? in groundmass.							
159		Chlorite							
Box 18		Chlorite, calcite VNLTS.							
		Jos. Diorite - pink xenoliths, dc. Ferro-Mag rich-Jos. Diorite? Calcite, chlorite on fracture-VNLT.							
169		bleaching in pink Diorite chlorite along fracture. Diorite shows minor argillic alteration	argillic & propylitic alteration chlorite and fritz clay						

Box 11		Calcite VNLT	
		Calcite VNLTS.	
106			
Box 12		Calcite, chlorite VNLTS chlorite shows bleaching along VNLTS.	Bleaching along VNLTS.
116			
13		Chlorite on VNLT., calcite, minor PY. Fine equigranular, biotite, QTZ K-spar, plag. Jos. Diorite	Bleaching along calcite, chlorite VNLTS
124			
14		Chlorite, calcite, minor PY on VNLT.	epidote - propylitic alt K-spar? - potassic alt?
133			
15		Chlorite, minor PX on VNLTS.	epidote Chlorite bleaching along fractures, pot? alt.
142		Chlorite, QTZ, Calcite, PX 1/4" VNLT.	Jos. Diorite is bleached - XLS are larger, epidote
Box 16		Chlorite, Clay along VNLT.	
151	D D	xenoliths of Fine-grained-FK. Ferro-Mag rich,	
Box 17		*Fracture w/ chlorite 25° off 90° Jos. Diorite, pink. minor epidote?	
159		in groundmass.	
		chlorite	
Box 18		chlorite, calcite VNLTS.	
		Jos. Diorite - pink xenolith, dc, Ferro-Mag rich-Jos. Diorite?	
169		Calcite, chlorite on Fracture-VNLT. bleaching in pink diorite chlorite along fracture.	
Box 19		Diorite shows minor argillic alteration	argillic & propylitic alteration chlorite and feldspar clay epidote replacing K-spar?
179		chlorite on fracture Calcite VNLTS. xenolith of Dre-Jos. Diorite? pink diorite seems to be latter.	epidote in groundmass of pink diorite and xenolith?
Box 20		clay along fracture	
188		Calcite VNLTS.	
21		Calcite VNLTS	
197.5		QTZ, calcite VNLT., chlorite chlorite xenolith of dc, Fine grained Ferro-Mag FK.	Propylitic chlorite epidote
Box 22		Calcite chlorite	

DEPTH	ROCK TYPE	DESCRIPTION: Lithology & Structure	DESCRIPTION: Mineralization & Alteration	ASSAYS: INT.
207		Medium to fine grained, pink slightly fragmental	epidote, chlorite	
Z2	DIORITE	dk. rx.	argillation increases	
216		calcite veins, chlorite		
		Jos. D.	Argillic alteration 216-222	
Z3	Diorite	calcite, chlorite veins	FeO increases	
226		FeO on fractures	epidote, chlorite in groundmass and veins.	
			minor py in ¼" qtz vein. hematite, striations	
Box 24	altered diorite	Rx has reddish look	argillic alteration mod.	
235		FeO, clay along slip-striations	propylitic - chlorite	
Box 25	altered diorite	FeO. Diorite has reddish cast	Argillic	
14		1½" Qtz-calcite vein. Diorite has greenish-grey look	Propylitic and argillic alt. Chlorite? 5% in groundmass green	
Box 26	altered diorite	broken, slickensides	bleaching, chlorite (argillization)	
254		Qtz stringers.		
Box 27			silicification begins at 257 py.	
263.5		Qtz vein, grey quartz, brecciated py	Silicified Diorite - Qtz diss py, chlorite, dk & along slips, dk, quartz. py, dk. streaks in rx., gouge geochem Argillic & propylitic alt. Silicification wk, rx soft - 272	263.5 ↓ 272
Box 28			Silicification + gouge zones wk, galena?, py, tet? core has greenish cast. Qtz veins v. wkly, min 281.5	272 ↓ 281.5
272				
Box 29				
281.5		Host rx. Jos. Diorite, bleached Chlorite	bleached, propylitized Fine grained galena, tet? 287 → 288.5 veins - v. minor Chalco py.	287 ↓ 288.5
Box 30				
289.5		Jos. Diorite - Silicified, Qtz veins, but v. wkly mineralized	Silicified, chlorite, Argillic alt. Feldspar → clay	
x 31				

226	Dio	FeO on fracture	epidote, chlorite in 5 dmass and vnlts. minor py in ½" Qtz vnlt. hematite, striations	
Box 24	Altered diorite	Rx has reddish look' FeO, clay along slip-striations	argillic alteration mod. propylitic - Chlorite.	
245				
Box 25	Altered diorite	FeO. Diorite has reddish cast	Argillic	
264		1½" Qtz-calcite vnlt. Diorite has greenish-grey look	Propylitic and argillic alt. Chlorite? 5% in groundmass green	
Box 26	Altered diorite	broken, slickensides	bleaching, Chlorite (argillization)	
254		Qtz stks.		
			silicification begins at 257 py.	
Box 27			Silicified diorite - Qtz [illegible] diss py, chlorite, dk [illegible] along slips, dk, quartz.	
263.5		Qtz vnlt, gray quartz, brecciated py	py, dk. streaks in Rx., gouey Geo Chem	263.5
Box 28			Argillic & propylitic alt. Silicification wk, rx soft -	271
272			272 Silicification + gouey zones wk, galena?, py, tet? core has greenish cast. Qtz vnlts v. wkly, min	272
Box 2.				281.5
281.5		Host Rx. Jos. Diorite, bleached Chlorite	bleached, propylitized Fine grained galena, tet? 287 → 288.5 vnlts - v. minor Chalco py.	287
Box 30				288.5
289.5		Jos. Diorite - Silicified, Qtz vnlts, but v. wkly mineralized	Silicified, Chlorite, Argillic alt. Feldr → clay.	
Box 31				
299		Altered Jos. Diorite Chlorite	307.5 galena, chalcopy, 308.5 Harmatite? intense propylitic alt. occurs with chlorite, minor Quartz stks	Assay 307.5 308.5
309		309 altered Jos. Diorite 312.5	309 Argillic alt. 312.5 bleaching, feldr. soft, core has gray look. vnlts of FeOx	
314		316.5 Jos Diorite w/ vnlts of calcite, quartz, calcite is dominate	312.5 Diorite is not bleached, Dk. Green 316.5 black.	
319		altered, broken Jos Diorite w/ calcite ≋ vnlts.	318 bleaching, Talc on seam, calcite diss, py. 318 → 322 - moderate bleaching, slickensides stained w/ FeOx, minor Talc (arg.) on seams.	
327				

NO. _____ STOP _____ DIRECTION N30°W

LOGGED BY Ray Rokipanch SIZE NX

DEPTH ____ COLLAR ELEVATION 5,505 COORDINANCE _____ N, _____

Footage	Geologic Description	Assay Cu	Pb	Zn	Au	Ag
	322 → 327.5 argillic alteration. Kaolinite on fractures, Feldsp. → clay, minor talc, chlorite, qtz, calcite vnlts.					
	327.5 → 330.5 silicification, altered Jur. Diorite. FeO₂ on vnlts., talc or chlorite on seams, mod. bleaching.					
57	330.5 → 349, bleached and silicified Jur. Diorite - potassic alteration. Qtz, adularia vnlts. V. minor ore minerals, diss py.					
7	349 clay increases, silicification, adularia					
	core has greenish cast.					
	Diss py increases, abundant adularia, silica					
57	vnlts qtz w/ adularia carry minor amounts of chalcopy, hermatite, galena, rosin zinc.					
	vnlts are sometimes massive sulfides but widely distributed.					
	A few vnlts 1" that are vuggy. poorly formed xls in vugs, Frothy looking.					
57						
17						
	— 321					
	Best mineralization					
7	Quartz is dense					
	vuggy middle					
	394 → 396 Chlorite, striations,					
7	394. seems to be post ore slicks.					
	} silicified, green -					
	398					
	↓ qtz, clay,					
	401					
	bleaching					
7	FeO₂ vnlts Diss py					
	↓					
	1" vnlts of specular hematite					
	qtz, end of bleaching					

ACT TORO START 10-15-78. INCLINATION -60°

HOLE NO. TD-11 STOP DIRECTION N30°W

LOGGED BY Ray Roseborough SIZE NX

DEPTH COLLAR ELEVATION ~~5520~~ 5,505 COORDINANCE N,

Stage	Geologic Description	Assay Cu	Pb	Zn	Au	Ag
	412 TO 442 Fresh Josephine Diorite, Dark, Fine grained, siliceous.					
	BOTTOM					

ROCKY MOUNTAIN GEOCHEMICAL CORP.
2561 EAST FORT LOWELL ROAD • TUCSON, ARIZONA 85716 • PHONE: (602) 795-0780
TUCSON OFFICE

Certificate of Analysis

RECEIVED
MAR 31 1978

RMGC Numbers:
Local Job No. 78-5-20T
Foreign Job No.:
Invoice No.: T7822

Date: March 30, 1978.

Client: Occidental Minerals
4500 E. Speedway
Suite #26
Tucson, Arizona 85712

Client Order No.:

Report On: 9 Samples.

Submitted by: Joe Wise

Date Received: March 27, 1978.

Analysis: Cu, Pb, Zn, Au, and Ag.

Analytical Methods: Cu, Pb, and Zn determined by Atomic Absorption.
Au and Ag determined by Fire Assay.

Remarks:

cc: Enc.(2), RMGC: SLC, file
PDW:sll

Sample Number	% Cu	% Pb	% Zn	oz./ton Au	oz./ton Ag
BJ-1-78	1.23	7.9	11.9	-0.006	7.23
BJ-2-78	-0.40	1.36	3.72	-0.006	1.22
BJ-3-78	1.87	0.83	4.9	-0.006	1.48
BJ-4-78	1.03	1.98	1.16	0.008	17.23
BJ-5-78	2.40	7.1	2.22	-0.006	71.32
BJ-6-78	0.054	0.20	0.16	-0.006	0.19
BJ-7-78	0.049	4.1	0.011	0.016	4.23
BJ-8-78	0.48	20.1	0.91	0.026	6.77
BJ-9-78	11.3	0.52	7.7	-0.006	5.00

By Parry D. Willard

Parry D. Willard

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

TORO PROJECT

ASSAY RESULTS

SAMPLE NO.	DESCRIPTION	oz./T Au	oz./T Ag	% Cu	% Pb	% Zn
BJ-1-78	H.G. Gn, Spl, Cpy at face of new drift, Veta Grande Pros. vein 8'+ wide	-0.006	7.23	1.23	7.9	11.9
BJ-2-78	Muck on waste dump, Veta Grande Pros.	-0.006	1.22	0.40	1.36	3.7
BJ-3-78	Dump Spt. Qtz vn material from shaft on Compadre Vein	-0.006	1.48	1.87	0.83	4.9
BJ-4-78	Dump Spl H.G.? w/green Agd. from Sm pros. pit on vein, vein 2' wide	0.008	17.23	1.03	1.98	1.1
BJ-5-78	H.G. Dump Spl. Arkansas shaft - spl. of hand sorted tetrahedrite on dump	-0.006	71.32	2.40	7.1	2.2
BJ-6-78	Dump Spl - sulfide dump Boulanger Vein	-0.006	0.19	0.054	0.20	0.1
BJ-7-78	Back of MS Tunnel 3' ox vein material w/scattered sulf.	0.016	4.23	0.049	4.1	0.0
BJ-8-78	Back of MS Tunnel 1-2' High Grade sulfides gn, spl.	0.026	6.77	0.48	20.1	
BJ-9-78	V.H.G. spl. of chunk of Cpy & Tetrahedrite ore from sluff at back of Bonanza B Level	-0.006	5.00	11.3	0.52	7.7
Toro						
1	M & S Vein, oxidized outcrop - 11 ft/sample - total 22feet	.32 ppm	22 ppm	.16	432	
2		.14 ppm	< 1 ppm	1.37	162	
T-30	Bonanza vein 10' to flt zone show 1-1½' qtz w bx Cr w/ 5-10% S^- Casts all S- leached from surface	.02	7 ppm	.08	.06	350
T-31	Bonanza vein 25' wide Slc flt. bx w/bx Qtz vein Tr CuOx orig. 5% S^- rx stgly bx over entire zone. All S^- leached rx La Bx 10% of total width Qtz vn.	.02	18	.15	.29	
T-32	Oroca O A Loc Mon. 8' deep pros pit show well of hem veined Latite bx & Hw of 3' Qtz bx Seds w/ 10-20% S^- casts & Tr Wox Spl of 3' Tr minzed. zone	.01	38	.58	2.66	
T-33	Bonanza vein 4' Tk show white Qtz w/ 5-10% S^- casts w/stg. FeOx, MnO_2 stain No ore minerals seen	.11	13	.17	.23	

TORO PROJECT

ASSAY RESULTS

SAMPLE NO.	DESCRIPTION	oz./T Au	oz./T Ag	% Cu	% Pb	% Zn
T-34	FW & HW wall rx adj. to vein 5' on either side shows 2-3 qv/ft on HW w/stg. FeOx MnO_2 FW stgly bx FeOx, MnO_2 stained La bx but no Qtz veinlets	<.01	4	.07	.10	.05
T-35	Bonanza Vein - 6' T white Qtz w/20% spc Tr S^- casts. Nature of veins gradually changed from area w. of flt. Much fewer S^-, host rx diorite are unminzed. adj. to vein.	.10	8	.06	.08	305 ppm
T-36	Bonanza vein spl. across 20' at vein intersection shows bx QV w/ 20% Spec. Tr S^- costs and weak veining of diorite	.05	2	167 ppm	170 ppm	270 ppm
T-37	Bonanza Vn Spl across 10' show bx Qtz vn w/ 5-10% spec. Minor FeOx. No evidence of S^- similar to above spl.	.01	15	129 ppm	.07	265 ppm
T-38	Possible Emily or sister vein south of Emily outcropping in road cut to Josephine Canyon. Split sample across vein.	<.01	<1	.05	.12	.06
T-39	Same as above	<.01	<1	.06	.11	289 ppm
T-40	Bonanza Vn. main entrance. Sample from a 25-30' width. Outer zones shows intense FeOx staining volcs.(?) hematite & limonite. Broad shattered zone wl flt. gouge and $CuCO_3$ 10' thick. Thick qtz vein with sulf. casts and intense FeOx stain grading back into stained volcs(?) Vein N72W 68NE	.08ppm	14	.22	.16	.32
T-41	Bonanza Vn. at entrance to the drfit on main road to Veta Grande. Spl. across a 15-20' zone in highly altered volcs(?). Show similar zoning as described in previous sample with outer zones carrying strong FeOx stain, hematite and limonite shattered zone is weaker here 2-3' max. and qtz is much more disseminated and less massive. Vn N72W 63NE	.02 ppm	8	.06	.29	.23
T-42	Continuation of previous spl - here encounter less qtz. and another flt. structure EW83°S. Qtz. occurs as thin veinlets. Rock in this zone is highly fractured. Much stain FeOx on fracs. To the N. of the structure are essentially unaltered volcs. or intrusive	.02 ppm	4	156ppm	.11	.26
T-43	Qtz. vn. on strike w/the Bonanza vn. Qtz. here does not appear to be massive but granular and f. gr. There are obviously many generations of depos. Minor FeOX and MnOx stain. Vein N69W 78°NE	.06 ppm	32	.12	.40	.11

TORO PROJECT

ASSAY RESULTS

SAMPLE NO.	DESCRIPTION	oz./T Au	oz./T Ag	% Cu	% Pb	% Zn
T-44	Right near 2nd claim post. Extension of Bonanza qtz vn (prev. smpl). Sample from 2' zone of qtz vn and some wall rock. Qtz. is massive unlike granular prev. spl. Appears to have embayed surrounding volcs. Strong FeOx stain on vn w/lg. suf. casts hematite and limonite coatings.	.10 ppm	16	.10	.96	.13
T-45	Qtz. gully vein. Massive and locally granular. Intense FeOx stain and sulf. casts. Zone is approx. 6-8' wide and highly shattered. The silica has embayed the volcs. cuts by the frac. as numerous volc. rock frags. were observed (breccia) Vein N75W	.02 ppm	2	88ppm	202ppm	128ppm
T-46	Qtz. vein right near claim post and at prospect pit. Massive Qtz. up to 3' wide. Obviously more than one generation. Fairly strong FeOx stain. Not as highly fractured as prev. spl. Some MnOx and limonite on fracs.	.08 ppm	58	166ppm	.11	74ppm
T-47	Veta Grande Vein N63W 81SW. Cuts volc. rocks oblique to their bedding attitude. Highly sheared zone 15-20' wide. Very qtz. rich - qtz is granular (multi-generation). Abnt. $CuCO_3$ in qtz. and hematite after sulf. Minor FeOx stain in central portion of vein as per usual. Stain most conc. at vein margins. Sampled zone 40' wide. Massive qtz. dies out away from central vein diminishing to veinlets. Slicks strike slip 3°N 67W	.02 ppm	14	.14	.11	.50
T-48	Extension of Veta Grande. Highly fractured silicified volc. rock. Qtz veinlets dying out. Some FeOx stain away from vein center fault EW50°S. $CuCO_3$ in shattered zone.	.08 ppm	2	.10	.13	310ppm
T-49	Veta Grande vein. Highly shattered qtz w/abnt $CuCO_3$'s. Fairly strong FeOx and MnOx. Wall rock is volc vein N10W 80NE	.08 ppm	18	.39	.23	.07
T-50	Spl. of Qtz vn and alt La ppy Po 2-3' TK w/Tr CuOx in vn & Gr. adj to vein 11 Qtz stringers ½" Tk. vn is qtz and patially digested rx. frags. Alt. zone 20' wide	.10 ppm	2	140ppm	296ppm	.11
T-51	5' Tk zone of sheeted Volc w several ¼" Qtz. stringers in 1" wide zone volc. show minor Slc & Che alt. of mafics. Veta Grande zone v. weak at this point, Tr CuOx w/qtz 2% S⁻ casts in Qtz.	.22 ppm	44	352ppm	460ppm	208ppm
T-52	Spl. alt Tv & Qtz stringers in HW of major falt. vn. - Qtz show 2-3% S⁻ Casts strg. clay alt. of La ppy.	.10 ppm	1	76ppm	462ppm	78ppm

TORO PROJECT

ASSAY RESULTS

SAMPLE NO.	DESCRIPTION	oz./T Au	oz./T Ag	% Cu	% Pb	% Zn
T-53	Qtz. vns in lg shear zone Tr $S^{=}$ Casts mostly while bx vn Qtz spl interesting in that Qtz. vns. are restricted to 150 x 100' area. Area is well alt. as any previously seen but mineralization appears weak.	.04 ppm	60	.07	.72	306ppm
T-54	Sm. otc. of alt. Tv w/Slc in wash. May be extension of zone in Spl T-52, 53 but 5' wide rx show minor FeOx, MnO_2.	.06 ppm	1	252ppm	.13	210ppm
T-55	Dump spl shows stgly clay-Ser alt. La ppy w/ minor MnO_2 & med. CuOx rx show Slc & evid. of 2% orig. $S^{=}$. Spl from pros. at bend in vein.	.04 ppm	6	.11	.27	.36
T-56	Select spl Qtz Ven show CuOx, Cpy, CC in FeOx std. Qtz on dump of sm. pros. Spl. same loc. as above. Alt & Minzed. zone 20-25' wide poss. good target.	.16 ppm	64	1.72	.21	.63
T-57	Qtz. vein N77W 79SW. White, massive w/alt. sulf casts. FeOx stain on fracs. Highly fractured 4-5' wide. Numerous intersecting veinlets and embayed country rock. Vein has banded qtz. druses.	.02 ppm	8	.05	.06	162ppm
T-58	Qtz. vein white massive, more widely spaced here than prev. spl. pinching out to just about nothing to the east. Minor FeOx stain fairly well shattered.	.08 ppm	20	254ppm	.05	108ppm
T-59	Qtz. vein from zone approx 35' zone. Massive qtz. and alt chl. wall rock. Some sulf. N67W 70NE. Strong FeOx stain	.12 ppm	12	238ppm	.12	.18
T-60	San Ramon Shaft. py & qtz. veins. dump sample.	.98 ppm	56	.10	.58	.15
T-61	12' due across vein at shallow shaft. Strong qtz, Limonite, hematite - total sulf. est @ 15-20% - some Asurite-malachite remaining - dip vertical, N80E srike	.02 ppm	100 ppm	0.77	2.56	.85
T-62	Vein 10-12' wide - grab sample from dump at east shaft - 80' deep - Qtz Limonite, hematite with occa. Az-mala. Total sulfide in original vein 20%. - dip 90°, N85E strike	.20 ppm	29 ppm	0.47	0.23	.03
T-63	8' vein - qtz, limonite, hematite, Az-mala. Original sulfide 15-20%. Dip 85'N, EW strike. Dump grab sample.	.02 ppm	22 ppm	0.19	0.22	.05
T-64	7'-8' vein - Qtz, limonite, hematite. 90° dip N70-75W strike	.12 ppm	42 ppm	180	0.05	.05

TORO PROJECT

ASSAY RESULTS

SAMPLE NO.	DESCRIPTION	oz./T Au	oz./T Ag	% Cu	% Pb	% Zn
T-65	Channel across Dolores vein in large open cut - silicified w/qtz stringers and occa. malachite, Azurite remaining	.03ppm	30 ppm	0.21	0.15	.14
T-66	Grab sample - dumps from upper Wandering Jew workings.	.15ppm	74 ppm	0.11	7.10	.25
T-67	Upper drill pad - Bonanza	Nil	5.16	6.45	8.10	31.10
T-68	Lower portal dump - Wandering Jew	Nil	1.32	.68	2.27	.32
T-69	Grab - Milatto Dump	Nil	.36	.06	8.65	.24
T-70	Altered host rock. Prob. volc. - feldspars are extremely altered to green clay	<.02	30 ppm	534 ppm	.37	.92
T-71	Vein material - appears to be a silicic dike rock w/intense FeOx stain. Also much calcite. Veinlets extend into wall rock across 5' zone on N57W 70° SW flt	.08	21.10	.11	.45	.21
T-72	Dump grab sample. Much calcite, qtz., some sulfide, good FeOx staining. Some CuOx's	<.02	22 ppm	268 ppm	.22	.30
T-73	Qtz. vein and veinlet material. Looks barren w/minor FeOx stain - MnOx's and perhaps sparse sulfide casts	<.02	16 ppm	120 ppm	.16	325 ppm

TORO PROJECT

ASSAY RESULTS

SAMPLE NO.	DESCRIPTION	oz./T Au	oz./T Ag	% Cu	% Pb	% Zn	Mo
TWJ- 6	Soil samples across Wandering Jew Vein	.06ppm	1ppm	34ppm	.07	220ppm	
7		.02ppm	1ppm	36ppm	.06	140ppm	
8		.02ppm	2ppm	56ppm	.16	180ppm	
9		.02ppm	2ppm	.53ppm	.09	.05	
10		.04ppm	3ppm	90ppm	.18	.16	
11		.08ppm	2ppm	40ppm	.10	.05	
12		.02ppm	1ppm	27ppm	.07	105ppm	
13	MnOx stained Quartz vein. 3.0' across. 1% casts. Jew Extension just above rd.	.04ppm	78ppm	.12%	1.23%	.17%	
14	Same vein up strike 200', 3.5' across MnOx stained Quartz vein. Cast approx. 1%. Multi-stage Quartz.	.04ppm	11ppm	235ppm	.40%	.15%	
TAT- 1	15.0' of Hanging Wall of Arkansas Traveler Vein. Quartz porphyry	<.02ppm	<1	82ppm	75ppm	67ppm	
TAG- 1	Dump sample from Apache Vein. 5% casts, Quartz, minor MnOx stain. Minor Wulfenite	.06ppm	3ppm	106ppm	1.71	.22%	42
TAP- 1	Dump sample. High-grade Quartz Arizona-Pittsburg vein	2.28ppm	18.67oz.	.29%	1.96%	1.00%	82
	Lower grade, Quartz	.46ppm	109ppm	.31%	.34%	.49%	8
T-Fox 1	Argillized agglomerate Fox Claim	<.02ppm	<1ppm	46ppm	33ppm	26ppm	4
2	Argillized agglomerate, minor py.	<.02ppm	1ppm	56ppm	34ppm	43ppm	2
3	Dump from Fox drift. Quartz, vuggy, FeOx, MnOx, malachite, azurite, galena, chalcopyrite	<.02ppm	16ppm	.28%	.34%	.27%	66
4	Dump from Fox shaft. Boxwork lacking Quartz, no sulfides noted. 21% casts	.04ppm	7ppm	157ppm	294ppm	510ppm	72
5	Argillized agglomerate	<.02ppm	1ppm	42ppm	29ppm	60ppm	1

TORO PROJECT

ASSAY RESULTS

MPLE NO.	DESCRIPTION	oz./T Au	oz./T Ag	% Cu	% Pb	% Zn
T-Do-1	Soil line across Dolores Vein	<.02ppm	4ppm	.08	.21	.05
2	Soil samples	.04ppm	13ppm	.14	.16	.06
3		.08ppm	24ppm	.21	.59	.05
4		.04ppm	2ppm	224ppm	.07	195ppm
5		.06ppm	2ppm	206ppm	.05	240ppm
6		.04ppm	1ppm	162ppm	320ppm	210ppm
7		.02ppm	1ppm	132ppm	92ppm	200ppm
Tw-J	Rock-chip across					
1	Jew Vejn - Quartz 7.0'	.04ppm	7ppm	57ppm	.12	.08ppm
2	10.0' silicified arkose	.02ppm	12ppm	226ppm	.14	.05ppm
3	10.0' silicified arkose	.05ppm	3ppm	60ppm	.07	.12
4	15.0' Quartz, veinlets, silicified arkose	.05ppm	6ppm	85ppm	.10	.06
5	15.0' silicified arkose	.05ppm	2ppm	47ppm	.15	.10ppm
.M.S.						
1	Soil line across M & S. vein	.02ppm	2ppm	88ppm	.17	.09
2		.12ppm	2ppm	78ppm	.15	.21
3		.14ppm	13ppm	89ppm	.32	.13
4		.12ppm	4ppm	94ppm	.50	.15
5		.14ppm	6ppm	104ppm	.67	.16

TOKO PROJECT

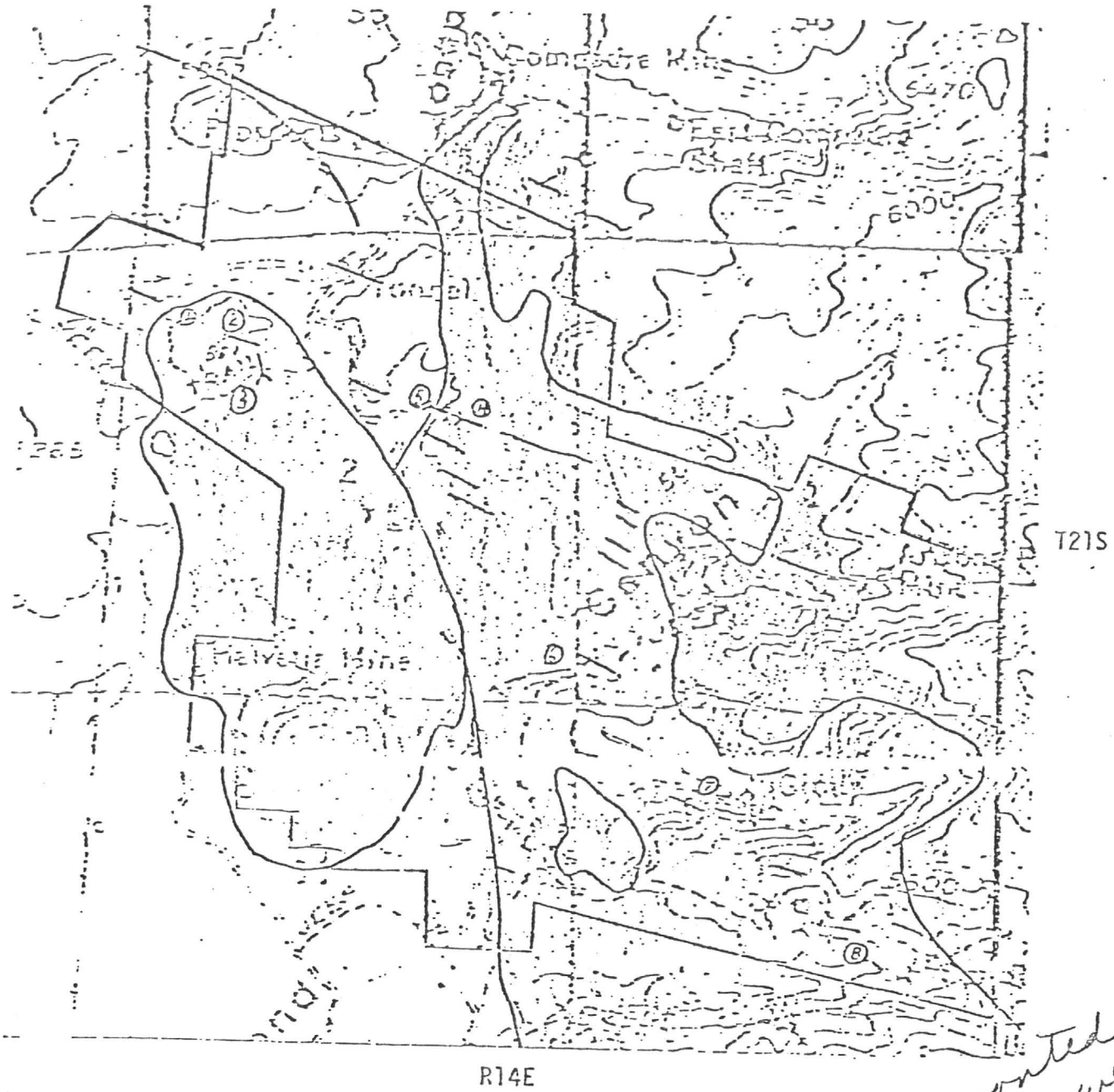
ASSAY RESULTS

MPLE NO.	DESCRIPTION	oz./T Au	oz./T Ag	% Cu	% Pb	% Zn	Mo.
TMS- 6	10.0' across mineralized zone parallel to M&S vein. Diorite host	<.02ppm	7ppm	276ppm	.68%	.54%	67pp
TWJ-17	6.0' across bull quartz. Minor specularite, comb quartz, crushed, banded	.04ppm	14ppm	205ppm	745ppm	96ppm	30pp
TWJ-20	1.0' quartz vein-brecciated-MnOx, minor hematite in casts, very buggy, pyrolusite cementing quartz frags., comb quartz	<.02ppm	7ppm	432ppm	.30%	424ppm	116pp
TWJ-21	5.0' across quartz vein and silicified volcanics, Minor py, cast 2%, minor MnOx, mostly FeOx stain	<.02ppm	19ppm	392ppm	.10%	152ppm	38pp
TWJ-22	0.2' quartz veinlet, 2% specularite, 5-10% boxwork. High-grade selected sample. Stringer zone approximately 5.0' wide. Pb boxwork?	<.02ppm	1ppm	76ppm	512ppm	24ppm	1pp
TWJ-23	Selected High-grade from Jew dump. Massive galena	<.02ppm	182ppm	.63%	28.2%	.41%	5
T-100	Quartz veinlet. 0.2' wide. Few S casts or vugs. Comb Quartz, multi-stage dep. specular hematite	<.02ppm	6ppm	187ppm	274ppm	20ppm	7pp
T-101	5.0' across quartz vein. Wandering Jew vein 300' w. of old Jew Mill Site. S casts in ¼ of vein. Multi stage vein 75% of vein is bull Quartz. Minor MnOx stain.	.04ppm	9ppm	448ppm	.31	228ppm	90pp
T-102	3.0' across quartz vein. 10-20% casts. Vein is brecciated. No workings. Malachite, anglesite, and galena-noted. Up to 6.0' wide. MnOx stain on outcrop. Paystreak about 1-1½' across.	.04ppm	29ppm	736ppm	2.17%	510ppm	87pp
T-103	1.0 channel across H.G. portion of 3-7.0' vein. 20-30% casts. Galena and anglesite noted 100' north of T-102	.04ppm	12ppm	.10%	1.66%	292ppm	38pp
T-104	2.0 channel across quartz vein. Total vein is about 5.0'. Casts about 5-10%	<.02ppm	17ppm	300ppm	.74%	374ppm	194pp
T-105A	Mulatto vein across from Drill Site TD-9. 5.0' across quartz outcrop. Minor MnOx. comb quartz.	<.02ppm	3ppm	166ppm	.15%	280ppm	36pp

MPLE NO.	DESCRIPTION	oz./T Au	oz./T Ag	% Cu	% Pb	% Zn
T-106A	Mullato vein 300 E of prev. sample (along strike) 3.0' across quartz vein. 2% casts. Minor MnOx stain. Comb quartz	<.02ppm	8ppm	282ppm	.30%	650ppm
T-105	Arizona-Pittsburgh Vein + 92' south - soil	<.02ppm	<1ppm	69ppm	48ppm	74ppm
T-106	+62' south	<.02ppm	<1ppm	76ppm	86ppm	108ppm
T-107	+42' South	<.02ppm	<1ppm	56ppm	47ppm	80ppm
T-108	+22' south	<.02ppm	<1ppm	94ppm	61ppm	106ppm
T-109	+22' north	<.02ppm	1ppm	140ppm	274ppm	222ppm
T-110	42' north of outcrop	<.02ppm	<1ppm	69ppm	162ppm	142ppm
T-111	+90' north of outcrop	<.04ppm	4ppm	194ppm	550ppm	320ppm
T-112	Fault zone with minor quartz parallel to Arizona-Pittsburgh vein in road cut 2.0' MnOx	.06ppm	2ppm	90ppm	112ppm	149ppm
T-113	Same zone 200 E. along strike. Very heavy MnOx.	.46ppm	6ppm	60ppm	184ppm	.10%
T-114	Float. MnOx, quartz. 200 yards E. along strike from Arizona-Pittsburgh drill site. Vein in Squaw Gulch granite.	<.02ppm	36ppm	165ppm	756ppm	.17%
T-115	2.0' channel across stope in Jew Mine.	0.04 oz/T	2.20 oz/T	0.53%	7.20%	4.60%

Santa Cruz Co., Arizona

QUINTANA



0 — 5000 Feet

Quartz Latite Porphyry

Quartz Diorite

Welded Tuff } Salero Formation

Arkose } Salero Formation

Quartz Vein

Fault

Quintana wanted to drill, but we chose OXY instead

QUINTANA

Bond Group Prospect

SAMPLE RESULTS

BG 11D Location 2 -- Quartz-fault breccia vein 10' wide
<0.02 ppm Au 0.47 oz/ton Ag 0.35% Pb 970 ppm Zn 910 ppm Cu

BG 12D Location 3 -- See underground map; 6' fault material with visible sphalerite, galena, and chalcopyrite
0.03 ppm Au 1.06 oz/ton Ag 1.46% Pb 3.22% Zn 0.56% Cu

BG 13D Location 3 -- See underground map; taken from muck pile
0.11 ppm Au 7.79 oz/ton Ag 3.00% Pb 8.90% Zn 1.39% Cu

BG 14D Location 4 -- See underground map; 3' vein
<0.02 ppm Au 0.38 oz/ton Ag 0.10% Pb 0.34% Zn 0.42% Cu

BG 15D Location 4 -- See underground map; 6-8' quartz-jasperoid vein
0.43 ppm Au 2.18 oz/ton Ag 0.45% Pb 1.22% Zn 2.91% Cu

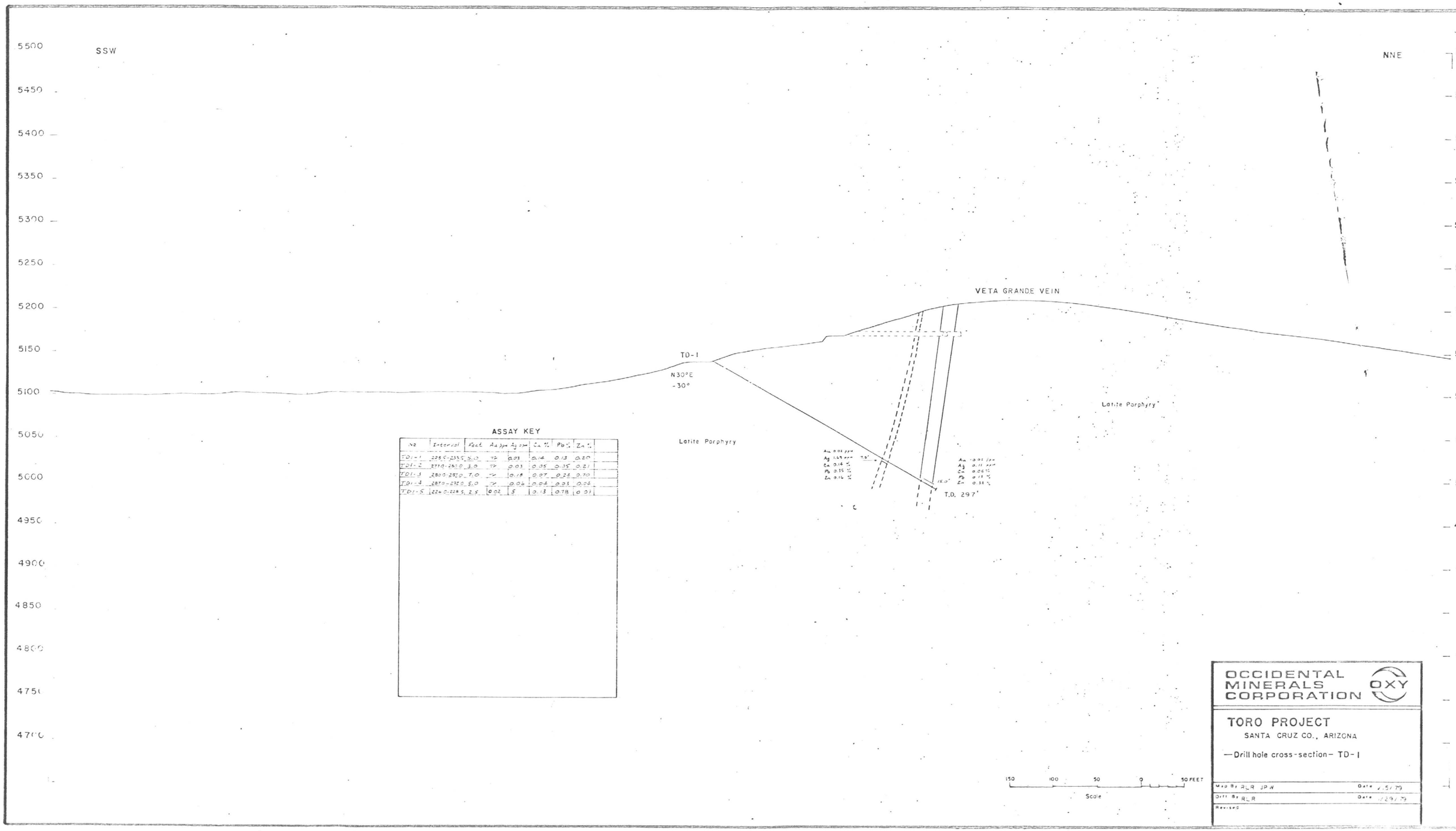
BG 16D Location 5 -- See underground map; 6' quartz-gouge
0.08 ppm Au 3.76 oz/ton Ag 0.90% Pb 3.72% Zn 1.98% Cu

BG 17D Location 6 -- 1' fault only at surface-structure is reported to be a 7' vein at 75' depth
<0.02 ppm Au 0.01 oz/ton Ag <0.01% Pb 520 ppm Zn 30 ppm Cu

BG 18D Location 7 -- 5' quartz vein
0.05 ppm Au 0.94 oz/ton Ag 1.44% Pb 340 ppm Zn 570 ppm Cu

BG 19D Location 8 -- Southern quartz-fault vein 10' wide
0.13 ppm Au 0.25 oz/ton Ag 0.85% Pb 0.88% Zn 330 ppm Cu

BG 20D Location 8 -- Northern quartz-fault vein 20' wide
0.16 ppm Au 0.38 oz/ton Ag 1.04% Pb 0.38% Zn 280 ppm Cu



ASSAY KEY

No	Interval	Feet	Au ppm	Ag ppm	Cu %	Pb %	Zn %
TD1-1	2295.0-2335.5	5.0	.02	.03	0.14	0.13	0.20
TD1-2	2770.0-2810.0	3.0	.02	0.03	0.05	0.35	0.21
TD1-3	2800.0-2870.0	7.0	.02	0.18	0.07	0.25	0.70
TD1-4	2870.0-2920.0	5.0	.02	0.06	0.04	0.05	0.06
TD1-5	2226.0-2228.5	2.5	0.02	.5	0.13	0.78	0.51

OCCIDENTAL MINERALS CORPORATION

OXY

TORO PROJECT

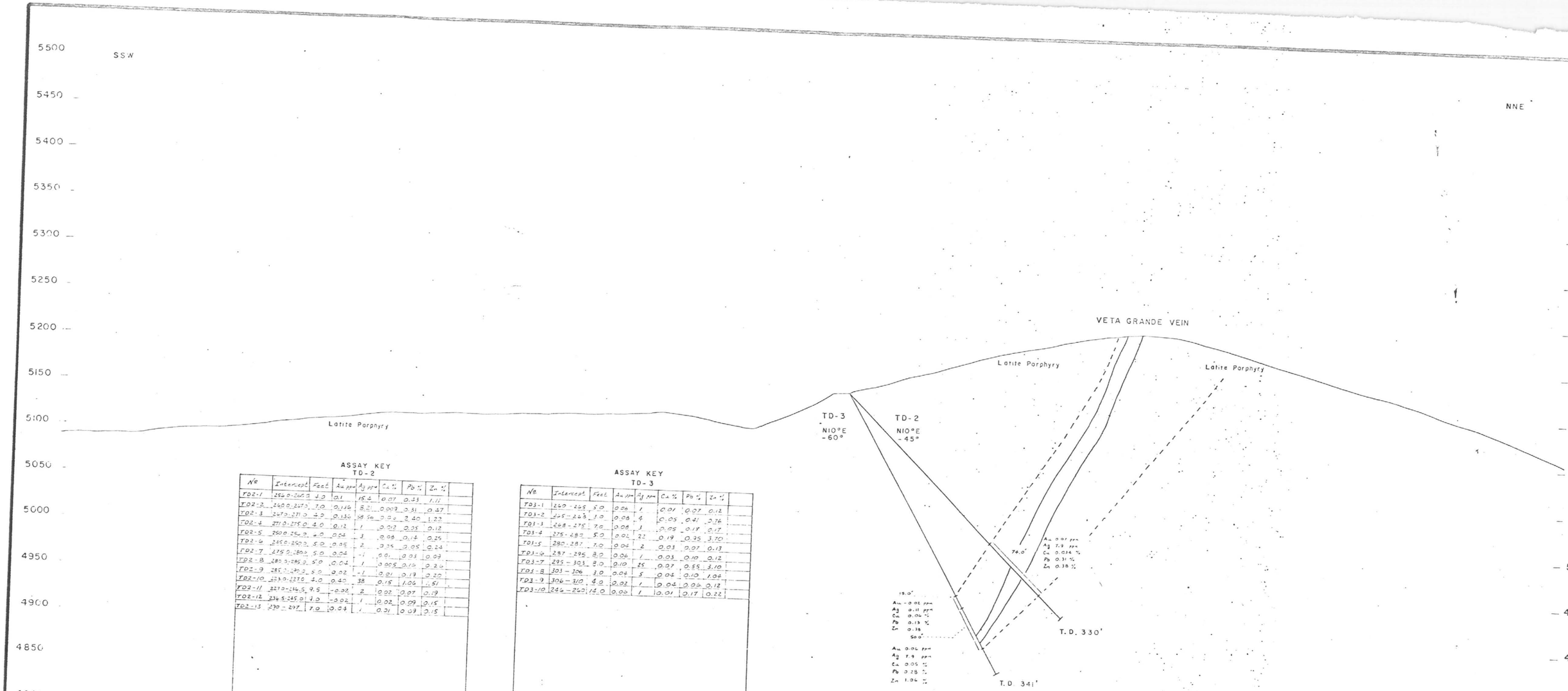
SANTA CRUZ CO., ARIZONA

—Drill hole cross-section— TD-1

Map By RLR JPW Date 1/5/79

Drft By RLR Date 1/29/79

Revised



ASSAY KEY
TD-2

Nº	Intercept	Feet	Au ppm	Ag ppm	Cu %	Pb %	Zn %
TD2-1	260.0-267.0	7.0	0.1	15.4	0.07	0.33	1.11
TD2-2	260.0-267.0	7.0	0.136	8.21	0.007	0.31	0.47
TD2-3	267.0-271.0	4.0	0.136	58.50	0.06	2.40	1.22
TD2-4	271.0-275.0	4.0	0.12	1	0.012	0.05	0.12
TD2-5	250.0-254.0	4.0	0.04	3	0.08	0.14	0.25
TD2-6	245.0-250.0	5.0	0.05	2	0.05	0.05	0.24
TD2-7	275.0-280.0	5.0	0.04	-1	0.01	0.03	0.09
TD2-8	280.0-285.0	5.0	0.04	1	0.005	0.16	0.26
TD2-9	285.0-290.0	5.0	0.02	-1	0.01	0.19	0.20
TD2-10	223.0-227.0	4.0	0.42	38	0.15	1.06	1.51
TD2-11	227.0-236.5	9.5	-0.02	2	0.02	0.07	0.19
TD2-12	236.5-245.0	4.0	-0.02	1	0.02	0.09	0.15
TD2-13	290-297	7.0	0.04	1	0.01	0.09	0.15

ASSAY KEY
TD-3

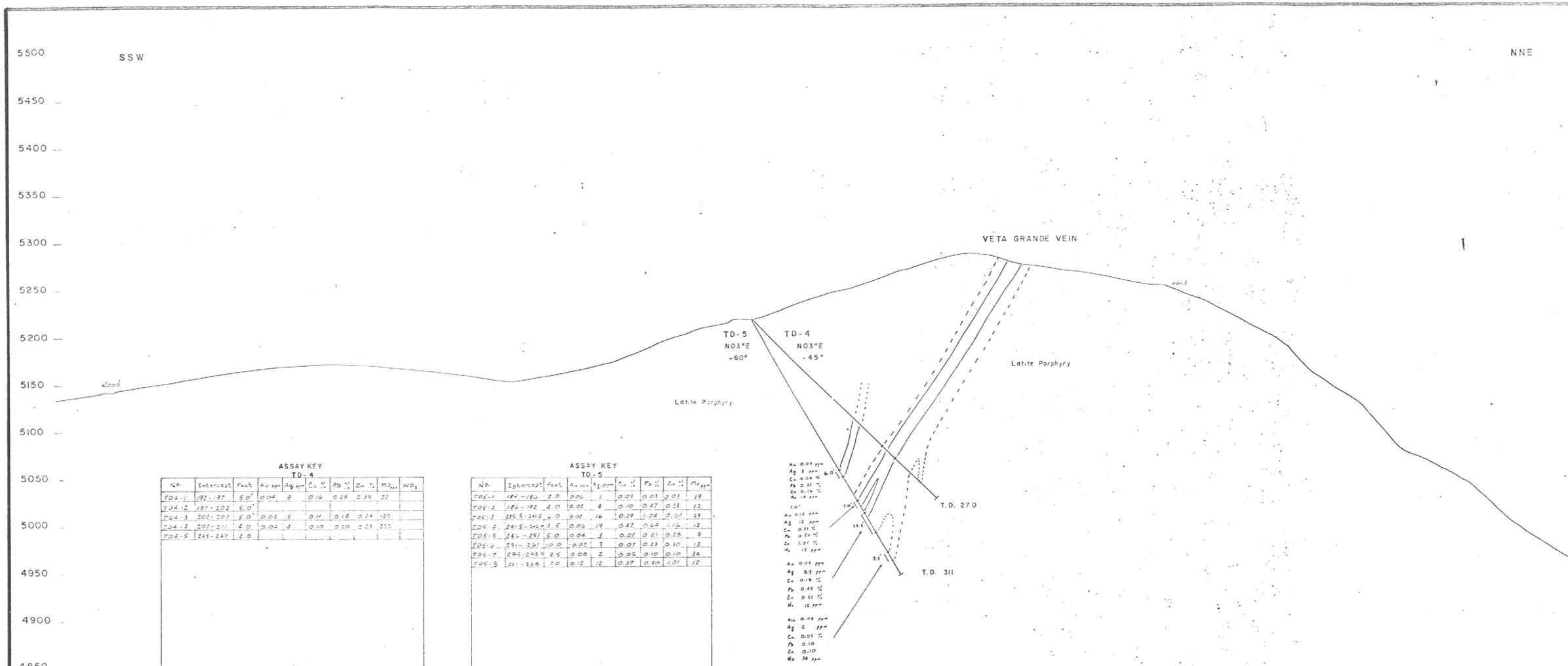
Nº	Intercept	Feet	Au ppm	Ag ppm	Cu %	Pb %	Zn %
TD3-1	250-255	5.0	0.06	1	0.01	0.07	0.12
TD3-2	255-258	3.0	0.08	4	0.05	0.41	0.76
TD3-3	268-275	7.0	0.08	3	0.05	0.18	0.17
TD3-4	275-282	5.0	0.01	22	0.19	0.35	3.70
TD3-5	280-287	7.0	0.04	2	0.03	0.07	0.13
TD3-6	287-295	8.0	0.06	1	0.03	0.10	0.12
TD3-7	295-303	8.0	0.10	25	0.07	0.55	3.10
TD3-8	303-306	3.0	0.04	5	0.04	0.10	1.04
TD3-9	306-310	4.0	0.02	1	0.04	0.06	0.12
TD3-10	246-260	14.0	0.06	1	0.01	0.17	0.22

OCCIDENTAL MINERALS CORPORATION
OXY

TORO PROJECT
SANTA CRUZ CO., ARIZONA

—Drill hole cross-section— TD-2 & 3

Map By RLR JPW Date 1/12/79
Drill By RLR Date 1/12/79
Revised



ASSAY KEY
TD-4

No	Intercept	Feet	Au ppm	Ag ppm	Cu %	Pb %	Zn %	Mo ppm	WO3
TD4-1	192-197	5.0'	0.04	8	0.16	0.25	0.35	22	
TD4-2	197-202	5.0'							
TD4-3	202-207	5.0'	0.02	5	0.11	0.18	0.24	125	
TD4-4	207-211	4.0	0.04	4	0.10	0.20	0.23	230	
TD4-5	245-247	2.0							

ASSAY KEY
TD-5

No	Intercept	Feet	Au ppm	Ag ppm	Cu %	Pb %	Zn %	Mo ppm
TD5-1	184-186	2.0	0.06	1	0.03	0.03	0.03	19
TD5-2	186-192	6.0	0.02	4	0.10	0.47	0.23	12
TD5-3	235.5-241.5	6.0	0.02	16	0.29	1.06	0.61	23
TD5-4	241.5-243	1.5	0.06	19	0.42	0.64	1.16	12
TD5-5	246-251	5.0	0.04	3	0.07	0.21	0.28	9
TD5-6	251-261	10.0	0.02	3	0.07	0.23	0.30	13
TD5-7	285-295.5	9.5	0.08	2	0.05	0.10	0.10	34
TD5-8	221-228	7.0	0.12	12	0.37	0.50	1.01	12

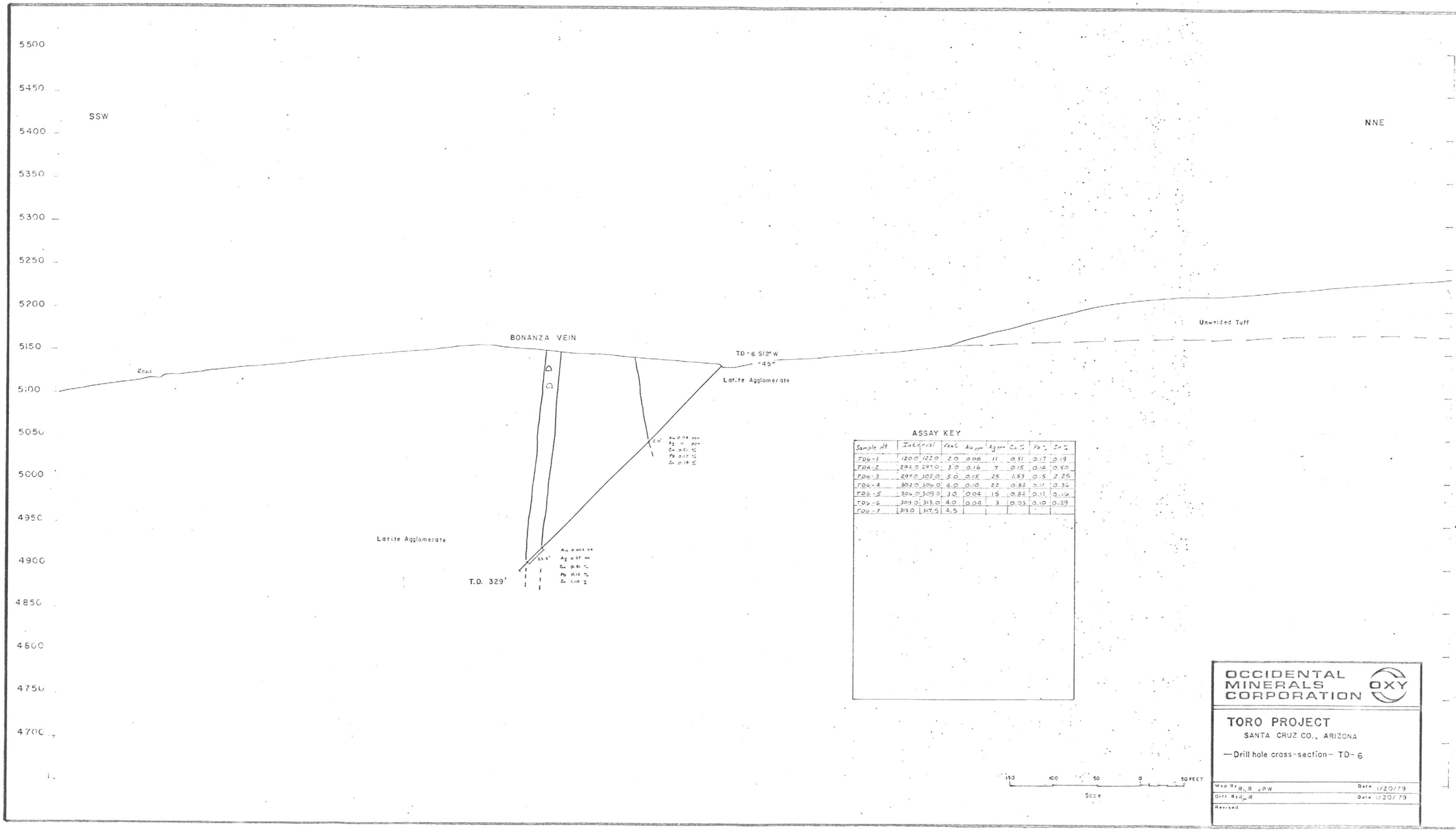
150 100 50 0 50 FEET
Scale

OCCIDENTAL MINERALS CORPORATION OXY

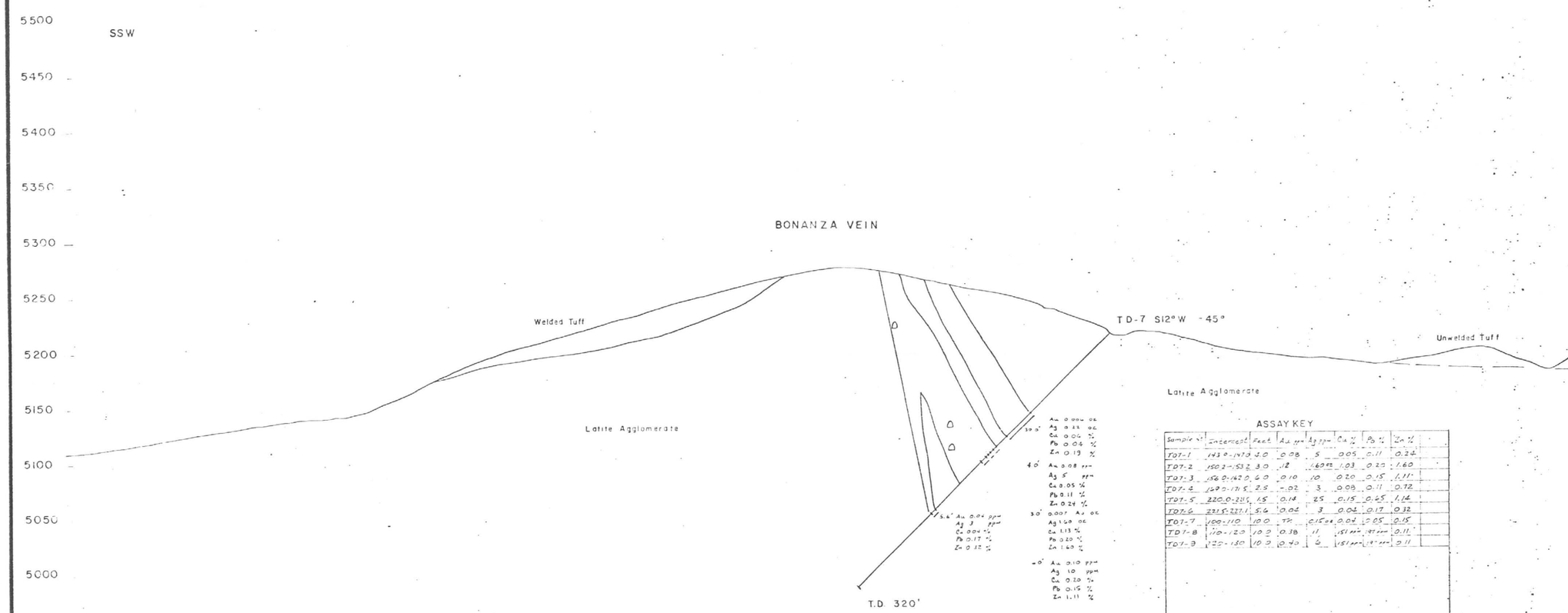
TORO PROJECT
SANTA CRUZ CO., ARIZONA

—Drill hole cross-section— TD-4 & 5

Made By RLR JPW Date 1/12/79
Drft By RLR Date 1/31/79
Revised



Sample No	Interval		Feet	Au ppm	Ag ppm	Cu %	Pb %	Zn %
TD6-1	120.0	122.0	2.0	0.08	11	0.51	0.17	0.19
TD6-2	294.0	297.0	3.0	0.16	7	0.15	0.14	0.50
TD6-3	297.0	302.0	5.0	0.15	25	1.53	0.15	2.25
TD6-4	302.0	306.0	4.0	0.10	22	0.82	0.11	0.36
TD6-5	306.0	309.0	3.0	0.04	15	0.82	0.11	0.16
TD6-6	309.0	313.0	4.0	0.04	3	0.03	0.10	0.29
TD6-7	313.0	317.5	4.5					



ASSAY KEY

Sample #	Intercept	Feet	Au ppm	Ag ppm	Cu %	Pb %	Zn %
TD7-1	143.0-147.0	4.0	0.08	5	0.05	0.11	0.24
TD7-2	150.2-153.2	3.0	.12	1.60 oz	1.03	0.20	1.60
TD7-3	156.0-162.0	6.0	0.10	10	0.20	0.15	1.11
TD7-4	169.0-171.5	2.5	-.02	3	0.08	0.11	0.72
TD7-5	220.0-221.5	1.5	0.14	25	0.15	0.65	1.14
TD7-6	221.5-227.1	5.6	0.04	3	0.04	0.17	0.32
TD7-7	100-110	10.0	Tr	0.15 oz	0.04	0.05	0.15
TD7-8	110-120	10.0	0.38	11	.151 ppm	.197 ppm	0.11
TD7-9	120-130	10.0	0.40	6	.151 ppm	.197 ppm	0.11

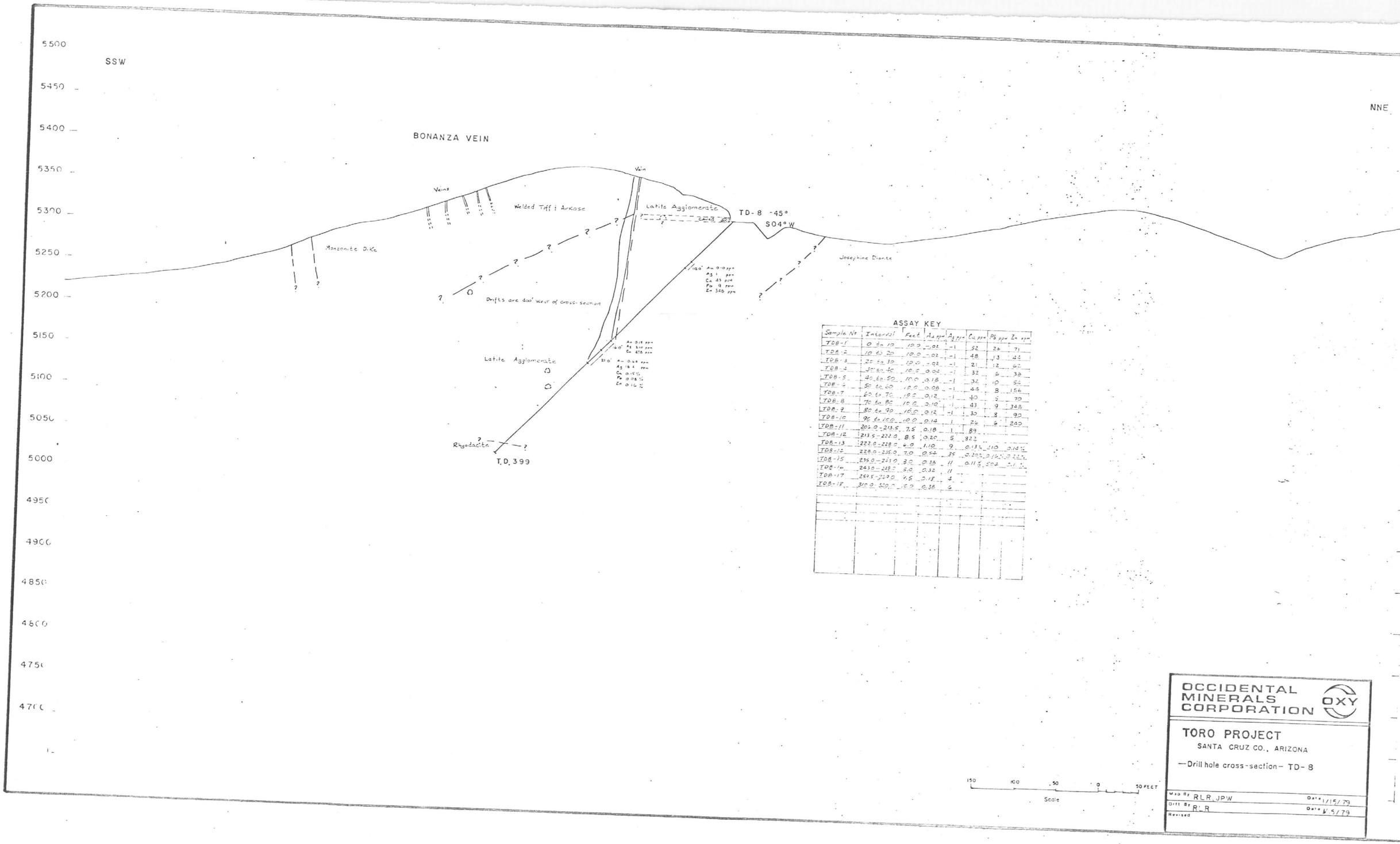
150 100 50 0 50 FEET
Scale

OCCIDENTAL MINERALS CORPORATION OXY

TORO PROJECT
SANTA CRUZ CO., ARIZONA

—Drill hole cross-section— TD-7

Map By RLR JPW Date 1/15/79
Drill By RLR Date 1/15/79
Revised



ASSAY KEY

Sample No	Interval Feet		Au ppm	Ag ppm	Cu ppm	Pb ppm	Zn ppm
TDB-1	0 to 10	10.0	-.02	-1	52	26	71
TDB-2	10 to 20	10.0	-.02	-1	48	13	42
TDB-3	20 to 30	10.0	-.02	-1	21	12	60
TDB-4	30 to 40	10.0	0.04	-1	32	6	38
TDB-5	40 to 50	10.0	0.18	-1	32	10	54
TDB-6	50 to 60	10.0	0.08	-1	44	8	156
TDB-7	60 to 70	10.0	0.12	-1	40	5	70
TDB-8	70 to 80	10.0	0.10	-1	43	9	348
TDB-9	80 to 90	10.0	0.12	-1	30	8	90
TDB-10	90 to 100	10.0	0.14	1	26	6	240
TDB-11	205.0-213.5	7.5	0.18	1	89		
TDB-12	213.5-222.0	8.5	0.20	5	322		
TDB-13	222.0-228.0	6.0	1.10	9	0.13%	210	0.14%
TDB-14	228.0-235.0	7.0	0.54	35	0.20%	0.16%	0.22%
TDB-15	235.0-243.0	8.0	0.36	11	0.11%	502	0.1%
TDB-16	243.0-248.0	5.0	0.32	11			
TDB-17	248.5-250.0	1.5	0.18	4			
TDB-18	310.0-320.0	10.0	0.38	6			

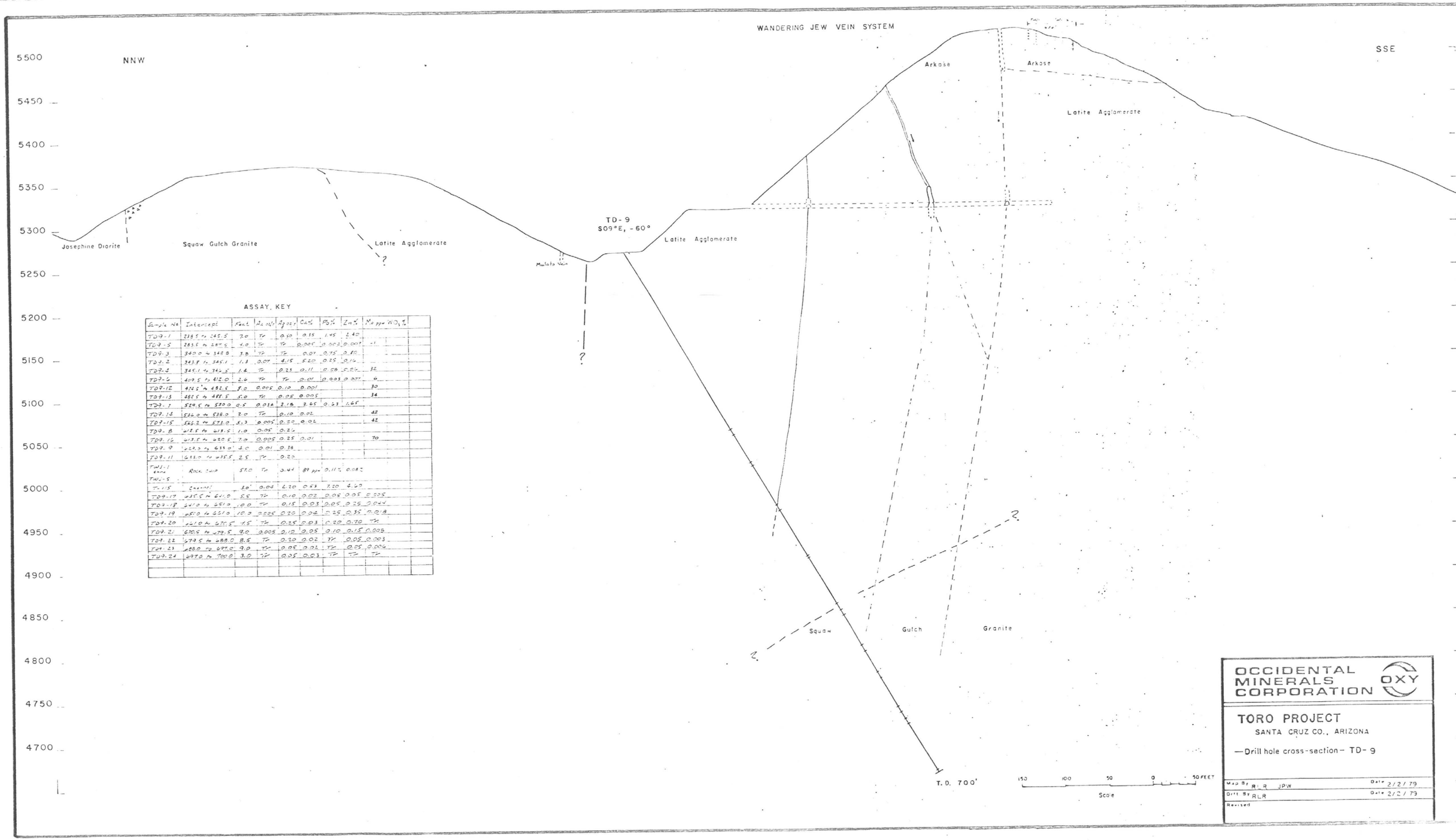
150 100 50 0 50 FEET
Scale

OCCIDENTAL MINERALS CORPORATION OXY

TORO PROJECT
SANTA CRUZ CO., ARIZONA

—Drill hole cross-section— TD-8

Map By RLR, JPW Date 1/15/79
Drft By RLR Date 1/5/79
Revised



ASSAY KEY

Sample No	Intercept	Feet	Au oz/t	Ag oz/t	Cu%	Pb%	Zn%	Mo ppm	WO_3%
TD9-1	238.5 to 245.5	7.0	Tr	0.50	0.15	1.45	2.40		
TD9-5	283.5 to 287.5	4.0	Tr	Tr	0.005	0.002	0.007	<1	
TD9-3	340.0 to 348.8	3.8	Tr	Tr	0.01	0.75	0.10		
TD9-2	343.8 to 345.1	1.3	0.07	4.15	5.20	0.25	0.14		
TD9-4	345.1 to 346.5	1.4	Tr	0.25	0.11	0.58	0.04	32	
TD9-6	409.5 to 412.0	2.6	Tr	Tr	0.01	0.003	0.007	6	
TD9-12	474.5 to 482.5	8.0	0.005	0.10	0.001			30	
TD9-13	485.5 to 488.5	5.0	Tr	0.05	0.005			34	
TD9-7	529.5 to 530.0	0.5	0.014	2.18	3.65	0.53	1.65		
TD9-14	536.0 to 538.0	2.0	Tr	0.10	0.02			42	
TD9-15	566.2 to 571.0	5.3	0.005	0.20	0.01			42	
TD9-8	612.5 to 613.5	1.0	0.05	0.26					
TD9-16	613.5 to 620.5	7.0	0.005	0.25	0.01			70	
TD9-9	623.5 to 633.0	2.0	0.01	0.38					
TD9-11	633.0 to 635.5	2.5	Tr	0.20					
TWJ-1 thru TWJ-5	Rock chip	57.0	Tr	0.44	89 ppm	0.11%	0.08%		
T-15	Cuttings	3.0	0.04	6.20	0.53	7.20	4.60		
TD9-17	635.5 to 641.0	5.5	Tr	0.10	0.02	0.05	0.05	0.005	
TD9-18	641.0 to 651.0	10.0	Tr	0.15	0.03	0.05	0.25	0.064	
TD9-19	651.0 to 661.0	10.0	0.005	0.20	0.04	0.25	0.35	0.018	
TD9-20	661.0 to 670.5	9.5	Tr	0.25	0.03	0.20	0.70	Tr	
TD9-21	670.5 to 679.5	9.0	0.005	0.12	0.05	0.10	0.15	0.005	
TD9-22	679.5 to 688.0	8.5	Tr	0.20	0.02	Tr	0.05	0.003	
TD9-23	688.0 to 697.0	9.0	Tr	0.05	0.01	Tr	0.05	0.006	
TD9-24	697.0 to 700.0	3.0	Tr	0.05	0.03	Tr	Tr	Tr	

OCCIDENTAL MINERALS CORPORATION OXY

TORO PROJECT

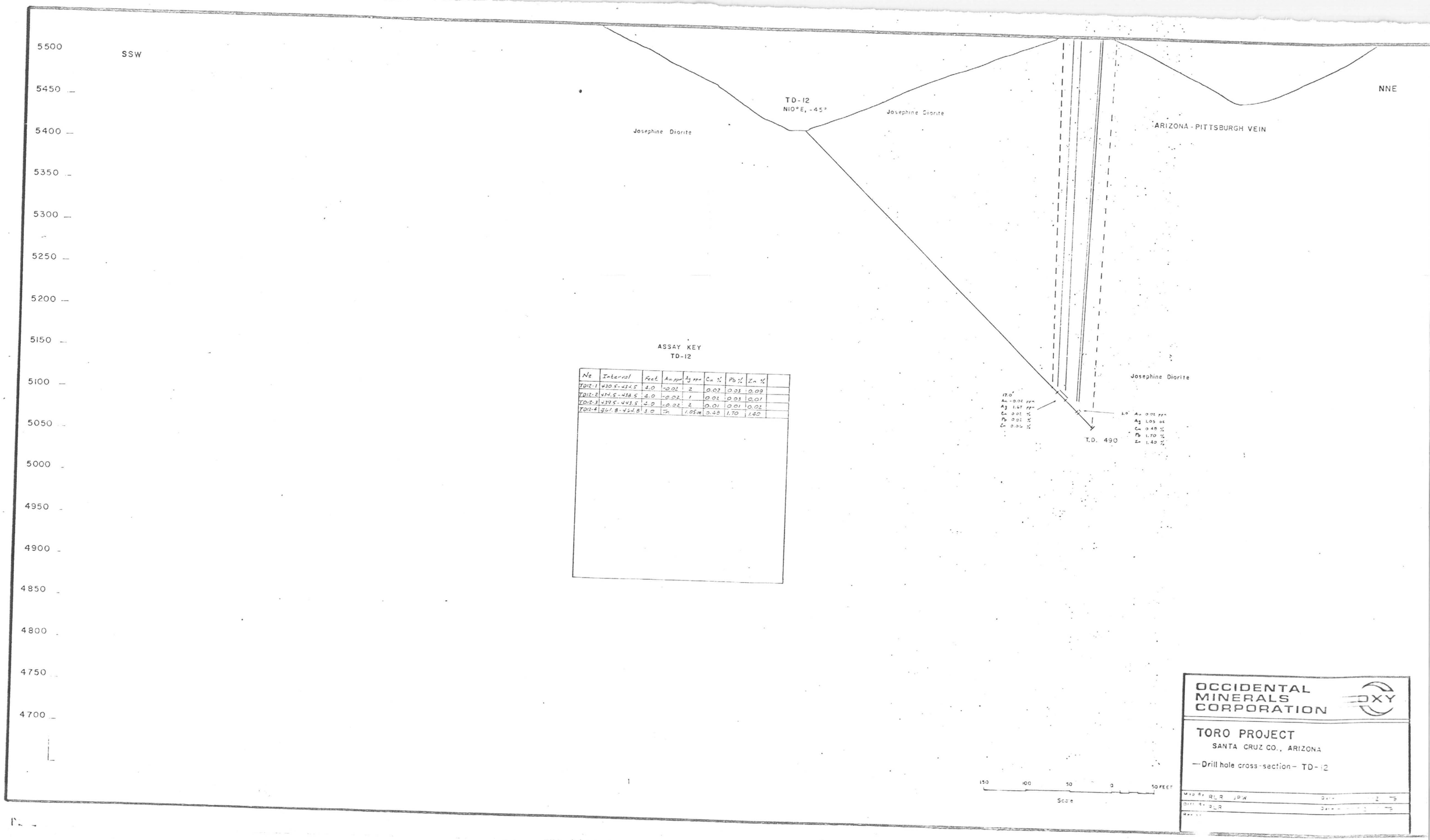
SANTA CRUZ CO., ARIZONA

—Drill hole cross-section— TD-9

Map By RLR JPW Date 2/2/79

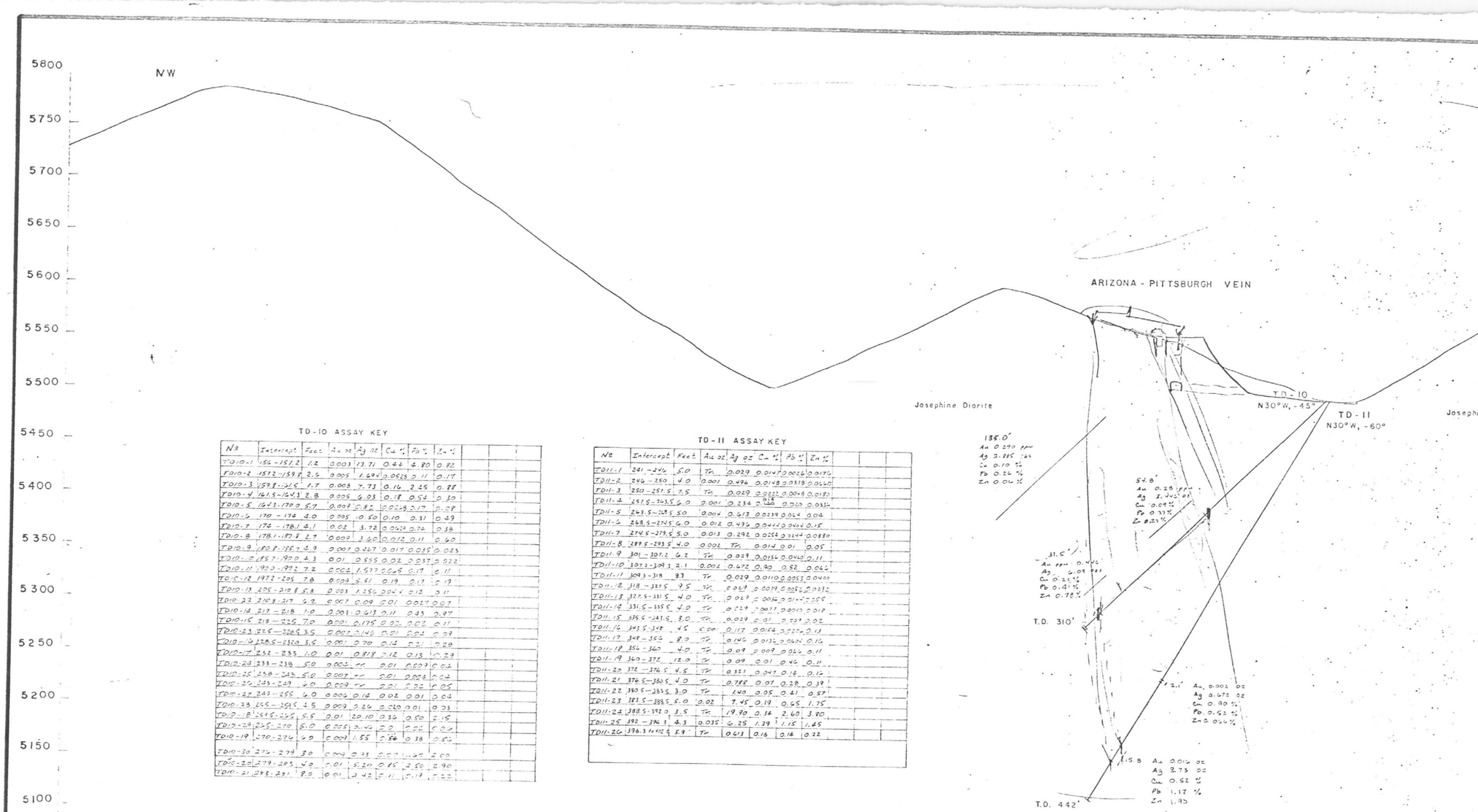
Drft By RLR Date 2/2/79

Revised



ASSAY KEY
TD-12

No	Interval	Feet	Au ppm	Ag ppm	Cu %	Pb %	Zn %
TD12-1	430.5-434.5	4.0	<0.02	2	0.02	0.03	0.09
TD12-2	434.5-438.5	4.0	<0.02	1	0.02	0.03	0.01
TD12-3	439.5-443.5	4.0	<0.02	2	0.01	0.01	0.02
TD12-4	561.8-564.8	3.0	Tr.	1.05oz	0.48	1.70	1.40



TD-10 ASSAY KEY

No	Intercept	Feet	Au oz	Ag oz	Cu %	Pb %	Zn %			
TD10-1	156-157.2	1.2	0.003	13.71	0.44	4.80	0.82			
TD10-2	157.2-159.7	2.5	0.005	1.694	0.0625	0.11	0.17			
TD10-3	159.8-161.5	1.7	0.008	7.73	0.16	2.25	0.88			
TD10-4	161.5-164.3	2.8	0.005	6.03	0.18	0.54	0.30			
TD10-5	164.3-170.0	5.7	0.009	0.82	0.0258	0.17	0.08			
TD10-6	170-174	4.0	0.005	0.50	0.10	0.31	0.49			
TD10-7	174-178.1	4.1	0.02	3.72	0.024	0.76	0.38			
TD10-8	178.1-180.8	2.7	0.009	3.60	0.012	0.11	0.60			
TD10-9	180.8-185.7	4.9	0.007	0.467	0.017	0.035	0.023			
TD10-10	185.7-190.0	4.3	0.01	0.555	0.02	0.037	0.022			
TD10-11	190.0-197.2	7.2	0.002	1.577	0.065	0.17	0.11			
TD10-12	197.2-205	7.8	0.003	5.81	0.19	0.17	0.19			
TD10-13	205-210.8	5.8	0.005	1.256	0.064	0.12	0.11			
TD10-22	210.3-217	6.2	0.007	0.09	0.01	0.027	0.07			
TD10-14	217-218	1.0	0.003	0.613	0.11	0.43	0.37			
TD10-15	218-225	7.0	0.001	0.175	0.02	0.02	0.11			
TD10-23	225-228.5	3.5	0.002	0.145	0.01	0.02	0.08			
TD10-16	228.5-232.5	3.5	0.001	0.70	0.12	0.21	0.28			
TD10-17	232-233	1.0	0.01	0.818	0.12	0.13	0.23			
TD10-24	233-238	5.0	0.002	--	0.01	0.009	0.02			
TD10-25	238-243	5.0	0.007	--	0.01	0.006	0.02			
TD10-26	243-249	6.0	0.009	--	0.01	0.22	0.05			
TD10-27	249-255	6.0	0.006	0.18	0.02	0.01	0.02			
TD10-28	255-259.5	4.5	0.009	0.26	0.020	0.01	0.03			
TD10-18	259.5-265	5.5	0.01	20.10	0.36	0.50	2.15			
TD10-29	265-270	5.0	0.005	0.46	0.2	0.02	0.02			
TD10-19	270-276	6.0	0.009	1.55	0.56	0.38	0.56			
TD10-30	276-279	3.0	0.004	0.35	0.07	1.60	2.00			
TD10-20	279-285	6.0	0.01	5.20	0.15	2.50	2.90			
TD10-21	285-291	6.0	0.01	2.42	0.11	0.19	0.23			

TD-11 ASSAY KEY

No	Intercept	Feet	Au oz	Ag oz	Cu %	Pb %	Zn %			
TD11-1	241-246	5.0	Tr.	0.029	0.0147	0.0026	0.0170			
TD11-2	246-250	4.0	0.001	0.496	0.0148	0.0378	0.0620			
TD11-3	250-257.5	7.5	Tr.	0.029	0.0222	0.0048	0.0180			
TD11-4	257.5-263.5	6.0	0.001	0.234	0.014 0.060	0.020	0.035			
TD11-5	263.5-268.5	5.0	0.004	0.613	0.0239	0.064	0.04			
TD11-6	268.5-274.5	6.0	0.012	0.496	0.0445	0.064	0.15			
TD11-7	274.5-279.5	5.0	0.013	0.292	0.0252	0.0244	0.0880			
TD11-8	289.5-293.5	4.0	0.002	Tr.	0.014	0.01	0.05			
TD11-9	301-307.2	6.2	Tr.	0.029	0.0156	0.0460	0.11			
TD11-10	307.2-309.3	2.1	0.002	0.672	0.90	0.52	0.062			
TD11-11	309.3-318	8.7	Tr.	0.029	0.0110	0.0053	0.0400			
TD11-12	318-327.5	9.5	Tr.	0.029	0.0079	0.0056	0.0332			
TD11-13	327.5-331.5	4.0	Tr.	0.029	0.0046	0.0147	0.055			
TD11-14	331.5-335.5	4.0	Tr.	0.029	0.0077	0.0050	0.017			
TD11-15	335.5-343.5	8.0	Tr.	0.029	0.01	0.039	0.02			
TD11-16	343.5-348	4.5	0.00	0.117	0.0164	0.0224	0.13			
TD11-17	348-356	8.0	Tr.	0.146	0.0132	0.0620	0.16			
TD11-18	356-360	4.0	Tr.	0.09	0.009	0.056	0.11			
TD11-19	360-372	12.0	Tr.	0.09	0.01	0.46	0.11			
TD11-20	372-376.5	4.5	Tr.	0.321	0.047	0.16	0.12			
TD11-21	376.5-380.5	4.0	Tr.	0.788	0.07	0.28	0.39			
TD11-22	380.5-383.5	3.0	Tr.	1.40	0.05	0.61	0.57			
TD11-23	383.5-388.5	5.0	0.02	7.45	0.19	0.65	1.75			
TD11-24	388.5-392.0	3.5	Tr.	19.90	0.14	2.60	3.80			
TD11-25	392-396.3	4.3	0.035	6.25	1.39	1.15	1.45			
TD11-26	396.3-402.5	5.9	Tr.	0.613	0.16	0.14	0.22			

150 100 50 0 50 FEET
Scale

OCCIDENTAL MINERALS CORPORATION OXY

TORO PROJECT
SANTA CRUZ CO., ARIZONA

—Drill hole cross-section— TD-10 & 11

Map By RLR JPW Date 1/23/79
Drft By RLR Date 1/23/79
Revised

U of Ariz. bulletin

RED ROCK MINING DISTRICT

The Red Rock mining district lies to the east and northeast of the Harshaw district, bounded on the north by Sonoita Creek, on the east by an arbitrary line along the Canelo Hills, and on the south by Meadow Valley Flat. The name probably came from the red color of the oxidized volcanics that cover much of the district.

The topography, carved out of the Laramide andesite and rhyolite volcanics, is very rough and partly rugged. Irregular mountains and hills are separated by wandering canyons and washes. In the Canelo Hills, fault blocks and slices of Paleozoic sediments, Mesozoic volcanics, and Laramide sediments occur in a northwest-striking belt. Known base and precious metal mineralization is restricted to small, shallow, and weak occurrences of oxidized copper, lead, and zinc in or along fault and fracture zones in Laramide volcanics. A small amount of manganese occurs in fractured and brecciated Mesozoic welded tuff in the Canelo Hills area.

Several mineral occurrences were prospected and worked in the 1880's and sporadically in the 1900's. Several pockets of high grade silver and minor lead, copper, zinc and gold were opened up by shallow shafts, adits, and open cuts. The total estimated and recorded production of base and precious metals from the Red Rock district would be little more than 530 tons of ore containing about 56 hundred ounces of silver, 20 tons each of lead and copper, 2 tons of zinc and 4 ounces of gold for a total value of about 15 thousand dollars. A few tens of long tons of hand-picked manganese ore came from one deposit at times of premium prices.

Only weak and spotty mineralization has been found in the district but a careful examination for alteration zones in the volcanics, particularly in the rhyolite to the east of Red Mountain should be made for indications of hidden mineralization. Some disseminated pyrite and oxidized copper mineralization has been found bordering the Harshaw district.

SAN CAYETANO MINING DISTRICT

The San Cayetano mining district is a small, elliptical-shaped area covering the San Cayetano Mountains, an outlying foothill range to the west of the southern Santa Rita

Mountains. The name was given to the mountains by the Spaniards. The rough topography results from the erosion of the Late Mesozoic tuffaceous and sandy sediments and volcanic tuffs intruded by Laramide quartz diorite and quartz monzonite and Tertiary granodiorite. Swarms of Late Tertiary rhyodacite porphyry dikes cut across the range. The district was first described by Schrader (1915) and mapped and described by Drewes (1971a, 1971b, 1972a, 1972b).

Scattered quartz-calcite veins and veinlets containing weak and spotty argentiferous copper, lead, and zinc mineralization ore are found in the Laramide intrusive and along a strong fault zone at the east side of the range. The mineralization was prospected by the early Spaniards and Mexicans and by Americans in the early 1900's. Considerable development has been done locally but only a few tons of silver-enriched copper ore was ever shipped.

The geologic setting and mineralization does not suggest the presence of economic mineralization in the district.

TYNDALL MINING DISTRICT

The Tyndall mining district covers a large area along the west flank of the southern Santa Rita Mountains, extending from the border with Pima County and the Old Baldy district to the north to Sonoita Creek to the south. The eastern boundary with the Wrightson district is along the general crest of the mountains and the western edge is an arbitrary line along the base of the western foothills, including the Governor Hills. The southern part of the district was at one time called the Aztec district from an early mine of that name. The origin of the name Tyndall is unknown but the district was organized in November 17, 1876 when the Tyndall Mining Company was operating the Abercon mine (location unknown).

The topography of the northern part of the district and the east side is mostly very rough with steep rocky slopes, sharp ridges, and deep canyons. The high peaks of Mt. Hopkins and Mt. Wrightson are at the northeast corner. To the south the topography is more subdued and rolling but locally rough. The western slope is broken into irregular bench-like foothills separated by numerous canyons.

The geology of the district has been mapped and studied

in some detail by Drewes (1971a, 1971b, 1972a, 1972b) and locally by university students. Some erosional exposures of Precambrian gneiss occur at the base of the western foothills and thrust-faulted blocks and strips of Paleozoic sediments occur in the northwestern section. Most of the district is underlain by Mesozoic and Tertiary volcanics and continental sediments that have been domed up and partly eroded away over a central core of Laramide quartz diorite to quartz monzonite intrusives. An intricate pattern of strong northwest and north striking thrust and block faults and swarms of quartz latite and rhyolite dikes cut across the district. Similarly swarms of irregular, lensing quartz veins locally occupy eastwest to northwest striking fissure or fracture zones. The strong major fault structures appear to be deep-seated and to have been active over a long geologic period, possibly extending back into the Mesozoic and thus were guiding controls on igneous intrusion and mineralization.

Two general types of mineralization occur in the district. Most prevalent are the irregular and lensing quartz fissure veins containing spotty argentiferous lead, zinc, and copper minerals with some pyrite, barite, and calcite. These veins, often in swarms, cut the Mesozoic volcanics, interbedded arkose, and the granitic intrusions in a westerly to northwesterly direction. The second and more localized type of mineralization is the largely oxidized replacement deposits of argentiferous lead, zinc, and minor copper in the strongly faulted and folded blocks of Paleozoic limestone in the northwest part of the district. Oxidation has produced rich silver values in the upper parts of both types. The gold content is very low.

Mining in the Tyndall district dates back to the arrival of the Jesuit Fathers in the Santa Cruz valley in the 1680's. With Indian labor they discovered and mined numerous vein outcrops for oxidized and enriched argentiferous lead. The ore was smelted and the silver recovered in crude adobe furnaces near the missions. Several deposits in the Salero and Alto areas continued to be worked up to the time of the Mexican Revolution. At the time of the Gadsden Purchase in 1853 they had long been abandoned due to unrestricted Apache raids. By 1856, Americans prospectors and exploration companys moved in, taking over the old mines and looking for additional deposits. Most prominent were the

Sonora Mining & Exploration Co., the Arizona Mining Co., and the Santa Rita Mining Co. The early account by Pumpelly (1870) gives a vivid account of the difficulties of mining operations in those early years. With the start of the Civil War and the withdrawal of military protection, the mines were forced to close down due to renewed Apache attacks. In the early 1870's it was again possible to start up mining activities in the district and considerable shallow, oxidized, and enriched lead-silver ore was extracted. In the Salero and Alto areas, lengthy litigation over the title to the claims with the owners of the Luis Maria Baca Land Grant No. 3 interrupted or delayed many operations. The Grant had been incorrectly surveyed in 1866 and final settlement was not reached for many years. Mining operations at any one property has been intermittent with few years when more than a few hundred tons of ore were shipped. The most productive years on record for the vein mines were in 1913-1914, 1923 through 1928, 1942, and 1948 when the Jefferson mine in the Alto area was the major operation. In 1952 through 1959, 1965-1966, and in 1972, the Glove mine, operating on the oxidized replacement deposits in limestone, produced from one thousand to over five thousand tons of ore per year. There has been little or no recent production from other mines in the district.

The total estimated and recorded production of base and precious metals from the Tyndall district through 1972 would be some 56 thousand tons of ore containing about 9.4 thousand tons of lead, 2.8 thousand tons of zinc, 480 thousand ounces of silver, 1,260 ounces of gold, and 500 tons of copper for a total value of some 3.6 million dollars.

The more obvious surface indications of economic mineralization in the Tyndall district have been prospected or worked over many years. What may remain in the vein-type deposits is of doubtful economic value and the replacement deposits in Paleozoic limestone appear to be limited. However, the strong northwestward alignment of faults and quartz vein swarms extend outward from Red Mountain which appears to be a center for more intense copper mineralization and suggests that a careful geologic study of this structural zone might indicate favorable loci for deeper economic deposits. Drewes (1973) has shown geochemical anomalous areas in the district which should be further investigated.

Valenzuela:						eraging about 3.5% Cu, Ag/T and 0.1 oz. Au/T.	
18. Santa Nino mine (Havalina Mg. Co., Miami Copper Co., Southern Copper Mines Co., Beyerle, Santo Nino Mg. Co., Young & Gardner, Santo Nino Lessees)	1-5S	16E	NW¼ 9	Cu, Mo, Ag, Au-, Pb-, Zn-	Lenticular, intensely hydrothermized zones with disseminated chalcopyrite, pockets of molybdenite, pyrite and pods of quartz surrounded by zones of quartz-sulfide veinlets along faults, fissures, and joints in Laramide granodiorite.	Adit operations. Worked sporadically from early 1900's through 1956, producing some 20,100 tons of ore averaging about 1% Cu, 1 oz. Ag/T and minor Au. Some 200 tons of Mo ore concentrated to 16 tons of MoS_2 concentrates.	Kupfer, 1965 ABM file data
IX. Redrock District	21-23S	16-18E	——	Cu, Ag, Pb, Zn-, Au-, Mn	1. Small, shallow, and generally weak, oxidized copper, lead, and zinc mineralization, with some supergene enrichment in silver, associated with fault and fracture zones in Laramide andesitic and rhyolitic volcanics. 2. Manganese minerals in a fractured and brecciated zone in Jurassic welded tuff.	Shallow shaft, adit, and open cut operations. Prospected and worked sporadically from the 1880's, mainly for pockets of high grade silver. Total production would amount to some 530 tons of ore containing about 20 tons of copper, 21 tons of lead, 2 tons of zinc, a few ounces of gold and 56,000 ounces of silver. A few tens of tons of hand picked manganese ore have been shipped.	Schrader, 1915, p. 239-245 ABM file data
1. Blue Bird mine (De la Osa & Lemas)	23S	18E	E. Cen. 5	Mn	Manganese oxides in narrow stringers and irregular pods in fractures and breccia in Jurassic welded tuff.	Shaft and open cut operations. Worked in WW I and in early 1950's, producing a few tens of tons of sorted 40-42% Mn.	Farnham et alia, 1961, p. 175-176
2. Durham Copper claims	22S	17E	NE¼ 18	Cu, Ag, Au-	Oxidized copper mineralization with supergene enrichment of silver in narrow fractures in Laramide volcanics.	Shallow shaft and adit operations. Worked sporadically from 1937 through 1941, producing some 70 tons of hand picked ore averaging about 24% Cu, 70 oz. Ag/T and minor Au.	ABM file data
3. Frisco Fair mine group (Hummer, Apex, Margaret; Sweby, Bergman, Chapman, Cole & Daniel)	22S	17E	S. Cen. 17	Pb, Ag, Cu	Small, irregular lenses and pockets of oxidized argentiferous lead mineralization, with some copper, along a fracture zone in Laramide volcanics cut by a granite porphyry dike.	Shaft and open cut operations. Sporadic production from 1916 through 1948 of some 70 tons of ore averaging about 24% Pb, 7 oz. Ag/T, and 2.5% Cu.	ABM file data
4. La Plata mine (Black Ace, Carrie, Jensen)	22S	17E	NW¼ 14	Ag, Cu-, Pb-, Zn-, Mn-	Small, irregular pockets and stringers containing argentite and enargyrite, associated with copper, lead, and zinc carbonates, iron and manganese oxides, and calcite, along a fracture zone in Laramide volcanics.	Tunnel and shaft operations. Worked prior to 1900 with a small production of high grade silver ore.	Schrader, 1915, p. 241-243

Table 4, Cont.

MINING DISTRICT AND MINES	LOCATION T.	R.	Sec.	MINERAL PRODUCTS	GEOLOGY	TYPE OF OPERATION AND PRODUCTION	REFERENCE
X. San Cayetano District (San Cayetano Mountains)	21-22S	13-14E	----	Cu, Ag	Quartz veins and veinlets containing spotty and weak argentiferous copper mineralization in Laramide quartz diorite and in a strong fault zone cutting Cretaceous and Tertiary rhyodacite volcanics.	Shallow shaft and tunnel operations. Worked in the early 1900's but only a relatively few tons of copper-silver ore were ever shipped.	Schrader, 1915, p. 356-358 Simons, 1974 ABM file data
XI. Tyndall District (Western slope of southern part of Santa Rita Mountains)	21-23S	14-15E	----	Pb, Ag, Zn, Cu, Au	1. Irregular and lensing quartz fissure veins containing spotty argentiferous lead, zinc, and copper mineralization and some barite. Generally shallow oxidation with supergene enrichment. Wall rocks are Cretaceous rhyodacite volcanics with interbedded arkose or Jurassic granite. 2. Replacement deposits of argentiferous lead and zinc mineralization with minor copper in strongly faulted blocks of Paleozoic limestone. Deep solution and oxidation produced supergene enrichment in silver, and lead and zinc carbonates.	Numerous scattered mines and prospects, some worked from time of Jesuits to recent times. The total estimated and reported production would be some 56,000 tons of ore containing about 9,400 tons of lead, 2,800 tons of zinc, 520 tons of copper, 480,000 ounces of silver, and 1,260 ounces of gold.	Schrader, 1915, p. 180-220 ABM file data Drewes, 1971a, b; 1972a, b, c
1. Alto mine group (Gold Tree, El Plomo, B. & R., Long Contact; Lully, A. Bernfeld & Co., Alto Consolidated Mines, Smltg. & Transportation Co., Alto Copper Co., Southwest Development Co., Henderson, Bradford, Bond, Laguna, Marano, Long Contact Mg. Co., B. & R. Mines, Fortuna Mg. Co.)	21S	14E	S.½ 12 N.½ 13	Pb, Ag, Cu, Zn, Au (Sb, Bi, As, Ba, U)	Series of roughly parallel, strong, quartz-barite fissure veins carrying lenses and pods of galena, argentite, pyrite, tetrahedrite, chalcopyrite, chalcocite, and local sphalerite, oxidized and supergene enriched near the surface. Wall rocks are Cretaceous rhyodacite welded tuff with interbedded arkose, underlain by Jurassic granite. Sparse fine grain uraninite crystals in a cross fracture.	Extensive tunnel and shaft operations. Worked originally by Jesuits and later by others, intermittently, since 1640's. Total estimated and recorded production probably more than 3,500 tons of ore averaging about 12% Pb, 14 oz. Ag/T, 3% Cu, and minor Zn and Au.	Schrader, 1915, p. 197-203 Copper Handbook, 1943 USAEC Prelim. Rec. Rpt., A-P-340, 1956 ABM file data
2. Apache mine (Santa Rita Mg. Co., Henderson, Figueroa)	21S	14E	Cen. 12	Pb, Ag, Cu, Zn-, Au-	Quartz-fissure vein, containing argentiferous galena, chalcopyrite, and sphalerite, largely oxidized, in Cretaceous rhyodacite underlain by Jurassic granite.	Tunnel and shaft operations. Worked intermittently since late 1800's with a total production of some 500 tons of ore averaging about 14% Pb, 39 oz. Ag/T, 2% Cu, and minor Au.	Schrader, 1915, p. 203-204 ABM file data
3. Arizona-Pittsburg mine (Black Hills; Reichert, Arizona-Pittsburg Mg. & Smelg. Co.)	21S	14E	E. Cen. 1	Pb, Ag, Cu, Zn-, Au- (Ba)	Narrow, lensing, quartz-barite fissure vein containing spotty galena, pyrite, chalcopyrite, tetrahedrite, and minor sphalerite, oxidized near the surface with iron and manganese oxides, copper carbonates and silver enrichment.	Shaft operations. Worked from 1890's through early 1900's, producing some 100 tons of ore averaging about 30% Pb, 9 oz. Ag/T, 1% Cu, and minor Au.	Schrader, 1915, p. 247-248

	Barclay			[illegible]		pyrite; secondary quartz, galena, chalcopyrite, bornite, and sphalerite; and some disseminated pyrite and chalcopyrite in crushed wall rock and gouge. Wall rock is Jurassic granite intruded by Laramide quartz monzonite.	1946 & to 1948 [illegible] 700 tons of ore averaging [illegible] 18% Pb, 14 oz. Ag/T, 4% Cu [illegible] Zn, and minor Au. [illegible]	[illegible]
	5. Blue Lead mine (Joesson & Valles, Washington Trading Co.)	21S	15E	SE¼ 25	Pb, Ag, Cu-, Au-	Irregular, lensing, quartz-fissure vein containing argentiferous galena and some chalcopyrite, oxidized near the surface with enrichment, in Laramide diorite.	Shaft and tunnel operations. Worked in 1912 through 1916, and in 1918 through 1916, and in 1920 and 1923. Produced some 340 tons of ore averaging about 22% Pb, 18 oz. Ag/T, 0.6% Cu, and minor Au.	AbM file data
	6. Bonanza mine (Devil's Chase Box group, Vista Grande; Ortonso, Alabama Queen Mg. Co., O'Neil & Candelaria, Ellefsen)	20S	14E	Cen. 19	Pb, Ag, Cu, Zn-, Au-	Largely oxidized, irregular replacement lenses of argentiferous galena, chalcopyrite, pyrite, and sphalerite in Permian limestone along a fault contact with Cretaceous arkose, in a folded and faulted synclinal thrust block. Some high grade zinc carbonate ore.	Shaft and adit operations. Worked intermittently from early 1900's through 1961, producing some 300 tons of ore averaging about 8% Pb, 8 oz. Ag/T, 3% Cu, and minor Au.	Schrader, 1915, p. 185 ABM file data
	7. Bowling Green mine (Lucky Spur group; Pierce)	21S	15E	Cen. Bor. 17, 26	Pb, Ag, Cu, Au- (U)	Largely oxidized argentiferous galena and minor chalcopyrite in a quartz-sulfide pocket in an altered shear zone cutting Jurassic granite. Traces of uraninite and metatorbernite.	Shallow shaft operations. Some 430 tons of ore averaging about 21% Pb, 16 oz. Ag/T, 0.8% Cu and minor Au produced in 1923.	USAEC Prelim. Rec. Rpt A-P-359, 1955 ABM file data
	8. Bradford mine (Ferry, Bradford Copper Mg. Co., McFarland)	22S	15E	NW¼ 31	Cu, Ag, Pb-, Au-	Copper carbonates and oxides with minor cerussite in quartz and iron oxides in sheared, altered, and metamorphosed Cretaceous sedimentary rocks and tuff breccia engulfed in Laramide quartz diorite.	Shaft and open cut operations. Worked sporadically from 1870's through 1912, producing some 300 tons of ore averaging about 10% Cu, 4 oz. Ag/T and minor Pb and Au.	Schrader, 1915, p. 219-220 Copper Handbook, 1903 ABM file data
	9. Bull Springs mine (A. D. E. Contracting & Development Co., McCutchan, Wolf & Callahan, LaRocque)	21S	14E	NW¼ 3	Pb, Ag, Zn, Cu-, Au-	Spotty, partly oxidized, argentiferous galena, sphalerite, pyrite, and chalcopyrite in a quartz-fissure vein cutting Cretaceous rhyodacite welded tuff and interbedded arkose members.	Shaft operations. Some 550 tons of ore averaging about 10% Pb, 11 oz. Ag/T, 5% Zn, and minor Cu produced from 1950 through 1955.	ABM file data
	10. Compadre mine group (Le Roy, Pulaski, Mary; Micheloke, Reid, Johnson, Kramer, Arizona Consolidated Gold & Copper Mines, Boulder Mg. Co.)	20S	14E	SE¼ 35	Zn, Cu, Pb, Ag, Au-	Spotty, partly oxidized sphalerite, pyrite, chalcopyrite, and galena in a narrow, lensing quartz fissure vein cutting Cretaceous rhyodacite welded tuff and interbedded arkose near intrusive Laramide diorite.	Adit and shaft operations. Sporadic production of some 350 tons of ore averaging about 7% Zn, 3% Cu, 2% Pb, and 3 oz. Ag/T, from the early 1900's through 1960.	Schrader, 1915, p. 188 ABM file data
	11. Connecticut mine (McCutchan & Hogan, Reid, Richardson, Parker & Reid)	20S	14E	SW¼ 36	Cu, Pb, Zn, Ag, Au-	Partly oxidized, spotty chalcopyrite, argentiferous galena, and sphalerite with iron oxides along a shear zone in crushed and silicified Laramide diorite. Considerable zinc mineralization.	Tunnel and shaft operations. Developed in mid-1890's and produced intermittently through 1937 some 240 tons of ore averaging about 11% Cu, 9% Pb, 8 oz. Ag/T and minor Au.	Schrader, 1915, p. 189-190 ABM file data

Table 4, Cont.

MINING DISTRICT AND MINES	LOCATION T.	R.	Sec.	MINERAL PRODUCTS	GEOLOGY	TYPE OF OPERATION AND PRODUCTION	REFERENCE
12. Elephant Head mine group (Quantrell, Eureka; Powers & Bockton, Garrett & Parks, New Stake Mg. Co.)	20S	14E	SW¼ 4 SE¼ 5 NE¼ 8	Pb, Ag, Cu-, Zn-, Au-	Partly oxidized, argentiferous galena with minor chalcopyrite, and spotty sphalerite in a quartz fissure vein and in a sheared and altered zone along rhyolite dikes cutting Laramide quartz monzonite wall rock.	Adit and shaft operations. Worked in the early 1900's and in 1913 and 1914, producing some 950 tons of ore averaging about 8% Pb, 3 oz. Ag/T, and minor Cu, Zn, and Au.	Schrader, 1915, p. 182-183 Mines & Copper Handbook, 1918 ABM file data
13. Eureka-Marble mine group (Thunderer, Highside, Old Mexican; Clark & Peterson, Ferry, Blake, Salero Mines Co., Gardner, Tobin & Pond, Henderson, Kolberg, Eureka Mg. & Mlg. Co.)	21S	14E	NE¼ 34	Pb, Ag, Cu, Zn, Au-	Argentiferous galena with minor chalcopyrite, tetrahedrite, pyrite, argentite, and spotty sphalerite, oxidized in part to chrysocolla, azurite, covellite, malachite and limonite with supergene enrichment of silver, in a crushed, banded quartz gangue, recemented with iron oxide and silica, in a fissure zone cutting Laramide diorite. Strong pyrite gossan.	Shaft operations. Prospected as early as 1850's and worked intermittently through 1942, producing some 950 tons of ore averaging about 12% Pb, 22 oz. Ag/T and minor Cu and Au.	Schrader, 1915, p. 211-212 ABM file data
14. Florida mine (Hooks, Bond)	21S	14E	SE¼ 13	Cu, Pb, Ag, Au	Partly oxidized argentiferous galena and chalcopyrite with pyrite in an irregular, lensing quartz-fissure vein cutting Cretaceous rhyodacite tuff and interbedded arkose.	Adit and shaft operations. Spotty production of some 140 tons of ore, averaging about 8% Cu, 5% Pb, 20 oz. Ag/T and 0.7 oz. Au/T, in 1910's and 1920's.	ABM file data
15. Glove mine group (Sheehy-O'Donnell, O. K., Rover; Sheehy, Santa Cruz Silver-Lead Co., Sunrise Mg. Co., Arivaca Mg. Corp., Colorado Fuel & Iron Steel Corp.)	20S	14E	Cen. & SE¼ 30	Pb, Zn, Ag, Cu, Au-, Mo	Argentiferous galena, sphalerite, and small amounts of pyrite, chalcopyrite, and quartz deposited in permeable zones at the intersections of a bedding plane fault and favorable beds in Permian Naco limestone. Extensive solution of the limestone and deep oxidation concentrated cerussite, anglesite, wulfenite, and smithsonite in the leached caverns as sand carbonate ore.	Shaft and adit operations. Worked at various times from about 1911 through 1972, producing some 29,260 tons of ore averaging about 22% Pb, 9% Zn, 7 oz. Ag/T, 0.3% Cu, and minor Au.	Schrader, 1915, p. 185 Anthony, 1951 Olson, 1961 Bee, J. M., Jr., 1964 ABM file data
16. Good Luck mine (Santa Rita Mg. Co.)	20S	14E	NE¼ 17	Pb, Au, Ag	Oxidized pyritic zone in Laramide quartz monzonite containing, near the surface, supergene enriched silver and lead values and concentrations of gold. Mineralization probably controlled by fractures.	Surface workings. In 1908, some 384 tons of ore were concentrated 20:1 to yield about 28 oz. Au/T, 13 oz. Ag/T and 18% Pb.	Schrader, 1915, p. 184-185 ABM file data
17. Washoe mine (Washoe Mg. Co., Johnson, Tobin & Beasley, Hopkins)	21S	15E	S. Cen. 34	Ag, Cu, Pb-, Au, Mo- (Zn)	Irregular, crudely-banded, iron and manganese stained, quartz-fissure vein containing spotty ore shoots of chalcopyrite and pyrite and small pockets of galena. Oxidation and supergene enrichment produced copper carbonates, cerussite, wulfenite, and silver halides.	Shaft operations. Worked by Mexicans as early as the 1850's and by others through 1924, producing some 420 tons of ore averaging about 51 oz. Ag/T, 7% Cu and minor Pb.	Schrader, 1915, p. 216-218 ABM file data

18. Jefferson mine (Curtis & Steinfeld, Henderson, Kruse, Fuls, Newman, Miller, Jefferson Mines Inc., Boulden, Nutal & Snyder)	21S	14E	SE¼ 13	Pb, Ag, Zn, Cu, Au	Irregular, leasing quartz-fissure vein containing galena, sphalerite, pyrite, and chalcopyrite, oxidized near the surface, along a dike cutting Laramide diorite.	Shaft and adit operations. Worked from early 1900's through 1949, producing some 6,500 tons of ore averaging about 18% Pb, 6 oz. Ag/T, 5% Zn, 0.4% Cu, and minor Au.	Schrader, 1915, p. 209 ABM file data
19. Jesuit mine (Abrams, White Tail Mg. Co., Drake Enterprises)	21S	14E	NW¼ 13	Ag, Pb, Cu, Au-	Leasing and irregular quartz-fissure vein containing galena, pyrite and chalcopyrite, oxidized near the surface with supergene enrichment, producing some high grade silver values. Wall rock is a Cretaceous arkose in rhyodacite tuff.	Tunnel operations. Worked sporadically from mid-1930's through 1961, producing some 450 tons of ore averaging about 10 oz. Ag/T, 2% Pb, 1.5% Cu and minor Au.	ABM file data
20. Joplin mine (Joplin Mg. Co., Pierce)	21S	15E	NW¼ 18	Pb, Ag, Cu, Au	Irregular, leasing, quartz-fissure vein containing spotty ore shoots of argentiferous galena, pyrite, and chalcopyrite, oxidized and enriched in silver values and copper carbonates. Wall rock is Jurassic quartz monzonite and granite showing some disseminated sulfide mineralization.	Tunnel and shaft operations. Worked intermittently from the 1880's through 1926, producing some 270 tons of ore averaging about 14% Pb, 13 oz. Ag/T, 2% Cu, and 0.3 oz. Au/T.	Schrader, 1915, p. 205 ABM file data
21. Lee mine (Ruby Copper Co., Pierce)	21S	15E	E. Cen. 18	Cu, Pb, Ag, Au-	Disseminations and spotty high grade ore shoots of chalcopyrite and argentiferous galena with pyrite, oxidized and enriched near the surface, along and in a quartz-fissure vein cutting Laramide diorite and engulfed blocks of Cretaceous volcanic tuff and arkose.	Shaft operations. Worked from about 1914 through 1918, producing some 100 tons of ore averaging about 9% Cu, 8% Pb, 13 oz. Ag/T, and minor Au.	Mines Handbook, 1918 ABM file data
22. Mohawk mine (Squaw Gulch Mg. & Mlg. Co., Kolberg)	21S	16E	SW¼ 29	Pb, Ag, Cu, Au-	Irregular, leasing quartz-fissure vein with spotty argentiferous galena, pyrite, and chalcopyrite, oxidized and enriched near the surface, cutting Laramide diorite.	Shaft operations. Worked mainly in 1918 and 1919, producing some 140 tons of ore averaging about 8% Pb, 7 oz. Ag/T, 4% Cu and minor Au.	ABM file data
23. Montezuma and La Paz mines (Wrightson Bros., Aztec Mg. Syndicate, Clark & Peterson, Red Cloud Mg. Co., Ferry, Henderson, Drake Enterprises)	21S	14E	E. Cen. 36	Ag, Cu, Pb-, Au-	Irregular, generally narrow, quartz stringers containing pyrite, chalcopyrite, galena, and argentite along a quartz-fissure zone in Laramide quartz diorite and quartz monzonite. Zone is brecciated, silicified, and oxidized with iron and manganese oxides and with enrichment in silver, copper carbonates, and chalcocite.	Shaft and surface operations. Worked by Jesuits in early 1800's and by others intermittently through the 1930's, producing some 300 or more tons of ore averaging about 3% Cu, 11 oz. Ag/T, and minor Pb and Au.	Schrader, 1915, p. 212-213 ABM file data
24. Montosa mine group (Isabella, Amado, Black Diamond; Calabasas Copper Co., Boykin, Amado Mines, McIntosh)	20S	14E	NE¼ 28 NW¼ 29	Pb, Cu, Ag, Zn-, Au	Largely oxidized galena, chalcopyrite, pyrite, and sphalerite in an irregular replacement body in a large exotic Paleozoic limestone block engulfed in a Cretaceous dacitic volcanic breccia and also as spotty mineralization in a quartz-fissure vein cutting the dacite volcanics.	Shaft and open cut operations. Worked sporadically from early 1900's through 1949, producing some 1,000 tons of ore averaging about 22% Pb, 3% Cu, 3 oz. Ag/T and minor Zn and Au.	Schrader, 1915, p. 184-187 Sulik, 1957 ABM file data

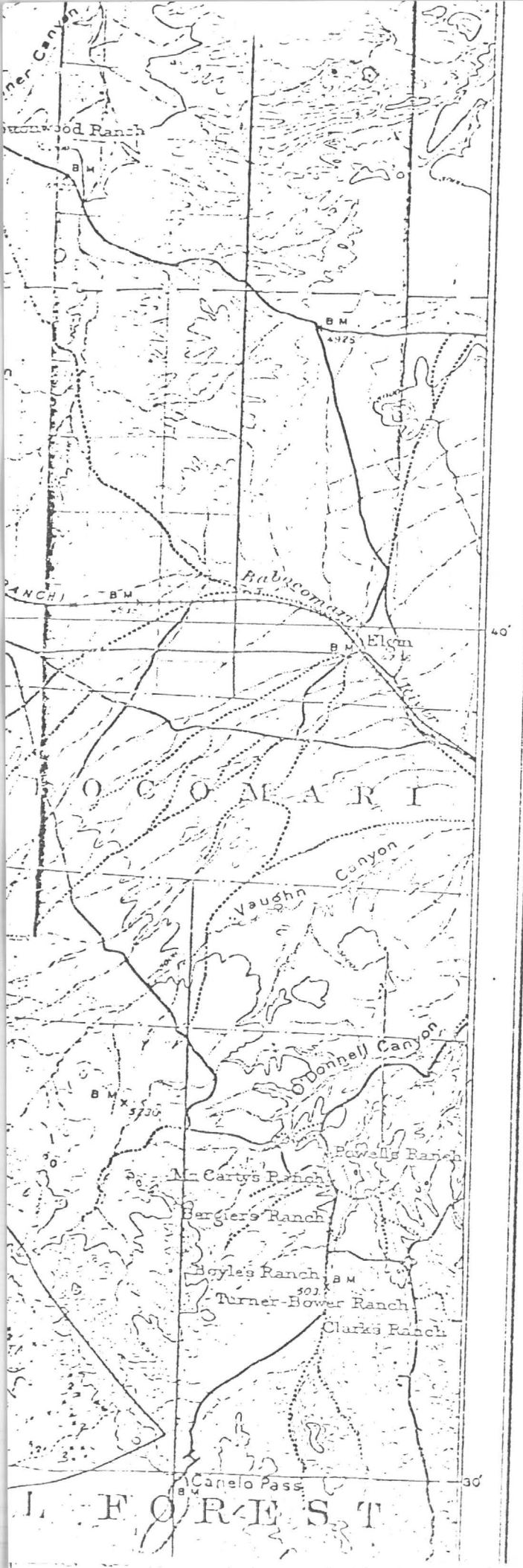
Table 4, Cont.

MINING DISTRICT AND MINES	LOCATION T.	R.	Sec.	MINERAL PRODUCTS	GEOLOGY	TYPE OF OPERATION AND PRODUCTION	REFERENCE
25. Royal Blue mine group (Apache Mg. Co., Frazer, Security Mg. Co., Henderson, Royal Blue Mg. & Mlg. Co., Heagney & Ellison, Royal Blue Mg. Co., Campbell, Merrill & Otero)	21S	14E	N. Cen. 13	Pb, Ag, Cu, Zn, Au-	Irregular, leasing, quartz-fissure veins containing ore shoots of argentiferous galena, pyrite, chalcopyrite, and sphalerite, oxidized with supergene enrichment near the surface. Wall rock is largely Cretaceous arkose members interbedded in rhyodacite tuff.	Shaft and tunnel operations. Worked mainly from 1912 through 1920 and 1945 through 1949, producing some 2,490 tons of ore averaging about 8% Pb, 13 oz. Ag/T, 3% Cu, 1% Zn and minor Au.	Schrader, 1915, p. 203 ABM file data
26. Salero mine (Darwin, Constitution; Wrightson Bros., Salero Mg. Co., Clark & Peterson, Weir, Salero Mines Co., Sortillon, Discovery Process Inc.)	21S	14E	NE¼ 25	Pb, Ag, Cu-, Zn-, Au-	Strong quartz-fissure zone with veins of crushed, drusy, laminated quartz containing spotty argentite, chalcopyrite, minor galena and some pyromorphite in sheared and fractured Cretaceous rhyodacite tuff and Laramide diorite. Strong and deep oxidation produced cerargyrite, lead chlorides, iron and manganese staining, and copper carbonates in upper part.	Shaft operations. One of oldest mines of the district, worked by Jesuit and Franciscan missionaries and early Americans prior to 1900 and only on small scale since then. Total production would be some 500 tons of ore averaging about 12% Pb, 14 oz. Ag/T, less than 1% Cu and Zn, and minor Au.	Schrader, 1915, p. 194-197 ABM file data
27. San Ramon mine group (Moreno, Costa & Morrisa, Mazson Mg. Co., Magoffin, San Ramon Mines)	21S	14E	E. Cen. 13	Pb, Ag, Zn, Cu, Au-	Leasing quartz-fissure vein containing argentiferous galena, sphalerite, pyrite, and chalcopyrite, oxidized with silver enrichment near the surface, cutting Cretaceous arkose and rhyodacite tuff and Jurassic granite close to intrusive Laramide diorite.	Shaft and tunnel operations. Worked mainly from mid-1940's through mid-1950's, producing some 250 tons of ore averaging about 8% Pb, 7 oz. Ag/T, 2.5% Zn, 1% Cu and minor Au.	ABM file data
28. Tiajuana mine (Tiajuana Mines Inc., Bekins)	20S	14E	NE¼ 26	Ag, Pb, Zn Cu, Au-	Strong quartz-fissure vein with spotty argentiferous galena, sphalerite, pyrite, and chalcopyrite, oxidized at surface with iron, manganese, and copper carbonates and oxides. Spotty high grade silver chlorides. Wall rock is Laramide quartz monzonite or quartz diorite.	Shallow shaft and adit operations. Worked for silver chlorides in 1870's and some sporadic mining through 1968. Production would be some 100 tons of ore averaging about 16 oz. Ag/T, 3% Pb, 3% Zn, and 1% Cu.	Schrader, 1915, p. 191-193 ABM file data
29. Trenton mine (Clarke & Peterson, Arizona Gold & Copper Co., Trenton Mg. Co.)	21S	14E	SE¼ 13	Pb, Ag, Cu-, Zn-, Au-	Irregular ore shoots of argentiferous galena, pyrite, and minor chalcopyrite and sphalerite in a brecciated stock work of quartz-barite fissure veins cutting Laramide diorite.	Shaft operations. Worked in late 1800's and early 1900's, producing some 1,300 tons of ore averaging about 4% Pb and 5 oz. Ag/T.	Copper Handbook, 1902 Schrader, 1915, p. 208-209 ABM file data
30. Victor mine (Bacon & Korn, Pierce, Victor Mg. Co., Weaver, Fortune Mg. Co.)	21S	15E	S. Cen. 17	Pb, Ag, Zn-, Cu, Au-	Narrow, irregular quartz-fissure vein containing argentiferous galena, pyrite, and minor sphalerite and chalcopyrite, largely oxidized near the surface. Wall rock is Jurassic granite.	Tunnel operations. Worked sporadically from late 1800's through 1959, producing some 800 tons of ore averaging about 10% Pb, 5 oz. Ag/T and minor Zn, Cu and Au.	Schrader, 1915, p. 214-215 ABM file data

31. Vulcan mine group (Allen, Wingfield & Farrel)	20S	14E	SW¼ 23	Cu, Ag-	Copper carbonates and sparse chalcopyrite and pyrite as irregular replacements in engulfed exotic blocks of Paleozoic limestone and in ferruginous quartz-fissure veins in Cretaceous dacite volcanic breccia. Associated Tertiary quartz latite dikes.	Adit operations. Worked in early 1900's and in 1954, producing some 850 tons of ore averaging about 5% Cu and 1 oz. Ag/T.	Schrader, 1915, p. 187-188, 334 ABM file data
32. Wandering Jew mine (Verfuth & Co., Henderson, Laguna, Beardsley & Co., O'Keefe, Headley)	21S	14E	NW¼ 12	Pb, Ag, Cu-, Zn-, Au-	Argentiferous galena, pyrite, chalcopyrite, and sphalerite, oxidized near the surface with silver enrichment, in an irregular quartz-fissure vein cutting Cretaceous rhyodacite tuff and interbedded arkose.	Shaft and adit operations. Worked sporadically from the early 1900's through 1951, producing some 1,700 tons of ore averaging about 11% Pb, 3 oz. Ag/T, and minor Cu and Au.	Schrader, 1915, p. 283-285 Mines & Copper Handbook, 1918 ABM file data
XI. Wrightson District (Southwestern part of Santa Rita Mountains)	20-22S	15-16E	----	Pb, Ag, Cu, Zn, Au (Ba)	Irregular groups and parallel bands of lensing quartz-fissure veins containing spotty base metal sulfides, pyrite, and often barite, largely oxidized and enriched near the surface. Wall rocks are a banded belt of folded and faulted Mesozoic and Tertiary volcanics with interbedded sedimentary or tuffaceous members, Jurassic granite and quartz monzonite, and Laramide and Tertiary granodiorite stocks with rhyolite and quartz latite dikes.	Numerous, scattered prospects and small mines worked since the late 1870's and up through the 1900's. Total estimated and recorded production would be some 4,000 tons of ore containing about 475 tons of lead, 51 thousand ounces of silver, 118 tons of copper, and 324 ounces of gold.	Schrader, 1915, p. 220-239 Rohrbacher, 1964 Drewes, 1967 ABM file data
1. American Boy mine group (Clark, Peterson & David, Gross Mg. & Investment Co.)	21S	15E	NW¼ 9	Pb, Ag, Cu, Zn, Au (Ba)	Series of irregular quartz and breccia veins containing seams, shoots, and stringers of spotty argentiferous galena, massive pyrite, chalcopyrite, tetrahedrite, barite, and sphalerite in quartz, calcite, and some bladed barite gangue. Oxidized near the surface with enrichment in argentiferous cerussite. Wall rock is Triassic quartz monzonite intruded by Jurassic quartz monzonite and aplitic bodies.	Tunnel and shaft operations. Worked from about 1905 through 1918 and sporadically through 1951, producing some 200 tons of ore averaging about 4.5% Pb, 8 oz. Ag/T, 4% Cu and 0.1 oz. Au/T.	Schrader, 1915, p. 229-230 Mines and Copper Handbook, 1918 Rohrbacher, 1964 ABM file data
2. Anaconda mine group (Double Header, Ultima, Copper Mountain or Armada, Philadelphia, Little Joker, St. Louis, Silver Cave; Parks, Anaconda-Arizona Mg. Co., Altamirano, Boulder Mg. Co.)	21S	15E	NW¼ Cen. S. Cen. & SW¼ 3 . N. Cen. & NE¼ 10	Ag, Pb, Cu, Zn-, Au-	Lensing quartz-fissure veins containing calcite and barite, and with shoots, stringers, and seams of argentiferous galena, chalcopyrite, sphalerite, tetrahedrite and pyrite. Veins are often vuggy with mineralization banded or lining vugs. Wall rock is Triassic rhyolite and latite volcanics.	Tunnel and shaft operations. Worked from early 1870's and intermittently through 1949, producing some 300 tons of ore averaging about 8% Pb, 30 oz. Ag/T, 3% Cu, and minor Au.	Schrader, 1915, p. 233-237 E. & M. J., Jan. 16, 1915 Rohrbacher, 1964 ABM file data

Table 4, Cont.

MINING DISTRICT AND MINES	LOCATION T.	R.	Sec.	MINERAL PRODUCTS	GEOLOGY	TYPE OF OPERATION AND PRODUCTION	REFERENCE
3. Castle Butte mine (Stockton, Castle Butte Mg. Co., American Mg. & Oil Co., Miller & Shearer)	22S	15E	W. Cen. 11	Cu, Ag, Au	Irregular, lensing quartz fissure vein containing spotty copper carbonates and silicate, iron and manganese oxides, epidote, and some gypsum and crushed wall rock in Tertiary rhyolite welded tuff and flows.	Shaft, tunnel, and open cut operations. Worked since the 1880's and sporadically through 1918, producing some 100 tons of ore averaging about 10% Cu, 2.5 oz. Ag/T, and 0.1 oz. Au/T.	Schrader, 1915, p. 237-239 ABM file data
4. Dixie mine (Powers, Jonston, Elliott, Altamirano & Goodsell, Lenon & Wilson)	21S	15E	NE¼ 8	Pb, Ag, Cu-, Zn-, Au-	Series of parallel fissure veins of massive quartz containing abundant pyrite, bladed masses of barite, and shoots and stringers of argentiferous galena, pyrite, and minor chalcopyrite and sphalerite, cutting Triassic monzonite intruded by Jurassic aplite. Oxidized and enriched near the surface.	Tunnel operations. Worked intermittently from 1911 through 1953, producing some 310 tons of ore averaging about 17% Pb, 7 oz. Ag/T, 0.5% Cu, and minor Au.	Rohrbacher, 1964 ABM file data
5. Gringo mine group (Francis group, Temporal group, Arizona Gold Mines & Mlg. Co., Altamirano, Richmond)	21S	15E	NW¼ 36	Au, Ag, Pb, Cu, Zn-	Series of irregular lensing quartz-calcite veins, some of coarse grained, banded quartz, minor calcite, and crushed rock, containing fine grained free gold with minor silver, iron and manganese staining and sparse copper and lead sulfides and molybdates, deeply oxidized. Others with more calcite contain more copper and lead mineralization. Wall rock is Cretaceous rhyolitic tuff and andesite.	Shaft operations. Discovered in 1890's but worked mainly for gold in 1907-1926. Minor lead-copper production in 1929-1930 and 1937. Total output some 100 tons of 0.43 Au/T and 9.5 oz. Ag/T ore and some 40 tons of 5% Pb, 4% Cu and 13 oz. Ag/T.	Schrader, 1915, p. 322-326 ABM file data
6. Happy Jack mine (Mountain View, Clipper, Eclipse; Lewis, Barnett & Powers, Happy Jack Mg. Co., Happy Jack Mg. & Reduction Co.)	21S	15E	N. Cen. 16	Pb, Ag, Cu, Au-, Zn- (U?)	Irregular and lensing quartz-fissure veins containing brecciated and altered wall rock, gouge, and streaks and shoots of argentiferous galena, tetrahedrite, argentite, chalcopyrite, and pyrite in Jurassic granite cut by lamprophyre dikes. Possible uranium reported but not confirmed.	Tunnel operations. Worked sporadically from 1881 through 1908, producing some 150 tons of ore averaging about 34% Pb, 24 oz. Ag/T, 2% Cu and 0.1 oz. Au/T.	Copper Handbook, 1903, 1918 Schrader, 1915, p. 231-233 USGS Prelim. Rec. Rpt. 3/15/31 Rohrbacher, 1964 ABM file data
7. Hoover mine group (Augusta, Presidential, Exposed Reef, Presidential Mg. Co., Lees, Ferguson, McDonald Mg. Co., Altamirano & Matrecita)	21S	15E	NE¼ 7	Pb, Cu, Ag, Zn-, Au-	Lensing quartz-fissure veins containing brecciated wall rock and shoots and stringer of massive, granular, and crystalline pyrite, argentiferous galena, chalcopyrite, tetrahedrite, chalcocite, argentite, and minor calcite and barite. Some spotty sphalerite. Wall rock is Triassic monzonite intruded by Jurassic granite.	Shaft operations. Worked in 1890's and sporadically through 1936, producing some 450 tons of ore averaging about 15% Pb, 9% Cu, 9 oz. Ag/T and 0.4 oz. Au/T.	Copper Handbook, 1903, 1918 Schrader, 1915, p. 230-231 Rohrbacher, 1964 ABM file data



9. Copper Point
7. Fortynine
8. Hilton ranch vein
6. Jerome No. 2
2. Montana
10. Red Cloud
4. Total Wreck
5. Verde Queen

GREATERVILLE DISTRICT

18. Anderson (Conglomerate)
16. Boston Gulch
5. Chesoa Gulch
7. Colorado Gulch
19. Cox Gulch
6. Empire Gulch
1. Entenberg mine (Mountain King)
25. Freiz (Gold Bug)
13. Graham Gulch
3. Hancock
2. Hardscrabble
17. Harshaw Gulch
10. Hughes Gulch
23. Hughes Mine
15. Kentucky Gulch
8. Los Posos Gulch
12. Louisiana Gulch
9. Ophir Gulch
21. Quebec
20. Royal Mountain
11. St. Louis
14. Sucker Gulch
24. Summit
4. Wisconsin
22. Yuba

OLD BALDY DISTRICT

14. Carrie Nation
5. Central
3. Copper King
11. Copper Queen
4. Florida
15. Iron Cliff
2. Iron Mask
1. Jackson
12. Lead
10. Lucky Ledge
6. Midst
7. Molybdenite
9. Old Baldy
13. Spear
17. Star Pointer
8. Tucson
16. Velvet

TYNDALL DISTRICT

26. Alto
28. Apache
12. Arizona-Pittsburg
4. Blacksmith
20. Bland
30. Bradford
21. Burro
9. Camp Bird
8. Devil's Cash Box
1. Eureka
14. Helvetia
3. Hermit's Home
35. Ivanhoe
19. Jefferson
7. Jenkins
16. Jersey Girl
11. Mary and Polatski
13. Merry Widow
25. Montezuma
32. Montosa
2. Quantrell
31. Rhode Island
24. Rosario
18. Royal Blue
29. Safero (Darwin)
6. Santa Rita
15. Silver Sally
10. Tia Juana
17. Three Star
5. Treasure Vault
33. Trenton
27. Wandering Jew
22. Viceroy
23. Victor
34. Vulcan

WRIGHTSON DISTRICT

12. American Boy
13. Augusta
14. Automobile Chute (Anaconda)
15. Black Cap (Mansfield)
11. Castle Butte
8. Copper Mountain (Anaconda)
7. Double Header (Anaconda)
16. Gringo
17. Happy Jack
3. Little Joker (Anaconda)
5. Philadelphia (Anaconda)
9. Silver Cave (Anaconda)
4. St. Louis (Anaconda)
18. Sweet (Mansfield)
6. Ultimo (Anaconda)
2. Walker
10. Wasp (Anaconda)
1. Wild Cat

REDROCK DISTRICT

2. Hale prospect
5. Jensen prospect
4. La Plata mine
6. Meadow Valley mine
3. New York mine
1. Power's (Copper Mountain)

HARSHAW DISTRICT

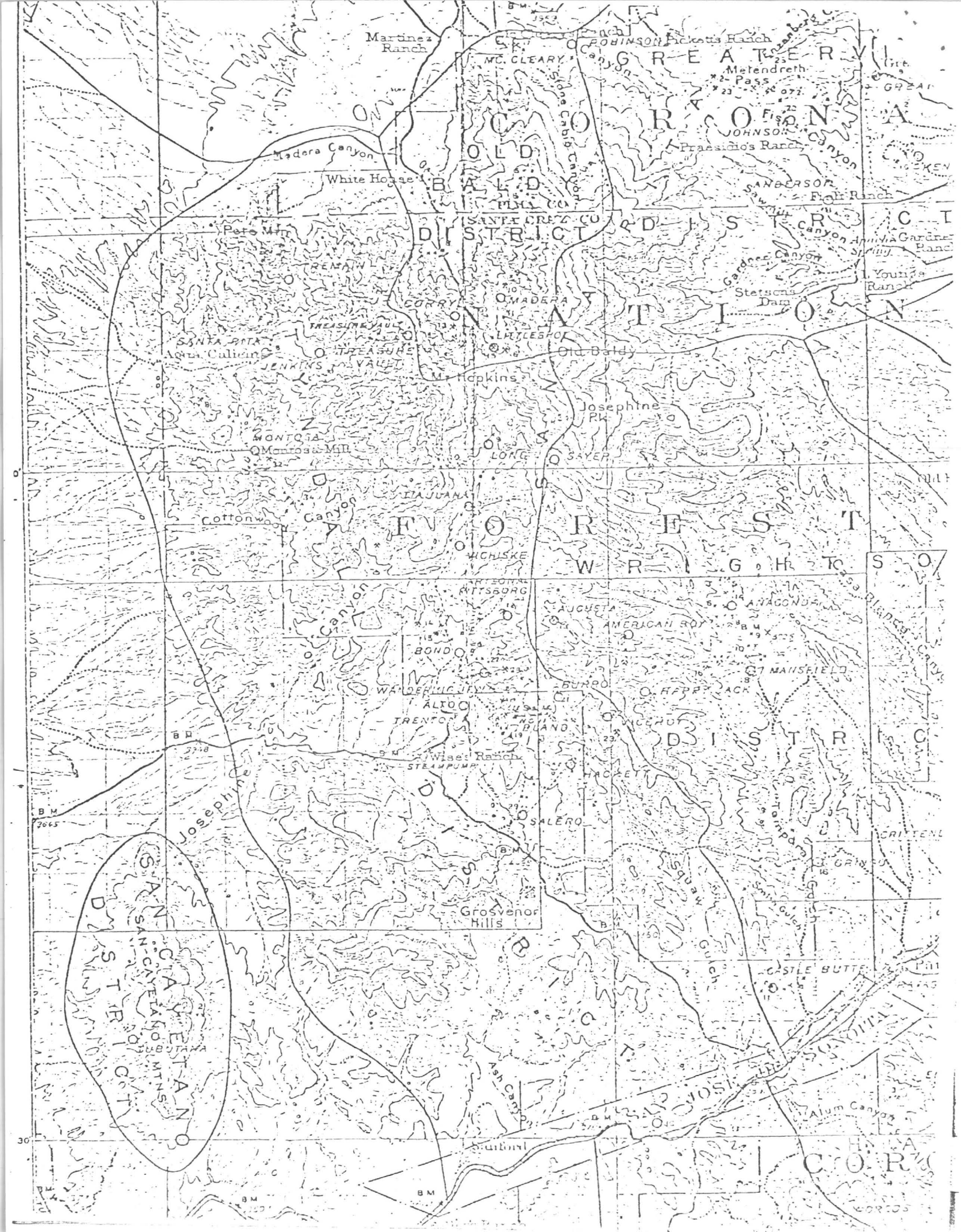
24. Alta
27. American
3. Aztec
4. Aztec open cut
11. Basin No. 1 prospect
7. Blue Eagle
28. Blue Nose (Abe Lincoln)
2. Christmas Gift
13. Dewey
1. Elevation
8. Flux
6. Garfield
12. Great Silver
9. Hampson
23. Hardshell
25. Hermosa
15. Humboldt
5. Invincible
14. January
22. Josephine
26. Lead Queen
16. Red Bird
19. Standard
17. Sunnyside
20. Thunder
21. Trench
18. Volcano
10. Worlds Fair

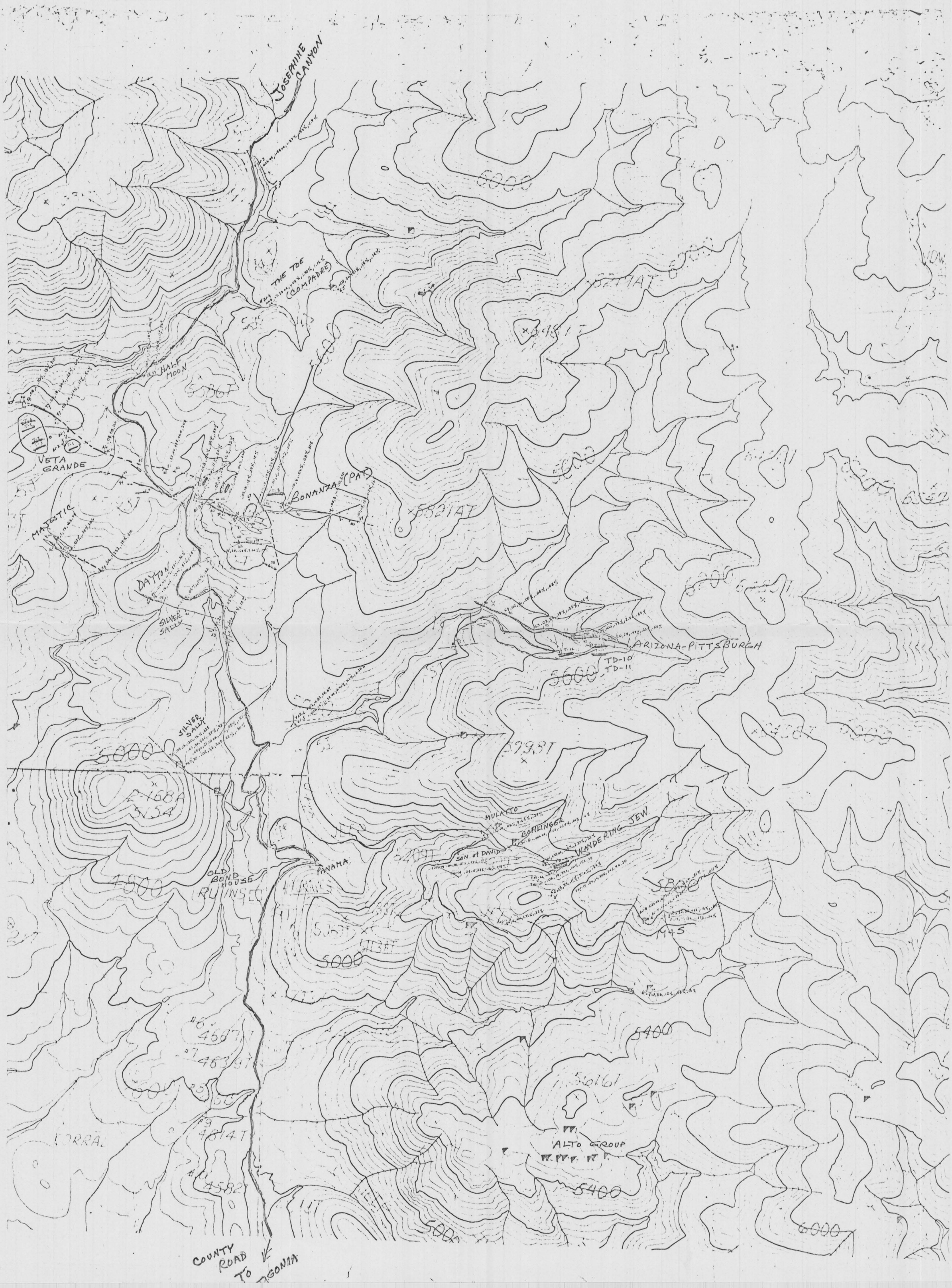
PALMETTO DISTRICT

4. Colossus
1. Domino (Chief)
7. Jarilla (Bullion)
2. New Hope
6. Palmetto
5. Sonorita
3. Three R tunnels

PATAGONIA DISTRICT

33. Augusta
26. Belmont
7. Bennett
27. Benton
32. Big Lead
22. Bonanza
39. Brooks
8. Buena Vista
30. Chance
38. Coughlin ledge
35. Empire
29. Endless Chain
13. Four Metals
11. Gladstone
6. Golden Rose
40. Gold Ledge prospect
23. Holland
4. Isabella
5. Jabalina
19. Kansas
41. Line Boy mine
36. Maine mine
10. Marche
28. Morning Glory
16. Mowry
2. National
18. New York
24. O'Conners
15. Off Pointer
1. O'Mara (Old Soldier)
37. Pocahontas
21. Pride of the West
12. Proto
34. Specularite prospect
25. Silver Bell
31. Shamrock
20. Tibbetts
14. Winnifred
3. National No. 4 prospect


Martinez Ranch
ROBINSON
Pickett's Ranch
MC. CLEARY
GREATER
Metendreth Pass
CORONA
OLD BALDY
Madera Canyon
White House
JOHNSON
Praesidio's Ranch
SANDERSON
Folk Ranch
SANTA CRUZ CO
Peto Mtn
DISTRICT
Gardner Canyon
Stetson Dam
Younger Ranch
TREMAIN
CORRY
MADERA
TREASURE VAULT
SANTA RITA
Agua Caliente
JENKINS
LITTLEFOX
Old Baldy
Mt. Hopkins
Josephine Pk
MONTOYA
Monroe's Mill
LONG
SAYER
ITALIANA
Cottonwood Canyon
FOREST
WICHISKE
WRIGHT
ARIZONA
PITTSBURG
AUGUSTA
ANACONDA
AMERICAN BOY
BOND
MANSFIELD
WALDEMUCK
BURRO
HAPPY JACK
ALTO
TRENTON
BLAND
VICEROY
DISTRICT
Wise's Ranch
STEAMPUMP
HACKETT
SALERO
Josephine Canyon
Tanque Verde Canyon
Squaw Gulch
Grosvenor Hills
SAN PEDRO DISTRICT
SAN CAYETANO
SAN CAYETANO MTNS
CASTLE BUTTE
Ash Canyon
Alum Canyon
Sunnyside
CORONADO
BM


JOSEPHINE CANYON
THE TOE (COMPADRE)
HALF MOON
VETA GRANDE
BONANZA (PAT)
MAJESTIC
DAYTON
SILVER SALLY
ARIZONA-PITTSBURGH
TD-10
TD-11
SILVER SALLY
MULATO
BOHLINGER
WANDERING JEW
SON of DAVID
PANAMA
OLD BOND HOUSE RUINS
CORRAL
ALTO GROUP
COUNTY ROAD TO GONIA