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85252

EXPLORATION SUMMARY REPORT
WINKLER-FAULKNER PROJECT
Lone Star Mining District
Graham County, Arizona

June 6, 1965

- - -

Summary

The Winkler-Faulkner property, located in T 6 S, R 26 E, Lone Star Mining District, approximately 6 miles north of Safford, Graham County, Arizona, was explored in a joint effort by Recla Mining Company, Wallace, Idaho, and Newmont Exploration Limited, New York City, during the period January-June, 1965. The exploration program consisted of 59,000 feet of data coverage by induced polarization survey, a magnetometer survey of the property, and the drilling of one diamond drill hole to a depth of 1500 feet. The field program was accomplished under the direction of J. D. Bell, Hecla geologist, and Dr. A. A. Brant, Newmont Chief Geophysicist.

The Lone Star District has a history of minor copper-gold production prior to 1910: interest in the area as the possible site of large low-grade disseminated copper deposits began in 1949, and culminated in discoveries of such deposits by Phelps Dodge and Kennecott in the mid-1950's.

The oldest formation exposed in the district is a series of andesite tuffs, flows, and agglomerates, Cretaceous or Early Tertiary in age. These rocks were strongly fractured on NE-SW trends, followed by successive intrusion of quartz diorite, quartz monzonite porphyry, and dikes and plugs of rhyolite and latite, hydrothermal alteration, and chalcopyrite-pyrite mineralization. After a period of erosion, oxydation, and enrichment, the region was covered by mid-tertiary flows of rhyolite and andesite, and then by later Tertiary flows of basaltic composition. Block faulting on NW-SE trends, with easterly tilting of the volcanics, then formed the Gila Mountains, succeeded by the long erosional period to the present.

The W-F property is situated on a gravel-covered pediment flanking the Gila Mountains on the southwest: no outcrops are present, and the alluvial thickness ranges from 400 to 1000 feet. Magnetics and drill holes indicate the sub-surface to consist of a broad intrusive mass of quartz diorite trending S 40 W across the easterly part, a broader area of Lower Volcanics comprising the central and Northwest part of the property, and Upper Volcanics in the southwesterly part. Seven holes have been drilled on the property by the owners to depths in bedrock ranging from 740 to 1308 feet: one hole, WF-1, reportedly assays 0.1 to 0.65% Cu, although the latter assay could not be verified. The remainder reveal only 0.01-0.04% Cu in spot samples.

Hecla-Newmont's induced polarization survey failed to yield difinitive information below 800 feet depth, due to a low resistivity layer near the bed-rock surface and to low resistivity contrasts between the various rock types of the area: no significant anomalies were found. The magnetics survey yielded data enabling interpretation of broad areas of the rock types. Drill-hole NH-1 was sited to test a zone of suspected fracturing in the Lower Volcanic series flanking the SW-trending intrusive mass, a potential environment for ore. It encountered the Lower Volcanics andesite, andesite porphyry, and andesite agglomerate, little altered except for weak clay-sericite, iron stain, and manganese stain confined to strong fractures. No copper minerals were observed: assays of split core ranged from 0.02 to 0.08% Cu and a trace of molybdenum. Almost no pyrite is present, and the rock has none of the characteristics of a leached capping.

It is the conclusion of Hecla and Newmont personnel that the weak alteration and lack of mineralization in Hole NH-1 indicate the absence of ore grade mineralization laterally or in depth in its vicinity. Although the remainder of the property is not completely tested, there are no scientific methods of defining a target, and future exploration will involve blind drilling. Such speculative and expensive exploration does not appear warranted by the work accomplished to date on the property.

General

Hecla-Newmont interest in the Winkler-Faulkner property began in June, 1964, when the claims and surrounding area were examined by the writer in company with Paul Winkler and Ted Faulkner of Safford, Arizona, representing a group of fifty-two participating owners. Subsequent examination by R. B. Fulton, of Newmont, and H. E. Harper and the writer, of Hecla, resulted in a decision to negotiate for exploration rights on the property. Agreement with the owners was reached in December, and a Lease and Option, dated January 15, 1965, was signed by the involved parties. Paramount terms of the lease and Option are as follows: End price of $3,000,000 payable in 3 years and 5 months, including immediate payment of $1,000, three annual payments of $25,000 commencing June 15, 1965, payment of remainder on or before June 15, 1968, if option is exercised, and right of Hecla-Newmont to terminate option at any time after completion of work requirement.

Location

The W-F property, encompassing approximately 4475 acres, is located principally within the northern half of T 6 S, R 26 E, G. & S. R. N., in Graham County, Arizona, about 6 miles due north of the city of Safford. It consists of 241 unpatented lode claims, part of which cover section 16 of the above township; Section 16 is State land, held by Arizona State Prospect Permit No. 564, issued to F. Winkler and T. Faulkner on December 6, 1962.

The holdings are situated on a broad gravel-covered pediment which slopes shallowly southwest from the Gila Mountains toward the Gila River Valley; the topography is slightly rolling, with SW'ly trending shallow dry washes. No bedrock outcrops are present , although in Section 10, immediately north of the claims, a small hill of andesite and andesite porphyry is present.

Access to the property is via the airport highway and San Juan Mine road northerly from Safford; the latter road traverses the claims, and unimproved drill roads leading from it yield access to a fair part of the holdings.

Safford is the rail and supply point; drilling water is obtained f from a pumping point near the Gila River.

Mining History

Mining in the Lone Star District commenced prior to 1910, with development of a number of small gold and oxidized copper prospects and mines in the low SW'ly foothills of the Gila Mountains; the San Juan Mine yielded 110,000 lbs. of copper in 1907. In 1949-1952, American Metals and Consolidated Copper tested the NE'ly trend of Mineralization indicated by surface showings at the Morton Mine, and in 1956-1959, this zone was further tested by Bear Creek Mining Companyo culminating in the discovery by the latter company of a low-grade disseminated copper deposit estimated at 100,000,000 tons, with a grade of minus 1% Cu, and at a depth of 800 feet. At about the same time as the Bear Creek exploration, Phelps Dodge optioned and later purchased a large block of claims north of the W-F property and west of the Bear Creek deposit, and reportedly has developed a similar large copper deposit of somewhat better grade and shallower depth than that of Bear Creek. Neither deposit is being worked at present, apparently constituting future reserves for the owning companies.

Duval, American Metals, Rare Metals, Charles Steen, Kerr McGee, Hecla-Newmont, and United Nuclear have conducted additional exploration in the district; United Nuclear ~~have conducted additional exploration~~ is currently drilling the Sanchez property about 5 miles SW of the Bear Creek deposit, and limited drilling has been continuing on the Phelps Dodge and Bear Creek properties.

Geology

Generalized geology of the Lone Star District is shown on the Safford Quadrangle topographic map, pocket. In this area of the Gila Mountains, the lowest exposed formation is a series of andesite flows, agglomerates, and tuffs of Crataceous or Early Tertiary age, termed here the Lower Volcanics formation (Tlv); these rocks outcrop on the lower SW'ly flank of the NW-trending Gila Range. The exposures exhibit severalzones of strong NE-trending shears and fractures, which are considered to have localized later successive intrusions of quartz diorite (Lone Star Stock), quartz monzonite porphyry (San Juan stock), and plugs and dikes of rhyolite and latite (Bear Creek area). Hydrothermal alteration and pyrite-chalcopyrite mineralization apparently accompanied the later intrusive phases, followed by renewed fracturing, oxidation, and enrichment of the protore. The region was then covered by volcanics of rhyolitic to andesitic intermediate composition (Tmv),

and then by basaltic flows (Tuv). In later Tertiary time, the Gila Range was block-faulted on NW'ly trends, with uplift and easterly tilting of the volcanics. Erosion has continued from that time, e exposing a belt of Lower Volcanics and intrusive bodies on the SW flank of the range, and leaving only remnant caps of Upper Volcanics in the dow-faulted foreland of the r nge. The long-continued erosion has filled the Safford Valley with a deep fill of semi-consolidated sand, gravel, and boulders, a younger mantle of slope wash on the upper flanks of the valley, and recent alluvium in its center.

The Kennecott ore body is described as a mixed oxide-sulfide body in which the most abundant copper mineral is chrysacolla. The ore occurs in the Lower Volcanics section in andesite flows sheared on NE'ly trends and intruded by rhyolite and latite; the mineralization occurs in both the andesite and the intrusives. Sericite-silica alteration characterizes the ore zone, bordered by a biotite alteration phase, and then by propylitic chlorite-epidote. Broad pyritic envelopes are described at both the Bear Creek and San Juan deposits, and iron staining indicates its presence at the phelps Dodge deposit.

The W-F property is located on the pediment slope south and s southwest of the Phelps Dodge and Kennicott ore deposits. Mapping by these companies indica tes the presence of two major NW-trending faults, the Foothills-Butte Fault and the Valley Fault, intervening between the Kennecott-Phelps Dodge zones and the W-F property; opposing dips suggest the area between the two faults (assumed normal) is a graben block.

The W-F property is entirely covered by a mantle of sand, gravel, and boulders which, according to resistivity data and drill holes, ranges from about 400 feet in thickness in the NE'ly part of the group to over 1000 feet in the SW'ly part. Immediately north of the property in Section 10, a small hill above outcrops of andesite and andesite porphyry tentatively identified as Lower Volcanics.

Sub-surface geology on the W-F property, shown on the 2000-scale map, is derived from study of short core intervals obtained by Faulkner in the rotary drilling of 10 holes on the claims, 7 of which cut bed-rock and bottom at depths ranging from 740 to 1308 feet, and from interpretation of a magnetic survey of the property. Summary logs of the cored intervals are included with this report. Magnetic profiles and contours indicate a broad magnetic high trending S hO W through the easterly part of the property; core from Drill Holes WF-1, 2, 7, and 10 show the bed-rock to be a medium grained, partly kaolinized quartz diorite.

Bounding the magnetic high on the west is a broad magnetic low area covering the central and NW'ly part of the group; the magnetic susceptibility of core from Hole NH-1, the andesite outcrop in Section 10, and drill core in WF-12 indicate that bed-rock here is Lower Volcanics. The SW'ly part of the group shows slightly higher magnetic readings, and drill core from holes WF-6 and WF-9 is basaltic in nature; this area is interpreted as Upper Volcanics. The Upper and Lower Colcanics may be separated by a N'ly trending Fault; the alluvial thickness is consistent with the rest of the property, and occurrence of the Upper Volcanics as a topographically high remnant cap in the buried bedrock surface does not appear probable.

Drill core from Holes WF-1, and 2, and 10 reveals considerable Kaolinization and limonite staining; the crystalline intrusive in WF-7 does not appear strongly altered, and the core from WF-12 reveals chlorite-epidote alteration with a little pyrite. No copper mineralization is visible in any of the cores, although some weak assays have been obtained.

Hecla-Newmont Exploration

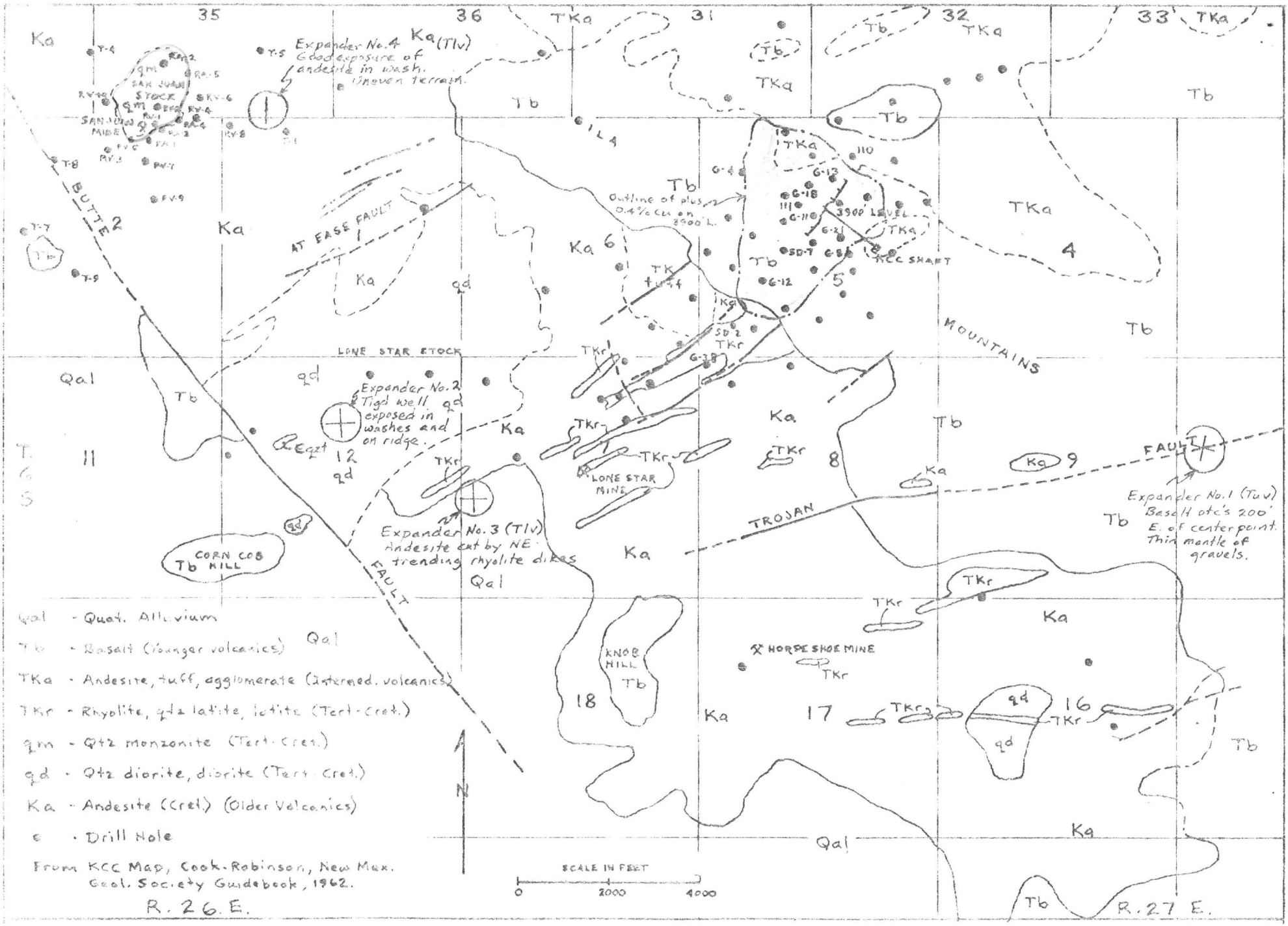
Predicated on the reasoning that the Phelps Dodge and Kennecott deposits are apparently localized within zones of NE-trending sheers, that the W-F property lies athwart the SW'ly projection of these trends, and that prior drilling indicates only moderate thicknesses of overburden, it was considered possible that an ore body might be found beneath the cover. The exploration project consisted of testing the area by induced polarization-resistivity and magnetic geophysical methods and by the drilling of one hole, NW-1, to a depth of 1500 feet.

Geophysical Exploration - This phase of the project was conducted by Heinrichs GeoExploration, Tucson, Arizona, under the direction of Dr. A. A. Brent, Chief Geophysicist, Newmont Exploration Limited, who describes the results and interpretation in a separate report. Geophysical field work was accomplished during the period January 12-March 14, 1965, and consisted of : (1) Induced Polarization-Resistivity Survey, dipole-dipole array, 460 stations, 59,000 feet data coverage, on lines 1-5 (see 2000-scale map, pocket); (2) Induced Polarization, Pole-Pole array, 40 data points, vicinity 5000' E of Base Line on Line 4: (3) Resistivity tests, rock outcrops of known age, Wesner array, in locations shown on map, following page; (4) Magnetic survey of property, Ask nia tripod-mounted magnetometer, 881 stations, 44.7 miles; (5) Magnetic susceptibility tests of drill core from Hole WF-6, 33 determinations between 910 and1223 feet depths.

Summarizong the results, the frequency system induced polarization method proved ineffective in penetrating depths below 800 feet in this area, and no significant anomalies were determined. The magnetic survey yielded results of material assistance in interpreting broad areas of fock types in the buried bedrock surface. Resistivity studies indicate a very low contrast between rocks mapped as quartz diorite, Upper Volcanics, and Lower Volcanics.

Drilling Exploration - Because of the wide electrode spacing required for effective interpretation, due to low resistivity contrasts of the rock types of the area, Dr. Brent concluded that an ore body 2500 x 2500 feet in areal extent and containing 2% total sulfides by volume, similar to the low total sulfide ore bodies of Phelps Dodge and Kennecott, could not be tetected below a depth of 1000 feet by the IP Method used.

The magnetic survey indicates the presence of an elongate mass of quartz diorite trending S 40 W in the easterly part of the property, in direct alignment with the Lone Star quartz diorite stock outcropping



GENERALIZED GEOLOGICAL MAP, SAFFORD PROJECT AREA
SHOWING LOCATION OF EXPANDER RESISTIVITY SPREADS

Heinrichs
Feb. 5-6, 1965

NE of the Foothills-Butte Fault. The alignment of the two intrusive masses is construed as indicating no strike-slip component on the intervening post-intrusive faults, and tentatively permits projection of the SW-striking fracture and dike zones into the W-F property as shown on Sections A-A' and B-B', following page, and on the 2000-scale map, pocket.

Drilling by Kennecott in the Lone Star stock has not shown that intrusive body to be strongly mineralized, and while Winkler-Faulkner drilling of the intrusive mass on the W-F property reveals some kaolinisation and iron stain in fractured zones, little significant copper mineralization has been found in depths to 1308 feet. Geological considerations suggested that the probably fractured Lower Volcanics flanking the intrusive mass on the west should provide a suitable environment for a possible ore body, and that one hole should be drilled to 1500 feet depth to test for ore and alteration.

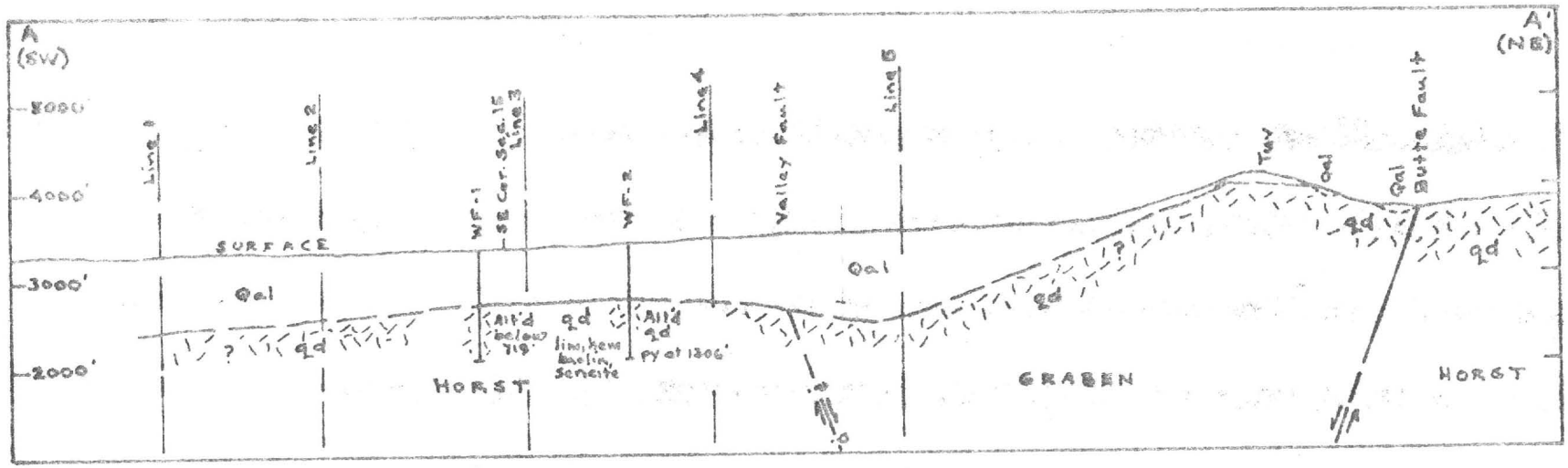
Hecla-Newmont Hole NH-1 was sited on March 22, 1965; road and site construction and rotary drilling to bedrock were contracted to Winkler and Faulkner, who completed the rotary drilling at a depth of 628 feet on April 21. A Boyles Brothers truck-mounted diamond drill was moved on the hole the same day, and the hole, drilled BEWL, was completed at 1500 feet depth on May 29, 1965.

The log of the core is included in this report; rocks encountered were andesite, andesite porphyry, and andesite agglomerate, strongly fractured, largely purplish-gray in color, but occasionally bleached and stained with iron and manganese oxides in the fracture zones. Epidote and chlorite are the dominant alteration minerals, indicating only propylitic alteration. Analyses by the Newmont laboratory of core specimens confirm rock type and alteration identification, and magnetic susceptibility tests indicate that the andesite is of the Lower Volcanic series.

No copper minerals were visible in the core. Over-all recovery averaged 81.8%, but dropped to 40-50% in the fractured zones. Split core samples of these fractured intervals of low recovery were assayed for copper through a total hole interval of 120 feet, and for molybdenum through a total hole interval of 39 feet. Jacobs Laboratory and Hawley and Hawley, of Tucson, were the assayers; copper assays ranged between 0.02 and 0.08 per cent copper, and molybdenum assayed only a trace.

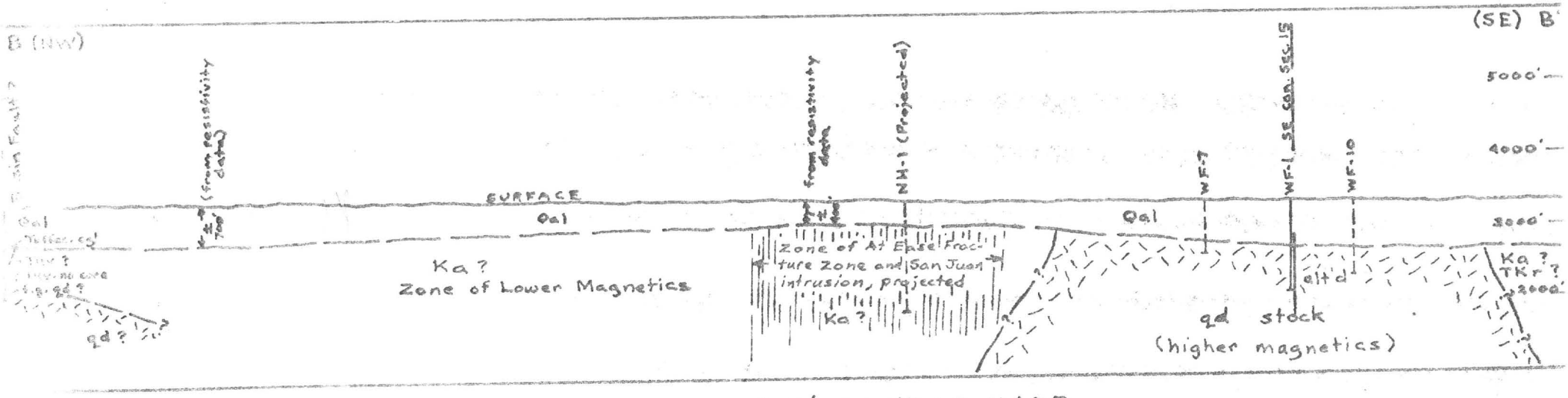
Cost of Project

Direct cost of the project, spent during the period January 8-June 15, 1965, and including control survey for the geophysical work, the geophysical work itself, and the drilling, including road and site construction, rotary and diamond drilling, drilling water, and assaying, has totalled $27,741.42.



SECTION A-A', LOOKING N45W

SCALE: 1" = 2000'



SECTION B-B', LOOKING N40E

SCALE: 1" = 2000'

SECTIONS TO ACCOMPANY PROPERTY-DRILLING MAP, WINKLER-FAULKNER

J D. Bell
3-23-65

Conclusions

Although the favorable Lower Volcanics andesite was encountered in Hole NH-1, and the rocks were strongly fractured, clay and weak sericite alteration is confined to the stronger fractures, and the intervening core reveals only weak propylitic alteration. Pyrite is almost entirely lacking; the metallic iron minerals are magnetite and specularite. The weakly altered appearance of the core, the low pyrite, and the lack of any trace of visible copper mineralization are features evidencing the absence of a leached capping and preclude the possibility of an underlying ore body; the trace assays of copper and molybdenum are not regarded as significant. Similarly, the weak alteration does not suggest the presence laterally of a nearby ore body.

While it cannot be said that the W-F property has been completely tested, the Hecla-Newmont effort has shown that induced polarization surveys as a guide to ore have little or no value here, and that there are no other scientific guides pointing to a defined target area. If further exploration of the W-F property is contemplated, it will probably entail blind drilling of a NW-SE trending fence of holes spaced one thousand feet apart, approximately along Line 4, and it will be a relatively expensive project.

Hecla and Newmont personnel concur that each speculative exploration is not warrented by the results of the work accomplished on the property.

Respectfully submitted,

J Douglas Bell
Geologist, Exploration

Appended: Drill Logs

Pocket: Safford Quadrange, General Geology
Claims and Drill Map

JDB:jan

HEINRICHS GEOEXPLORATION COMPANY

806 WEST GRANT ROAD, TUCSON, ARIZONA, 85703. P.O. BOX 5671. PHONE: (AREA CODE 602) 623-0578

APRIL 3, 1965

Newmont-Hecla Joint Venture

Re: Letter Report
Winkler-Faulkner Project

Gentlemen:

This is a brief letter report outlining the field work accomplished and results obtained for the Newmont-Hecla Joint Venture on the Winkler-Faulkner project from January 12 to March 14, 1965.

ELECTRICAL PHASE

	Data Coverage	Stations
I. P. Line 1 (0 N/S)	7000 ft.	54
I. P. Line 3 (4000 N)	19500 ft.	154
I. P. Line 4 (6000 N)	10000 ft.	76
I. P. Line 5 (8000 N)	22500 ft.	176

I. P. Pole-Pole depth probe #1: East & West legs: 40 data points total.
East leg a= 100 ft. to 2000 ft.
West leg a= 20 ft. to 3000 ft.

Wenner depth probes for rock property test on:

Long Star granite	12 stations	a= 10 to 200 ft.
Tuv	12 stations	a= 10 to 200 ft.
Tlv	18 stations	a= 10 to 200 ft.

MAGNETIC PHASE

Magnetic susceptibility log of Drill Hole #6 core from 910 to 1223 feet - 33 determinations.

Magnetic Survey	Coverage
5 - East-west lines	100,000 feet
17 - North-south lines	136,000 feet

Re: Letter Report
Winkler-Faulkner Project

Total coverage: 236,000 feet for a total of 44.7 miles and 881 stations.

RESULTS
ELECTRICAL PHASE

The induced polarization effects noticed were attributed mainly to low resistivity inductive coupling and the normal background response of the alluvium. The only zone of possible sulfide indication noticed is on Line 3 at about 100 E, although this zone is more likely just a zone of higher background effects.

The resistivity data, in general, shows a three layer case with the middle layer lower in resistivity than the others. A possible interpretation of this could be dry alluvium for the upper layer, water saturated alluvium for the middle layer and bedrock for the lower layer. Depths to bedrock indicated were from about 200 feet to the north to about 1000 feet to the south.

The induced polarization two array depth probe was centered at 50 + 00 E Line 4 and gave a two layer solution with the upper layer higher in resistivity and about 220 feet thick. This 220 foot interface is possibly the alluvial water table. The absence of the third layer may be the result of a lack of electrical contrast between bedrock and water saturated alluvium in this area. No frequency effects were noted that could not be attributed to inductive coupling interference.

The Wenner depth probe, rock property tests were made on outcrops of the three suspected bedrock types; Tuv, Tlv, and the Lone Star granite. This test shows these three rocks to have very similar resistivities (rho/2 pi from 115 to 160 ohm feet), thereby making it very difficult to distinguish between them electrically. The resistivity of these rocks is higher than was indicated at depth on the I.P. lines and two array probe and may be due to their being above the water table on the Wenner test and below on the I.P. and the I.P. generally nearer to the lower part of the valley (i.e. finer and more conductive constituents).

MAGNETIC PHASE

Drill Hole #6 was logged for magnetic susceptibility and a

change was noted at approximately 1050 feet, perhaps indicating the contact between Tuv and Tlv. The Tlv was somewhat higher in susceptibility and considerably more polarized than the Tuv.

The vertical intensity magnetic data was very erratic over the whole area due to the abundant volcanic boulders in the surface alluvium and, therefore, the plan and profile data had to be smoothed out before interpreting. The most obvious feature was a high zone centered at about 6000 N - 10000 E and trending NE-SW. On interpretation of the profiles of this high zone, it was estimated that the cause was a truncated wedge or tubular zone 2000 to 3000 feet thick and buried from 700 to 1200 feet below surface. This feature is likely the SW downfaulted block of the Lone Star granite and thereby indicates that the faulting only had a dip slip component since both the exposed block to the NE, and the downfaulted block, are on the same strike.

Sincerely,

HEINRICHS GEOEXPLORATION COMPANY

Chris S. Ludwig

Chris S. Ludwig
Senior Geophysicist

pr

cc: Dr. A. A. Brant 5

DIAMOND DRILL RECORD

Standpipe
Casing

Started 3-30-65
Finished 5-29-65
Hole Size BXWL
Depth 1500
% Core Rec. 81.8

Mine Winkler-Faulkner, Safford, Arizona
Location 1990' E. and 990' S. of NW Cor.
Sec. 15, T 6 S, R 26 E, Graham Co., Arizona
Logged by Bell-Quinlan Date May, 1965
Drilled by Faulkner (Rotary), Boyles Bros. (DD)

Hole No. NH-1
Level Surface
Grid IF Line 4 - 4400 E
Latitude --
Departure --
Elevation 3465' Apx
Bearing --
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description Summary Log	Sample Data No.	Interval Feet	Sple. Feet	Oz. ~~Ag~~	% ~~Pb~~ Cu	% ~~Zn~~ Mo
0		Alluvium, difficult drilling, many boulders alternating with sections caving fine-grained sands.						
	Plug							
250		Alluvium, fairly uniform sand. Improved drilling. Water table at 350.						
	Plug							
500		Boulders, caving sand, difficult drilling. Bedrock at 572.						
	Plug							
572		Plug-bitted for assurance of bedrock and to provide good seating for casing.						
	Plug							
595		Cored NX with rotary. Andesite agglomerate (Lower Volcanics), fine grained purplish ground mass, fragments, to 4" length, of lt gy-grn med grain porph. volcanic.						
	5.4							
601		To reach unfractured rock for start of diamond drilling.						
	Plug							
628		Andesite agglomerate as before, fragments to 7" length. Mild epidotization and chloritization. Rounded to sub-angular fragments of light grn-gy strongly porphyritic rock (andesite porphyry) and dark gy-purplish aphanitic rock with less numerous white fs phenos (porphyritic andesite). Thin fractures 10-20 to core, often lined with xtal. calcite. Specks fe ox and minor magnetite. Color banding and textural variations 60-90 to core, suggesting flow attitude. Rock moderately broken, but no pronounced faulting.						
	120.6		NH-1-1	875.7-877) 896-905)	10.3		(.08	NS
			NH-1-2	921-928.2	7.2		(.05	NS
764		Andesite porphyry, fine grained greenish groundmass, many ortho and plag. phenos, few clots dark mafics, sparse magnetite and epidote. Fracturing 10-40 to core. Mod. broken.	NH-1-3	939.6-962	22.4	Jacobs	(.08	Tr
	15.2		NH-1-4	1119-1136	17.0		(.04	Tr
			NH-1-5	1230-1239	9.0		(.03	NS
811.5		Porphyritic andesite, dk gy-purplish sugary vfg ground mass, scattered white fs phenos. Epidote and sparse magnetite. Minor Mn Ox, fe ox, calcite on thin fracts. 10-30 to core. Andesite porphyry 861.9-862.1. Andesite is badly brkn, blchd yellowish, fe ox specks after py	NH-1-6	1298-1341	43.0	H & H	(.02	NS
	138.1		NH-1-7	1453-1465	12.0		(.08	NS

(cont. next page)

DIAMOND DRILL RECORD

Standpipe
Casing

Started
Finished
Hole Size
Depth
% Core Rec.

Mine Winkler-Faulkner, Safford, Arizona
Location

Logged by Date
Drilled by

Hole No. NH-1
Level
Grid
Latitude
Departure
Elevation
Bearing
Inclination

Depth Feet	Feet Core	Lithologic Description Summary Log (continued)	Sample Data No.	Interval Feet	Sple. Feet	Oz. ~~Ag~~	% ~~Pb~~ Cu	% ~~Zn~~ Mo
811.5	(cont.)	875.7-877, 896-905, and 921-935.5, 939.7-955.3. Partly blchd dull gy to yellowish gy from 935.5 to 939.7 and 971-975.5. 57% recovery 921-928, 44.75% recovery 934-955 (with some sericite), and 42.4% 975.5-984 (fractured, with a little andesite porphyry).						
984		Andesite agglomerate, mostly gy to purplish gy, except in fract. zones 10-30 to core, where blchd to yellowish brn. Stronger epidote 1056-1067, sparse epidote below 1067 (decreased propylitic alteration). Weak orange-brn fe ox, black mn ox, xtal. calcite on open fracts. to bottom. A few striated brown xtals (py?) 1241-1245, and scattered sparse magnetite and specular hematite. Rare textural variations 60-75 to core suggest flows tilted 15-30°. Badly brkn ggy fract. zones 1005-1019, 1105-1147, 1230-1239, and 1265-1280. No Cu noted. 29.2% recovery 1118-1130, and 53.8% recovery 1221-1280.						
	268.7							
1298		Andesite agglomerate, ± 1" sub-angular to rounded pebbles in porphyritic andesite ground mass, mostly purplish gray to dull gray, but bleached yellowish brown in fracture zone 1453-1465. Slight increase propylitic epidote-chlorite 1338-1445, weak epidote, chlorite, Fe ox-Mn ox stains on fractures, very sparse magnetite and specularite to bottom. Increased MnOx and orange-red FeOx in gouge zones 1338-1351 and 1453-1465. Moderately broken, except badly broken 1296-1351 and 1453-1465, with gg and bx. 44.2% recovery 1298-1351, 47.0% recovery 1378-1401, and 60.7% recovery 1452-1466.						
	148.4							
1500 End		Note: Core specimen at 796' identified by Newmont technical laboratory as andesite porphyry, and at 835' as andesite. Alteration minerals are chlorite, epidote, sericite, calcite, and secondary quartz. Magnetite, hematite, no sulfides.						

DIAMOND DRILL RECORD

Standpipe
Casing 702'

Started
Finished
Hole Size 3½"
Depth 1275
% Core Rec.

Mine Winkler-Faulkner, Safford, Arizona
Location 190' W, 250' S of NE cor.
Sec. 22, T 6 S, R 26 E
Logged by Bell Date 10-20-64
Drilled by Faulkner, Rotary

Hole No. W-F - 1
Level Surface
Grid
Latitude
Departure
Elevation 3355' Apx
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description
0		Alluvium, sand, boulders, conglomerate, clay.
660		Rock bit. No core.
706	18.0	Qtz diorite (?). Gray, med. grained, xtalline texture, lt gy-white partly euhedral fs; gy-grn mafics, softened outlines, gy interstitial qtz, some hematite stain. Brkn, stronger alteration, with fe ox and sericite 719-724.
724		Rock bit. No core.
1275		
End		

Note: Hole was deflected above 1150', and re-drilled through the 1150'-1200' interval. Hecla assay of cuttings from 40 feet of this 50' re-drilled interval assayed only 0.02% Cu. No copper visible in cuttings.

Sample Data

No.	Interval Feet	Sple. Feet	Oz. Ag	% Pb	% Zn
Assays by P-D Laboratory					
			% Cu	% S	
Sludge, rotary chips					
	736-1150	414	.064	.015	
	1150-1200	50	.650	.070	
	1200-1275	75	.100	.050	
Core					
	702-724	22	.104	.095	
Bit Sample					
	1255	Spot	.225	.110	

DIAMOND DRILL RECORD

Standpipe
Casing

Started
Finished
Hole Size
Depth 1308'
% Core Rec.

Mine Winkler-Faulkner, Safford, Arizona
Location 975' N and 975' E of NE Cor. Sec. 22, T 6 S, R 26 E
Logged by Bell Date 10-20-61
Drilled by Faulkner, Rotary

Hole No. W-F - 2
Level Surface
Grid
Latitude
Departure
Elevation 3410' Apx.
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data No.	Interval Feet	Sple. Feet	Oz. Ag	% Pb	% Zn
0		Alluvium, sand, conglomerate.						
670		Rock bit, no core.						
680	10	Qtz diorite (?). Core is strongly altered, with Kaolin and limonite. Mafics gone. Ghosts of xtalline texture.						
690		Rock bit, no core. Cuttings show white fs, lesser qtz grains, dark mafics, minor epidote-chlorite, moderate to minor limonite and hematite stain. Classified as qtz diorite (?).						
900	3	Qtz diorite (?), altered, with faint relict euhedral fs, cube void after py, kaolin, orange limonite with some reddish specks indigenous hematite.		No visible copper.				
903		Rock bit, no core. Cuttings as in 690-900 interval, varying amounts limonite and hematite, some specks disseminated pyrite 945-960, sparse epidote-chlorite. Qtz diorite (?).						
1227		Rock bit, no core. Not logged. Harder rock reported in bottom.						
1308								
End								
		Note: Tool string in bottom.						

DIAMOND DRILL RECORD

Standpipe
Casing

Started
Finished
Hole Size
Depth
% Core Rec.

Mine Winkler-Faulkner, Safford, Arizona
Location See below

Logged by Date
Drilled by Faulkner, Rotary

Hole No. W-F - 3, 4, 5
Level Surface
Grid
Latitude
Departure
Elevation
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data No.	Interval Feet	Sple. Feet	Oz. Ag	% Pb	% Zn
		W-F - 3: 1600' N, 180' W of SE Cor. Sec. 8, T 6 S, R 26 E. Lost hole at shallow depth in alluvium.						
		W-F - 4: 800' N, 1100' W of SE Cor. Sec. 10, T 6 S, R 26 E. 0-240' Alluvium 240-580' Crushed, ggy rock. No core.						
		W-F - 5: 2200' N, 1800' W of SE Cor. Sec. 8. 0-580' Alluvium. Stopped.						

DIAMOND DRILL RECORD

Standpipe
Casing 910'

Started
Finished
Hole Size
Depth 1232'
% Core Rec.

Mine Winkler-Faulkner, Safford, Arizona
Location 1500' N, 100' E of SW Cor, Sec. 16, T 6 S, R 26 E.
Logged by Bell Date 10-20-64
Drilled by Faulkner, Rotary

Hole No. W-F - 6
Level Surface
Grid
Latitude
Departure
Elevation 3285' Apx
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data No.	Interval Feet	Sple. Feet	Oz. Ag	% Pb	% Zn
0								
		Alluvium, sand, conglomerate, 165' clay.						
800								
		Rock bit, no core.						
910								
		Alternating beds red-brn conglomerate, pinkish-gy sandstone, brn siltstone, and thin andesite flows 45 to core.		No visible copper.				
	322							
1044								
		Dense gray aphanitic andesite flows and thinner flows red vesicular basalt. Sparse chlorite, calcite, fe ox. Talcy bx at bottom.						
1232								
End								

DIAMOND DRILL RECORD

Standpipe 11'
Casing
Started
Finished
Hole Size
Depth 740'
% Core Rec.

Mine Winkler-Faulkner, Safford, Arizona
Location 400' N, 1200' W of NE Cor.
Sec. 22, T 6 S, R 26 E.
Logged by Bell Date 10-20-64
Drilled by Faulkner, Rotary

Hole No. W-F - 7
Level Surface
Grid
Latitude
Departure
Elevation 3350' Apx
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data No.	Interval Feet	Sple. Feet	Oz. Ag	% Pb	% Zn
0		Alluvium, sand, with many boulders.						
665		Rock bit, no core.						
710	10	Qtz diorite, medium grained, somewhat porphyritic xtalline texture, lt gy milky euhedral fs xtals with glistening surfaces, brn-blk biotite, gy interstitial qtz, a little orthoclase. Not strongly altered.	Spot assays to 0.04% Cu.					
720		Rock bit, no core.						
725	14	As in 710-720 interval, with some brn fe ox stains and sparse epidote. Qtz diorite.						
739		No core.						
740								
End								

DIAMOND DRILL RECORD

Standpipe
Casing

Started
Finished
Hole Size
Depth 1063'
% Core Rec.

Mine Winkler-Faulkner, Safford, Arizona
Location 1300' N, 550' E of SW Cor.
Sec. 16 T 6 S, R 26 E.
Logged by Bell Date 10-20-64
Drilled by Faulkner, Rotary

Hole No. W-F - 9
Level Surface
Grid
Latitude
Departure
Elevation 3290' Apx
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data					
			No.	Interval Feet	Sple. Feet	Oz. Ag	% Pb	% Zn
0		Alluvium, sands, conglomerate, boulders						
970		Rock bit, no core. Cuttings suggest reddish andesite or basalt.		No visible copper. Spot spl by Faulkner reported to assay .01 oz. Ag, .02% Cu, Tr. Mo.				
1043	20	Andesite, dark gray dense aphanitic rock, flecks fe ox after py, 3' bx section, color banding 40 to core.						
1063								
End								

FORM 147 - 4M - 1-62

DIAMOND DRILL RECORD

Standpipe
Casing

Started
Finished
Hole Size
Depth 1040'
% Core Rec.

Mine Winkler-Faulkner, Safford, Arizona
Location 110' N, 1220' E of NE Cor.
Sec. 22, T 6 S, R 26 E.
Logged by Bell Date 6-29-64
Drilled by Faulkner, Rotary

Hole No. W-F 10
Level Surface
Grid
Latitude
Departure
Elevation 3390' Apx
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data No.	Interval Feet	Sple. Feet	Oz. Ag	% Pb	% Zn
0								
		Alluvium, sand, conglomerate, clay						
675								
	10	Some core, not marked as to depth. Gray porphyritic rock, badly brkn, with calcite veinlets, considerable limonite. Qtz diorite (?).						
690				No visible copper.				
		Rock bit, no core. Cuttings described as yellowish, limonitic, some brn fe ox.						
1040								
End								
		Note: 3 bit cones in bottom.						

FORM 127 4M

DIAMOND DRILL RECORD

Standpipe
Casing

Started 7-11-64
Finished
Hole Size
Depth 1270'
% Core Rec.

Mine Winkler-Faulkner, Safford, Arizona
Location 900' N, 2250' E of SW Cor.
Sec. 5, T 6 S, R 26 E.
Logged by Bell Date 10-20-64
Drilled by Faulkner, Rotary

Hole No. W-F - 12
Level Surface
Grid
Latitude
Departure
Elevation 3480' Apx
Bearing
Inclination Vertical

Depth Feet	Feet Core	Lithologic Description	Sample Data No.	Interval Feet	Sple. Feet	Oz. Ag	% Pb	% Zn
0		Alluvium, sand, gravel, conglomerate.						
550	20	Two boxes core, depth intervals not marked. In first, some tuffaceous conglomerate, succeeded by porph. andesite (?), a gray fine grained rock, faintly xtalline texture, consisting of partly euhedral fs, hornblende lathes, biotite, and interstitial qtz. Specks magnetite, some fe ox specks after disseminated py, and a few yellowish py grains. Second box, same fine grain gray rock, faintly xtalline texture, biotite. Remainder rock bitted, no core.		No visible copper.				
1090	10	Gray fine grained rock, sugary ground mass, with gray white fs, biotite, specks magnetite and pyrite, interstitial qtz. Porphyritic andesite (?).						
1100		Rock bit, no core.						
1270								
End								

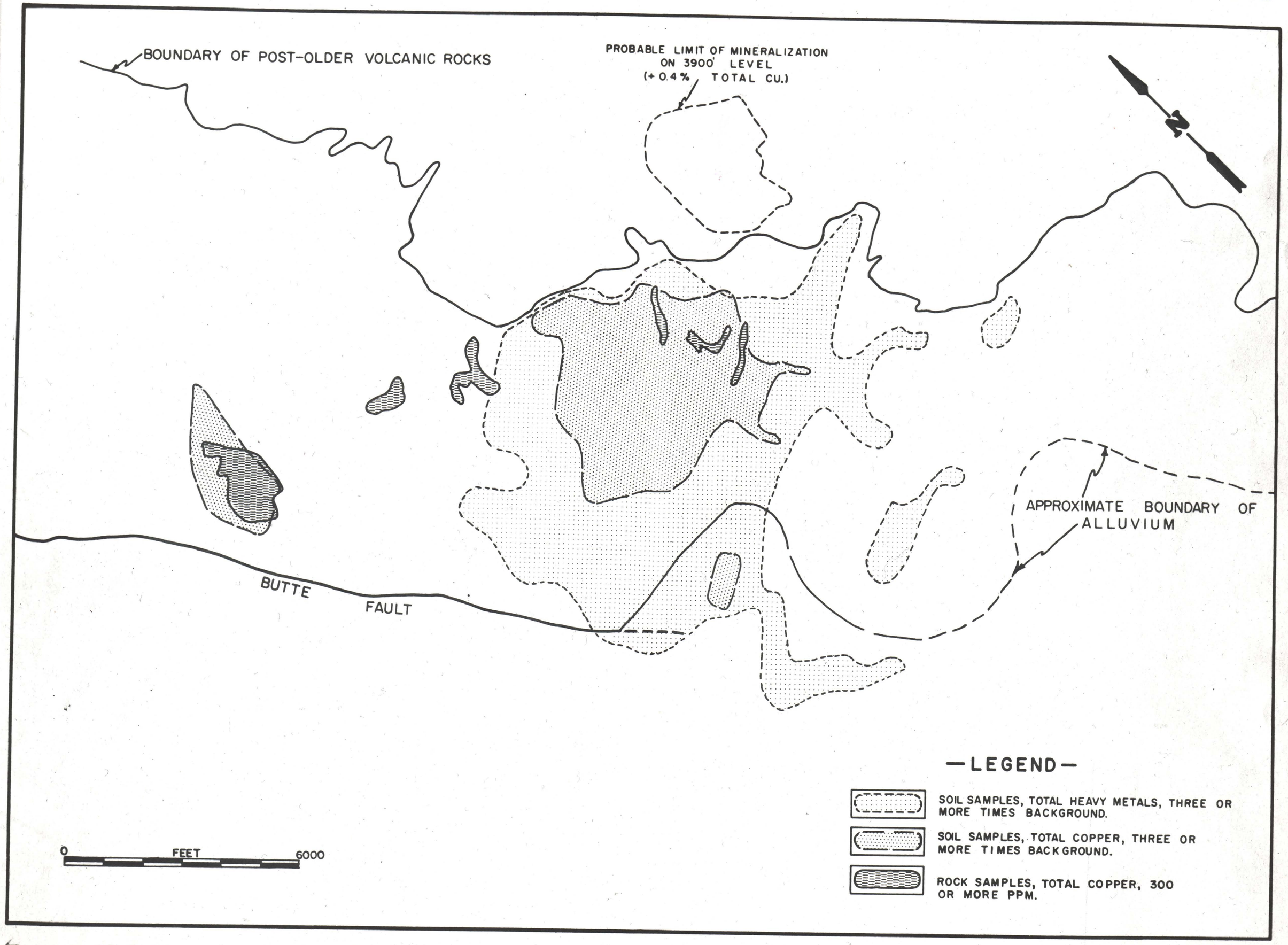


FIGURE 12.—Map showing geochemical anomalies

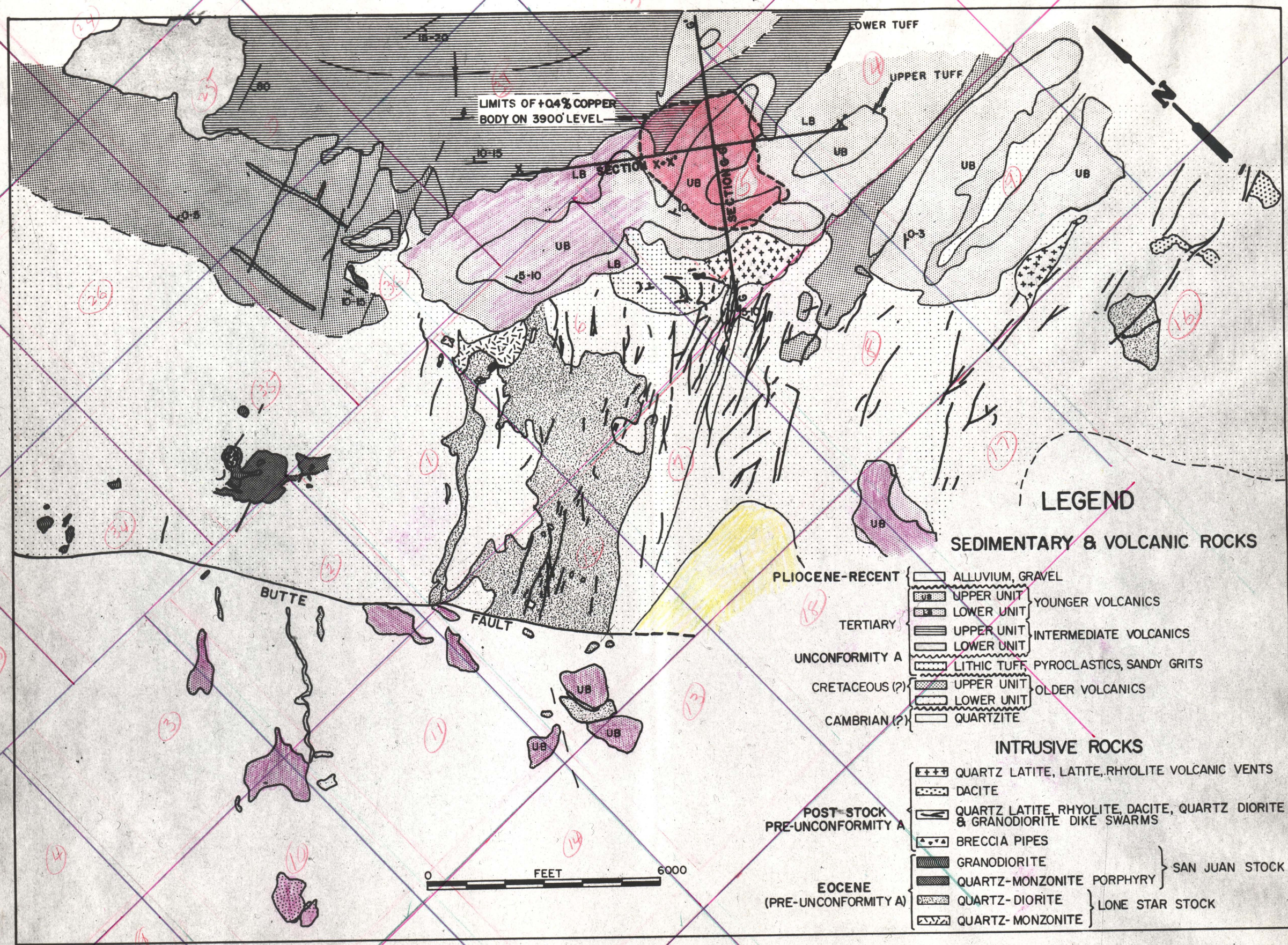


FIGURE 3.—Geologic map.

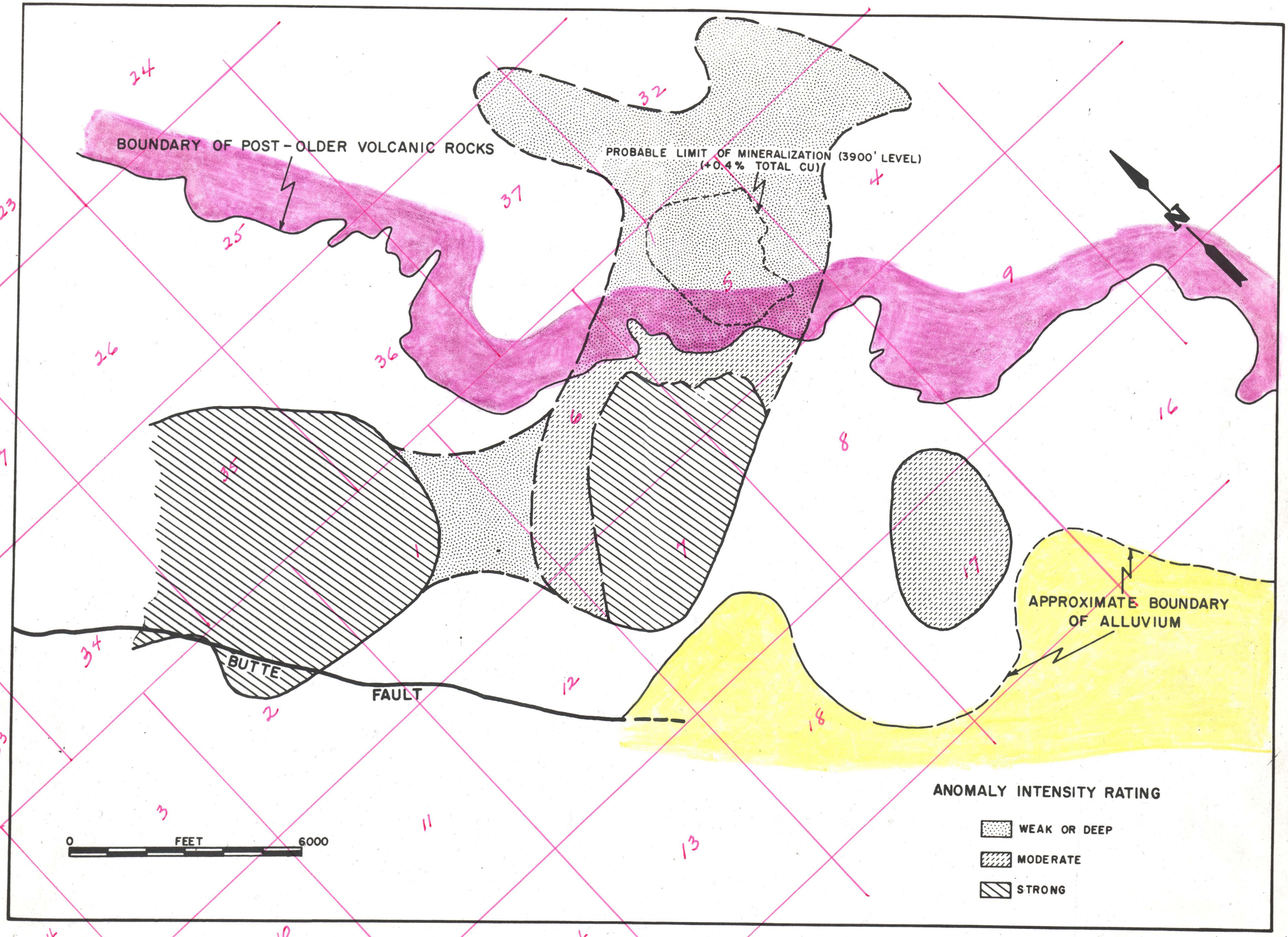


FIGURE 11.—Map showing I.P. anomalies.

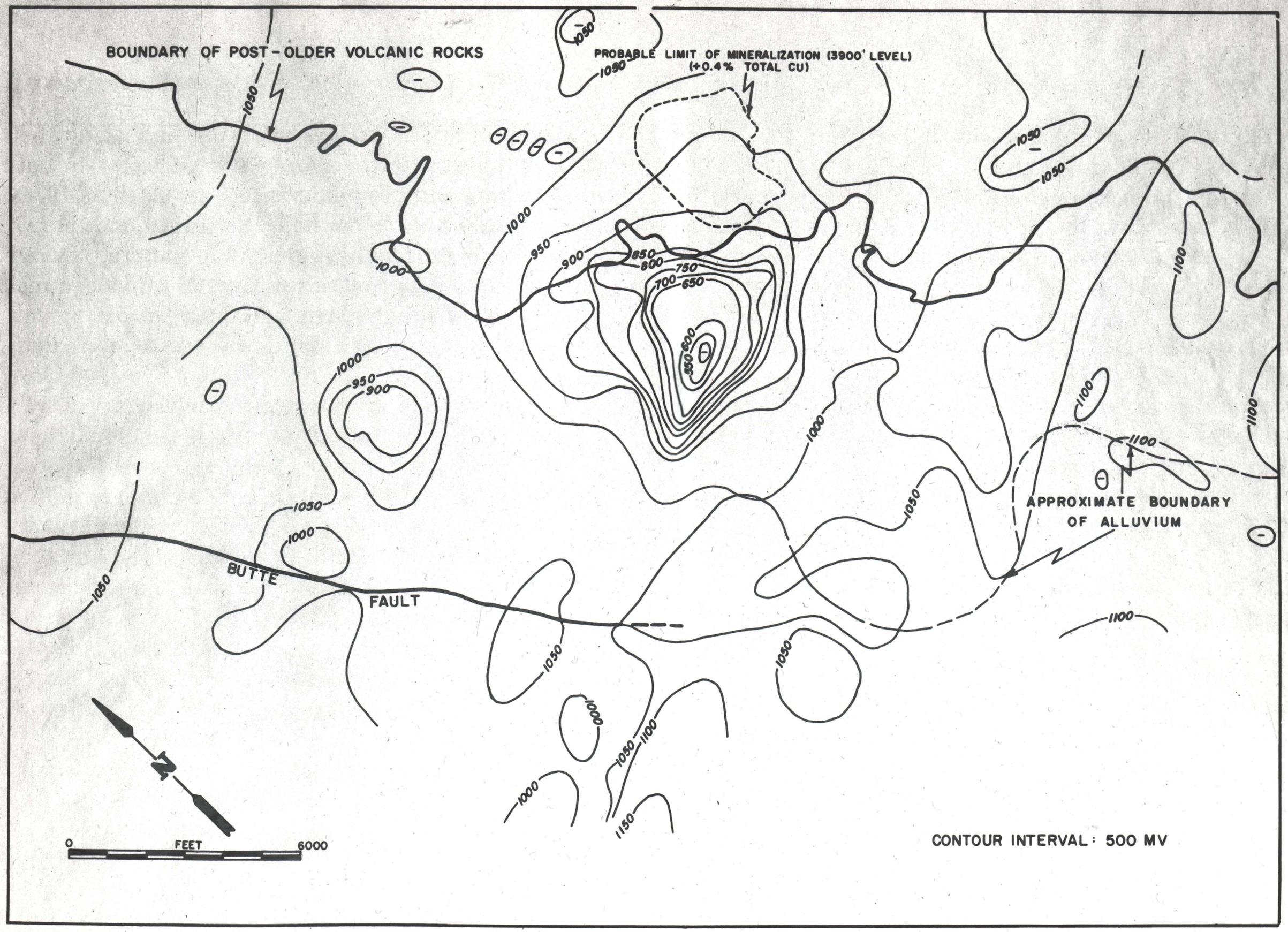


FIGURE 10.—Map showing S.P. anomalies.

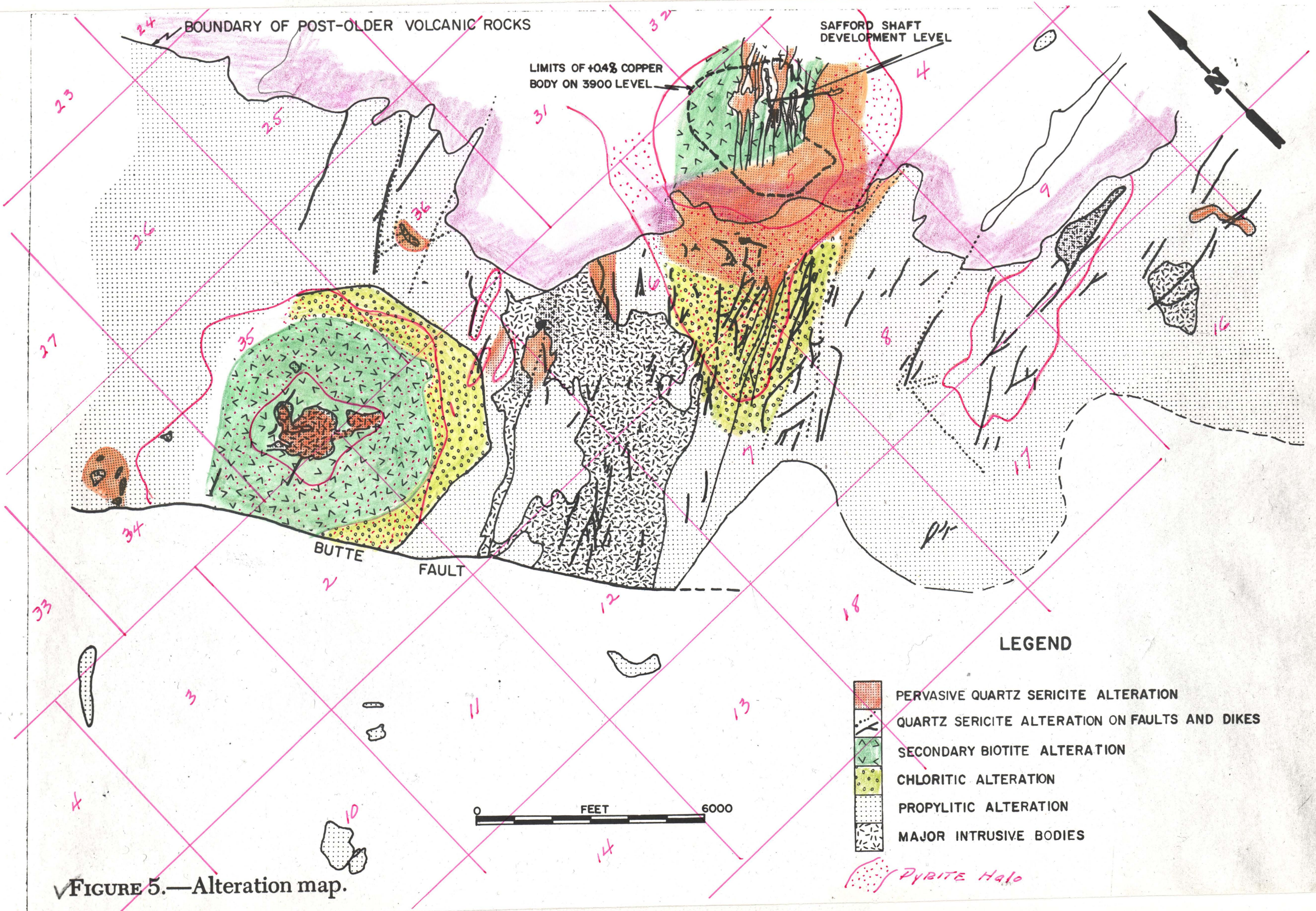


FIGURE 5.—Alteration map.

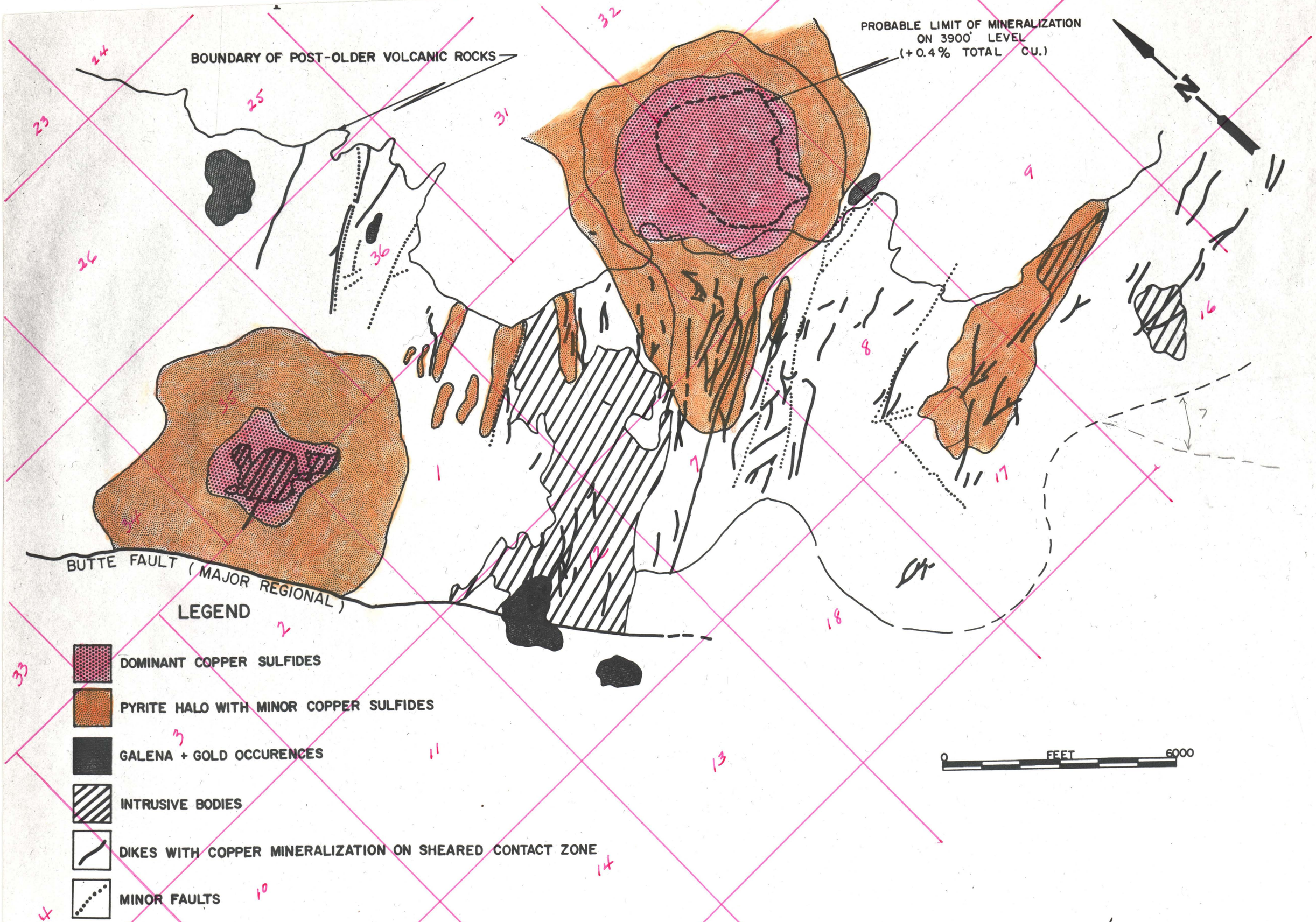


FIGURE 6.—Map of mineralization distribution.

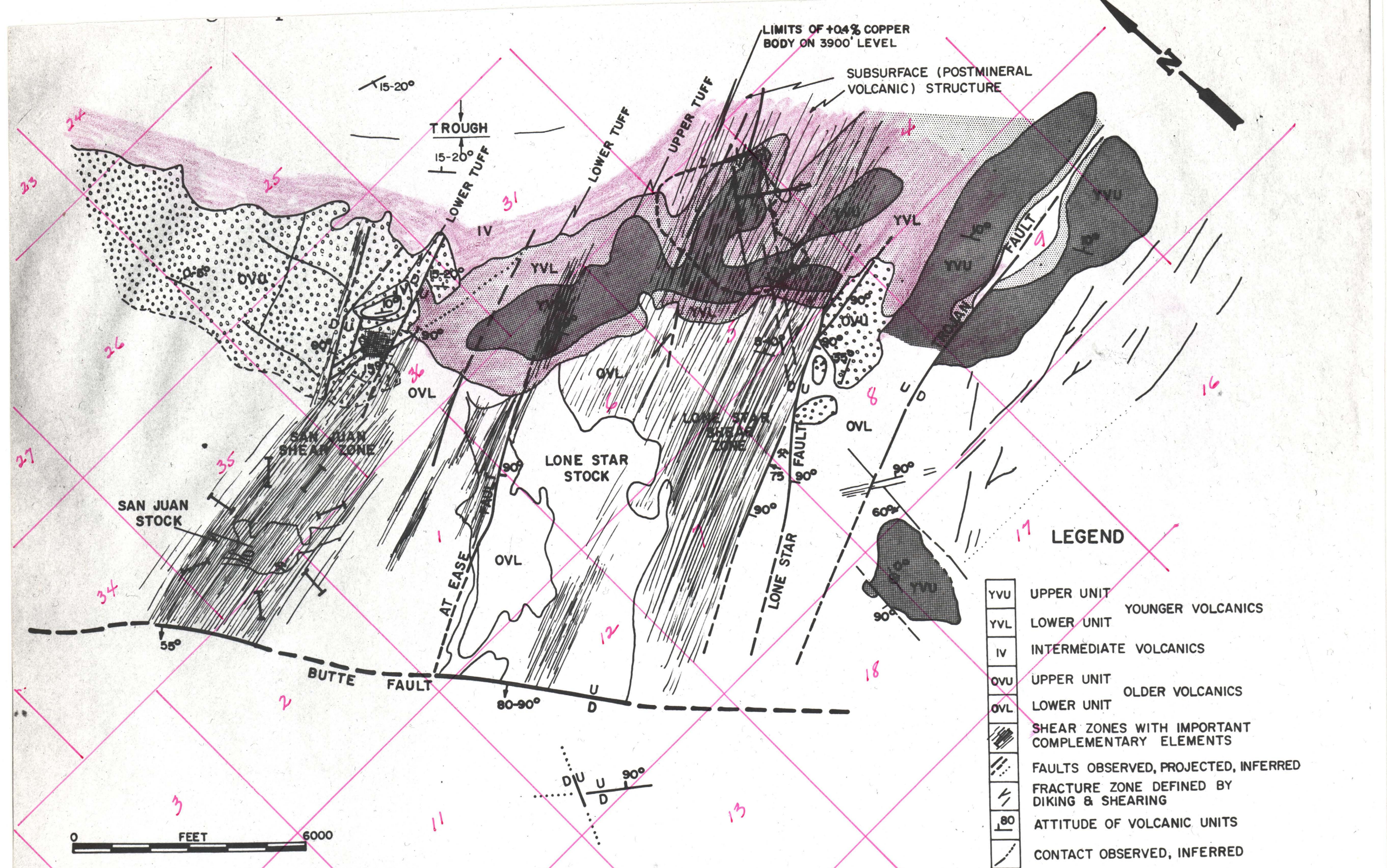
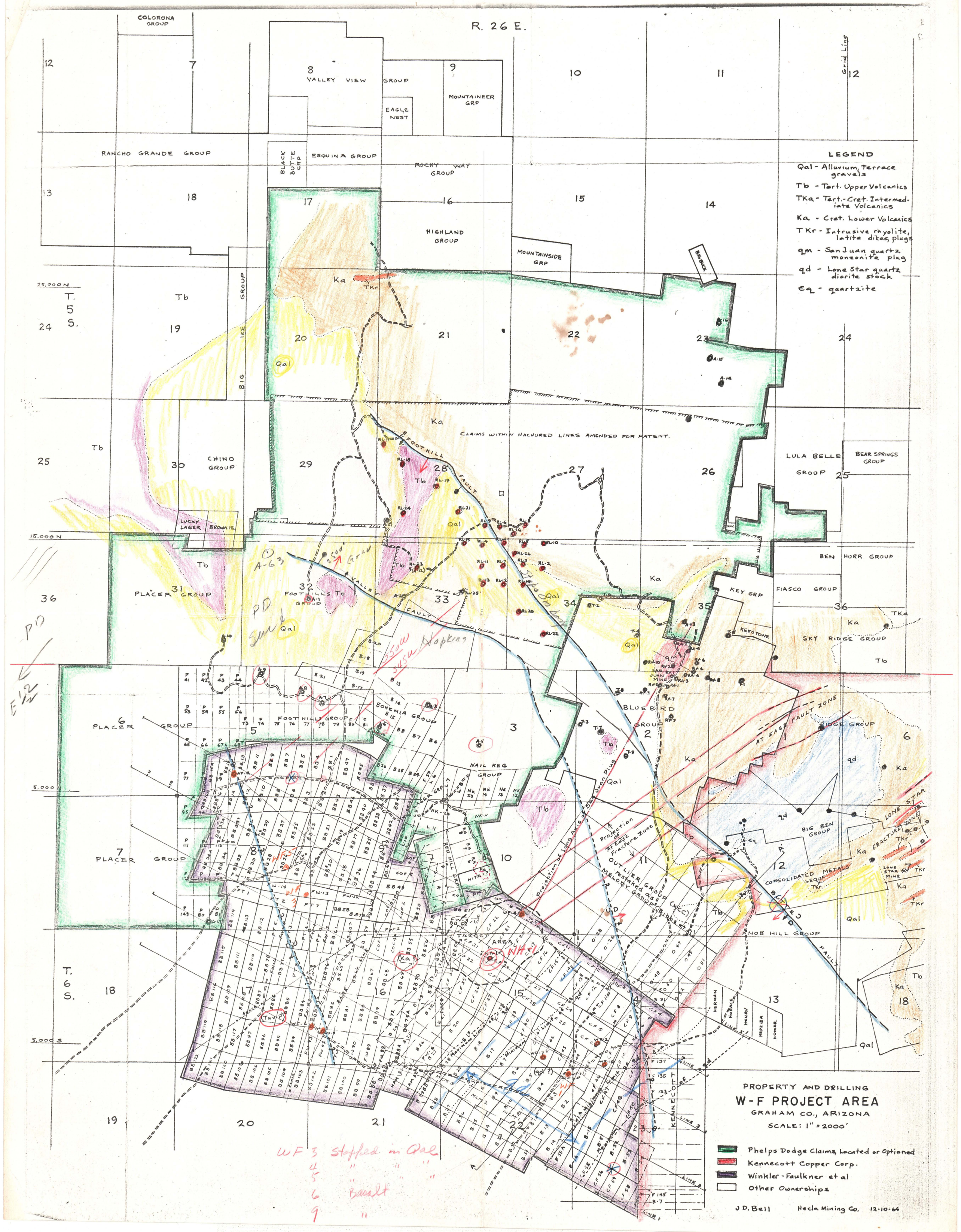
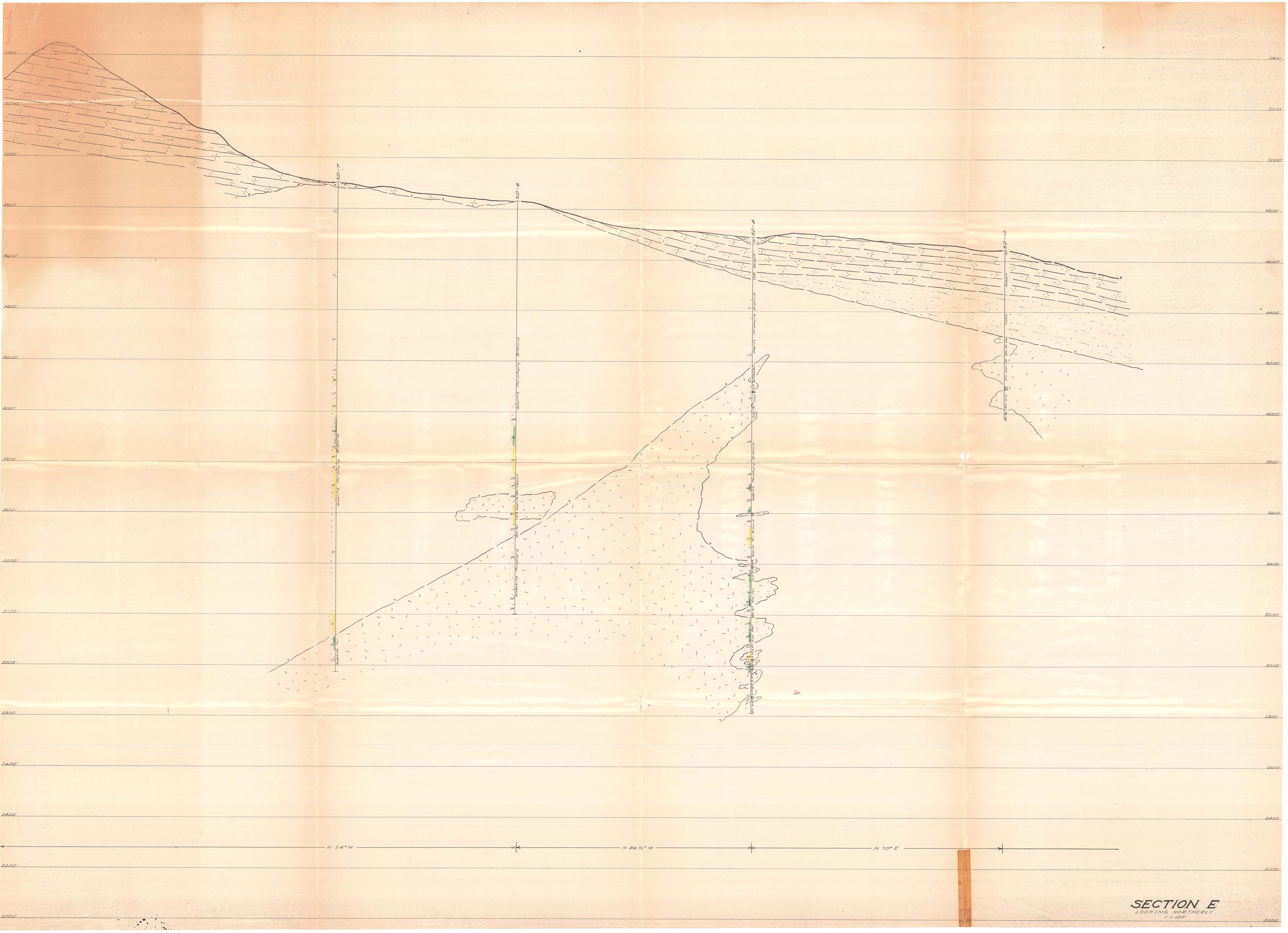
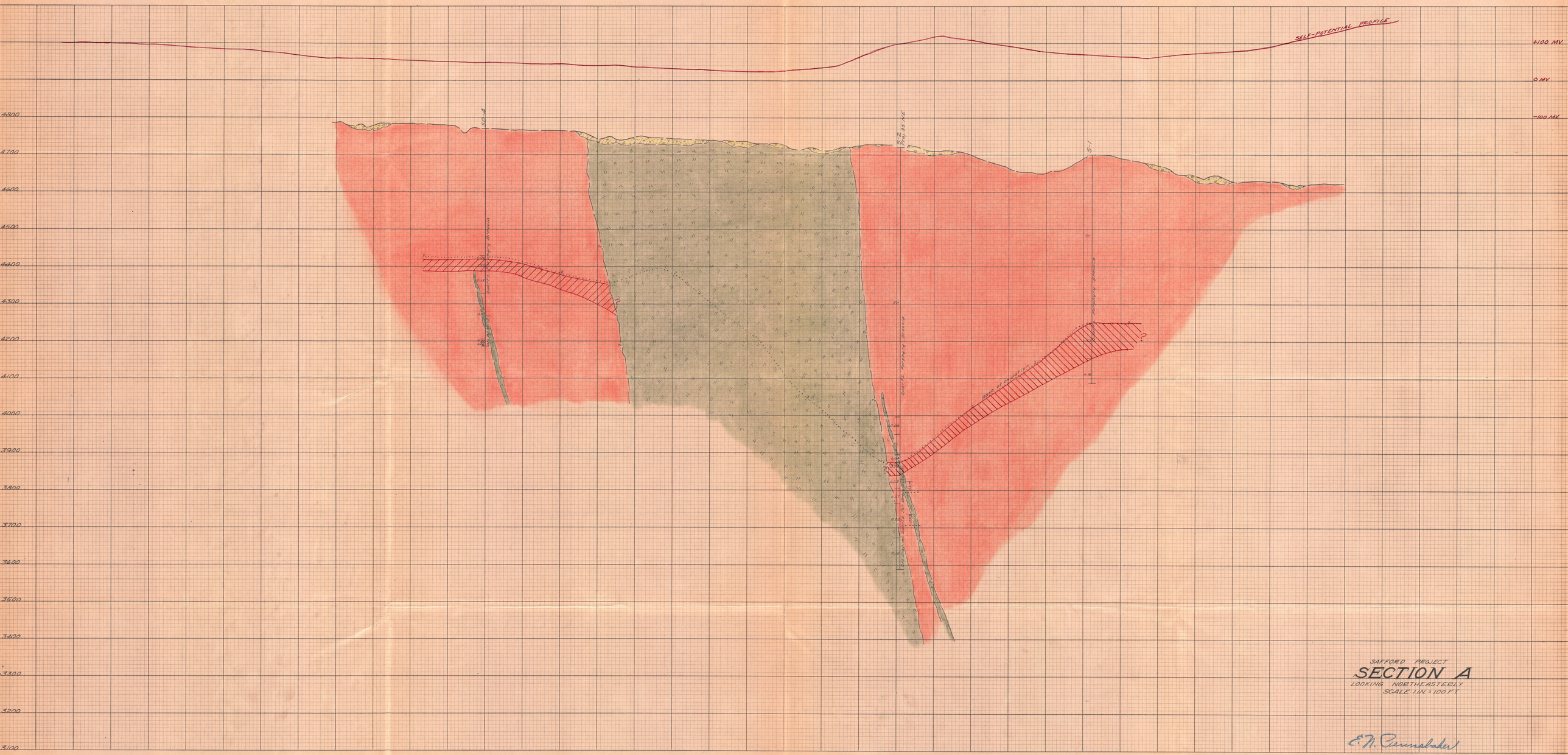


FIGURE 4.—Structural map.


R. 26 E.
T. 5 S.
T. 6 S.
COLORONA GROUP
VALLEY VIEW GROUP
EAGLE NEST
MOUNTAINEER GRP
RANCHO GRANDE GROUP
BLACK BUTTE GRP
ESQUINA GROUP
ROCKY WAT GROUP
HIGHLAND GROUP
MOUNTAINSIDE GRP
BIG BUCK
BIG IKE GROUP
CLAIMS WITHIN HACHURED LINES AMENDED FOR PATENT.
FOOTHILL FAULT
CHINO GROUP
LUCKY LAGER
BROWNIE
PLACER GROUP
FOOTHILLS GROUP
VALLEY FAULT
LULA BELLE GROUP
BEAR SPRINGS GROUP
BEN HURR GROUP
FIASCO GROUP
KEY GRP
KEYSTONE
SKY RIDGE GROUP
BLUEBIRD GROUP
BOHEMIA GROUP
NAIL KEG GROUP
RED HILL GRP
TARGET AREA
OUTLIER GROUP
MELBOY GROUP
BIG BEN GROUP
CONSOLIDATED METALS GROUP
LONE STAR FRACTURE ZONE
LONE STAR MINE
KNOB HILL GROUP
KENNECOTT
HERMAN
HORACE
HENRY
HEP 1-5A
HOMER
AT EASE FAULT ZONE
Projection of Long Axis of San Juan Plug
Projection of Edge of Fracture Zone
Grid Line
25,000 N
15,000 N
5,000 N
5,000 S
LEGEND
Qal - Alluvium, Terrace gravels
Tb - Tert. Upper Volcanics
TKa - Tert.-Cret. Intermediate Volcanics
Ka - Cret. Lower Volcanics
TKr - Intrusive rhyolite, latite dikes, plugs
qm - San Juan quartz monzonite plug
qd - Lone Star quartz diorite stock
Eq - quartzite
PROPERTY AND DRILLING
W-F PROJECT AREA
GRAHAM CO., ARIZONA
SCALE: 1" = 2000'
Phelps Dodge Claims, Located or Optioned
Kennecott Copper Corp.
Winkler-Faulkner et al
Other Ownerships
J.D. Bell
Hecla Mining Co.
12-10-64
WF 3 stopped in Qal
4 " " "
5 " " "
6 Basalt
9 "

HECLA-NEWMONT
PLAN
(Bell)


5400'
5200'
5000'
4800'
4600'
4400'
4200'
4000'
3800'
3600'
3400'
3200'
3000'
2800'
2600'
2400'
2200'
2000'
SD-7
SD-8
SD-8
SD-10
N 54° W
N 86½° W
N 70° E
SECTION E
LOOKING NORTHERLY
1" = 100'


SELF-POTENTIAL PROFILE
+100 MV.
0 MV.
-100 MV.
4800
4700
4600
4500
4400
4300
4200
4100
4000
3900
3800
3700
3600
3500
3400
3300
3200
3100
SAFFORD PROJECT
SECTION A
LOOKING NORTHEASTERLY
SCALE 1 IN. = 100 FT.
E. N. Cunnabaker

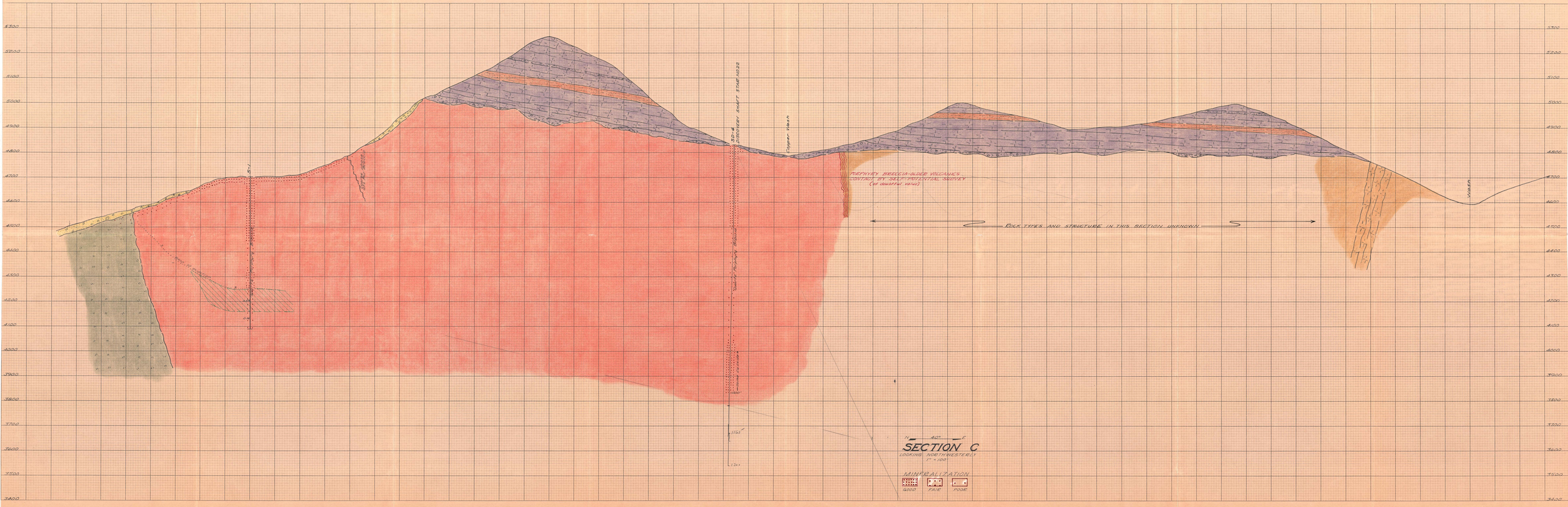
SAFFORD LONG. SECTION "A"

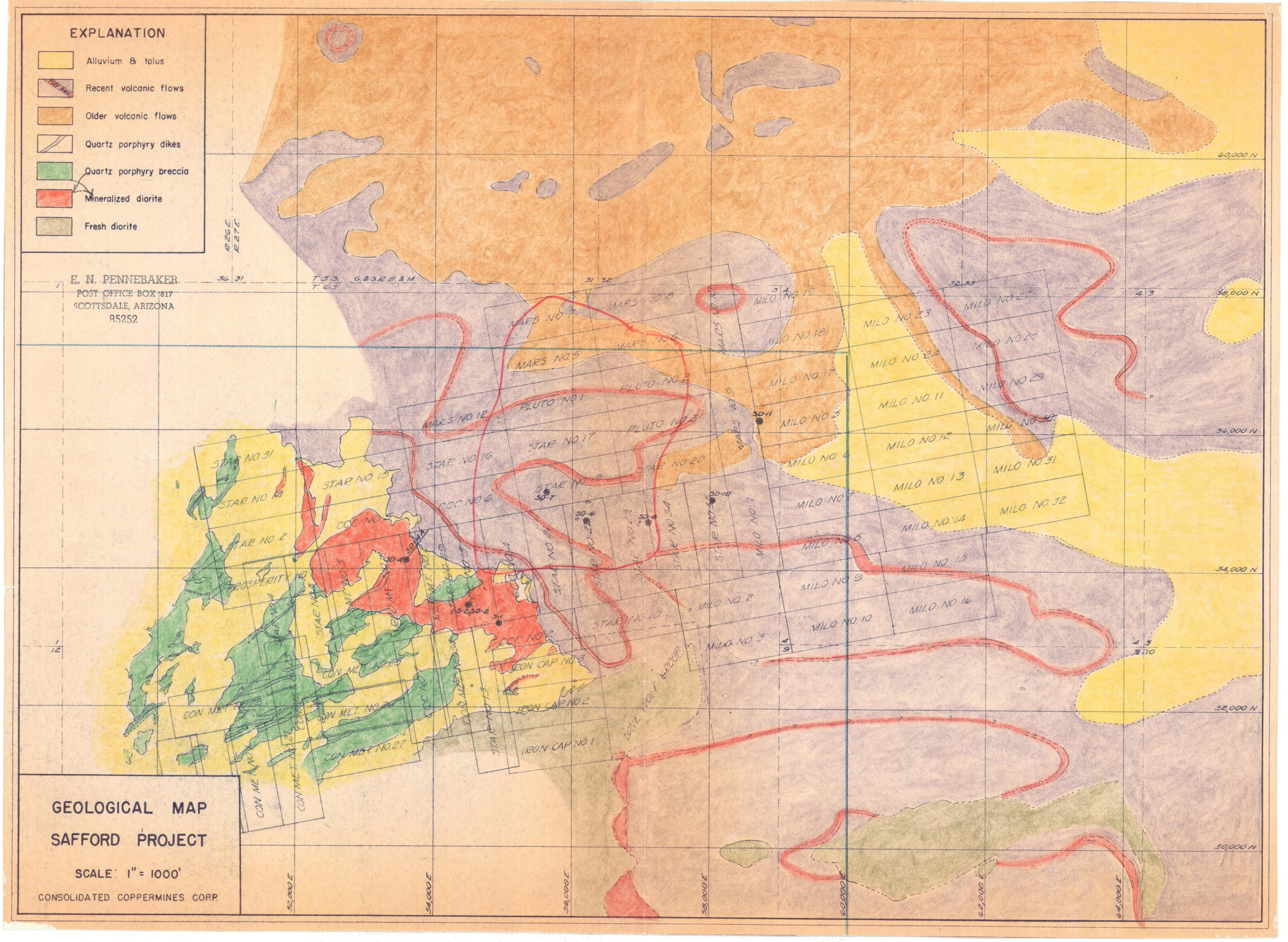
Showing Holes
S-1, S-2, & S0-4

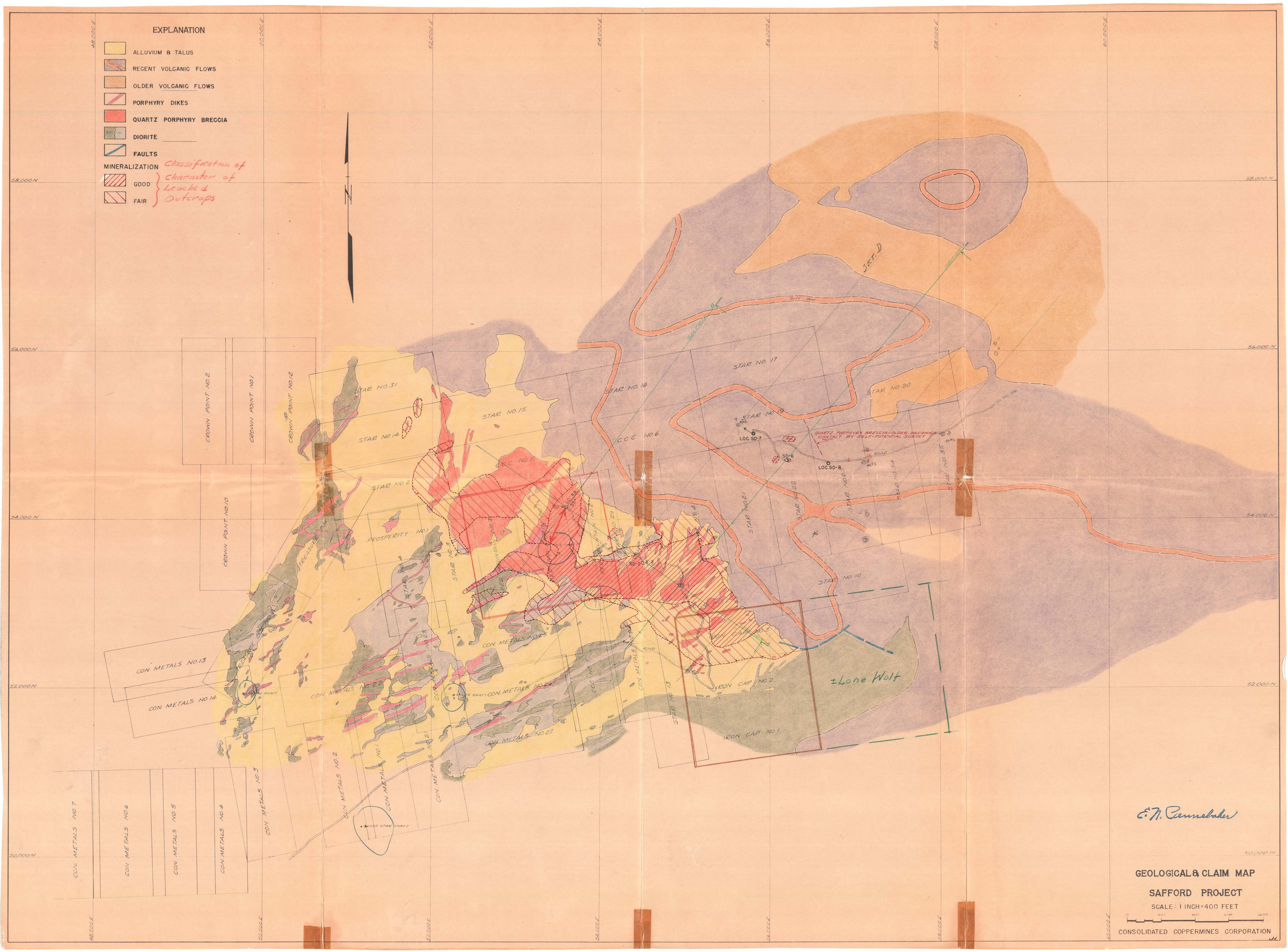
RECEIVED
APR 12 1950
E. N. PENNEBAKER

E. N. Pennebaker

E. N. Pennebaker


5300
5200
5100
5000
4900
4800
4700
4600
4500
4400
4300
4200
4100
4000
3900
3800
3700
3600
3500
3400
SD-4
DISCOVERY SHAFT STAT. N 22
Copper Wash
TERTIARY BRECCIA-OLDER VOLCANICS
CONTRD BY SELF-POTENTIAL SURVEY
(of doubtful value)
ROCK TYPES AND STRUCTURE IN THIS SECTION UNKNOWN
WASH
116'
132'
N
40°
E
SECTION C
LOOKING NORTHWESTERLY
1" = 100'
MINERALIZATION
GOOD
FAIR
POOR


EXPLANATION
Alluvium & talus
Recent volcanic flows
Older volcanic flows
Quartz porphyry dikes
Quartz porphyry breccia
Mineralized diorite
Fresh diorite
E. N. PENNEBAKER
POST OFFICE BOX 817
SCOTTSDALE, ARIZONA
85252
GEOLOGICAL MAP
SAFFORD PROJECT
SCALE: 1" = 1000'
CONSOLIDATED COPPERMINES CORP.
60,000 N
58,000 N
56,000 N
54,000 N
52,000 N
50,000 N
52,000 E
54,000 E
56,000 E
58,000 E
60,000 E
62,000 E
64,000 E
MARS NO. 8
MARS NO. 7
MARS NO. 6
MARS NO. 5
MARS NO. 12
MARS NO. 9
PLUTO NO. 1
PLUTO NO. 2
PLUTO NO. 3
STAR NO. 17
STAR NO. 16
STAR NO. 20
STAR NO. 31
STAR NO. 15
STAR NO. 14
STAR NO. 2
STAR NO. 10
CCC NO. 6
CCC NO. 2
PROSPERITY NO. 4
CON MET NO. 27
IRON CAP NO. 1
IRON CAP NO. 2
IRON CAP NO. 3
LONE WOLF
MILO NO. 19
MILO NO. 18
MILO NO. 17
MILO NO. 23
MILO NO. 24
MILO NO. 11
MILO NO. 12
MILO NO. 13
MILO NO. 31
MILO NO. 32
MILO NO. 14
MILO NO. 15
MILO NO. 9
MILO NO. 16
MILO NO. 10
MILO NO. 2
MILO NO. 3
MILO NO. 29
SD-11
SD-7
SD-6
SD-10
SD-1


EXPLANATION
ALLUVIUM & TALUS
RECENT VOLCANIC FLOWS
OLDER VOLCANIC FLOWS
PORPHYRY DIKES
QUARTZ PORPHYRY BRECCIA
DIORITE
FAULTS
MINERALIZATION
GOOD
FAIR
Classification of Character of Leached Outcrops
N
48,000 E
50,000 E
52,000 E
54,000 E
56,000 E
58,000 E
60,000 E
58,000 N
56,000 N
54,000 N
52,000 N
50,000 N
CROWN POINT NO.2
CROWN POINT NO.1
CROWN POINT NO.12
CROWN POINT NO.10
CON. METALS NO.13
CON. METALS NO.14
CON METALS NO.7
CON METALS NO.6
CON METALS NO.5
CON METALS NO.4
CON METALS NO.3
CON METALS NO.2
CON METALS NO.1
CON METALS NO.21
CON METALS NO.22
CON METALS NO.27
CON METALS NO.28
STAR NO.31
STAR NO.14
STAR NO.15
STAR NO.16
STAR NO.17
STAR NO.19
STAR NO.20
STAR NO.2
STAR NO.21
STAR NO.22
STAR NO.10
STAR NO.13
STAR NO.35
CCC NO.6
CCC NO.5
PROSPERITY NO.1
TREASURY
IRON CAP NO.1
IRON CAP NO.2
IRON CAP NO.3
±Lone Wolf
LOC. SD-7
LOC. SD-8
SD-6
SD-2
SD-1
QUARTZ PORPHYRY BRECCIA-OLDER VOLCANICS CONTACT BY SELF-POTENTIAL SURVEY
SECTION A
SECTION B
SECTION C
SECT. D
TULL ROAD
ROAD
MILES SHAFT
LONE STAR SHAFT
E. N. Pennebaker
GEOLOGICAL & CLAIM MAP
SAFFORD PROJECT
SCALE: 1 INCH=400 FEET
CONSOLIDATED COPPERMINES CORPORATION

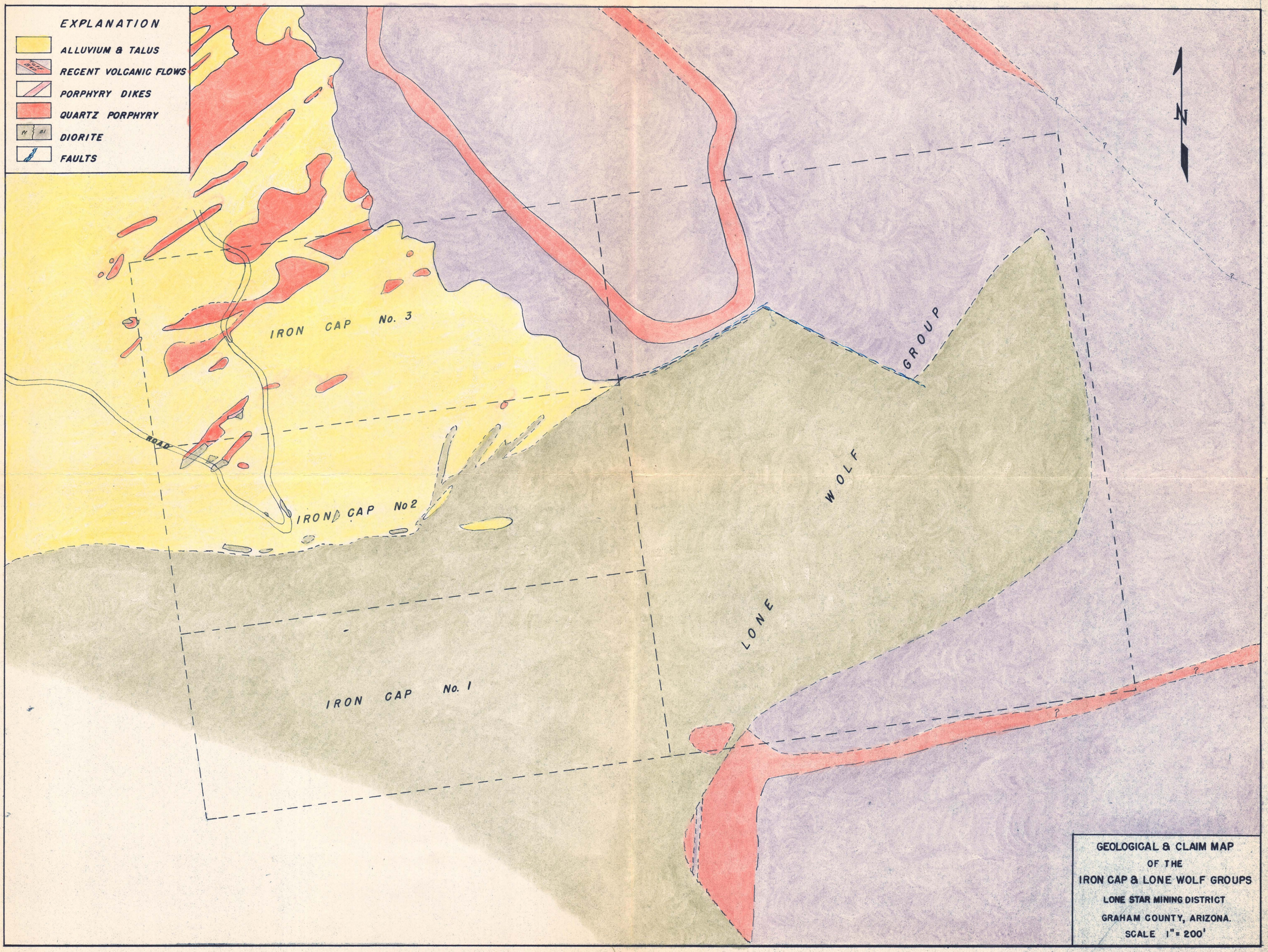
SAFFORD GEOLOGICAL MAP

E. N. Cressbaker

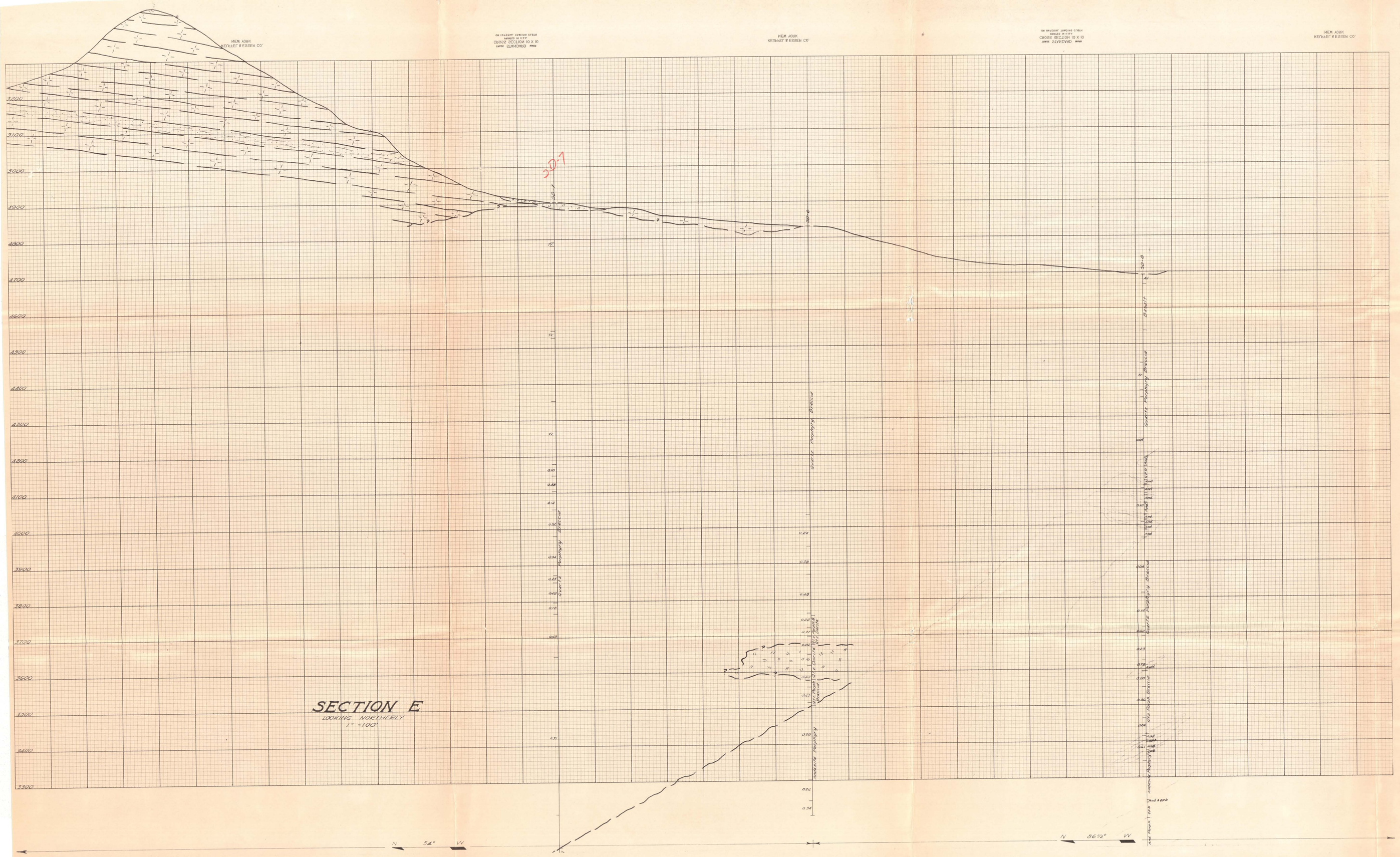
SAFFORD GEOL.

E. N. Cressbaker

SAFFORD GEOLOGICAL MAP


EXPLANATION
ALLUVIUM & TALUS
RECENT VOLCANIC FLOWS
PORPHYRY DIKES
QUARTZ PORPHYRY
DIORITE
FAULTS
N
IRON CAP No. 3
IRON CAP No 2
IRON CAP No. 1
ROAD
LONE WOLF GROUP
GEOLOGICAL & CLAIM MAP
OF THE
IRON CAP & LONE WOLF GROUPS
LONE STAR MINING DISTRICT
GRAHAM COUNTY, ARIZONA.
SCALE 1" = 200'

SAFFORD PROJECT
SECTION B
LOOKING NORTHWESTERLY
SCALE 1"=100 FT
E.H. Carnahan
+100 MV.
0 MV.
-100 MV.
SELF-POTENTIAL PROFILE
CLARA SHAFT
ADIT
QUARTZ STRUNTH BRECCIA
SP-8
SP-8-A
5600
5500
5400
5300
5200
5100
5000
4900
4800
4700
4600
4500
4400
4300
4200
4100
4000
3900
3800


SP-7
SECTION E
LOOKING NORTHERLY
1" = 100'
5200
5100
5000
4900
4800
4700
4600
4500
4400
4300
4200
4100
4000
3900
3800
3700
3600
3500
3400
3300
N 54° W
N 36½° W