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3-4-25

REPORT ON

THE KEYSTONE MINE

GILA COUNTY, ARIZONA

by

John E. Kinnison

Chief Geologist

January 9, 1970

Geo-Comp Exploration, Inc.
1706 W. Grant Road
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January 9, 1970

Mr. Jack Fraser
President
Glen Explorations
1204 Praetorian Building
Dallas, Texas 75201

RE: Keystone Mine, Gila County, Arizona

Dear Mr. Fraser:

I have examined the subject property, spending initially one day, Thursday, October 30, 1969, on the ground and subsequently reconnoitering the surface outcrop by helicopter. Additional work, including claim-staking, is described in the following. I herewith present my report thereon.

John E. Kinnison

John E. Kinnison
Chief Geologist
Geo-Comp Exploration, Inc.

GEO-COMP EXPLORATION, INC.

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Attachments

A. Index Map, Arizona

B. Access and Location Map: 1" = 4 mi.

B1 Detailed Access Map and Topography: 1" = 1 mi.

C Long Shorty Claim Group, showing Keystone vein: 1" = 500'

D. Sketch of Surface at Shaft 1" = 30'

E. Sketch map, 65 ft. level 1" = 30'

F. Sketch map, 115 ft, level 1" = 50'

G. Sketch map, Gun Creek adit 1" = 100'

H. Sketch map, Main workings and drill hole 1" = 100'

I. Cross-section through main workings and drill hole 1" = 100'

J1, J2, and J3. Landscape Photographs

SUMMARY AND RECOMMENDATIONS

The Keystone is a pre-Cambrian copper vein in schist, with an indicated total strike length approaching 2000 feet. A central area 550 feet long, prospected on the surface and by a few underground workings, is an oxidized, partially leached capping which will undoubtedly give way, probably in less than 300 feet, to a sulphide zone of pyrite and chalcopyrite. My appraisal of this leached capping indicates that it is derived from the oxidation of a sulphide zone which could have contained about 5% copper. There is no reason to assume that the sulphides in depth, beneath the level of oxidation, are materially different from that indicated by the leached capping.

The pre-Cambrian copper veins in schist are represented by some notable small mines, as well as the large and famous United Verde at Jerome. One of the demonstrable characteristics of these deposits, in general, is to persist uniformly to considerable depth (1000 feet plus). The vein is indicated to be at least 20 feet wide. Thus, the tonnage available -- even if extensions beyond the central 550 foot outcrop area is not found -- is substantial.

I recommend that approximately $10,000 be spent in further exploration, to determine if drilling is warranted. I recommend this work 1) to clear up some geological uncertainties that exist at present, and 2) also as preparation for drill site selection. To allow for contingencies, about $12,000 should actually be available. It is

premature to prepare drilling cost estimates, but you should have in mind that this would initially be about $50,000 at a minimum.

The Keystone has a prospective possible profit yield of 18.5% on capital investment, over and above repayment of capital. If you, as the investor, consider this rate of return sufficiently attractive, you will naturally wish to follow it to conclusion. I believe the merits of the property are substantial enough to be attractive at that rate, and that initial exploration costs are low enough to warrant the risk attendant.

Although the prospect is currently very inaccessible -- and this feature will raise exploration costs somewhat -- it is not so extremely isolated when viewed as an operating mine. There will be a 12 mile haulage road to be constructed and a relatively long trucking route from mill to smelter. However, none of the adversities, individually or collectively, are sufficiently great to mitigate against a profitable operation, provided, however, that exploration actually finds sufficient tonnage of sulphides grading nearly 5% Cu.

To place the economics into focus, I have run the trial outcome given on page 3. I have assumed that drilling reached a point at which underground exploration was justified, and that this resulted in developed reserves as given in the table, with possible extension in depth. At this point exploration is temporarily suspended, and a 200 ton per day operation constructed, with anticipation of expansion

POSSIBLE ECONOMIC OUTCOME*

Assumed: 5% Cu 400,000 tons

Net Smelter Return	$27/ton
Trucking: Mine to mill	$ 1.08/ton
Trucking: Mill to smelter	1.03/ton
Direct Mining	8.00/ton
Direct Milling	4.00/ton
Engineering	1.00/ton
Overhead	.75/ton
Local Taxes	.50/ton
Total Operating Costs	$16.36; or, in round figures: $16.50/ton

Net Operating Profit Before Federal Income Tax: $10.50/ton

@ 200 ton/per day, life of mine: 6-1/2 years $1,620,000 Net Smelter/Yr.

1 year production, 60,000 tons $ 630,000 Profit on Net Smelte

Capital Amortization @ 8%	out 259,000	$205,000
Depletion, 15% Net Smelter 15% x 1,620,000		$243,000
Operating profit less amort. & depl.	128000	$182,000
Federal Income Tax, 52%	67000	$ 95,000
Net Profit after Taxes	563 000	$535,000 per year

Capital Costs: $1,685,000

Hoskold Formula, Discount to Present Value, Factor: 3.05
6-1/2 year life of mine, total net profit $535,000 per year, will pay off capital investment of $1,685,000 by a 6% sinking fund, and yield 18-1/2% return on investment.

* Refer to "Mining and Milling", also Appendixes 2 and 3 of this report, for details of assumptions re: grade ore, concentrates, smelter liquidation, operating and capital costs, and related data.

at a later date. An overall reduction in cost structure, following expansion, would move the return to 20% or greater. Supporting details are given in the report and appendixes. It would be possible to run many such trial outcomes, predicated on different assumptions of tonnage, grade, etc. However, since this is but a hypothetical model of a geologic possibility, I will generalize using this one as a base.

I believe it is obvious that 3% copper (unless bolstered by substantial gold and silver) would not pay and that 4% is probably sub-marginal. The exploration target, then, must be 4.5 to 5% copper.

What are the odds of finding a sizeable deposit of this grade? I fully anticipate that an extensive sulphide zone exists and rate the chances on that part of the venture very good. As to grade, my appraisal of the leached capping shows 5% to be permissible. However, a leached capping of this type (massive sulphide) cannot be interpreted with sufficient finesse to distinguish with certainty between, say, 5% Cu and 3% Cu – the difference between pay and no-pay. Other veins of this type have graded between 3 and 4% copper, usually closer to 3%. Only the United Verde at Jerome, a major deposit, has produced 5% copper. Statistically then, the chances of discovering a 4.5% to 5% copper deposit must be rated as long-shot, but possible.

REVIEW OF HISTORY AND CURRENT EVENTS

Introductory:

In the sequence of a normal mining property report, I prefer to relegate historical detail to the end-portion, or refer it entirely to an appendix. In this instance, however, our telephone conversations have made only cursory reference to the past attempts to work the mine. Further, our current investigations have been conducted in a series of semi-connected "steps", one following the other. So that you may now have a full understanding of these matters in proper sequence, which I believe will give you a firm grasp of the property and will better enable you to follow the recommendations which I set forth in the following, I have included this section as an introductory chapter to the body of my report.

Historical:

The old Keystone workings consist of a vertical shaft, 115 feet deep, sunk near the center of the length of the main surface outcrop. There is a cross-cut on the 65 foot level. The 115 level adit drives toward the shaft and connects to it. The 185 level adit drives toward the shaft and beneath it. A drift driven from the surface at Gun Creek searched for the vein, and eventually found a sulphide stringer - which may or may not be the extension of the Keystone vein. Other small

diggings are present, including a caved-in adit at the northeast end of the main surface outcrop, a 60 foot deep inclined shaft at the southwest end, and some small prospect pits. The surface workings have exposed the vein at several points over a distance of about 550 feet (as surveyed by Ventures, Ltd.); my own first visual estimate, by helicopter traverse, was 800 to 900 feet. We may assume that most of these diggings were started on an actual outcrop of the vein.

No information is available on who did this work, or when it was done. Because there are no hand-forged square nails, the work probably is post-1900 (roughly). Most likely it was done during the period between 1900 and 1920 when other small mines in the Jerome-Mayer "schist belt" were first being operated. Due to erratic gold values in the outcrop and workings, I suspect that gold rather than copper was the objective. All work was confined to exploration of the vein, and no mining as such was done.

Clarence B. "Long Shorty" Pettengill, a life-long miner and prospector, who had for several years tried to open gold veins in the Del Shay basin several miles southwest of the Keystone, evidently liked the Keystone property. He found it obviously abandoned, and on December 21, 1948, located the Keystone claims No.'s. 1 through 4, together with Mrs. Edna Ray Haught. In a mining deed of October 11, 1951, Mrs. Haught quit claimed her interest in the property to Mr. Pettengill, leaving him sole owner.

Mr. Pettengill drove the 115 level adit, which had been stopped short, on through the vein and connected with the vertical shaft, this work being done by drilling with hand steel and single jack, and hand mucking into a wheel barrow. He channel sampled the vein where exposed, made a brunton and tape survey of the workings, and plotted a plan map and longitudinal section. He renovated the old Fred Pranty cabin on the property, where he lived from the late 1940's until his death in 1956, at age 74.

About 1952, he came to Tucson to try and interest my father in the property, without success. I liked the samples of sulphides from the Gun Creek adit, and the length and width of the vein as shown on Pettengill's maps. Later, while living in Globe in 1955, I located Mr. Pettengill, visited the property, and for a few months tried to promote it, hoping to make a "finders fee", but without success. About the same time, another geologist, one Paul Bennett, also examined the property and promoted it to Southwest Ventures, Ltd., a United States sub of the parent Canadian company. They actually operated under the name - if my recollection is correct - of "Southwest Metallurgical Laboratories". Ventures constructed a primitive road, following the old 2-1/2 mile foot trail to the property, and dug one diamond drill hole which apparently failed to find the vein. They also advanced the 185 level a distance sufficient to intersect the downward projection of the vein from the 115 level above - and reportedly failed to find it. The

Ventures people concluded the vein was a small "pocket" and dropped the project at that point.

Certain details on the Ventures work are given later in the report. Their work was, if their report in my possession is any indication, poorly handled. While it signals a warning -- of which I will take due note -- there are several reasons why the reported results of their work are not conclusive. I will cover this fully in a subsequent section of this report.

Following Mr. Pettengill's death, the claims were sold to Anthony F. Scalone of Guymon, Oklahoma for $500.00, by court order June 24, 1957. Either Mr. Scalone, or lessees from him, advanced the Gun Creek drift by slusher about 80 feet, and found the sulphides to be extremely spotty. This is the last evidence of work done on the property, and I can find no recorded transfer of the claims to any other party. Evidently Mr. Scalone dropped his interest in the property, and the brush and trees in the access roads are testimoney to many years of non-use. The claims, unpatented, were open for new location by other parties at the time of my examination for Glen Explorations.

Current Events:

Having now given the past history of the property as I know it, I will briefly summarize recent events concerning our examination for Glen Explorations.

On Friday, October 10, 1969, I telephoned you and reported on my examination of the Copper Queen mine near Mayer, Arizona - rejecting same. I briefly related the fact that a number of the veins in the so-called "schist belt" which runs northerly from Phoenix, through Mayer toward Jerome, had been notable producers in their time. These are pre-Cambrian deposits which have been mined to significant depths. I recalled to you the fact that, back in 1955, I had been impressed with the width, strength, and character of a vein known as the Keystone property, in the Sierra Ancha mountains, also a pre-Cambrian vein in schist. Thus, the Keystone project was initiated with your pronouncement "GO!". The examination of this particular property has been more expensive than the average due to its inaccessibility. There is simply no way to get to the property without a lot of time spent in driving, or in flying charter to the air strip in Young, or in using helicopter out of Phoenix as we have done on numerous occassions.

Initially, I made a preliminary investigation of the property to confirm or deny my earlier impressions made when I had seen it in the mid '50's. This examination was made in October 29, 1969, through October 31, 1969, accompanied by Mr. Peter L. Beery.

I was, following this initial examination, still favorably impressed with the exploration possibilities of the vein, and so reported to you on the telephone. I recommended, and you concurred, that the strike

length of the outcrop be reconnoitered by helicopter -- this choice of method being made due to the dense brush and thick soil cover over most the outcrop. The helicopter reconnaissance was made Wednesday, November 5, 1969. The outcrop appeared to be straight and continuous in that area where it had been principally exposed by the old prospect diggings. The general trace was flagged by placing toilet paper on the brush so that the trace was readily observable. During this helicopter reconnaissance, I also noted that, on strike with the main vein outcrop, another outcrop had been test-pitted some 1000 feet to the northeast - the interval between being entirely covered by soil and brush with no outcrops.

Inasmuch as the reconnaissance by "chopper" had disclosed an apparently continuous strong vein, with a possible extension northeast, I assumed that you would wish some further work to be done. The following day, November 6, 1969, Mr. Beery and I went to Globe -- the county seat -- and checked records in the County Recorder's office. This check was sufficiently thorough to corroborate the field appearance that it had been many years since anyone had worked the property, and that the unpatented mining claims were open for relocation. I further checked with the Bureau of Land Management for any known or contemplated land withdrawls, and with the United States Forest Service and determined that the Sierra Ancha Wilderness area did not include the Keystone ground.

I am keenly aware of the rapidity with which news travels via the grapevine of the Sierra Ancha Mountains, and the communities of Payson, Young, and Globe. I deemed it advisable to protect your interest by staking claims. By using such base maps as were available to me, I drew up the layout for five mining claims, with sufficient overlap to allow for defects in the measurements given by the crude base map with which I worked, as well as to give due allowance for the crude brunton and pace survey which would be used for some of the locations. This was necessary to avoid having internal fractions. These overlaps can be partically corrected by amending the location notice calls when the transit survey of the location points has been completed.

Although we missed connection by telephone the day before the claim staking, I did contact your wife with a message of our intent and probable cost, and a telephone number at the Freeway Airport where you could reach me if you wanted to say STOP. I also took the precaution of having Mr. Victor Verity, a well known and highly competent mining law attorny, inspect the location notices which I had prepared, and discussed the general manner in which we planned to stake the claims. He made a suggestion in the wording of one claim, which I followed. Other than that, he saw no fault.

Mr. Beery and I left Tuesday, November 11, 1969, from Tucson for Scottsdale and thence by helicopter to the property. We established

a general bearing using the compass on the helicopter by re-flying the previously flagged route of the main vein outcrop. Parallel claims were laid by brunton compass according to this bearing. We staked the five claims that day, constructed the location monuments, and documented the same with photographs.

On Thursday, November 13, 1969, we discussed the Keystone and the new claims by telephone, and I made a verbal recommendation to continue with work. You agreed that a transit survey of the discovery points should be made, and that the old Fred Pranty Cabin should be renovated for future work. You stated, however, that you wished to see my full report before considering the more expensive work of trenching, etc.

Accordingly, after some difficulty, we found two able men -- one a geologist temporarily out of work and another, a laborer. These two spent several days renovating the cabin, cleaning out the camp site, and in general making it fit for habitation. They also brushed trails to the major workings to allow for reasonable access thereto and built up the location monuments to fully comply with Arizona statutes. A registered engineer, Bill Joplin of Tucson, recently placed a three-man survey party into the field, and they have just finished surveying the discovery (location) points and have also surveyed the location of certain other critical points, such as the portals to the various workings.

No further work in the field will be done until you have received this report and given your consideration to it.

The claim notices were recorded November 26, 1969, in Gila County at the court house in Globe, and are being quit claimed from my name to yours, as per your instructions.

LOCATION

The Keystone property is in the central mountain belt of Arizona, as shown on Attachment A, a general index map. Refer also to Attachment B, which gives details of the region. The best generally known geographic point from which to refer the property is the small village of Young, Arizona, which is shown on most road maps. The Keystone is 12 miles airline distance due west of Young, and 18 miles by road. The road, however, is very bad, requires 2-1/2 hours for the trip and a 4-wheel drive vehicle. For reference, note that Young is 128 airline miles due north of Tucson, and 50 airline miles north of Globe, Arizona. Details of access and location, and description of the route in, are given for the record in Appendix I.

GENERAL GEOLOGY

The Sierra Ancha Mountains, in which the Keystone Mine is situated, are dominated throughout most of their area by the younger pre-Cambrian Apache group, which overlies the Archean (older pre-

Cambrian) basement of granite and schist. In the northwestern part of the range, the younger pre-Cambrian Apache series has been eroded, and the basement schist is there exposed. It is correlative with the pre-Cambrian Yavapai group of central Arizona, and is the host rock for the Keystone vein. In the Keystone vicinity, the schistosity generally strikes north 40° to 50° east, and dips vertically to steeply southeast.

The Sierra Ancha range is north of the regional boundary of Laramide ore deposits which characterize most of the copper deposits of southern and central Arizona. The Keystone, as will be discussed later, is undoubtedly older pre-Cambrian (Archean). In common with other Archean deposits in schist in central Arizona, such as Jerome, the Iron King, and others. I propose that the Keystone has a potential to be mined to a significant depth. This is an important aspect of the exploration potential of this property.

TOPOGRAPHY AND VEGETATION

Throughout most of the range, the Sierra Anche Mountains are characterized by precipitious bluffs and steep slopes, with knife-like, sharply incised canyons. Local relief is extreme. In the northwestern part of the range, however, where the pre-Cambrian Apache Group strata have been eroded away, leaving exposed the basement schists, the topography is somewhat less rugged.

The schist belt locally forms steep slopes, but the hills characteristically display a rolling topography, and the relief along steep canyons rarely exceeds a few hundred feet. In the Keystone vicinity Pranty wash is steep sided with about 500 feet of relief from top to bottom. Gun Creek is the most noticeable topographic incisement, and cuts its path straight way across the bedding of the schist. The elevation at the Pranty cabin, as established by altimeter reading and roughly checked by the USGS topographic sheet is 4330 feet.

The elevation of the property is in the oak belt, and there is no timber suitable for mining. The southern slopes of the ridges show many spots bare of vegetation, with scattered oak and brush. The northern slopes and also the ravines and draws are another matter. A combination of oak interspersed with heavy brush make access along northern slopes exceedingly difficult. Manzanita grows abundantly, and there are many other types of low lying brush reaching a height of about 5 feet.* The growth hugs the ground too closely to crawl under it, and although thick enough to walk across on top it is limber enough to give way under weight. It is too pliable to be cut with an ax, for it gives way under the blow. It is too stout to be cut with a machete. The only instrument we have found useful in cutting and brushing the trails is a heavy, curved object with a sharp inside edge, attached

* The associated varieties which, collectively, are often called "chaparral".

to a long pole - known as a "lopper". This does a reasonably good job of snagging and cutting.

The photographs on Attachments J-1, J-2, and J-3 will give you a general impression of the topography and vegation. J-1 indicates the brushy growth, You will note the bare spots on the southern slope behind Pranty cabin, J-1-A. Attachment J-2 shows typical rolling landscape in the distance. Attachment J-3 is a documentary of an unusual type of location monument - a five gallon army gasoline can, with the notice of location inside. This was lowered by rope from the helicopter. A standard rock monument has since been built beside it. Another brushy hillslope is seen in J-3-A.

The combination of dense brush, above described, together with the soil from rotten schist which spreads out over the hillside, nearly obscures the Keystone vein. Tracing on the ground from point to point of exposure is difficult, and is impossible without detailed surveying. It is for these reasons that helicopter traversing, traveling about 10 feet above the ground, was so necessary in determining rapidly the continuity of exposures.

I do not know the actual rainfall, but common to most mountainous regions in Arizona it is probably about 18 inches. Some snow may fall in the winter, but will not long remain on the ground. There is no difficulty in working year round.

LAND STATUS

As already mentioned under the general heading, "current events", the vicinity of the Keystone is open, unoccupied federal forest land and is outside the limits of the Sierra Ancha Wilderness area. The physical appearance of the land, and our title search at Globe at the county courthouse, both reveal that the land had been abandoned for mining purposes. I have already described the general nature of the manner of staking five claims, November 11, 1969, by Mr. Beery and myself.

The claims are named as follows: The Long Shorty, Poor Boy, High Power, Low Power, and the Liz. Attachment C gives the general configuration of the claims and their relationship on to the other, and with reference to physical objects such as Gun Creek, Pranty Wash, the Keystone vein and the Pranty Cabin.

I signed the location notices in my name, with Mr. Beery as witness, for practical convenience. The claims were filed for your behalf, and at your request. Our lawyer here is drawing up a quit claim directly to you. As soon as the transit survey now completed has been plotted, I will file amended location notices to correct defects in the calls on the original notices.

For your information, Arizona statutes require that four claim corner monuments, and two end center monuments, one at each end, be constructed on the ground within 90 days from the date of location.

Thus the first deadline date will be approximately February 11, 1970. Arizona statutes further stipulate that the locations must be perfected by digging "location pits" within 120 days of the date of location. These location holes are required to be 4 x 6 feet in aerial extent, and 8 feet deep; alternately, a four foot wide open cut may be trenched, having an 8 foot bank at its face.

At a later date, we may wish to file additional claims to allow for additional working room. For the moment, you are fully protected along the strike of the vein, and there is ample room for exploratory work to be done, including drilling.

DESCRIPTION OF THE VEIN

General Nature:

There is a region in central Arizona of pre-Cambrian pyritic copper deposits, which, beginning in the Bradshaw Mountains some 50 miles north of Phoenix, trends generally north for 50 miles to Jerome. The width of this zone is about 30 miles east to west. Within this general region, also, are gold quartz veins, some of which are pre-Cambrian. The pre-Cambrian pyritic copper deposits in schist share common features of mineralization among themselves, and are similar in their general form, character, and extent. The United Verde and United Verde Extension Mines at Jerome -- truly great mines -- are the largest, followed by a handful of others with

notable copper production. In addition, there are numerous veins which have yielded minor amounts of copper. The deposits generally carry some zinc in the form of sphalerite and a little gold and silver. One of this group of pyritic schist deposits recently closed, was a major zinc producer. Jerome is an oval, pipelike body, 800 feet in diameter, extending many thousands of feet in depth. The others are replacement veins in schist, often consisting of a zone of parallel veins, or of overlapping veins and oreshoots. The veins tend to follow and replace shearing parallel to the schistosity of the enclosing wall rock.

The Keystone vein, also of undoubted pre-Cambrian age -- as will be discussed later -- displays the features characteristic of the other pre-Cambrian pyritic copper deposits in schist. It does, however, lie outside of the principal zone of pre-Cambrian deposits described in the foregoing - extending through the Bradshaw Mountains to Jerome. However, there are pre-Cambrian gold quartz veins at Payson, roughly 50 miles east of the town of Mayer (Mayer is near the Copper Queen which I recently examined for you, located centrally in the "schist belt"). The Keystone deposit is approximately 15 miles southeast of Payson. This geographic isolation from the pre-Cambrian "schist belt" must undoubtedly count as a "strike" against the exploration potential of the property, for we are no longer hunting "elephants in elephant country". However, the Keystone shares, with its other pre-Cambrian

cousins, their mutual characteristics, and I feel it must be evaluated upon its individual merit, judged by what may be seen on this particular property.

The pyritic copper deposits, consisting generally of pyrite in a vein along a shear zone in schist, with lessor amounts of calcopyrite and sometimes bornite, tend to fall into that classification known as "massive sulphide veins". Any vein may be divisible into two main parts -- the valuable metallic minerals, in this case the sulphides, and the enclosed strands of country rock or other worthless minerals formed during mineralization. This combination of country rock and other worthless minerals are collectively known as the gangue. If the vein consists only of sulphides, there is little hesitancy in classifying the vein as a "massive sulphide vein". At the opposite end are those veins in which the gangue dominates, with a scattering of sulphides - perhaps as little as 5%. There is no clearly defined definition among geologists concerning the quantity of sulphides requires to place a given deposit into the category of "massive", but suffice it to say that when the sulphides begin to occur in large clots and bunches, and in thick strands, and their appearance begins to dominate over the gangue, the vein is approaching that of the massive sulphide type. 50% sulphides, to the eye, gives the impression of a nearly solid sulphide vein, when in fact it is not. Probably a lower limit, for classification purposes, would be on the order of 25% total sulphides. Thus, these pyritic copper

deposits of pre-Cambrian age, containing as they do from 20% upwards toward 80% total sulphides, are properly classified as "massive sulphide replacement veins". I so classify the Keystone vein.

The Keystone vein is not exposed at the surface over its full strike length. Soil and talus obscures most of the outcrop. The vein is known mainly along a length of about 550 feet, where scattered diggings have exposed portions of the vein (this may have originally been an area of more abundant outcrop). An isolated outcrop, on strike with the principal outcrop area of the vein, 1000 feet to the northeast on the Liz claim, indicates an extension in that direction. To the southwest, about 400 feet the sulphides in the Gun Creek adit prove mineralization at that point. These sulphides are on strike with the vein -- or nearly so -- but may not be a direct extension of the principal vein. Thus, a mineralized structure in excess of 1900 feet long is indicated. The overall outcrop configuration is shown on Attachment C, which shows also the Long Shorty claim group and the major workings.

I should point out that, except for the sulphide lens in the Gun Creek adit, the surface and underground workings are all in the oxidized and leached zone, consisting of a limonite residue and copper oxides. My conclusions regarding the sulphides beneath the leached zone stems of an appraisal of the limonite residue.

At present, the vein is penetrated by too few exposures to determine whether it is a single, continuous vein, or whether it is a series of closely spaced, overlapping lenses, generally along the same shear zone. It could be a discontinuous series of lenses - although I do not expect this to be the case. Along the surface and also underground, the persistence of a specularite band on the hanging wall side of the vein suggests that it is a single, continuous vein. Extensions northeast and southwest of the main outcrop are covered by soil, and cannot be evaluated at this time. They appear to be in a general alignment, but could nonetheless be discontinuous lenses along the same structure.

Age:

The mineralogy and alteration of the vein, and its formation along a pronounced shear zone, are indicative of formation at a high temperature, by solutions ascending toward the surface. In the immediate vicinity of the Keystone, the overlying younger pre-Cambrian strata have been eroded. However, nowhere in the range do these younger strata show any deposit of deep seated origin formed by high temperature solutions. The entire range is in fact, beyond and northerly from the regional boundary of Laramide deposits. The significance of this latter is that, in Arizona, there are only two major episodes of ore deposition, the one being older pre-Cambrian

(Archean), and the other being Mesozoic to Tertiary, largely of the age termed Laramide. Thus, the Keystone is undoubtedly pre-Cambrian. Also note that gold quartz veins near Payson 15 miles northwest of the Keystone, are positively overlain by Cambrian sandstone, proving their age without question.

Details of the Vein:

Sketch maps of the vein, with assays, at the surface near the 115 foot vertical shaft, 65 foot level, and the 115 foot level, are shown by Attachments D, E, and F, respectively. In the main, these maps are self explanatory and contain pertinent details thereon. The following supplementary remarks are worthy of record.

The vein at the shaft collar (Attachment D), is exposed principally by a small open cut adjacent to the shaft. The vein in the cut, being near the surface, has been decomposed to a great extent to soil, and many mineralized bands are bent and broken by downhill, gravity-directed creep. Limonite is diffused throughout the rock to such an extent, as a result of surficial accumulation, that it is very difficult to ascertain the original total content of sulphides -- although it must have been 30% or greater. As closely as could be measured, the vein is 18 feet wide where here exposed. Although no visible copper minerals are present, nearly .6% copper remains in the outcrop, as shown by sample 1998. This sample is also worth note in that it

contains .24 oz. per ton in gold - a notable amount of an auxiliary metal. Sample 1999 - selected pieces of rather solid, but slightly vuggy, dark hard hematite gossan, probably came from the 65 foot level. These were scattered about the dump, and a sample was made from them. I would estimate the former total sulphide content at 60% as a minimum. Here again, although no visible copper is present, .44% copper remains. These unidentified copper oxides are undoubtedly in the form of tenorite or copper "pitch", which, mixed with limonite, is very difficult to distinguish. As shown by the sketch, the band of specularite which characterizes the hanging wall is well displayed.

I should here comment that the open cut by the vertical shaft is the only surface exposure of the full width of the vein. The adit on the northeast end of the principal surface showing is caved, and the outcrop sloughed in, except for the specularite band. The inclined shaft on the southwest reveals only the specularite band and a few feet of the hanging wall of the vein. Other small diggings are only prospect pits now sloughed in.

The 65 foot level is now inaccessible. I visited it in 1955, and Attachment E results from a sketch made at that time. The samples shown were channels cut by Mr. Pettingill. My recollection is of a very strong hematite gossan throughout the length of the crosscut through the vein. The specularite band was just barely exposed in the face of the crosscut. Pettingill's assays showed that for his samples

No.'s 4 and 5, almost no copper remained. This, theoretically, fits the principal of a high ratio of pyrite to chalcopyrite, thereby inducing rather complete leaching. However, it is difficult to reconcile these very low assays with the nearly 1/2% copper assay which I obtained from similar gossan on the dump of the vertical shaft, and which probably came from this zone. Again worth note, is Pettingill's report of his sample No. 6, which assayed .77 oz. per ton gold. The vein on the 65 foot level is 27 feet wide as measured by Pettingill, and as checked by me by pacing.

The vein is 24.5 feet wide on the 115 foot level, as measured by myself and Mr. Beery (Attachment F). As shown by the assay for oxide copper, there are evidently some sulphides still left within this leached zone. The so-called "oxide assay" for copper is a difficult process, and is an approximation at best. However, the difference between the oxide assay and the total copper assay yields a rough idea of the amount of sulphide contained in the sample. In both cases, a few tenths appear to be represented by unrecognized sulphides, probably as small grains of chalcopyrite. The leached zone on this level did not originally have as great a content of total sulphide as indicated at the surface and on the 65 foot level.

My notes indicate that sample 2001 (nearest the shaft), 10.5 feet long, prior to leaching contained about 10% total sulphide. The adjacent sample, number 2000-14 feet long, was estimated to have

contained 20% total sulphides at a maximum. Thus, although the sulphide replacement in the shear zone is uniform across the width of the vein, the total sulphides were less than 20%.

Attachment G is a sketch map of the Gun Creek adit. Here, the old workings were roughly aligned with the strike of the vein, as known near the workings around the old vertical shaft, and driven in through a mantle of talus in search of the vein. As seen from the sketch map, after cross cutting south, eventually a thin sulphide stringer was found and followed northeasterly for a short distance, to the point marked "face of drift 6/25/55". This was the position of the face at the time of my visit at that date. There was exposed a four inch stringer of unoxidized sulphides containing chalcopyrite and bornite, togehter with pyrite, replacing a chloritized shear zone in schst. Following Mr. Pettingill's death, and acquisition of the property by Mr. Scalone, either he or parties who leased the property from him set up a slusher, and advanced this drift about 80 feet, to the face where it now stands. This work showed that the sulphide stringer exposed in the mid-50's, at the end of the original face, was a very short lens of sulphide only, and the additional drifting failed to yield other than scattered grains of sulphides.

There is a question whether or not this sulphide zone is actually an extension of the Keystone vein. The band of specularite, which is so persistent at the shaft, is not present in the Gun Creek drift.

Although a cross-cut, as shown on Attachment G, advanced into the hanging wall (southeast), the band of specularite was not found. The helicopter reconnaissance which I flew in tracing the vein on the surface establishes that the Gun Creek drift is approximately on strike with the main vein. However, that survey was not accurate enough to define the projection of the vein closer than a hundred or so feet. The recently completed transit survey will help establish the line of projection with more certainty.

I believe the principal importance of the showing of sulphide in the Gun Creek adit is that, whether it is the tail-end of the Keystone vein or whether it is a subsidiary strand, it furnishes an indication of the type of sulphides which we may expect. Mr. Pettingill had taken two assays from this four inch stringer in the original face, as it was when I first visited the property and obtained assays of 11.3% and 8.3% copper. Mr. Beery and I collected massive pyritic samples from the dump of the Gun Creek adit, with only a small amount of visible chalcopyrite, which assayed 13.5% copper, .03 oz. per ton gold, and .18 oz. per ton silver. We also collected a sample made of sulphide fragments containing much visible chalcopyrite along with bornite, and retained these as hand specimens -- they were obviously high grade and we did not assay them. I do not wish to leave the impression that I expect the Keystone vein to average as high as the copper values just quoted, for our sample was selected of sulphides

only, and contained a smaller proportion of gangue than would be the case if we had cut a full sample across a sulphide vein. Mr. Pettingill's assays, also, are suspect of being selected samples. None the less, these samples indicate that considerable copper is present. The presence of bornite is an important point, also. This is so because, grain for grain, bornite contains about twice as much copper as does chalcopyrite. Thus, a lesser total percent of the sulphide, bornite, will materially raise the grade of ore, compared to an ore which contains chalcopyrite only.

I believe it might be appropriate at this time for you to refer again to Attachment C, which shows the various workings throughout the claim group, and their relation one to the other.

Finally, a note or two about the 185 level. Please refer to Attachment H, a sketch map of the main workings and the Ventures diamond drill hole. The outline of the 185 level is taken from a Ventures map in my possession. This adit is now caved and inaccessible, at the portal. However, I visited it in 1955, but without the aid of a base map of any sort. I recall a zone of spotty sulphides -- mostly pyrite -- and partly oxidized. Also, I recall a few thin sulphide fissures. On Attachment H, the "small vein" is taken from data by Ventures. The red dots, representing scattered, somewhat disseminated sulphides, are from my recollection of the same. The location and direction of the Ventures drill hole is also from their data. They reported a 4 foot

intercept of sulphides which assayed 1.28% copper and a little silver, at a position in the drill hole which matches the projection of the mineralization as shown on the 185 level. The drill hole was continued well past the depth at which it should have crossed the downward projection of the keystone vein, and reportedly failed to do so. Ventures then advanced the 185 level - which according to their surveys had been stopped short of the vein - past the downward projection of the vein, and reportedly failed to find it. These relationships are shown in cross-section by Attachment I.

There are several unsolved problems regarding the Ventures, Ltd. work. In the first place, as nearly as I can ascertain, the drill hole was not surveyed for deflection, which ~~same~~ often is a serious problem when drilling angle holes in schist. The drill hole itself could well have deflected in such a manner that it never reached the vein. Advancing the drift and failing to find the vein is another matter. Could they have advanced through a lean portion of the shear zone and failed to recognize it? In fact, could there have been an error in their entire survey with regard to the portal of the 185 level and the collar of the drill hole, so that neither was extended far enough to intersect the vein? Our own survey will soon answer this latter question -- the figures are being reduced at this time, but I do not yet have the map at my hands. If the 185 level did indeed pass under the downward projection of the Keystone vein, it is imperative that we find out for ourselves whether

or not it actually penetrated the vein. If it did not, we may well assume that the vein had been offset along a flat fault -- which is a geological problem to be considered in future exploration. It does not represent a deterent to future exploration. There are yet other possibilities connected with the Ventures work, and the interpretation thereof. I will not try to enumerate these, or to speculate on them at this time. Suffice to say, I am keenly aware of the problem that exists and have given this due consideration.

In addition to pointing up the difficulty regarding the outcome of the Ventures work, Attachment H will place in prospective for you the vein as it is known on the surface and at the 115 level, and its comparison to the general trend of the vein as exposed at various points on the surface between the inclined shaft at the southwest edge of the main exposure, and the caved adit at the northeast end of this same main exposure.

Attachment I is a cross section through the main workings and drill hole, and is self explanatory. It portrays a cross sectional picture of the vein as known from the surface to the 115 level, and of the probable downward projection - which the 185 level reportedly failed to reveal.

EXPLORATION POTENTIAL

Summary:

The Keystone is a replacement vein in a shear zone, of pre-Cambrian age, with sufficient possible length and of demonstrable width that it is a favorable exploration target. As mentioned previously, it is of the type that may be referred to in general terms as a massive-sulphide type of vein. The real potential hinges on the extension to considerable depth, perhaps well over 1,000 feet. This vein may, as have other pre-Cambrian veins of this type, reach such depths.

The indicated tenor in the primary (sulphide) zone could be on the order of 4% to 5% copper. As will be shown in the following, the already indicated length of 550 feet, developed to a mere 400 feet, will yield a substantial return on capital investment. This factor is of importance in exploring a vein at considerable depths. Basically, this means that a mine of smaller size may be first developed, and be in production and yielding profits while deeper exploration is being undertaken.

Additionally, there is a chance for lateral extension beyond the 550 foot main segment.

Continuity on Strike:

The principal area of old diggings is incompassed within a surface strike length of 550 feet (Ventures' survey). As noted in previous sections, there is indication that it extends northeast to

the Liz claim, and southwest toward the Gun Creek drift. The widths of such extensions, and their continuity, is not at present known. The continuity within the 550-foot principle surface zone is not known in detail. Trenching on closely spaced centers may reveal overlapping lenses in the vein, or local pinch-outs. The workings put in by the old timers at various showings appeared, when reconnoitered by helicopter, to fall on a quite regular, straight line. Continuity, however, or lack of it, must be proven as an initial step, both for the northeast and southwest extensions, as well as for the internal 550-foot length segment.

Extension in Depth:

A crucial point in exploration potential of the Keystone vein is a possible extension to considerable depth.

As a background against which to compare this possibility, I should first point out the general case, which is that most small mines are shallow. Hoover, in 1909 in the hey-day of vein type mining, made the following pertinent statement: "All mines become completely exhausted at some point in depth, therefore the actual distance to which ore can be expected to exist below the lowest level grows less with every deeper working horizon". Concerning the average of many mines, Hoover further supplies us with the following data:

"... prepared a list of several hundred dividend-paying mines of all sorts, extending over North and South America, Australia, England, and Africa. Notes were made as far as possible of the depth at which values gave out, and also at which dividends ceased. Although by no means a complete census, the list indicated that not 6% of mines (outside blanket) that have yielded profits, ever made them from ore won below 2000 feet. Of mines that paid dividends, 80% did not show profitable values below 1500 feet, and the said majority died above 500."

Some time a specific reason for a mine shut-down may be had -- a calamity such as a disastrous fire, a sudden influx of water, poor management, a decline in metal prices, etc. However, the most singular outstanding reason for failure -- and the one least often mentioned -- is that the ore plays out in depth.

Let us now, however, turn from generalities to specific conditions. If we were to explore some of the bonanza gold veins in Nevada, a shallow depth surely could be predicted. Furthermore, the extension of any known ore shoot could be predicted to bottom suddenly, perhaps within 100 feet. Such are the conditions with that particular region and particular type of depot. Turning to the Arizona "schist belt copper deposits", we find the opposite. The United Verde was mined to about

4000 feet, and deep drilling showed it to bottom at a little over 4500 feet. The United Verde Extension, which is the down-faulted upper half of the United Verde, was mined to 2000 feet. Thus, the original extent of this great deposit was, at a minimum, approaching 7000 feet. The Iron King, a zinc producer rather than copper, but otherwise similar to the massive sulphide copper deposits, was closed at 3000 feet due to excessive mining costs. The Blue Bell was mined to 1500 feet. The Binghampton, adjacent to the Copper Queen which I recently examined for you, has a 1000 foot shaft, and is reported to have been mined to 600 feet, with some ore still existing. The Copper Queen itself, which I rejected, did not show sulphides in sufficient quantity to pay -- but the mineralized structure had been followed to the 800 level and, under water, was reported to exist on the 900.

From the above, I conclude that one of the characteristics of the deposits in the pre-Cambrian schist belt is the tendency to extend to a significant depth. Focusing on the geologic history of the deposits, this is seen as a logical outcome. In Archean times, tremendously large, metamorphosed mountain ranges were formed and intruded by masses of granite. Before the heat generated during mountain building and igneous intrusion subsided, additional earth movements formed permeable shear zones parallel to the schistosity of the rocks. Through these permeable zones, solutions of uncertain origin, but

probably hot, passed upward towards the surface. Their passage was through many thousands of feet of rock, under conditions of uniform heat. Mineralizing solutions therefore had the chance to deposit their metals over a long distance under similar conditions, and thus formed relatively long vertical zones of sulphides. Subsequent erosion has exposed these veins to the present surface.

The characteristics of the Keystone vein, as seen in the cut near the vertical shaft on the surface, and in the 115 level adit, indicate a strongly mineralized shear zone. It is logical to assume that this would extend downward along its dip. The work by Ventures, Ltd. thus poses an anomalous situation. As already stated, it is their claim that the 185 level was advanced beyond the downward extension of the vein from the 115 and did not find it. This anamolous situation is depicted in cross-section, Attachment I. It will be necessary, and crucial to the analyses of this problem to clean out the caved portion of the 185 level for inspection.

Possible Tenor of Sulphides

The sulphides at depth below the oxidized zone will consist of pyrite and chalcopyrite, and, as shown by the Gun Creek adit, probably bornite as well. To arrive at a possible grade of copper which might exist in the sulphide zone, I carefully reviewed those exposures in the oxidized zone which are present. By interpretation, I have arrived at the conclusion that the grade could approach 5% copper. This is,

of necessity, a highly subjective estimate, and one which is confronted with the possibility of gross error.

The analysis of a leached capping generally proceeds as follows. The trained eye scans the outcrop or exposure in a drift, and the geologist makes a judgement on the percentage of total sulphides which had been once contained in the gossan being viewed. Also, the color and texture, as well as distribution, of the limonitic products produced by sulphide oxidation is mentally recorded. The total sulphides estimate represents sulphides by volume, and this amount may be converted mathematically to sulphides by weight. It is my overall opinion, based on the various exposures of the leached zone, and in consideration of factors of permissability, that the vein will probably average about 25% total sulphides -- certainly no more than 35%. Thus, the Keystone is on the bottom margin of that which we might call a "massive sulphide" type of deposit. The grade of copper in the sulphide zone is dependent on the ratio of pyrite to copper sulphides, the two of which go together to make up the total sulphide content. In low-grade porphyry copper ores, it is possible to make rather good estimates by the type and color of limonite present, concerning the copper content of underlying sulphides. Unfortunately, in deposits with sulphide percentages exceeding 20%, there has usually been so much sulphuric acid liberated during oxidation of pyrite, that diagnostic limonite is not well formed. This is the case with the

Keystone. Most of the limonite is non-diagnostic, although there are occasional pockets surely derived from chalcopyrite.

Our assays have shown that the leached zone contains from 1/2 to 1% copper. This indicates incomplete leaching. If the ratio of pyrite to copper sulphides was high, an excess of sulphuric acid would have been produced, and the copper would all have been leached away. In a chemically non-reactive host rock (such as schist), a ratio of 2:1 between pyrite and chalcopyrite would probably induce complete leaching whereas equal amounts of pyrite and copper sulphides -- 1:1 ratio -- probably would produce insufficient acid for complete leaching. Thus, I conclude that for the Keystone vein, the pyrite to copper sulphide ratio is low -- on the order of 1 to 1. Given a total sulphide content in the range about estimated then, (25-35%), a grade approaching 5% Cu is permissable.

The actual grade of ore is, of course, a crucial point. I might note that the average run of the pre-Cambrian schist belt deposits, which is closer to 3% Cu than to 4% Cu, will not pay its way under present conditions. As I have stated in the general summary, however, 5% will pay off handsomely.

COMPARISON TO OTHER ARIZONA PRE-CAMBRIAN DEPOSITS

I believe it is instructive to compare the production from other deposits similar to the Keystone, to give a general indication of the extent of production which came from the better properties.

The two mines at Jerome, the United Verde, and the United Verde Extension, are the largest. There is no indication that the Keystone would even remotely approach the magnitude of these two great mines. However, they indicate the extent and strength of copper mineralization during the pre-Cambrian in the central Arizona schist belt. Production was:

United Verde	United Verde Extension
2-3/4 billion pounds copper	730 million pounds copper

Of the veins in schist, those with notable production are as follows:

Blue Bell	DeSoto
67 million pounds copper 900,000 tons ore	18 million pounds copper
Binghampton	**Stoddard**
8 million pounds copper	5 million pounds copper

The Iron King is similar in all respects to the pre-Cambrian schist belt copper veins, except that its chief production was zinc, with very subordinate copper. From 1942 through 1967, when the mine shut down, it produced approximately 350 million pounds zinc. The zinc content of 4 to 6% would alone, have been sub-marginal,

but, sufficient gold and silver was also recovered to make a profitable mine.

MINING, MILLING AND MARKETING

The vein, where exposed, appears to be of sufficient width and with sufficiently strong walls to permit mining by shrinkage stope methods. This is a low cost method with relatively little timber used.

Although ore may eventually be found, through exploration, to extend to considerable depth, it is not likely to be explored and developed for mining to its full depth in one step. More than likely, a smaller mine would be installed after sufficient reserves had been developed to support, say, a 200 ton per day operation.

As a trial run, to more fully establish the grade which would be necessary to produce a profit with this type of mine in this locality, I have made certain assumptions and carried them through to an economic conclusion, as already given under the general summary.

I do not anticipate any difficulty in milling, and a recovery of 90% or better should be obtained from the copper sulphides. I have arbitrarily assumed that recovery of the gold and silver values (a minor quantity anyway) will be 50%.

Crude ore would be trucked from the mine to a mill site on Tonto Creek, probably near Gisela, along a road yet to be constructed for haulage purposes. Probable routes are shown on Attachment B.

I have reconnoitered these routes by helocopter, and sketched them on small-scale topographic sheets, to arrive at a very rough estimate of capital cost.

Concentrates from the mill would be trucked southward along the graded dirt country road towards Roosevelt. It may not be permissible to regularly cross this narrow dam with ore trucks, so the graded dirt road which leads easterly, just north of the dam, would be taken towards a connection with the Young Road. From there the trucking would go southward to the bridge over Salt River, and thence into the Inspiration Smelter at Miami. Inspiration accepts custom ores, although all custom smelters fluctuate somewhat with the quantity they are willing to accept. The ASARCO smelter at Hayden also accepts custom ores, but would require additional trucking past Inspiration, through Superior, and then to Hayden. Trucking from the mill on Tonto Creek to the Inspiration Smelter amounts to 82 miles, and reduces to about $1.00 per ton of crude ore from mill to smelter. Additional trucking required to take the concentrates to Hayden would be 48 miles.

All pertinent details to support the economic outcome given in the general summary are listed by Appendix 3. Details of the hypothetical ore reserve are given by Appendix 2. Basically, the economics calculated evolve from a possible development of 400,000 tons of ore with grades assumed as given. Other assumptions are:

1. 550 foot length of ore shoot. (the minimum known surface strike length).

2. 20 feet, average width.

3. 300 feet of leached zone.

4. 400 feet of sulphide, indicated by 10 diamond drill holes, and proven by underground development.

5. 90% mill recovery of Cu: 50% recovery of gold and silver.

The above assumptions indicate 200 tons per day to be the feasible rate of mining and milling, producing a life of 6-1/2 years. The net smelter return from the Inspiration smelter at Miami on concentrates produced from an assumed 5% Cu crude ore, with minor gold and silver, is $27 per ton. The ASARCO smelter at Hayden, after deducting increased trucking cost from Miami to Hayden, yields $27/ton. Details of the smelter liquidation are given by Appendix 4.

A mill site on Tonto Creek has been chosen as the closest place where adequate water may be developed. The inflow into the gravel beds in Tonto Creek is undoubtedly rather large, and although I have no specific well data as a basis for prediction, there is essentially no doubt that wells can be developed.

Water for mining purposes and camp site use at the mine would come from Gun Creek, which flows sufficiently for these purposes most of the year. During June -- usually a dry month, and in the later fall, water would have to come from wells in the creek bed, or from catchments. There is a chance that a water shortage might exist

for about two months out of the year.

EXPLORATION RECOMMENDATIONS

I recommend the following steps be undertaken to determine the continuity and extent of the vein at the surface, and to furnish more data regarding its width. Examination of the 185 level will help evaluate the problem of depth extension created by the Ventures work. The outcome of this work will determine whether or not the property warrants drilling.

A. The road in to Keystone from the soldier camp jeep trail should be improved, using a D-6 Bulldozer and an experienced "mountain-road" cat skinner. Estimated, 3 days, $700 including mobilization.

B. The central area of the vein between the "east" adit and the inclined shaft should be trenched with a bulldozer, in so far as possible, to expose a depth of 2 to 5 feet of bedrock across the width of the vein, at 100 foot centers. Thus, about 5 trenches are suggested. The actual cost is somewhat open-ended, in that the length and depth of the trenches will be unknown until completed. Actual bulldozer time can be only crudely estimated. Probably 5 days, $800.

The extension northeast from the "east" adit to the showing on the Liz claim should be trenched at, initially,

200 foot intervals. Probably 4 or 5 trenches, $1200 and 6 days.

Two trenches should be cut along the ridge southwest of the inclined shaft, at about $300, or about 2 days. Total initial trenching, then, will cost about $2300, and might be somewhat higher. Two weeks will be required.

C. During the time occupied by A and B above, a geologist will be required for guidance and evaluation of the results. He will also utilize this time to map the 115 level and Gun Creek adit, plus tracing the specularite band on the surface (for use as a "marker", as it occurs near the hanging wall side of the vein). This surface tracing will be done by observing float, and by the use of a small hand-held magnetometer. This work will be coincided with the bulldozer trenches, and is estimated to cost about $2000, including expenses.

D. If the trenching shows favorable continuity, and the project appears worth continuing at this time, the 185 level must be cleaned out, timbered where necessary, and mapped geologically. I can merely offer a guess on this expense. If not caved at more than the portal and one or two other spots, it might be done for $2000. Mapping would be an additional $1000.

E. The above steps should be undertaken promptly to meet a decision on surveying and establishing corner monuments by February 11, 1970, which same will cost about $1500.

F. When the above data is gathered, it should be assembled and a decision regarding drilling and the cost of same then made. The first three drill holes may be expected to cost about $55,000.

In summation, then:

A through E	
Road Work	$ 700
Trenching	2,300
Opening 185 level	2,000
Geology	3,000
Supervision by Chief Geologist	1,000
Office follow up	1,000
Total	$10,000

APPENDIXES

LOCATION AND ACCESS

The following details of location and access of the Keystone mine - the Long Shorty group - is here given for the record.

Considered only from airline distances, the Keystone property is not far from major towns. As previously stated, it is 128 airline miles due north of Tucson, and 50 airline miles north of Globe. These latter distances are referenced to the small mountain village of Young, Arizona, the Keystone mine being 12 miles airline due west of Young. Arriving at the Keystone by available means of transportation, however, is quite another matter. The mine is in the northern slopes of the rugged Sierra Ancha mountains and is considerably isolated by road from any town of consequence.

The mine is reached from Tucson via Globe and Young. Driving distance to Globe via Florence is 125 miles and requires approximately 2 hours and fifteen minutes. One then drives northerly from Globe toward Young 26 miles on a paved, but sinuous road, to a bridge crossing the Salt River. From this bridge to Young, is 40 miles of winding mountain road, of improved graded dirt. The total driving distance, then, is 66 miles and requires 1.5 to 2.0 hours depending on the driver's inclination regarding speeds of travel over the winding mountainous portion of the road. There are no dependable accommodations at Young. The Antlers Cafe and Motel is operative most of the time --

providing the owner, Bob Leturno, is in town. There are two stores and two gasoline stations. The general geography of access and mountainous regions are shown on Attachment B, for the area between Globe, Young and the Keystone mine. To reach the Keystone from Young, a 4-wheel drive vehicle is a necessity at the present time. Directions are as follows: Take a sharp left at the schoolhouse at Young. For the following descriptions, reference may be had to Attachment B1, which shows detailed access from Young to the Keystone mine. From the schoolhouse at Young, drive westerly 10.7 miles to the Flying W Ranch on a medium to fair graded ranch road. About 30 minutes is required. From the Flying W Ranch take the old road -- a primitive bulldozer road -- which leads towards the solider camp site and is generally known as the solder camp trail. Travel this road 4.7 miles. The road is bad and steep and rocky -- 4-wheel drive vehicle is a necessity. From this point just mentioned on the solder camp trail, take a sharp left and travel on a very, very bad bulldozer trail approximately 2.5 miles down to Pranty wash and the Pranty cabin. The road ends here at the Keystone property - the Long Shorty claim group. This latter 2.5 miles most definitely requires a 4-wheel drive vehicle. The road is basically well placed, it has been put in by an experienced mountain cat skinner, and has resisted 12 years of rain without serious washout. However, there are numerous steep grades and points where the road has sloughed on the cut-bank side,

particularly along that portion going down into Pranty wash. The total driving time from Young to the Keystone is approximately 2.5 hours, over a total of 17 road miles. Travel over the final 2.5 miles will be greatly facilitated when a bulldozer has cleaned up this portion of the road.

For further reference on access, the following air flight times may be of interest. Globe has a municipal airport about 5 miles out of town. Flight time from Tucson to the Globe airport varies from 45 minutes to 1 hour and 15 minutes depending on the type of light aircraft chartered for this purpose.

There is Taxi service in Globe, but no rental car agencies. There are two airstrips -- if you can call them that -- in Young. Each is about 3400 feet long, of semi-maintained dirt. These are capable of allowing alight plane to land but will probably not take a twin engine or other hot, fast planes. On the other hand, the altitude, 5213 feet, and surrounding higher mountains requires a good, stout engine with a high rate of climb, for safety. The strips are unlighted and are so poorly defined that landing and take-off at night is not advisable and probably not possible. Flying time from Tucson to the Young airstrip is approximately two hours give or take 30 minutes, depending on the type of light aircraft used. Since there is no taxi service, arrangements must be made to be met at the airstrip at a pre-determined time by another party in an automobile.

A third method of reaching the Keystone is by helocopter. Flying time from Tucson to the Scottsdale municipal airport near Phoenix is about 45 minutes to an hour and a quarter, depending on the type of light plane chartered for this purpose. The Arizona Helicopter Service has adequate facilities and a well-kept maintenance shop, and is a first-rate helicopter service. Their ferry time from the Scottsdale airstrip to a landing site on a bend in the road near Gun Creek at the Long Shorty group is 1.2 hours. The chopper which I have used for this helicopter work has been a Bell, type B-1. This is a versatile machine capable of landing on the site available on the Gun Creek road. A larger helicopter will not be able to land in this restricted area.

In passing, I should note that there is a grassy mesa above the Pranty wash, which, with very little work, could be converted into an airstrip capable of landing a suitable plane -- say a Cessna 206 or in any event a light plane with plenty of engine to allow for the 5000 ± ft. elevation, cross winds which may frequently occur at this spot. Such a strip would have an easy connection into the road leading to the Pranty Cabin, and may be highly desirable if exploration is to proceed further, particularly into a drilling stage. Such an airstrip would be within about .7 miles of the Pranty cabin.

ORE RESERVE

Possible Hypothetical

Assume: Sulphide ore shoot, 400 feet deep, beneath 300 feet of gossan (leached zone), average of 20' wide.

550 x 20 x 400 = 4,400,000 Cu. ft.

Tonnage Factor taken as 10

$$\frac{4,400,000}{10} = 440,000 \text{ Tons}$$

10% allowance for loss left in drift and shaft pillars, approximately 40,000 tons

Net Reserve, 400,000 tons

Mining/Milling at 200 tons per day, 6 day week, with allowance for holidays and down time, use 300 days per year.

200 x 300 = 60,000 tons per year production.

Life of mine about 6-1/2 years.

NOTE: 400,000 tons ore, Mill Rec 90%, grade @ 5% Cu

Total production 36 mill pounds copper

If the ore shoot was extended for a total of 1000 feet in depth, production would be 1 million tons ore and 90 million pounds Cu.

ESTIMATED OPERATING AND CAPITAL COSTS

MINING (operating)

Mining by shrinkage stoping, with four levels 100 feet vertically apart, and raise on 80-foot centers. Drift pillars used. Direct operating cost estimated: $8/ton.

MILLING (operating)

Assumption: 6 day week, with 300 working days per year.

200 tons per day feed. All flotation mill.

Assumed Mill Feed and Products

Crude Ore	Concentrates	
Cu 5%	Cu 32%	90% Rec
Ag .2 oz/ton	*Ag .79 oz/ton	50% Rec
Au .06/oz/ton	*Au .24 oz/ton	50% Rec

* Calculated

Ratio Concentration: 7.9 to 1

200 tons crude ore per day yields:
25 tons conc. per day
or, 150 tons conc. per week
or, 680 tons conc. per month

Estimated Direct Operating Cost: $4.00/ton crude ore

TRUCKING (operating)

Ore, Mine to Mill	
12 miles @ $.09/ton mile	$1.08 per ton Crude
Concentrates, Mill to Smelter	
82 miles @ $.10/ton mile,	
Conc. Ratio 7.9 to 1	$1.03 per ton Crude
Total Trucking	$2.11 per ton Crude

MISCELLANEOUS (operating)

Engineering	$1.00 per ton
Other overhead	.75
Local Taxes (rough estimate)	.50
Total	$2.25 per ton crude ore

MINE DEVELOPMENT (capital)

Drilling Program:

First	3 holes	$ 55,000
Remaining	7 holes	105,000
	Total Drilling	$160,000

Development will be by a shaft sunk 700 feet deep, the upper 300 of which is in the leached zone, and the lower 400 of which is in a sulphide ore shoot 550 long on strike. Assume the shaft is central to the ore shoot and that 4 levels are run 225 feet laterally on each side of the shaft, 100 feet vertically apart. Each 225 foot segment of level is further developed by raises between levels, 100 feet high on 80-foot centers, 3 each side of the shaft. For purposes of this estimate, assume that sampling of muck from these development workings confirms the ore reserve indicated by drilling.

Shaft	$210,000
Levels & Raises	225,000
Total	$435,000
Mine Surface Plant	$175,000
Mining Equipment	140,000
Total Mine Capital Development	$910,000

TRUCKING ROAD, MINE TO MILL (capital)

A 12 mile, single-width dirt road, with culverts as needed for drainage control and three short wood bridges will be constructed from mine to a mill site on Tonto Creek near Gisela (see Attachment B). There are three possible routes which I have traversed quickly with helicopter, estimated probable switch-backs required, etc. The following estimated capital cost is, therefore, very approximate. Tonto Creek can be forded so that no bridge is there required.

Initial layout, engineering and cutting a primitive bulldozer trail	$ 18,000
Finishing	153,000
	$171,000

or in even figures, $175,000

ROAD WORK, PRANTY WASH AND MINE AREA (capital)

Probably: $30,000

MILL (capital)

200 tons per day all flotation $500,000

MILL AND MINE CAMP (capital)

$40,000

WATER WELL DEVELOPMENT (capital)

$30,000

INSPIRATION CONSOLIDATED COPPER COMPANY

MIAMI, ARIZONA

SMELTER LIQUIDATION

Assume: Copper Concentrates;

Copper	32% (640 lb/ton)
Silver	.79 oz/ton
Gold	.24 oz/ton

Metal Forecast:

Cu-42¢/lb Ag-$2.00/oz
Au, London Final - $40/oz

PAYMENTS

Copper:	640 lb less 30 lb deduct. Pay 610 lb @42¢ less 5.5¢ x 610 deduct for refining and freight east	$222.65/ton
Silver:	Less than 1 oz., no payment	
Gold:	92% of $40 x .24	8.85
	TOTAL PAYMENTS	$231.50/ton

Treatment Base Charge	$11.50/ton	
Plus: 5% of Excess Value above $40/ton	9.60	
	TOTAL CHARGES	21.10
	NET SMELTER RETURN	$210.40/ton

Concentration Ratio: 7.9 to 1

Value per ton crude ore: $27.00

AMERICAN SMELTING AND REFINING COMPANY

HAYDEN, ARIZONA

SMELTER LIQUIDATION

Assume: Copper concentrates;
Copper 32%
Silver .79 oz/ton
Gold .24 oz/ton

Metal Forecast:
Cu - 42¢/lb Ag -$2.00/oz
Au, London Final - $40/oz

PAYMENTS

Copper:	640 lb less 8 lb deduct Pay 95% of 632 lb @ 42¢ less 4.5¢ x 632	$225.00
Silver:	95% of .79 oz @ $2.00 less 13¢/oz deduct	1.50
Gold:	92.57% @ $40 x .24 oz	8.90
	TOTAL PAYMENTS	$235.40

Treatment Base Charge $8.00/ton

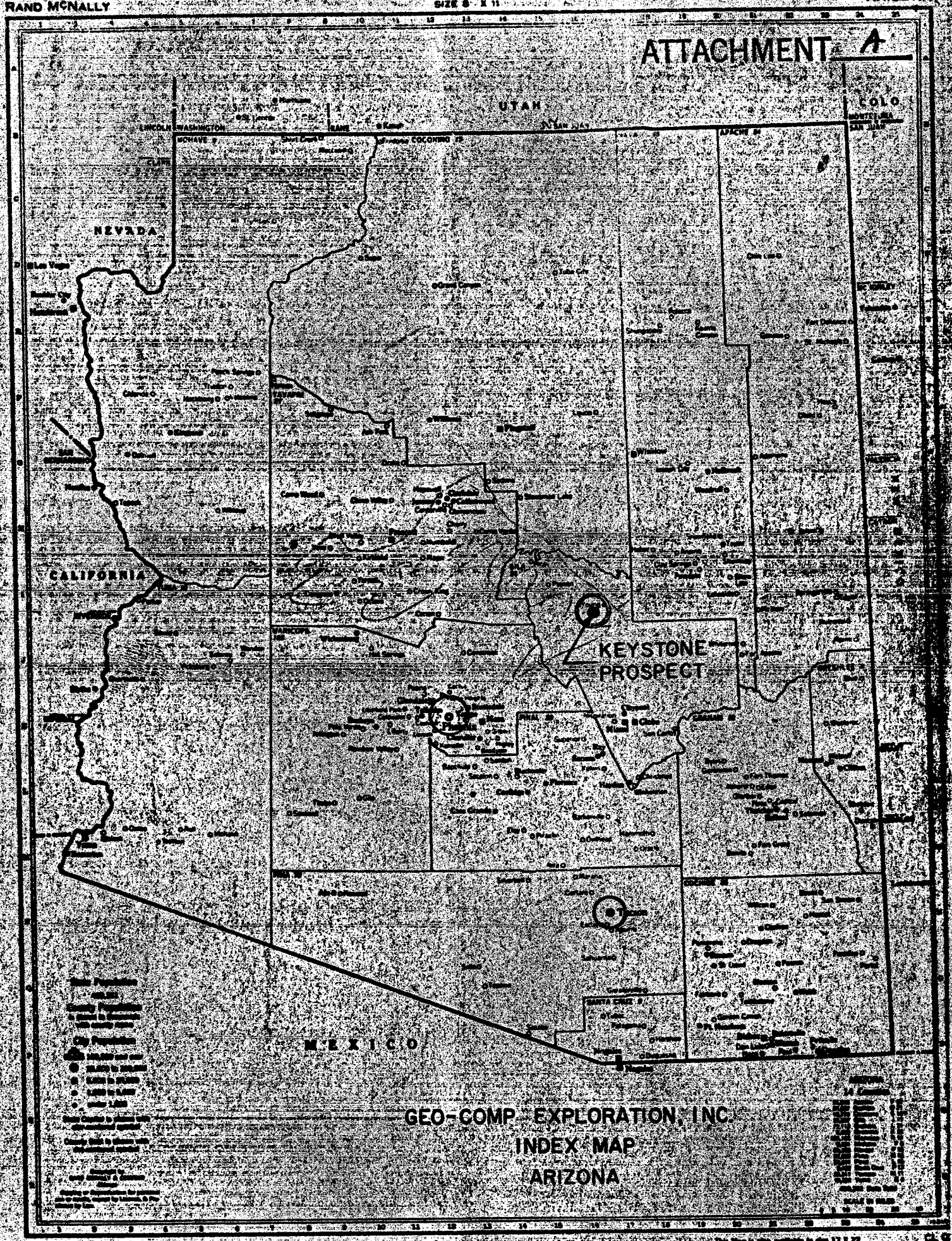
Plus: $1.50 to maximum of 9.50/ton, based on ore value 9.50

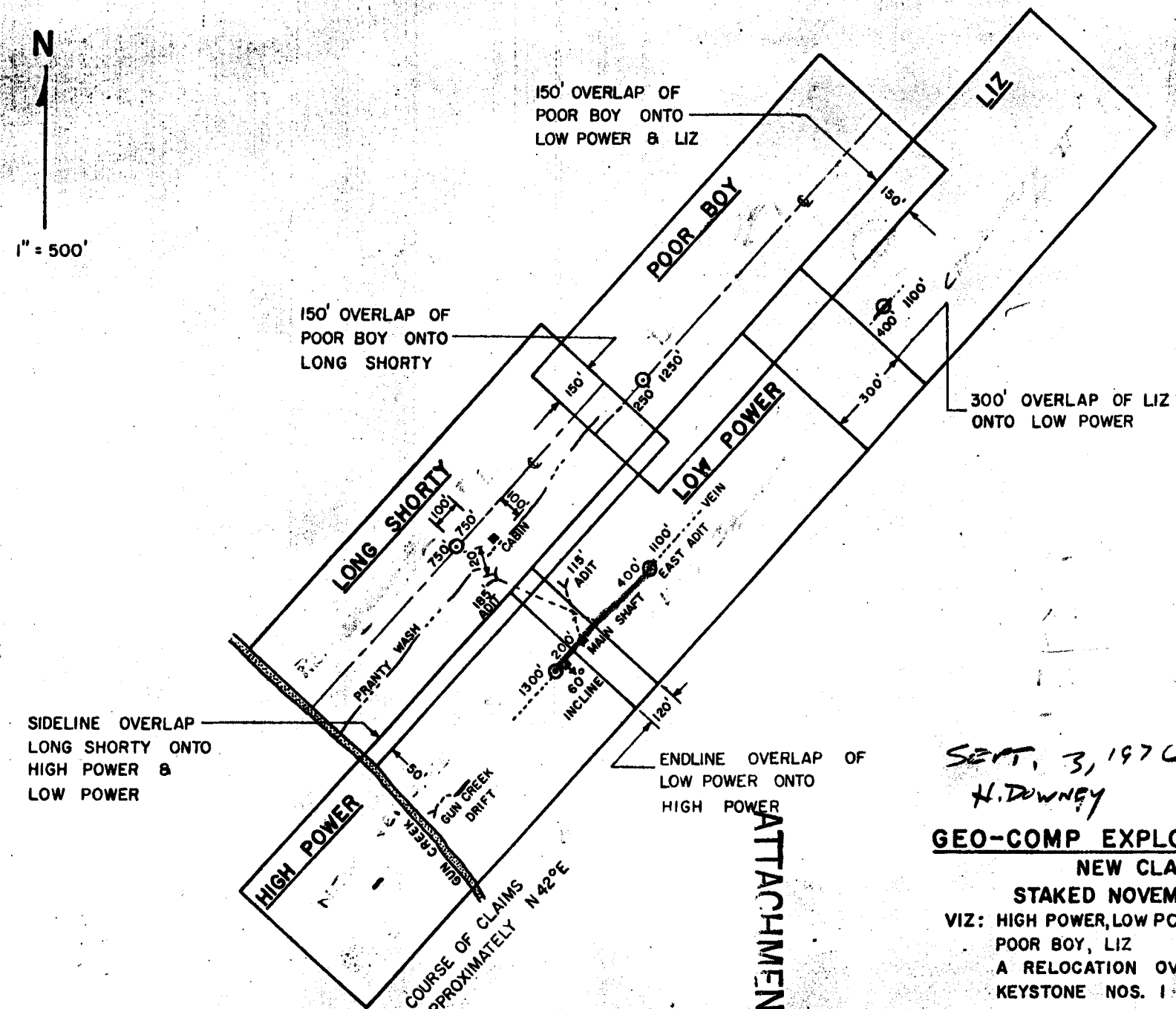
TOTAL CHARGES	17.50
NET SMELTER RETURN	217.90/ton
Additional trucking from Inspiration to Hayden; 48 mi @10¢/ton mile	4.80
	$213.10

Concentration Ratio: 7.9 to 1

Value per ton crude ore: $27.00

ATTACHMENTS


RAND McNALLY
CITY-COUNTY STATE MAP
SIZE 8 X 11
ARIZONA
ATTACHMENT A
UTAH
COLO.
NEVADA
CALIFORNIA
MEXICO
KEYSTONE PROSPECT
GEO-COMP EXPLORATION, INC.
INDEX MAP
ARIZONA



SEPT. 3, 1976
H. DOWNEY

GEO-COMP EXPLORATION, INC.

NEW CLAIMS

STAKED NOVEMBER 11, 1969

VIZ: HIGH POWER, LOW POWER, LONG SHORTY, POOR BOY, LIZ

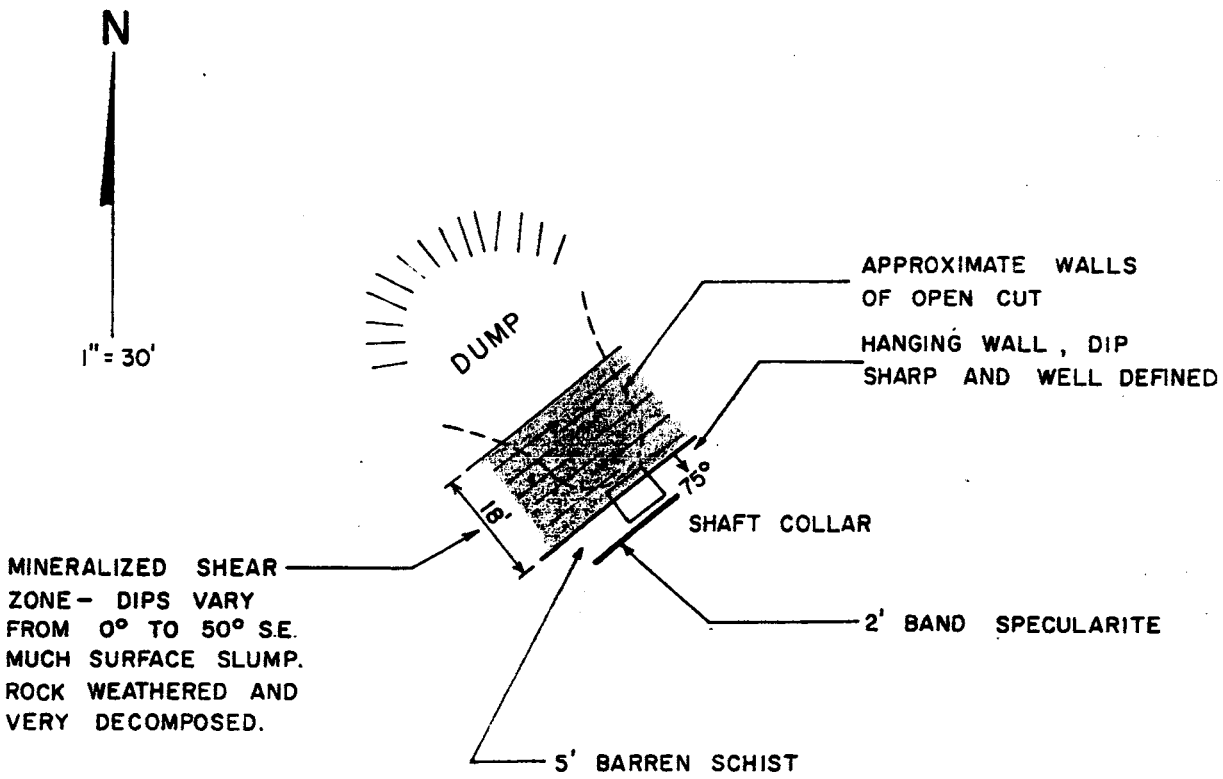
A RELOCATION OVER PARTS OF KEYSTONE NOS. 1 THROUGH 4, BEING TO ALL APPEARANCES ABANDONED FOR MANY YEARS

1300' 200' DISCOVERY POINT SHOWING DISTANCE CLAIMED TO EACH END

SPRING CREEK MINING DISTRICT GILA COUNTY, ARIZ.

ATTACHMENT C

ATTACHMENT D



NOTE: ALTIMETER READING AT SHAFT COLLAR 4500 FT. ELEVATION

DUMP GRAB SAMPLES

1998 — PROBABLY DERIVED LARGELY FROM SHEAR ZONE IN OPEN CUT. RUSTY SCHIST, FORMER SULFIDES VERY STRONG AS SHOWN BY QUANTITY OF LIMANITE.

.59 % Cu
0.240 OZ/TON Au
0.51 OZ/TON Ag

1999 — PROBABLY FROM THE SHAFT WORKINGS, SELECTED PIECES OF SOLID, SLIGHTLY VUGGY, HEMATITE GOSSON. ESTIMATED 60% FORMER TOTAL SULPHIDES.

.44 % Cu
.065 OZ/TON Au
.21 OZ/TON Ag

GEO-COMP EXPLORATION INC.

KEYSTONE MINE

Gila County, Arizona

SKETCH OF SURFACE AT VERTICAL SHAFT

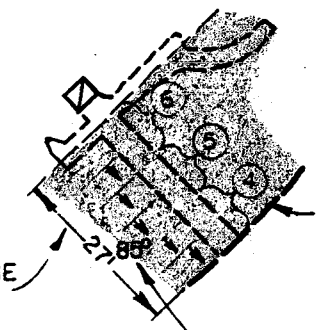
J.E. KINNISON
PL. BEERY
OCTOBER 30, 1969

DRN. BY: W. SAYER

ATTACHMENT E

NOTE:
CHANNEL SAMPLES CUT BY C.B. PETTENGILL.

SAMPLE NO.	WIDTH	%Cu	Oz./TON Au	Oz./TON Ag
4	9 Ft	.05	Tr.	.19
5	9 Ft.	0	Tr	0
6	9 Ft.	1.0	0.77	2.4



N

Scale: 1" = 30'

SPECULARITE BAND

VEIN-SHEAR ZONE
STRONG GOSSON

SHEARING DIPS
85° SOUTHEAST

FROM BRUNTON AND PACE SKETCH
BY J.E. KINNISON, 6/25/55

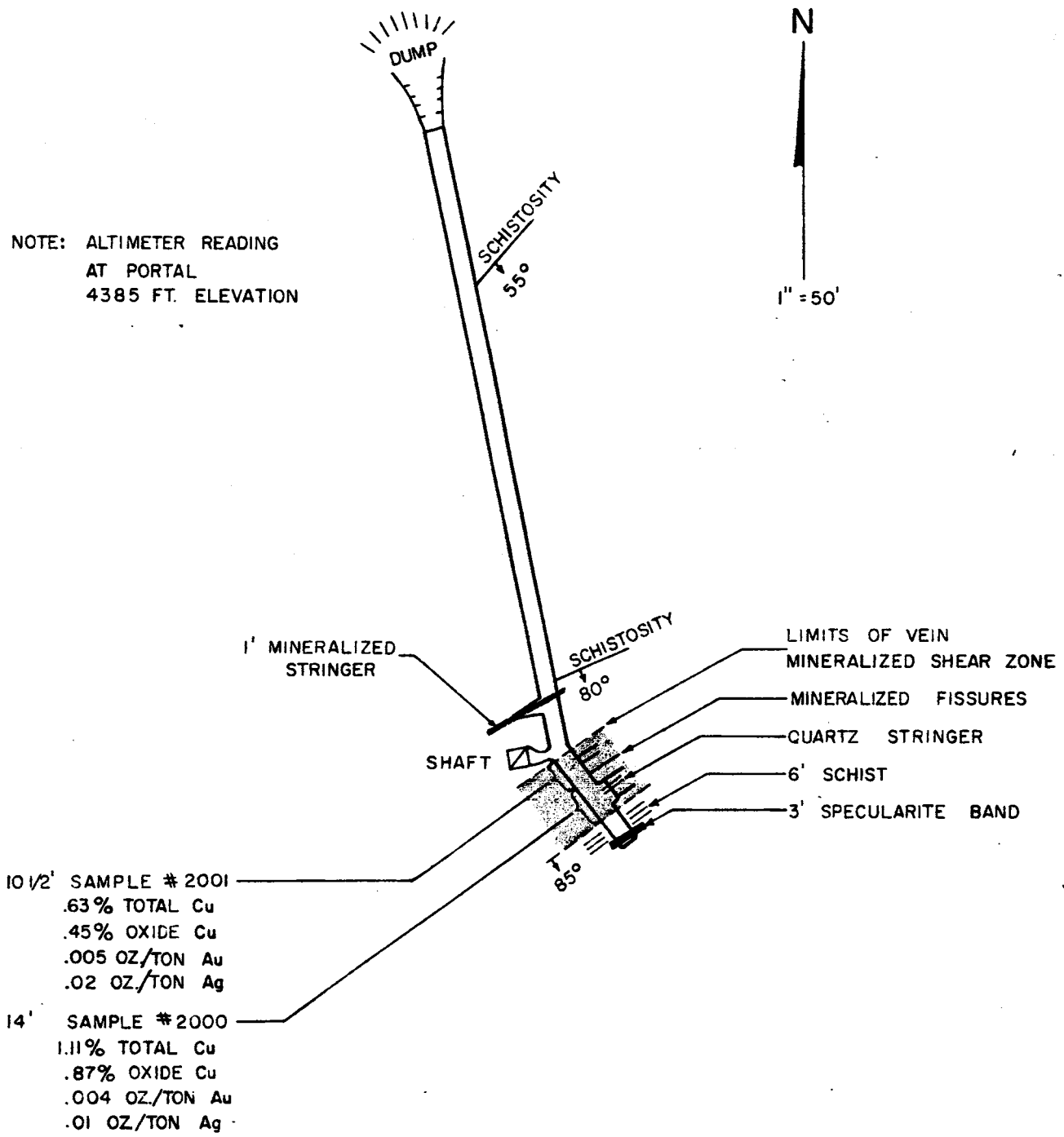
NOTE:
THE SHAFT AND 65' LEVEL ARE
PRESENTLY INACCESSABLE.

GEO-COMP EXPLORATION INC.

KEYSTONE MINE
Gila County, Arizona

SKETCH MAP 65 FT. LEVEL

ATTACHMENT F



GEO-COMP EXPLORATION INC.

KEYSTONE MINE

Gila County, Arizona

SKETCH MAP

115 Ft. Level

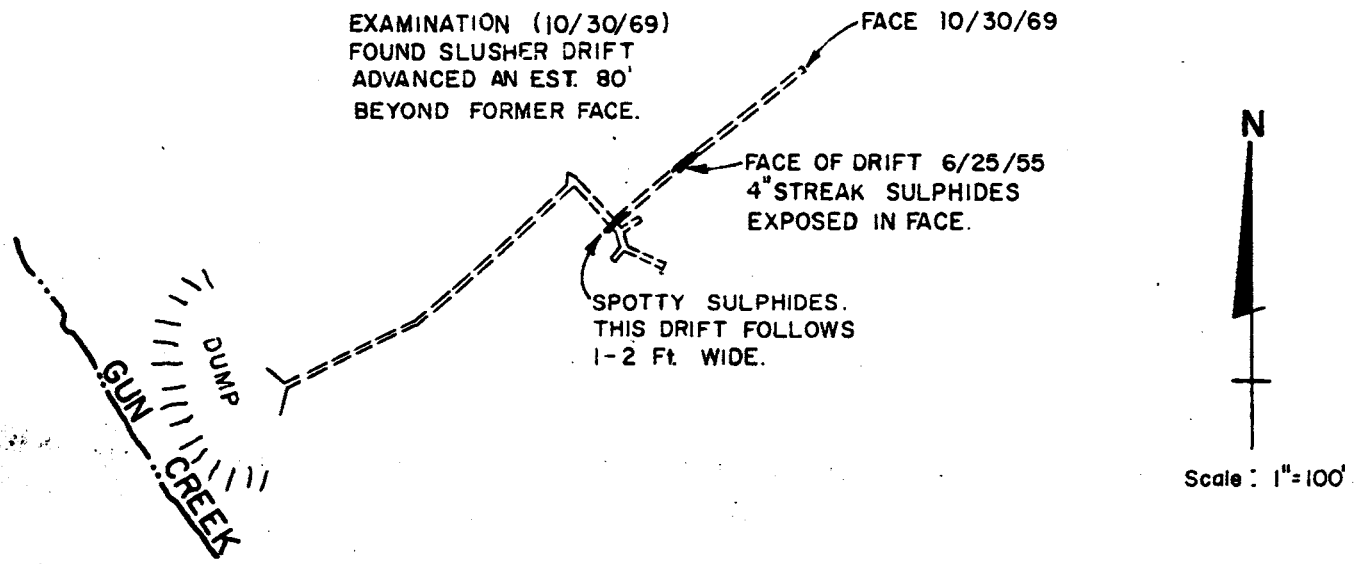
J.E. KINNISON

P.L. BEERY

OCTOBER 30, 1969

DRN. BY.: W. SAYER

ATTACHMENT G



NOTE:
ALTIMETER READING 4270 Ft. ELEVATION. THUS, ADIT IS LOCATED AT THE 230 Ft. LEVEL WITH REFERENCE TO VERTICAL SHAFT COLLAR.

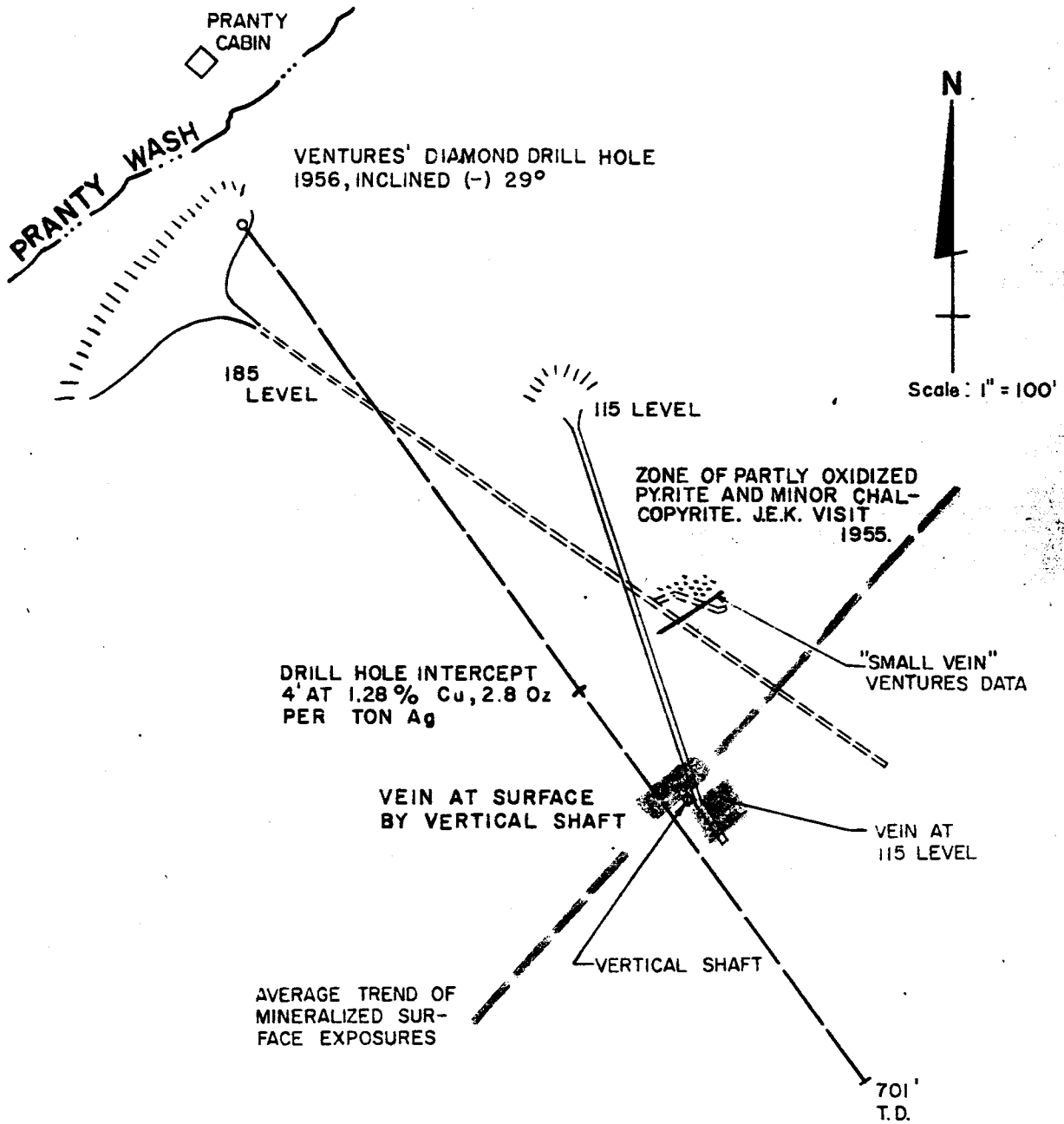
Sources:
1. Exam. by J.E. Kinnison 6/25/55.
2. Exam. by J.E. Kinnison and P.L. BEERY 10/30/69

GEO-COMP EXPLORATION INC.

KEYSTONE MINE
Gila County, Arizona
SKETCH MAP
GUN CREEK ADIT

DRN. BY: W. SAYER

ATTACHMENT H



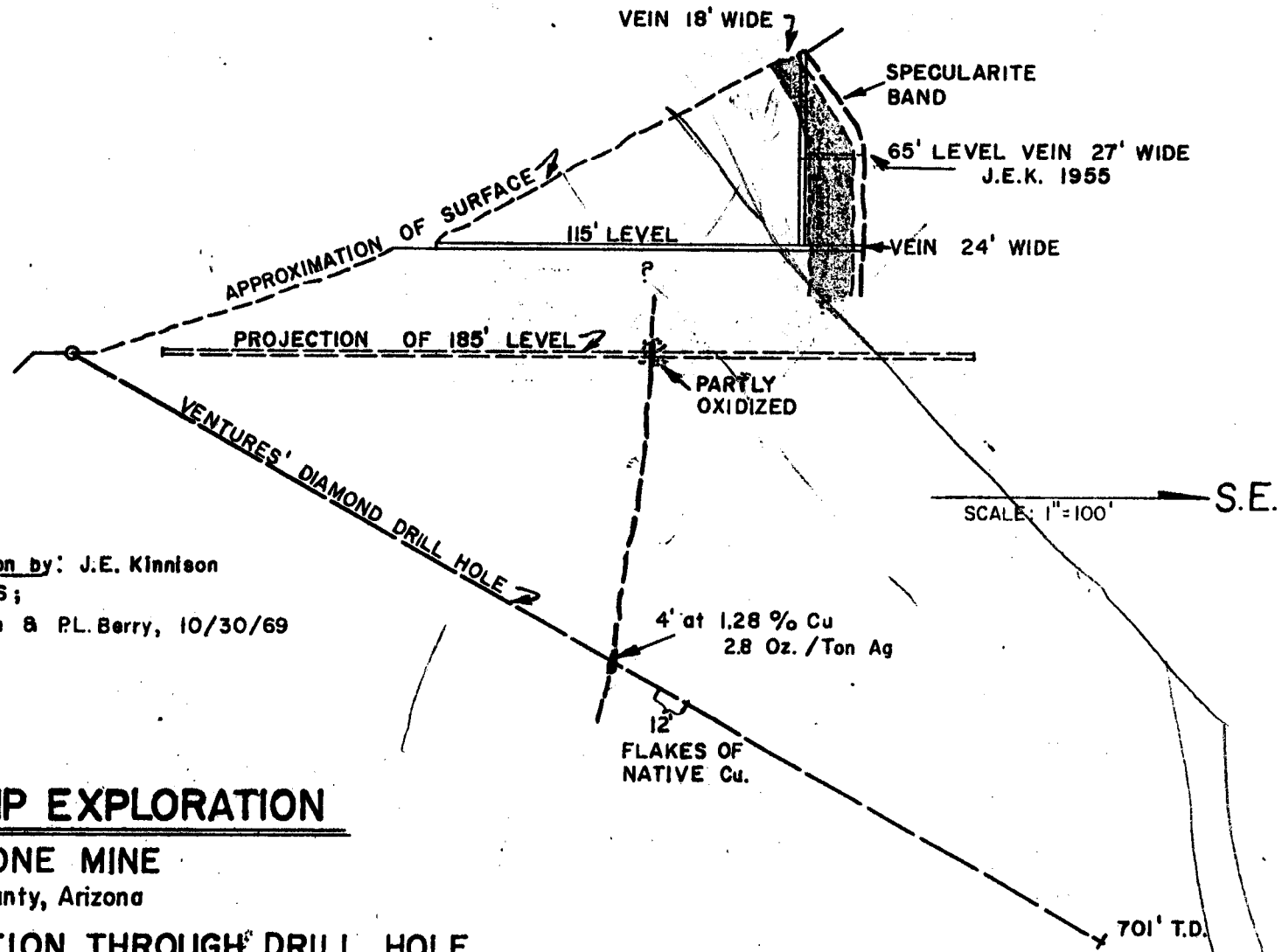
SURVEY OF WORKINGS BY VENTURES 1956
GEOLOGY BY J. E. KINNISON 1955,
AND OCTOBER 30, 1969

GEO-COMP EXPLORATION INC.

KEYSTONE MINE

SKETCH MAP SHOWING RELATIONSHIP OF MAIN WORKINGS AND VENTURES' DIAMOND DRILL HOLE

DWN. BY : W. SAYER



Geologic Interpretation by: J.E. Kinnison
Data: Ventures, 1956;
Exam by J.E. Kinnison & P.L. Berry, 10/30/69

GEO - COMP EXPLORATION

KEYSTONE MINE

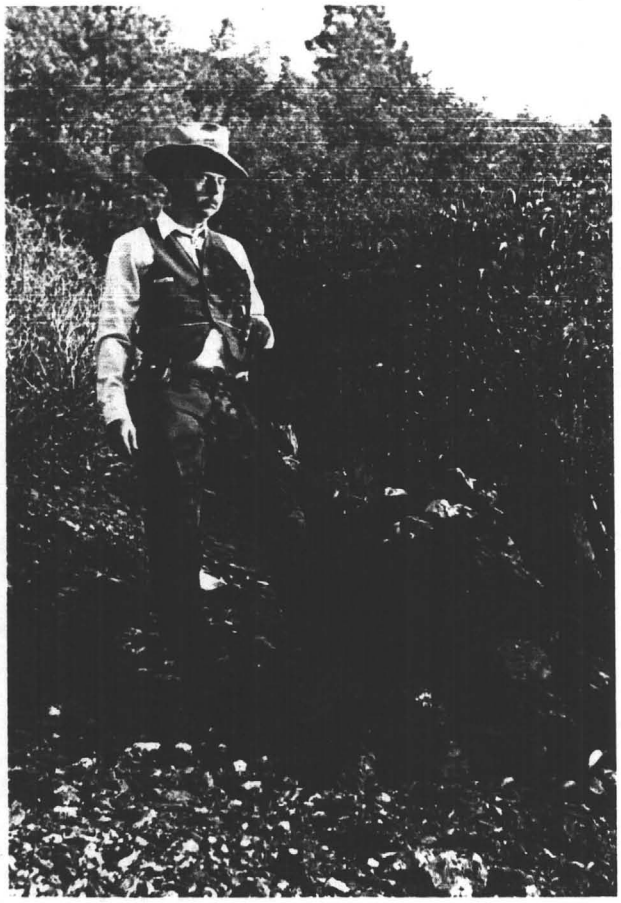
Gila County, Arizona

CROSS SECTION THROUGH DRILL HOLE (LOOKING NORTHEAST)

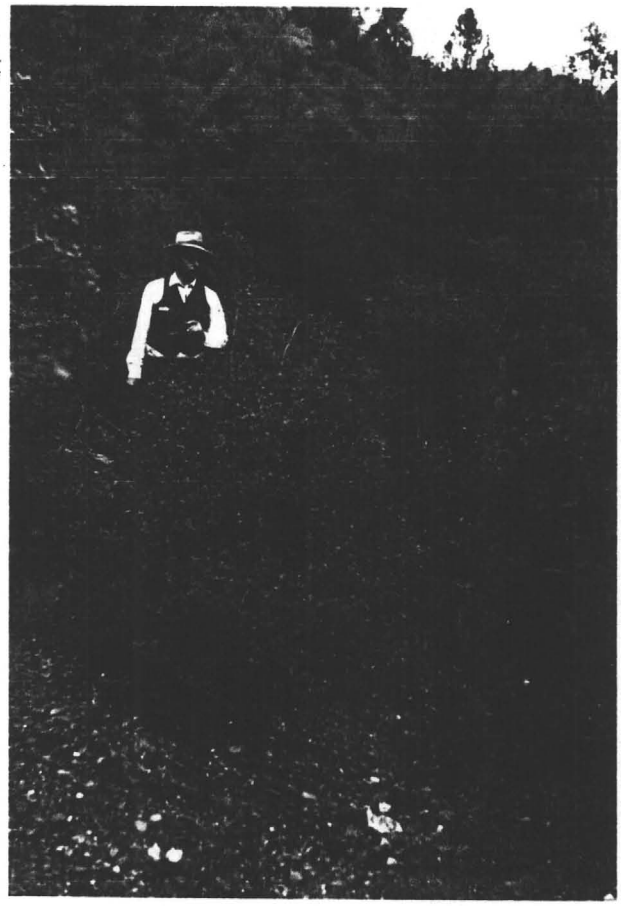
J.E. KINNISON & P.L. BEERY
OCT. 30, 1969

ATTACHMENT I

Pranty Cabin. Looking downslope from vertical shaft dump

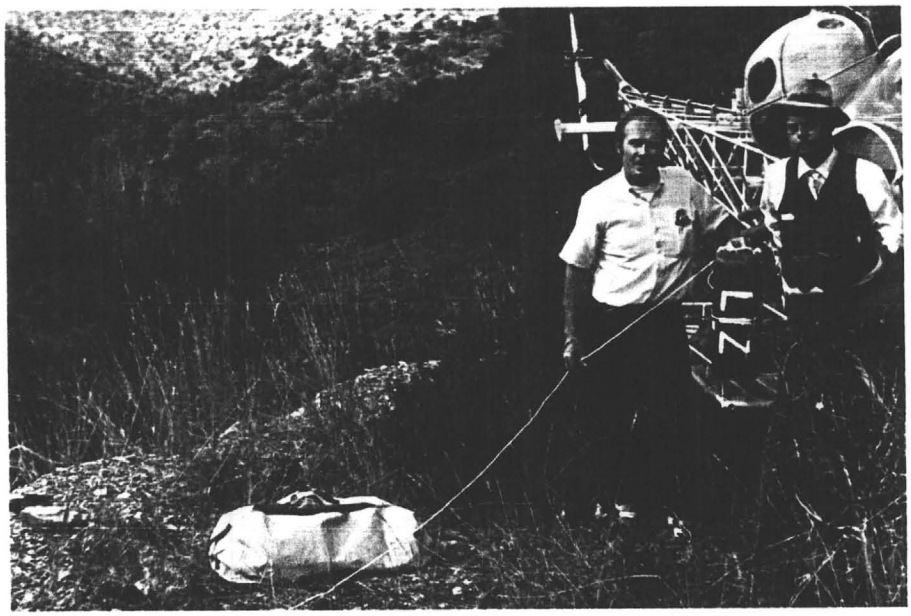


Rock Monument. Low Power Claim

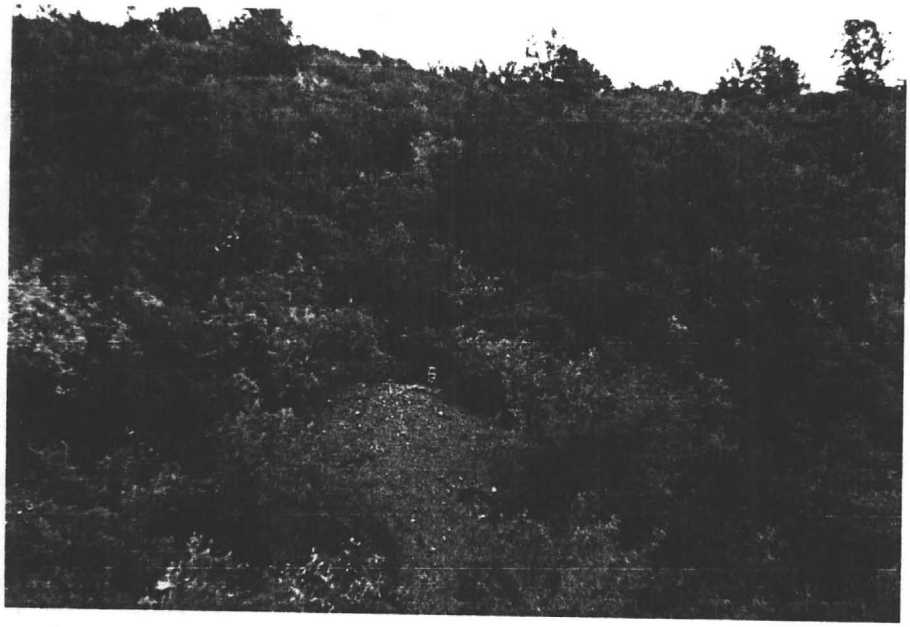


The road into Pranty Cabin.
Kinnison standing in right hand rut.
Brush documents non-use in recent years

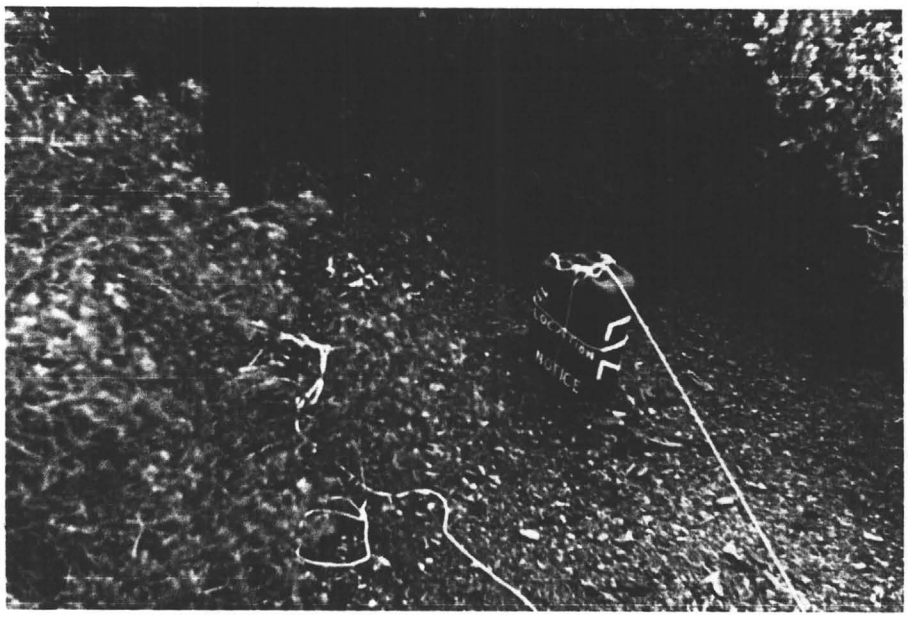
Heliocopter landing bend in road.
Looking north down Gun Creek



Beery left, Kinnison right.
Looking north down Gun Creek



Liz Claim. Location can in center.



Close-up view 5-gallon gas can
used as Location Monument - Liz Claim

GEO-COMP EXPLORATION, INC.

LOCATION
DOCUMENTATION
PHOTOS
(also shows landscape)

KEYSTONE PROSPECT

Gila County, Arizona

LOCATION: 14 miles (air) SE of Payson
12 miles (air) E of Young

ACCESS: West from Young via Flying W Ranch Road

TYPE OCCURRENCE: Volcanogenic massive sulfide in Precambrian schist (Yavapai)

HISTORY FROM PRESENT

1987: Drilled by Chevron--one 30° hole to 752' tested 2 EM anomalies. Found formational continuity with minor sulfides within banded iron formation (iron as specularite) and anomalous but low grade gold.

1984-1987: Miscellaneous work by Chevron--mapping and GP.

1976-1981: (approx.) Held by Noranda--program from Tucson Office (Bill Payne et al.) included drilling but data not available.

1970-1976: Miscellaneous work by Glen Exploration, John Kinnison, Harold Downey.

1956: Drilled by Ventures Ltd. Refer to Kinnison Report, 1970.

POTENTIAL: Drilling by Chevron, Noranda and Ventures indicates that the surface showing is either a sulfide lens or a layer that has been cut off by a shallow dipping fault. Deeper drilling from opposite direction (from SE) may find an extension. If massive sulfide is found, grades of up to 5% Cu and 0.2 oz Au may be anticipated.

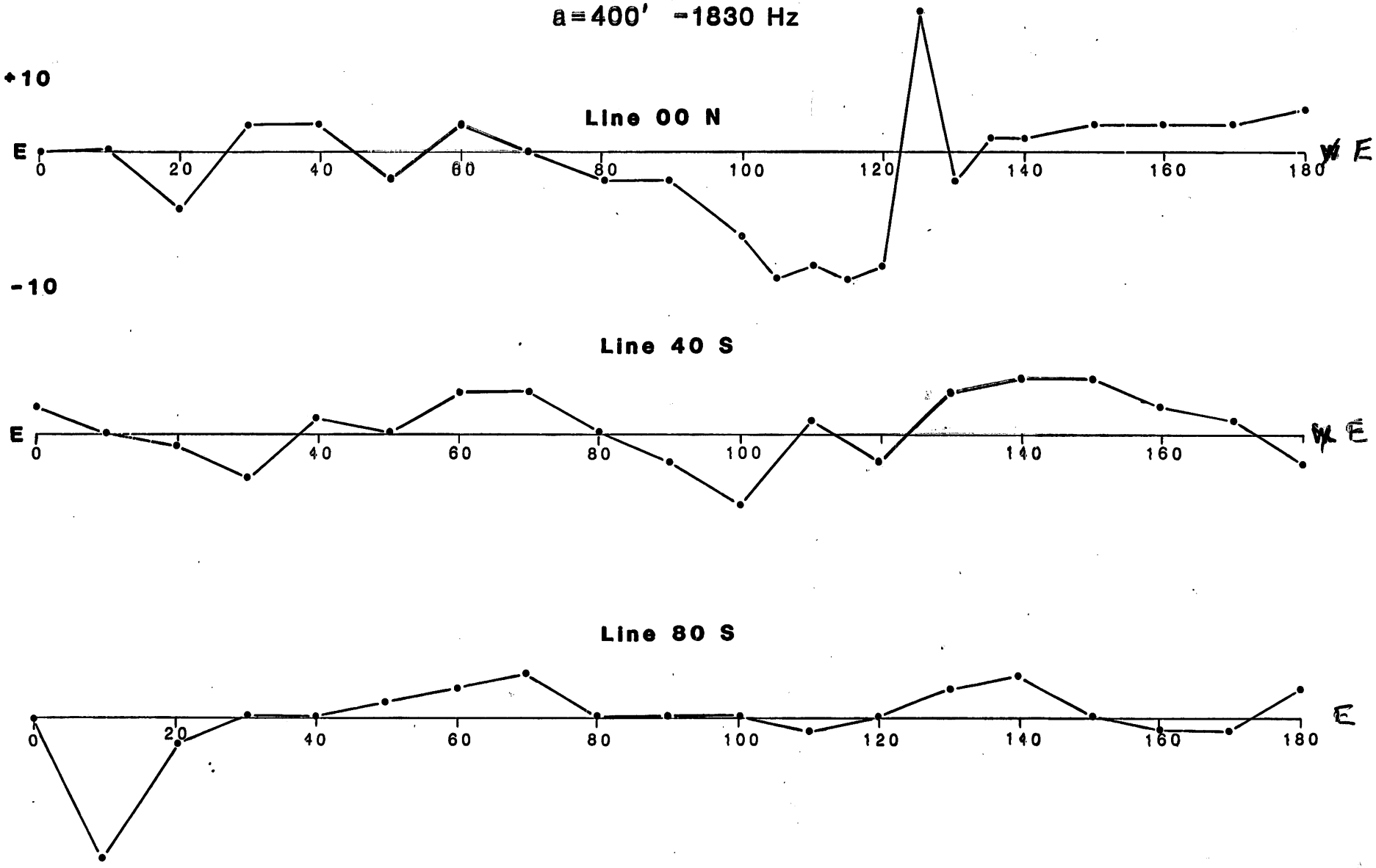
OWNERSHIP: Harold Downey, Tucson AZ, W. Arthur Gallan, Philadelphia, PA, William Mounts, Tucson AZ, as equal partners.

MISCELLANEOUS: 24 claims--Brandy 1-8 and Key 1-16
Chevron drill core is stored in Reno but will be moved to Tucson
Chevron may have additional data not received.

KEYSTONE PROSPECT

CRONE EM

a=400' -1830 Hz

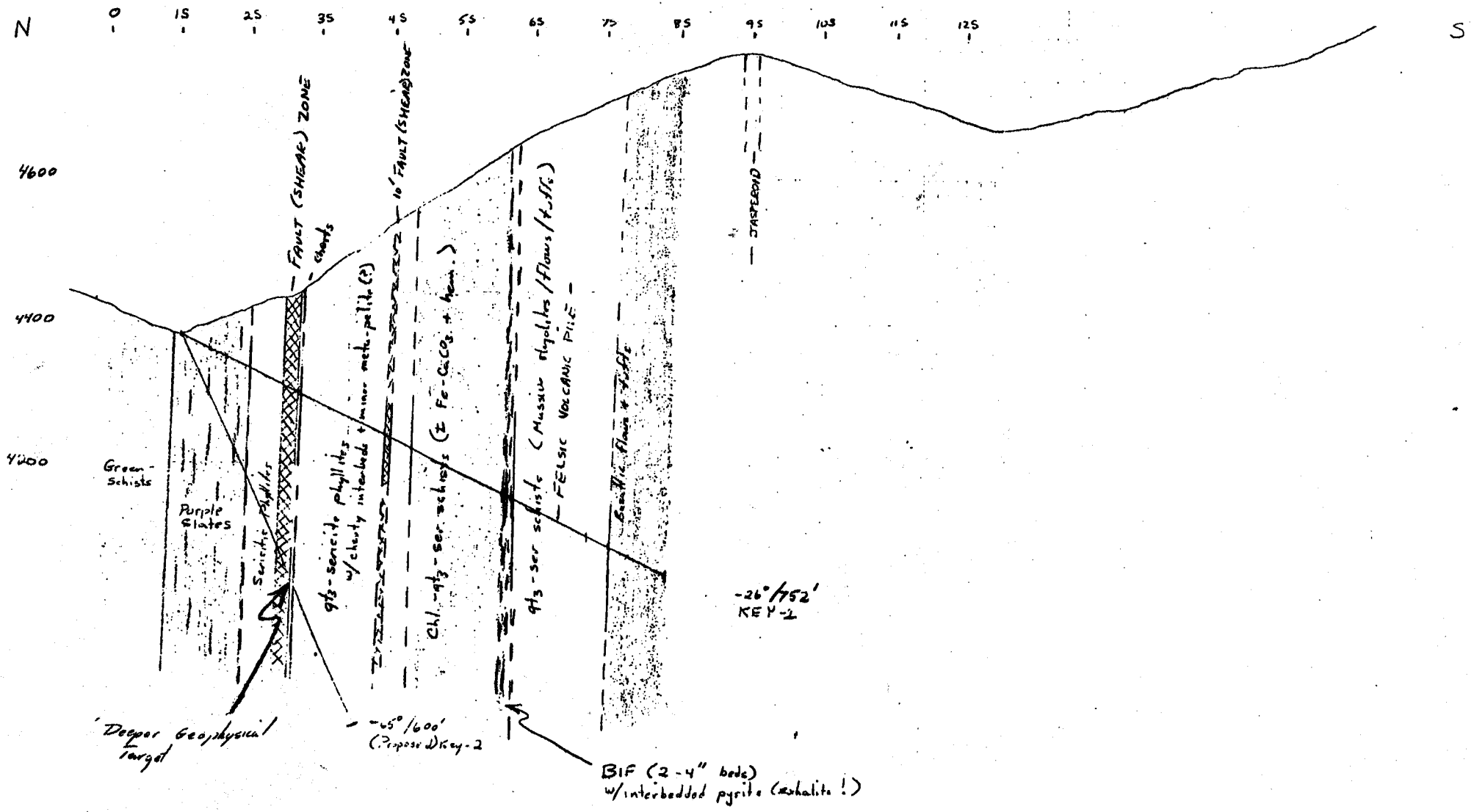


R.A.E. 1/85

KEYSTONE PROJECT. 1987 BY CHEVRON

LINE O

1" = 200'



NORTHEAST GEOCHEMICAL AND ASSAY COMPANY
198 MAIN STREET
YARMOUTH, MAINE 04096
207-846-4673

Chevron Resources Company R. Eisenberg FINAL REPORT

7/31/87 CHV 189-87 lb 2

All Results in ppm

Lab No.	Sample No.	As	Ag	Au	Au
1	DDH KEY - 1 112-117 RC	35	<0.2	0.005	
2	DDH KEY - 1 141-146 RC	42	0.2	<0.005	
3	DDH KEY - 1 146-151 RC	16	0.3	<0.005	
4	DDH KEY - 1 151-154 RC	49	0.4	0.006	
5	DDH KEY - 1 154-156 RC	51	0.2	<0.005	
6	DDH KEY - 1 165-170 RC	52	0.3	<0.005	
7	DDH KEY - 1 182-187	38	0.3	<0.005	
8	DDH KEY - 1 225-230 RC	2	<0.2	<0.005	
9	DDH KEY - 1 245-250 RC	5	0.2	<0.005	
10	DDH KEY - 1 250-255 RC	3	<0.2	<0.005	
11	DDH KEY - 1 255-260	9	<0.2	<0.005	
12	DDH KEY - 1 260-265 RC	12	<0.2	<0.005	
13	DDH KEY - 1 265-270 RC	7	<0.2	<0.005	
14	DDH KEY - 1 270-275 RC	12	0.2	<0.005	
15	DDH KEY - 1 275-280 RC	12	0.2	0.007	
16	DDH KEY - 1 280-285	16	<0.2	<0.005	
17	DDH KEY - 1 285-290 RC	17	<0.2	<0.005	
18	DDH KEY - 1 290-295 RC	18	<0.2	<0.005	
19	DDH KEY - 1 295-300 RC	15	<0.2	<0.005	
20	DDH KEY - 1 300-305 RC	17	<0.2	<0.005	
21	DDH KEY - 1 305-310 RC	10	<0.2	<0.005	
22	DDH KEY - 1 310-315 RC	10	<0.2	<0.005	
23	DDH KEY - 1 359-364 RC	8	<0.2	0.006	
24	DDH KEY - 1 364-369 RC	19	<0.2	0.062	0.085
25	DDH KEY - 1 375-380 RC	10	<0.2	0.023	
26	DDH KEY - 1 390-395 RC	3	<0.2	0.005	
27	DDH KEY - 1 395-400 RC	8	<0.2	0.007	
28	DDH KEY - 1 400-405 RC	7	<0.2	0.006	
29	DDH KEY - 1 405-410 RC	13	0.2	0.010	
30	DDH KEY - 1 410-415 RC	18	0.2	0.017	
31	DDH KEY - 1 420-425 RC	19	0.3	0.011	
32	DDH KEY - 1 425-430 RC	24	0.6	0.017	
33	DDH KEY - 1 442-447	33	0.5	0.014	
34	DDH KEY - 1 470-475 RC	45	0.2	<0.005	
35	DDH KEY - 1 487-492 RC	54	2.1	0.147	

NORTHEAST GEOCHEMICAL AND ASSAY COMPANY
198 MAIN STREET
YARMOUTH, MAINE 04096
207-846-4673

Chevron Resources Company R. Eisenberg FINAL REPORT

7/31/87 CHV 189-87 2a 2

All Results in ppm

Lab No.	Sample No.	As	Ag	Au	Au
36	DDH KEY - 1 502 -504 RC	32	0.4	0.021	
37	DDH KEY - 1 504 -507 RC	24	0.2	0.008	
38	DDH KEY - 1 507 -509.3RC	37	0.2	0.013	
39	DDH KEY - 1 509.3-510.4RC	29	0.3	0.014	
40	DDH KEY - 1 510.4-511.2RC	86	0.4	0.021	0.015
41	DDH KEY - 1 511.2-512.2RC	39	0.6	0.012 ✓	
42	DDH KEY - 1 512.2-515 RC	78	0.5	0.008	
43	DDH KEY - 1 515 -520 RC	46	0.3	<0.005	
44	DDH KEY - 1 520 -522 RC	160	<0.2	0.005	
45	DDH KEY - 1 522 -527 RC	74	<0.2	<0.005	
46	DDH KEY - 1 532 -537 RC	50	<0.2	<0.005	
47	DDH KEY - 1 575 -580 RC	21	<0.2	<0.005	
48	DDH KEY - 1 610 -615 RC	6	<0.2	0.006	
49	DDH KEY - 1 645 -650 RC	10	<0.2	0.005	
50	DDH KEY - 1 665 -670 RC	15	<0.2	<0.005	
51	DDH KEY - 1 727 -732 RC	22	<0.2	0.005	
52	DDH KEY - 1 744 -748 RC	23	<0.2	0.005	
53	DDH KEY - 1 748 -752 RC	24	<0.2	<0.005	

Approved

Hal Downey

NORTHEAST GEOCHEMICAL AND ASSAY COMPANY
198 MAIN STREET
YARMOUTH, MAINE 04096
207-846-4673

Chevron Resources Company R. Eisenberg FINAL REPORT

7/31/87 CHV 189-87 1a 2

All Results in ppm

Lab No.	Sample No.	Cu	Pb	Zn
1	DDH KEY - 1 112-117 RC	40		
2	DDH KEY - 1 141-146 RC	26		
3	DDH KEY - 1 146-151 RC	33		
4	DDH KEY - 1 151-154 RC	60		
5	DDH KEY - 1 154-156 RC	33		
6	DDH KEY - 1 165-170 RC	40		
7	DDH KEY - 1 182-187	25		
8	DDH KEY - 1 225-230 RC	25		
9	DDH KEY - 1 245-250 RC	17		
10	DDH KEY - 1 250-255 RC	13		
11	DDH KEY - 1 255-260	49		
12	DDH KEY - 1 260-265 RC	16		
13	DDH KEY - 1 265-270 RC	21		
14	DDH KEY - 1 270-275 RC	37		
15	DDH KEY - 1 275-280 RC	54		
16	DDH KEY - 1 280-285	83		
17	DDH KEY - 1 285-290 RC	49		
18	DDH KEY - 1 290-295 RC	52		
19	DDH KEY - 1 295-300 RC	57		
20	DDH KEY - 1 300-305 RC	47		
21	DDH KEY - 1 305-310 RC	10		
22	DDH KEY - 1 310-315 RC	33		
23	DDH KEY - 1 359-364 RC	28		
24	DDH KEY - 1 364-369 RC	174		
25	DDH KEY - 1 375-380 RC	27		
26	DDH KEY - 1 390-395 RC	10		
27	DDH KEY - 1 395-400 RC	54		
28	DDH KEY - 1 400-405 RC	23		
29	DDH KEY - 1 405-410 RC	74		
30	DDH KEY - 1 410-415 RC	50		
31	DDH KEY - 1 420-425 RC	91		
32	DDH KEY - 1 425-430 RC	121		
33	DDH KEY - 1 442-447	271	<2	240
34	DDH KEY - 1 470-475 RC	49	<2	84
35	DDH KEY - 1 487-492 RC	736	556	460

NORTHEAST GEOCHEMICAL AND ASSAY COMPANY
198 MAIN STREET
YARMOUTH, MAINE 04096
207-846-4673

Chevron Resources Company R. Eisenberg FINAL REPORT

7/31/87 CHV 189-87 2a 2

All Results in ppm

Lab No.	Sample No.				Cu	Pb	Zn
36	DDH KEY - 1	502	-504	RC	176	<2	188
37	DDH KEY - 1	504	-507	RC	126	<2	143
38	DDH KEY - 1	507	-509.3	RC	161	<2	131
39	DDH KEY - 1	509.3	-510.4	RC	141	<2	134
40	DDH KEY - 1	510.4	-511.2	RC	380	<2	184
41	DDH KEY - 1	511.2	-512.2	RC	495	<2	214
42	DDH KEY - 1	512.2	-515	RC	316	<2	138
43	DDH KEY - 1	515	-520	RC	340		
44	DDH KEY - 1	520	-522	RC	50		
45	DDH KEY - 1	522	-527	RC	8		
46	DDH KEY - 1	532	-537	RC	4		
47	DDH KEY - 1	575	-580	RC	8		
48	DDH KEY - 1	610	-615	RC	11		
49	DDH KEY - 1	645	-650	RC	6		
50	DDH KEY - 1	665	-670	RC	34		
51	DDH KEY - 1	727	-732	RC	23		
52	DDH KEY - 1	744	-748	RC	34		
53	DDH KEY - 1	748	-752	RC	13		

KEYSTONE PROSPECT

Gila County, Arizona

A Brief Summary of Potential and Approach

The Keystone Prospect is a classic occurrence of volcanogenic massive sulfide mineralization in Precambrian Yavapai Schist which displays the features characteristic of major massive sulfide deposits in the so-called "schist belt" further west at Jerome, Mayer, and the Bradshaw Mountains. The Keystone is located about halfway between the towns of Payson and Young and although not distant by air miles from either location, is difficult to reach by road. From the Flying W Ranch, west of Young, the area is accessed by five miles of very rough 4WD road usually requiring about 2 hours driving time. The rough terrain and inaccessability have been major factors in limiting the exploration work undertaken by some of the major companies.

The most recent work has been done by Chevron Resources Company under the direction of Ralph Fitch, now U. S. Exploration Manager in Reno. The property was held under lease by Chevron through the period May 1984-July 1987. Chevron's work consisted of geologic mapping, running 3 EM lines and drilling one angle hole to test 2 of 3 EM anomalies. The project and lease were ended after the drilling.

The claim owners (Harold Downey, William Mounts, and Arthur Gallan) believe there is at least one major drilling target which remains untested. The Chevron drill hole did not reach the third anomaly (1,000-1,200 feet southeast of Pranty Cabin). This anomaly is of particular interest because it lies along the projected contact between mafic and felsic volcanics, a classic environment for massive sulfide deposition.

It is not practical to drill the third anomaly from the Pranty Cabin area, however, a new access road could be built relatively easily along ridges to the southeast. An old road connects from the existing access to "Gun Tank" located about one mile southeast of Pranty Cabin. A new road about 3,000 feet long can be built off this road and taken to a ridge about 500 feet southeast of the third anomaly (refer to attached maps). Such a road would provide a new approach to the entire area as well as for drilling purposes.

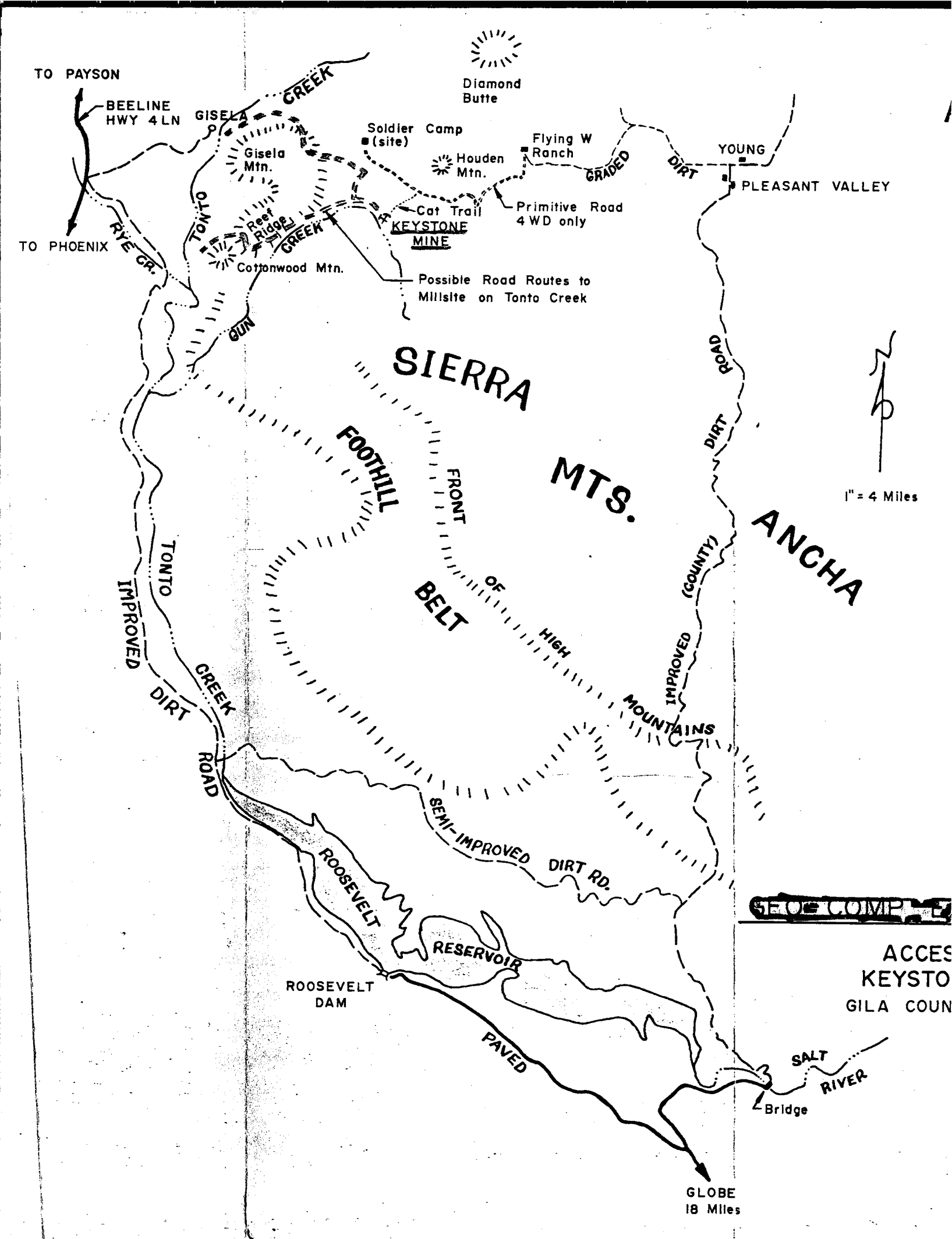
Attached are portions of maps, a portion of an old report by John Kinnison, Chevron drill data, and copy of color photo (1" = 500') of the area. Additional information is available if needed.

Harold Downey

Harold Downey

10/25/88

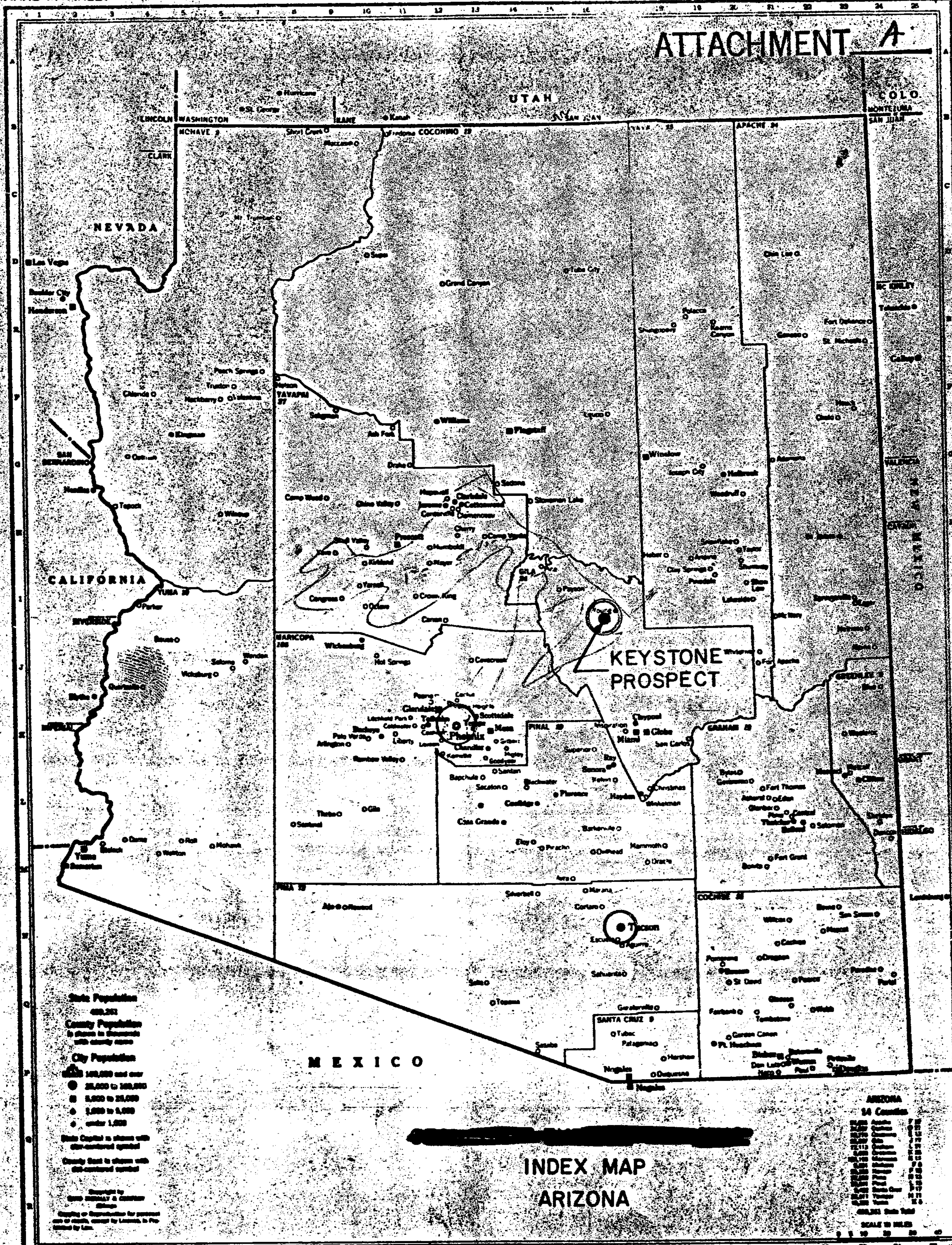
Date


TO PAYSON
BEELINE HWY 4 LN
GISELA
CREEK
Diamond Butte
Soldier Camp (site)
Flying W Ranch
Houden Mtn.
Gisela Mtn.
GRADED
DIRT
YOUNG
PLEASANT VALLEY
Cat Trail
Primitive Road 4 WD only
KEYSTONE MINE
TO PHOENIX
RYE CR.
TONTO
Reef Ridge
CREEK
Cottonwood Mtn.
Possible Road Routes to Millsite on Tonto Creek
GUN
SIERRA
MTS.
ANCHA
FOOTHILL
FRONT
BELT
OF
HIGH
MOUNTAINS
ROAD
DIRT
(COUNTY)
IMPROVED
1" = 4 Miles
TONTO
IMPROVED
DIRT
CREEK
ROAD
SEMI-IMPROVED DIRT RD.
ROOSEVELT
RESERVOIR
ROOSEVELT DAM
PAVED
SALT
RIVER
Bridge
GLOBE 18 Miles
ACCES
KEYSTO
GILA COUN

RAND McNALLY

CITY-COUNTY STATE MAP
SIZE 8 X 11

ARIZONA



MADE IN U.S.A. Specially engraved and indexed for use with the Rand McNally Commercial Atlas and Marketing Guide. This Map is also available in size 17 X 22

KEYSTONE PROJECT

Hole # : DDH - KEY 1
Total Depth : 752'

		Assay Interval	Analyze	Sample Width	Notes
	1)	112' - 117'	Cu, Au.	5'	chert zone
	2)	141' - 146'	"	5'	Mn-Oxides, ↑$CaCO_3$
	3)	146' - 151'	"	5'	Siderite + qtz
	4)	151' - 156'	"	5'	"
	5)	165' - 170'	"	5'	Fault zone sample
	6)	182' - 187'	"	5'	cherts w/sid.
	7)	225' - 230'		5'	" w/Fe-oxides
	8)	245' - 250'		5'	qtz veins w/Mn-ox.
	9)	250' - 255'		5'	Dissem py.
	10)	255' - 260'		5'	cherty section
	11)	260' - 265'		5'	
	12)	265' - 270'		5'	
	13)	270' - 275'		5'	
	14)	275' - 280'		5'	qtz - ser. phyllites
	15)	280' - 285'		5'	w/dissem py and
	16)	285' - 290'		5'	cherty zones
	17)	290' - 295'		5'	and Fe - oxides
	18)	295' - 300'		5'	
	19)	300' - 305'		5'	
	20)	305' - 310'		5'	
	21)	310' - 315'		5'	
15 ✓	22)	359' - 364'		5'	Chalco(?) + qtz + chl.
16 ✓	23)	364' - 369'		5'	" + hem.
	24)	375' - 380'		5'	Sid. + hem.
	25)	390' - 395'		5'	py. (dissem.)
	26)	395' - 400'		5'	" + qtz veins
	27)	400' - 405'		5'	$CaCO_3$ + sid. + qtz.
20 ✓	28)	405' - 410'		5'	qtz veins + py.
19 ✓	29)	410' - 415'		5'	blk. chl. + qtz.
17 ✓	30)	420' - 425'		5'	string py. (bedded)(?)
18 ✓	31)	425' - 430'		5'	"
12 ✓	32)	442' - 447'	Cu, Pb, Zn, Au, Ag, As	5'	BIF
13 ✓	33)	470' - 475'	Cu, Au	5'	Sid + qtz.
14 ✓	34)	487' - 492'	Cu, Au	5'	Bedded py.
1 ✓	35)	502' - 504'	Cu, Pb, Zn, Au, Ag, As	1.5'	BIF
2 ✓	36)	504' - 507'	"	3'	BIF
3 ✓	37)	507' - 509.3'	"	2.3'	BIF
4 ✓	38)	509.3' - 510.4'	"	1.1'	BIF
5 ✓	39)	510.4' - 511.2'	"	.8'	BIF
6 ✓	40)	511.2' - 512.2'	"	1'	BIF

KEYSTONE (cont.)

	ASSAY INTERVAL		Sample width	Notes
7 ✓ 41)	512.2' - 515'	Cu, Pb, Zn, Au, Ag, As	2.8'	Cherty layer w/BIF chert
9 — 42)	515' - 520'	Cu, Au	5'	" + $CaCO_3$
8 ✓ 43)	520' - 522'	"	2'	Oxides near BIF's
44)	522' - 527'		5'	Oxides margin
45)	532' - 537'		5'	Spec. hem. veins
46)	575' - 580'		5'	altered
47)	610' - 615'		5'	drk. chl. + hem.
48)	645' - 650'		5'	strong $CaCO_3$
49)	665' - 670'		5'	mafic margin
✓ 50)	727' - 732'		5'	silicified (?)
10 ✓ 51)	744' - 748'		4'	} Silicified (Dacitic) Tuff
11 ✓ 52)	748' - 752'		4'	w/qtz veins + blk Chl. (?)

CHEVRON RESOURCES

Property Keystone, Az Sec. 6 T 8N R 12E State Arizona Drill Hole No Key 1 Sheet 1

Scale 1" = 10' Coord. N _____ E _____ Bearing 535 E Dip 26° Collar Elev. ~4380' Grid _____

Logged by: Chris Washko

ROCK TYPE & STRUCTURES	Mineralization and Alteration	Hole Depth	Lithology	%Rec	Interval	Rec ftg.	Nmbr.	SAMPLE					ASSAY					
0 - 9' Regolith/Overburden Hole collared in purple slate Drilled + cased to 9' (no core)				0%														
Purple slate/mudstone																		
V.F.G. Purple to reddish brown, well foliated slate. Alt. qtz veinlets 1/8" to foliation 1mm - 1cm veins (?) folds, sub-parallel to foliation, appears to be cutting when folded + tight isoclinal folding w/axis along plane of foliation	Hematitic/maroon mottles w/minor color variation. Qtz veinlets along foliation throughout section (white qtz.)	10		~100%														
Bedding planes generally // foliation planes throughout interval. Bedding tensors are common and boudinaged appearance. Qtz veinlets also folded (micro-folding) - 2nd bedding and hematite rich "lenses" (remains of ...) 1mm - 4mm thick	Qtz veinlets along foliation planes through slate seen as 1mm - 5mm thick 10-12 veins/ft	20		~100%														
- [illegible] qtz veins - foliation has wavy appearance as original foliation has been folded (two episodes of secondary folding ⊥ C.A.)	- Alt veins are post foliation + 2 folding episodes. Qtz veins show minor folding	30		~100%														
Maroon/purple slates (cont'd). Minor color variation/non-mag. Very fine-ly bedded. Consistent foliation between 60°-70° to C.A. - broken, clay rich zone (fault gouge ?) lost circulation		40		~100%														
- Alt. veins isoclinally folded (3rd generation ?) - V.F.G. lt. gen to gray felsic tuffs, appear [illegible] lt. gen. contacts w/slate may indicate lts a ntg. aplite sill (?) 12" Qtz veinlets strongly folded and broken Hgrec, wiss felsic tuff (laminated) Aplite sill (?)	- fine, lt. gray to gray clays. - Sericite/chlorite (?) Alt. qtz veining (white qtz) - white qtz vein w/tuff breccia [illegible] zone	50		100%														
strong [illegible] zone, 1" hematitic (red) clear zone along foliation planes good bedding of fine muds and minor silts Qtz veinlets show micro-folding	- Qtz veinlets x-cut foliation [illegible] 3" zone, included sericite (white to lt. gray clay minerals)	60		100%														
(cont'd) maroon slates, minor color variation w/consistent 60°-65° foliation to C.A. - good bedding of muddy layers	- qtz veinlets ⊥ C.A.	70		100%														
Min. evidence of shearing along foliation (?) [illegible] separated beds, micro-faulting ?	- qtz veins w/white clays [illegible] strongly contorted, brecciated - strong hematite band 1" - Bull qtz vein // C.A. clear to white	80		100%														
[illegible] to fault (?) 1" zone of [illegible] shearing zone clay fault gouge (?) (2 zone) reddish brown clay. Alt qtz veins chaotic structure good [illegible] maroon to gray [illegible]	- strong mud, clay zone - strong hematite, and qtz veining (qtz veinlets 1mm	90 94.8																
[illegible] bedding/folding of foliation. Bedrock appearance is horizontal. (CONTACT)		100																

CHEVRON RESOURCES

City Keystone, Az Sec. 6 T 8N R 12E State Arizona Drill Hole No Key 1 Sheet 2

Scale 1" = 10' Coord. N _____ E _____ Bearing S35E Dip 26° Collar Elev. ~4380 Grid _____

Logged by: C.P.W.

ROCK TYPE & STRUCTURES	Mineralization and Alteration	Hole Depth	% Rec.	Intrvl	Rec ftg.	Nmbr.	SAMPLE	ASSAY
Maroon slates, gradational color change from purple to gray approaching contact								
Qtz-sericite phyllite, variable colors white to black, lt. to dark grn, pink to orange. Bedded, flow banded appearance, and are likely flow banded interbedded ash: lapilli rhyolite tuffs. Cherty rhyolites interbedded w/ash tuffs	Qtz-sericite clay alteration lt. green to gray.		100%					
Highly contorted bedding, isoclinal folding steepening foliation w/depth. Rhyolite flows (lapilli to breccia size fragments) very siliceous with interbeds of softer tuffaceous units. Bedding chaotic, foliations roughly 60° CA. Extremely blocky and contorted	Distinctly orange to red siliceous rhyolitic zone possibly exhalative (?)	110	100%					
(120-121.5) broken zone, sericitic phyllites lt. Grn to black (more regular, wavey beds and foliation than up-hole unit)	Variable clay colorations from lt grn. to drk. grn. to shades of pink and yellow (sericite/talc ?) (121.5-132.8) Dark gray to black v.g. clays. Chert chert 1cm (red)	120	100%					
(121.5-132.8) V.F.G., gray to black tuffs w/ interbedded lt. grn. lapilli tuffs. Alt. chert Qtz veinlets ∥ foliation and are themselves folded. This unit possible an argillite (?)								
lapilli, tuff units lt. green to yellowish grn to red. (132.6-151) Sericite-phyllites well laminated (flow banded?) lapilli and felsite breccia tuffs. Bouldinger appearance (lousiled character). Extreme variability in color from lt. green or white to dark green and reddish orange	Minor $CaCO_3$ (calcite) Sericitic/talcose clays significantly fewer qtz veins within foliations	130	100%					
Broken/chaotic locally. Possibly debris flow volcanics interbedded w/breccias and lapilli tuffs	Start of Mn.-oxides dendritic texture (1%) ↓ increasing $CaCO_3$ content and qtz veining (fault related ?)	140	100%					
qtz - Fe - $CaCO_3$, veinlets ∥ foliation and x-cut foliation at ⊥ attitude. Increase brecciation + veining close to fault zone.	Siderite veinlets 1cm, in association w/qtz veins	150	↓					
(156-179.5) FAULT/SHEAR ZONE Extreme broken/sheared clay rich phyllites(?) Entire sequence ⊥	Nice Mn-oxide dendrites w/ Fe-oxides and qtz veins Mn-oxides 2-4% of rock		80-90%					
chaotic mix. of clays and various tuffaceous, siliceous and clay rich fragments. Locally semi-competent, though 90% sheared/broken. Color variable lt. green to dark green, pink, brownish red, orange and black (Mn-oxides)	clay rich zone muddy brown to lt and dark green clays. Sericite + hematite + talc(?)	160	80%					
	Alt. Fe & Mn oxides in veins and disseminated. Increase silicification near fault [illegible]	170	80-90%					
transition to silicified, brecciated zone near fault's edge								
Silicified felsite breccias (fault related). Hematitic, siliceous, cherty rhyolites, intensely brecciated but competent from [illegible] SiO_2 (182.5-184) greenish gray Qtz-sericite felsite tuff well laminated very siliceous (184-185.5) Built orange/red cherty exhalite intensely brecciated w/70% qtz veins (siliceous, sericite phyllites)	Alt. qtz veins ∥ [illegible] (1cm-10cm) [illegible] Fe, Mn [illegible]							
lapilli to breccia size lenses and fragments lt. grn to lt. orange V.F.G. clay to tuff [illegible] (195.3-196) Qtz-stockwork [illegible] (196.1-227) Finely laminated lapilli to breccia size felsic tuffaceous [illegible] phyllites								

CHEVRON RESOURCES

...rty Keystone, Az Sec. 6 T 8N R 12E State Arizona Drill Hole No Key 1 Sheet 3

...le 1" = 10' Coord. N _____ E _____ Bearing _____ Dip ____ Collar Elev. _____ Grid _____

...ogged by: C. P. Washko

SAMPLE ASSAY

ROCK TYPE & STRUCTURES	Mineralization and Alteration	Hole Depth	%Rec	Intrvl	Rec ftg.	Nmbr.
200 Cont. 186.1 Qtz-sericite phyllites (schists?) lt. green, variable to lt. oranges and dark green layers. 95% lapilli size frags w/ thin bands of breccia size frags. good kink banding ⊥ CA. Well laminated, boudenaged appearance. Likely felsic lapilli tuffs (209-210) siliceous, orange rhyolitic tuff	Qtz-sericite alteration consistant lt. grn. coloration. Reddish-orange color hematitic, siliceous rhyolite	210	100%			
w/5% secondary qtz veining. Qtz-sericite phyllites. Felsite lapilli tuffs w/good schistosity 60-65° to CA. Boudenage appearance, Oensoidal structure. 2mm qtz veins ∥ core axis	Sericite clay alteration. No carbonate. Non-magnetic. "clean" qtz-sericite schists	220	100%			
(227-229.5) Qtz-sericitic phyllites (schists) siliceous laminated phyllitic tuffs w/15% secondary qtz within lamination. Qtz bands (1mm-2cm) are pink to orange (edialitic(?))	Abt. 1mm-2cm qtz veins w/minor Fe-oxide and $CaCO_3$ in veins	230	100%			
229.5 - Qtz-sericite phyllites (schists) alternating bands of lt. green, lt. pink to clear qtz-sericitic felsite tuffs. "clean" rock w/no metals. consistant schistose textures 60-65° to CA. well laminated, minor folding. Probably felsite lapilli tuffs	Pale qtz veinlets (amethysitic) ⊥ CA. 1cm widths 6-8 veins from 237-237.7	240	100%			
Same as above. lt. grn, laminated qtz-sericitic phyllites	Consistant qtz-sericitic alteration, lt. grn to white clays. Minor disseminated pyrite (<1%) (247) - black veinlets (1mm) MnO_2 (?) (247-251) increased qtz veining 10-12/f' (1mm-2cm wide) clear to white qtz along foliation planes	250	NC to 249	100%		
(255-257) orange to pinkish red, extremely siliceous rhyolitic cherts, massive texture, cut by numerous qtz veinlets. Minor interbedded clay rich phyllites (2-3cm thick) 257-267 - lt. green sericitic phyllites	chert w/white qtz veinlets. minor sericite in phyllite interbeds (259-266) abt Fe-oxide staining of lt. grn. phyllites. Appears stockwork-like vein related	260	NX from 249 →	100%		
well-laminated, kink bands ⊥ CA, abt qtz along folia, no $CaCO_3$, non-mag. (267-273) qtz-sericitic phyllites w/ breccia size fragments in tuffaceous matrix, locally lapilli size frags.	(164.6-165) 20% rust coloring of interval. Siliceous, qtz-sericite, Fe-oxides. NOT Gossan	270		100%		
(273-275.5) Qtz-sericite breccia (volcaniclastic?) 2mm-1cm elongate/angular frags. Pinkish orange color w/ stockwork qtz veining x-cutting foliation (275.5-286) Extremely fine interbedded felsic to intermediate tuffs. lt. green to dark grn, brown and greys and marrons. Appear tuffaceous w/ incipient clots finely disseminated throughout matrix	Pyrite along qtz-veinlets x-cutting foliation. Blackish metalic colored pyrite (possibly other type sulfide?) - qtz veins w/minor pyrite + Fe-Oxides abt. sericite - extremely fine clays, lt. gray, green, and marroon. Minor disseminated pyrite	280		100%		
some interbedded felsite (qtz) layers throughout section. May be interbedded pelitic seds argillites (?), though most layers appear tuffaceous. very f.g. well laminated beds. (286-288.8) Inter laminated lt-dark green, black and brown v.f.g. tuffs (argillites?) Well laminated phyllites w/qtz veins (3-5cm) ⊥ bedding (289-290) xtal + lapilli tuff phyllites	abt. brownish Fe-oxides along vein structures. 1cm brownish mud layers as well. Chalcopyrite xtals in 4mm qtz-chl-$CaCO_3$ vein. Zoned vein qtz/chlorite rims. Dull alkaline qtz-$CaCO_3$ vein	290		100%		
(290-305) well laminated, bedded felsite tuffaceous, sericitic/chert phyllites. lt. to dark green beds interbedded w/orange to reddish cherty rhyolites. Chert beds massive, f.g. and cut by numerous qtz veins. V.f.g. chlorite bands as wisps along folia planes (leopardskin appearance)	massive pink/orange-red cherty rhyolites. Very siliceous massive texture. Fine interbeds of qtz-sericitic phyllites. (296) 1mm pyrite bed (discontinuous) minor disseminated pyrite throughout cherty section. Black chert interlaminated in tuffs and cherts	300		100%		

CHEVRON RESOURCES

[redacted] Sec. [redacted] T 8N R 12E State Az. Drill Hole No. Key 1 Sheet 4

= 10' Coord. N ____ E ____ Bearing ____ Dip ____ Collar Elev ____

d by C.P. Washko

SAMPLE ASSAY

...ock Type & Structures	Mineralization and Alteration	Hole Depth	% Rec.	Interval	Rec. ftg.	Number
Phyllites interbedded lt to drk green f.g. felsite tuffs w/orange-red cherty rhyolitic interbeds. Isoclinal folding of interbeds and secondary qtz veins. Well foliated, consistant ∠ to CA of 65°	chert layer w/abt. qtz veins and minor dissem pyrite abt. sericite ± chlorite		100%			
cyclically bedded tuffs + cherts (1cm beds), chloritic/sericitic phyllites + qtz veins	chert w/interbedded sericitic chloritic phyllites + qtz veins	310				
brecciated cherty tuff zone (tectonic) w/qtz veins x-cutting laminations chaotic assemblage. (311-314.5) fine laminated tuffaceous sericite phyllites w/ 1% dissem sulfide as hematite red spotted appearance. Numerous qtz veins (6-8/ft) x-cut bedding. Distinctive gray and green phyllites, increasing tectonic brecciation w/ depth to 317.5	chlorite + qtz + $CaCO_3$ in veins minor sulfide in veins and dissem throughout chert-phyllite section.		100%			
(317.5-328) fault breccia strongly brecciated / tectonically broken zone. Rock appears to have been admixture of tuffs / cherts(?) and volc clastic (angular frags). 328-365.5 qtz-sericitic phyllites	strong qtz-chlorite-$CaCO_3$ alteration.	320	95%+			
Interbedded f.g., gray to black lapilli tuffs w/siliceous orange to red cherty rhyolite layers between. Predominantly lapilli size frags w/locally breccia size zones. Well laminated, bordanaged appearance w/elongate compressed lapilli // ing foliation	qtz-sericite alteration lt. grn. and gray clays (pelitic ?) Abt. Fe-oxides in veins // and ⊥ CA. Also minor along tilia planes.	330	100%			
(340-365.5) Dark gray and white/pink laminated qtz-sericitic phyllites. Siliceous cherty tuffaceous bands (1mm-1cm) interbedded w/ v.f.g. drk gray to grayish green tuffaceous phyllites (1mm-1cm bands)	qtz-sericite (± chlorite)	340	100%			
Phyllites (Gray to black lapilli tuffs w/interbedded pink-orange rhyolitic cherty tuffs) Well laminated (bordanage appearance) Consistant texture.	qtz-sericite alteration minor qtz-veining to 359	350	100%			
	chalcopyrite (<.1%) in qtz-chl. veinlet	360				
(366.4-367.2) Pink-orange v. siliceous f.g. cherty tuff horizon. Tectonically brecciated w/hematite/chl. veinlets and chl. tuff interbeds. (367.2-) Chloritic green schists w/interbedded pink/orange cherts (cherty rhyolites). Well laminated w/boudems of cherts, but tectonically broken w/minor brecciation of semi-continuous laminae. Flow-foliation textures w/cherty tuffs as competent rotating blocks in softer incompetent green-tuffs which flows around cherts. Increasing massive texture down hole	(366.4-367) cherty tuffs w/qtz-chl-hematite veins 365.5 ↓ strong chl. alt. dark grn. clays + Hematite (3-5%) (367.5) Chalcopyrite in chl. veinlets ⊥ CA. Strong hematite alt. along veinlets ⊥ +// to laminae	370	100%			
	hematite (blood red) in veins ⊥ CA Bull qtz vein (no mineralization) Very strong qtz-chl.-$CaCO_3$-hematite (10% of 2" band) ± siderite (?) strong Hematite ~365-378.5	380	100%			
f.g chlorite schists w/ broken interbeds of pink-orange rhyolitic tuffs. Chlorite schists possibly intermed tuffs, non-mag. partial recrystallization w/resulting coarsening of texture. Rhyolites strongly broken and contorted (tectonic) w/rare isoclinal folding	minor dissem py. (<.1%) Bull qtz vein (4") w/minor chlorite + Fe-oxide on fractures. strong hematite + qtz + chl. in 2" zone.	390	100%			
(cont) massive chl. schists w/ 10-15% interbedded pink-orange, f.g. siliceous rhyolitic tuffs ↓ gradual decrease of rhyolites, increased qtz veining // foliation (5-7.3m white veinlets) isoclinal folding of qtz veins	2mm py ctal in qtz-vein minor py wisps Bull qtz vein (6") w/strong chl + Fe-oxides in fractures qtz-vein fracture ⊥ CA 1% dissem pyrite in most of qtz-chlorite schist interval	400	100%			
(cont.) massive, dark grn. v.f.g. qtz-chl. schists + sericite						

CHEVRON RESOURCES

Property Keystone Sec. 6 T 8N R 12E State AZ Drill Hole No KEY 1 Sheet 5

Scale 1" = 10' Coord. N _____ E _____ Bearing _____ Dip ____ Collar Elev. _____ Grid _____

Logged by: C.P.W.

ROCK TYPE & STRUCTURES	Mineralization and Alteration	Hole Depth		% Rec.	Interval	Rec ftg.	Number	SAMPLE			ASSAY		
Chl - qtz - sericite schists: Dk. grn. massive v. f.g. (intermed.?) volc. tuffs w/good laminations, weak bedding evidence. Abt qtz veinlets // schistocity w/ sochin folds. 1st bed of good qtz-eye chlorite tuff interbed w/ 2% dissem py.	qtz veins w/ minor py mineralization mostly oxidized no Fe-oxides + hematite. Also brown $CaCO_3$, probably siderite associated with qtz - $CaCO_3$ veinlets. siderite = 1% of rock as dissem in veins.	410		100%									
Massive f.g. texture, 5-7% qtz veins/vol. x-cutting laminae + bedding. Veins show strong contorting/little shearing (417-419) strongly contorted/partially sheared hematite/chl./sericitic schists/phyllites	strong qtz/Fe-$CaCO_3$/black chlor alteration in 3" zone // laminae } strong hematite/chl./sericit. alteration. (shear zone all?)	420		100%									
Dk green (423-430) Qtz-chl-sericite schist w/ massive boll qtz veins and 10-15% pyrite in chloritic interval veins and pyrite bands highly contorted massive qtz doesn't appear to fit charts of f.g. dikes. Look like massive white to clear qtz veins	Boll qtz veins (1-8") in f.g. chl. schist. Var. pyrite dissem to 20% semi-conformable w/ contorted laminae = Bedded(?) contorted qtz-chl. pyrite zone. 15-20% sulfide 15-20% pyrite w/ qtz-chlorite-sericite altered f.g. tuffs + qtz veins no $FeCO_3$ minor Fe-oxides + hem.	430		100%									
(430-434) Chl. schists. (2' core return due to misslatch of core-barrel.) strongly contorted chl-qtz-schists. Med-dk grn f.g. texture. Well developed schistocity, which obscures bedding. (439-440) Probable bedding indicated sub-// schistocity (strongly contorted)	Lost CORE } lost CORE (MISSLATCH) - chl - qtz alt., dark grn chl., minor hematite, strong qtz (veins likely) - 1-2% dissem pyrite - 8" boll qtz-vein w/ chl. + 2% py.	440	2' missing	100%									
Chl - qtz schists w/ minor sericite. Minor interbedded hematitic Fe-tongues 2"-4" thick. F.g. intermed (mafic?) tuffs and mafic fragmentals. Intire sequence through 500' TD is strongly contorted schist, med to	1mm bands bedded magnetite in Hematitic Fe-tongues (chlorite) 2"-4" thick. 8-10% brown Fe-$CaCO_3$ alt. w/ qtz - $CaCO_3$ veins (1m-3cm)	450		100%									
dark green w/ 10% qtz-veins (1mm-2cm thick) - qtz-chl schist w/ increased qtz-veining (20% of core/vol). Probable admixture of felsite frags, strongly boudinaged, squished and fragmented tectonically	consistent qtz - dark chl alteration. Local Fe $CaCO_3$ as noted, 1% dissem py through chl. schist section, bedded as noted. Propylitic assemblage included py, $CaCO_3$, chl. + qtz (minor ser.)	460		100%									
qtz veins (?), felsite tuff interbeds (?) likely a combination of both. } Good evidence of mafic fragmental (breccia) character ↓ same ↓	} strong blk. bedded mineralization Chl (?) 2" band, high contorted w/ qtz + chl. (med green color) - boll qtz-vein, w/ secondary veinlets of Fe-oxides (v. fine)	470		100%									
} felsite tuff: (white/green/brown) interbed (cont) qtz-chl. schists, dark green strongly contorted, schistose, intermed fragmentals and mafic (intermed tuffs)	} strong qtz - Fe $CaCO_3$ veining (470.5-480.2) 6mm qtz-siderite vein sub-// CA. chl-schist section has 10-15% qtz-$CaCO_3$ veining by volume	480		100%									
(Cont.) F.g. lt. to dk. grn. intermed to mafic tuffs w/ 15% qtz-$CaCO_3$ veining // to sub // schistocity, highly contorted tectonically broken (strong rotational folds + microfaults). Alt. wispy bedded sulfide horizons (<1mm), locally to 15% sulfide →	minor hematite in fractures // foliation strong siderite in qtz-$CaCO_3$ veinlets/bands sub// foliation wispy bedded pyrite w/ qtz + $CaCO_3$ (487-491.5) 20% highly contorted bedded pyrite (489-489.4) 25% " " pyrite	490		100%									
(490-496) Coarser textured, green, chl-qtz schists. (Bedding (?)) schistocity strongly contorted, chaotic. Qtz-$CaCO_3$ veinlets boudinaged and [illegible]	(491-491.3) 10% pyrite as bands in contorted tuff beds qtz-chl.-$CaCO_3$-pyr. alt. ± sericite Hydrothermal [illegible]			100%									

CHEVRON RESOURCES

...rty Keystone Sec. 6 T 8N R 12E State Az. Drill Hole No Key 1 Sheet 6

...ale 1" = 10' Coord. N _____ E _____ Bearing _____ Dip _____ Collar Elev. _____ Grid _____

Logged by: CPW

ROCK TYPE & STRUCTURES	Mineralization and Alteration	Hole Depth		%Rec.	SAMPLE Intrvl	Rec ftg.	Nmbr.	ASSAY
(Cont.) qtz-chl.-$CaCO_3$ schists med to dk green, f.g. tuffaceous volcanics w/ 15-20% qtz-$CaCO_3$ veins (white) sub-paralleling schistocity. Intermed to mafic tuffs (± fragmentals) w/ interbedded BIF and 4mm M.S. bands	qtz-chl.-$CaCO_3$ (± sericite) ± 1-2% dissem pyrite - BIF w/ 2 bands (4mm each) of bedded M.S. (pyrite) - BIF-4" spec. hem + mag + $CaCO_3$ - BIF-2" spec. hem + mag + $CaCO_3$ good exhalite beds	510		99%				
qtz-chl-$CaCO_3$ schists w/increasing felsic component (fragmental + lithologic) w/depth to 520'. Transitional to felsite fragmentals, with chl. tuff interbeds. Strongly broken and contorted bedding and folia w/rough schistosity/bedding 70° to CA	(509.8-510.1) BIF spec. hem + mag. + $CaCO_3$ + chert. True exhalitive horizon 5% py in cherty BIF clast Strong qtz-chl.-$CaCO_3$-Ser. w/minor hematite + Fe-oxide	520		99%				
(520-521) Brown-red-orange exhalite breccia schist. Abt Fe-$CaCO_3$ + qtz + cherty tuff w/interlaminated chl tuff. Very distinct oxide zone!! Qtz-sericite schists - Very siliceous. purple to purple-gray rhyolitic lapilli and breccia tuffs. Massive texture, mod. developed schistocity.	qtz-$CaCO_3$-(Sid. + hem. + orange-red cherty exhalite qtz-sericite (+ $CaCO_3$) minor hem. + Fe-$CaCO_3$ in veins + fractures $CaCO_3$ most localized to veins and fracture breccia zones	530		99%				
Qtz-sericite schists - strongly brecciated w/secondary qtz-Fe-$CaCO_3$ veins and fracture zones to 4" thick Probably rhyolite fragmentals / breccias w/ minor qtz-eye tuff component.	Brown oxides + shiny black hem. - qtz-Fe$CaCO_3$-spec. hem. vein - Qtz-Fe$CaCO_3$-spec. hem. veins - 1 cm wide. - Shiny blk vein mineralization + hematite	540		99%				
Sequence strongly brecciated. Abt. boudinaged layers, which have been tectonically broken and twisted. Brecciation and lamination from schistocity give sequence clastic appearance. Schistocity poorly developed due to rock comp.	5% qtz-Fe-$CaCO_3$-hematite veins in sequence/vol. qtz-sericite alt. w/lesser $CaCO_3$, hem, Fe-oxide <1% dissem spec. hem. (fine)	550		99%				
Qtz-sericitic schists Purple-gray color, massive, f.g. to coarse breccia texture. Predominantly felsite lapilli and breccia volcanics w/admixture of primary volcanoclastics of rhyolitic composition	qtz-sericite ± $CaCO_3$ ± hem. and minor Fe-oxides in fractures. 5% qtz veining (<1mm-5mm)	560		99%				
Purple-gray to pink qtz-sericite schists Very siliceous, f.g. rhyolite lapilli tuffs, and fine qtz-eye flows. Massive texture, poorly developed schistocity Pinkish to lt. gra + white felsite tuff seperate/distinct flow unit possibly(?)	less $CaCO_3$ in veins, increase qtz-sericite w/minor chl. and minor spec. hem (<1%, dessemmated + vein) qtz-sericite + (minor chl.)	570		99%				
Massive dark purple to dary gray, f.g. siliceous qtz-ser schists. Highly competent/weakly foliated massive rhyolite to 587'. Weakly brecciated w/qtz-veinlet re-cementing	qtz-ser ± (hem., $CaCO_3$, Fe-$CaCO_3$) as veinlets - spec. hem vein (2mm) ∥ CA. Pink-orange alt. (Ser. + hem. + Fe-$CaCO_3$) 10% qtz veins - blk, metalic, tabular veinlet ∥ CA. spec. hem? Argentite(?)	580		99%				
(Cont.) massive qtz-ser-schists w/ very weak schistocity, very competant f.g. rhyolite. - 587' - ~598' Qtz-ser schists. Bedded felsic volc.	qtz-sericite + (hem in veins) minor mn-oxides in folia planes and fractures Strong sericite alt + qtz, minor chl. + hem. + $CaCO_3$	590		99%				
lapilli and breccia tuffs. lt. gra matrix w/various colored lensoidal frags in tuffs. Unit seperated by strong ser. alt. (lt gra color) and distinct bedded tuff character. Qtz-eye tuffs interbedded w/ felsic fragmentals. (598 - ~618) Bedded, siliceous, qtz-ser., schists.	minor Fe-ox. in veinlets (1mm width/most ∥ folia; some x-cut beds/folia) Qtz-ser (± hem)	600		99%				

CHEVRON RESOURCES

erty Keystone Sec. 6 T 8N R 12E State Az. Drill Hole No KEY1 Sheet 7.

ale 1" = 10' Coord. N _____ E _____ Bearing _____ Dip ___ Collar Elev. _____ Grid _____

Logged by: C.P.W.

ROCK TYPE & STRUCTURES	Mineralization and Alteration	Hole Depth		%Rec	SAMPLE Intrvl	Rec ftg.	Nmbr.	ASSAY
(598 - ~618') Qtz-ser. schist Bedded, siliceous felsic volcanic tuffs. lt. gray to black, (+ chl. greens + hem. reds). Minor frag. component w/10% frag by volume. (1cm - 2" frags) f.g. matrix (1mm beds), variable coloration from clays/qtz	qtz - sericite + ($CaCO_3$) minor hem (red) 1% qtz - $CaCO_3$ veining /vol 1mm - 5mm veins // and ⊥ to folia 1% dissem hem (after py?)	610		99%				
Mod developed schistocity ~65° to CA boudanaged layers, minor qtz-$CaCO_3$ veins // and ⊥ folia. Very competent rhyolitic tuffs. strongly brecciated/contorted at base of section (618 - ~645.5) - Qtz - Sericite schists -	qtz - ser. (+ $CaCO_3$) 1% dissem hem (very fine) - xtaline (v.f.) dark grn. min. chl. (?) on fracture face	620		99%				
Coarse felsic fragmental unit. Rock is 40-50% coarse/angular felsic frags in matrix supported f.g. gray-black tuffs Frags 1cm - 3". Rough tectonic alignment and lensing of frags // foliation ~65 to CA Juvenile volc-clastic sequence (?) or good felsic fragmental (?) (Appears clastic!)	qtz - sericite w/minor $CaCO_3$, hem and drk. grn. chl. minor qtz veining (<1%) veins 1mm w/qtz-chl. and minor $CaCO_3$	630		99%				
Clasts/frags are mostly qtz-eye rhy. tuffs and bleached felsics of various comp. Variable lithic/frag content w/depth from 20-50% of rock/vol. Good planar bedding w/only mod. devel. schistocity. Highly competent felsics. Minor brecciation and flow foliation. No folding	strong qtz-ser alt. w/lesser $CaCO_3$/chl. 1% hem. dissem (py.)	640		99%				
(hole shallowing! schistocity closer to ⊥ CA) (645.5-653) Seperate felsic tuff flow Massive, f.g. v. siliceous, rhyolite flow. little to no evidence of schistocity, minor // fracture, 70° to CA. Drk. gray color, strong silica (ALT?) + drk grn chl.	- qtz - ser. alt (weak) w/minor drk grn. chl. strong $CaCO_3$ (in veins) 2% of interval/vol	650		99%				
Appears to have minor (<2%) lithic component (653 - 670.5) Qtz - ser. - chl. (schist) w/abt $CaCO_3$ veinlets (10% of interval) 1mm - 1cm veins Very siliceous, felsic (rhyolitic) tuffs w/minor fragmental content. Frags are angular, 2mm - 2" in width and felsic in comp. (unit is ~5-10% frag. by vol. so variable)	qtz - sericite + minor chl. 10% $CaCO_3$ veining (chaotic orientation w/preference toward // folia.	660		99%				
Same: Increased $CaCO_3$ veining w/depth. Very weak schistocity. Weak laminar structure w/ lensoidal character of frags	qtz + increased sericite w/ abt. chl. + $CaCO_3$ veins Very minor hemitite dissem after pyrite. <1% and strong hem in fractures // schist	670		99%				
670.4-700+) Massive, f.g. vesicular (Good contact) basalts w/ interflow sediment (5%) Non-magnetic, moderate alignment of vesicles // foliation of schists up-section. Drk grn, massive texture, w/2-10% variable vesiculation (chl + $CaCO_3$)	v. strong chl. + $CaCO_3$ + minor SiO_2 $CaCO_3$ and chl. in vesicles and veins Very minor sericite in interflow tuffs + seds (<2%)	680		99%				
Distinct mafic flow (tuff?) unit. f.g. non-mag, purple-gray (non-vesicular) (Locally very f.g. w/ tuffaceous character) No distinct increase or decrease, or size variation of vesicles to determine flow tops. <5% total $CaCO_3$ veining	chl. - ser. alt. + $CaCO_3$ and hematite finely dissem strong chl. - $CaCO_3$ $CaCO_3$ vesicles w/chl. rims minor dissem hemitite	690						
weak to mod developed schistocity as evidenced by vesicle alignment. Minor color variation in section from dark grn to dark purplish-gray. - "Typical" basalts weakly altered	Most $CaCO_3$ vesicles have pink to reddish tint from hem	700						

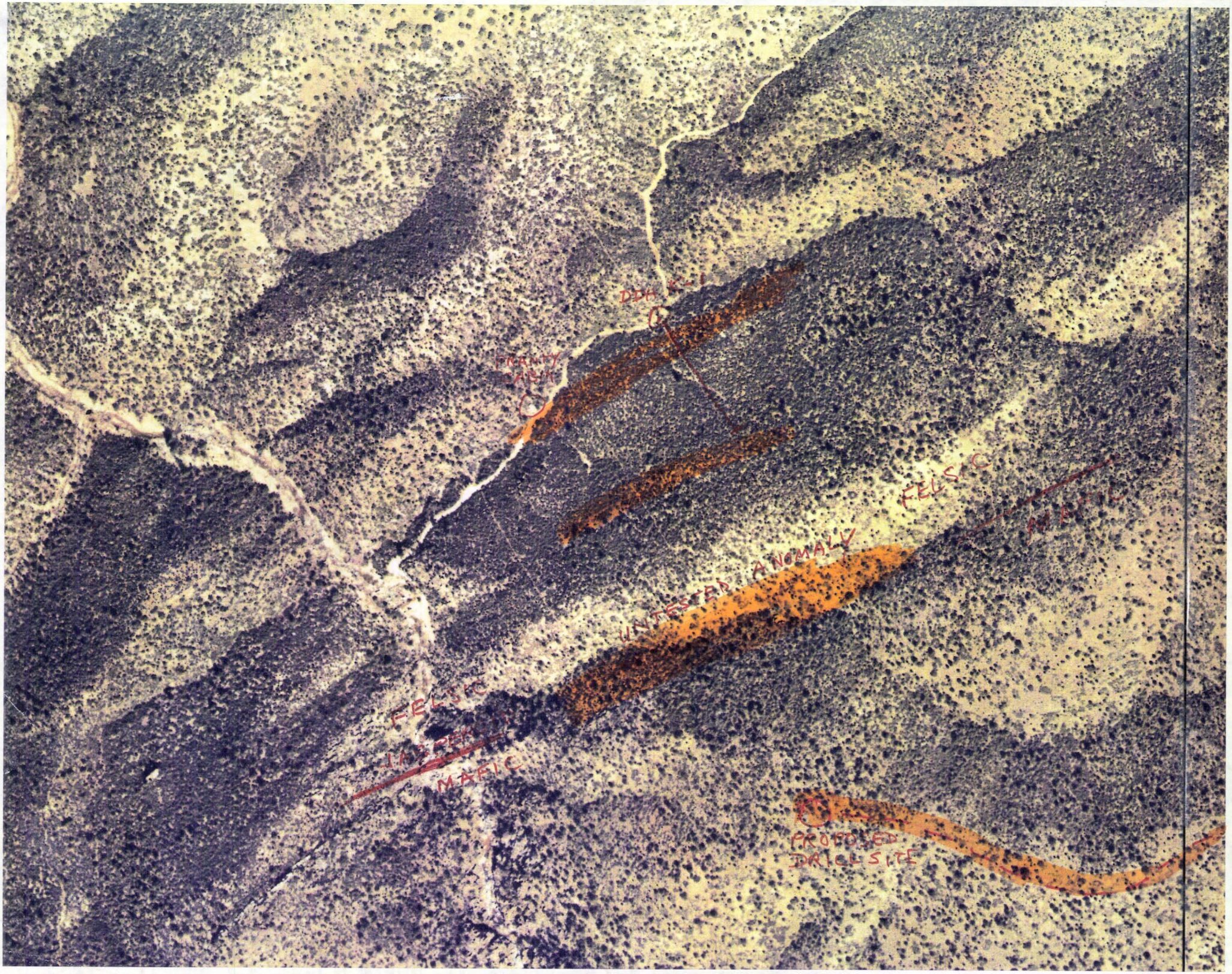
CHEVRON RESOURCES

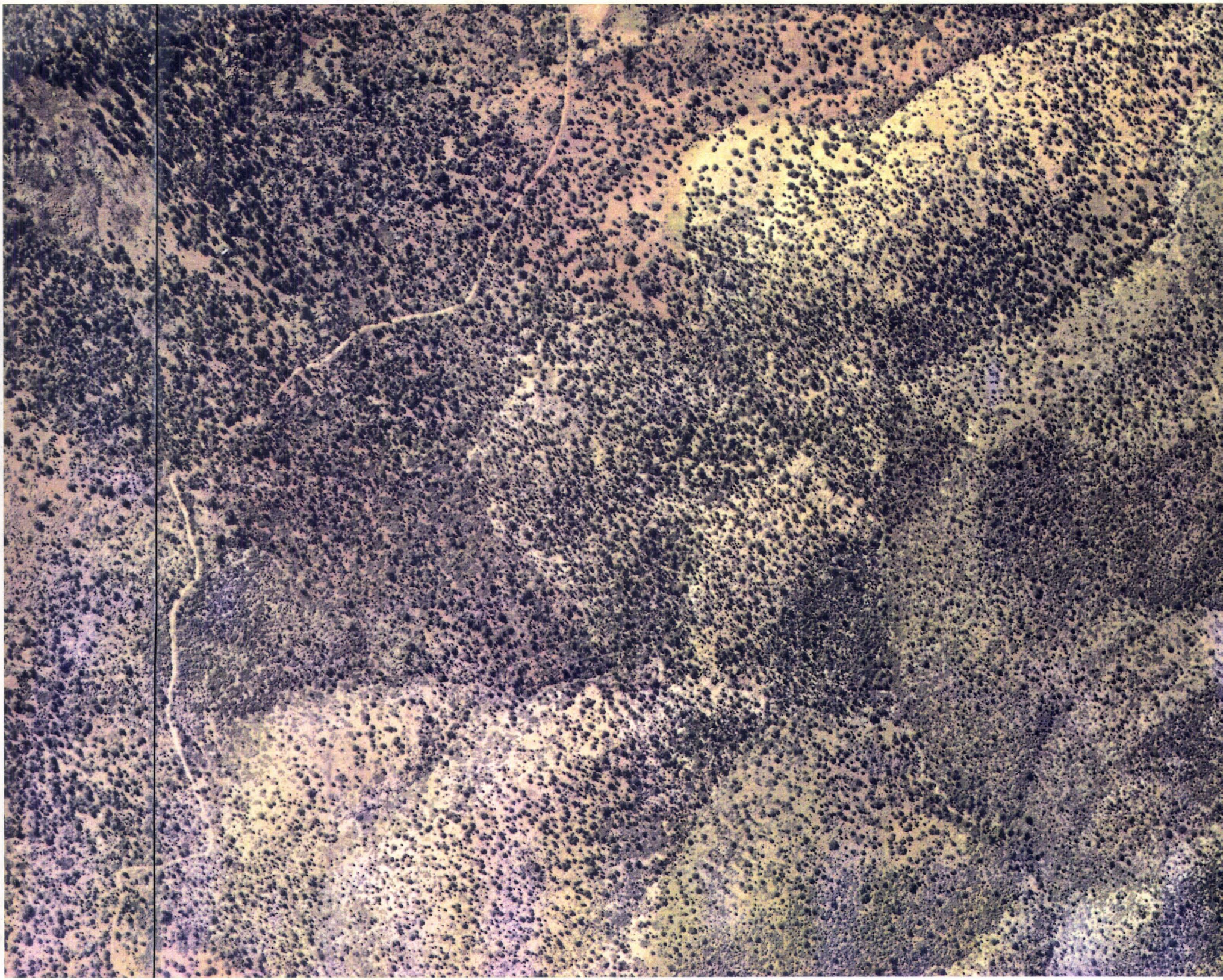
Property KEYSTONE Sec. 6 T 8N R 12E State Az. Drill Hole No KEY 1 Sheet 8

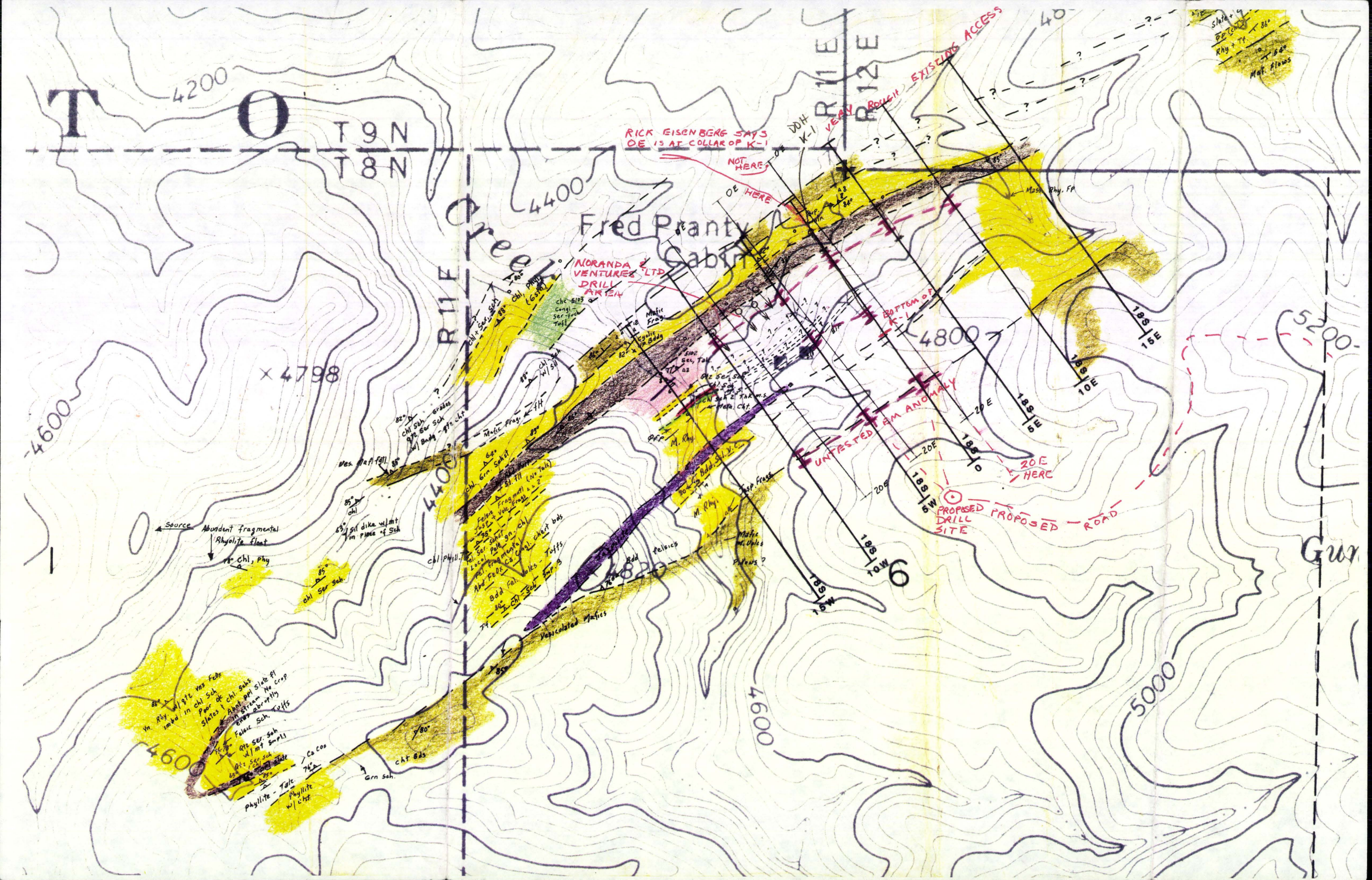
Scale 1" = 6' Coord. N _____ E _____ Bearing _____ Dip _____ Collar Elev. _____ Grid _____

Logged by: C.P.W.

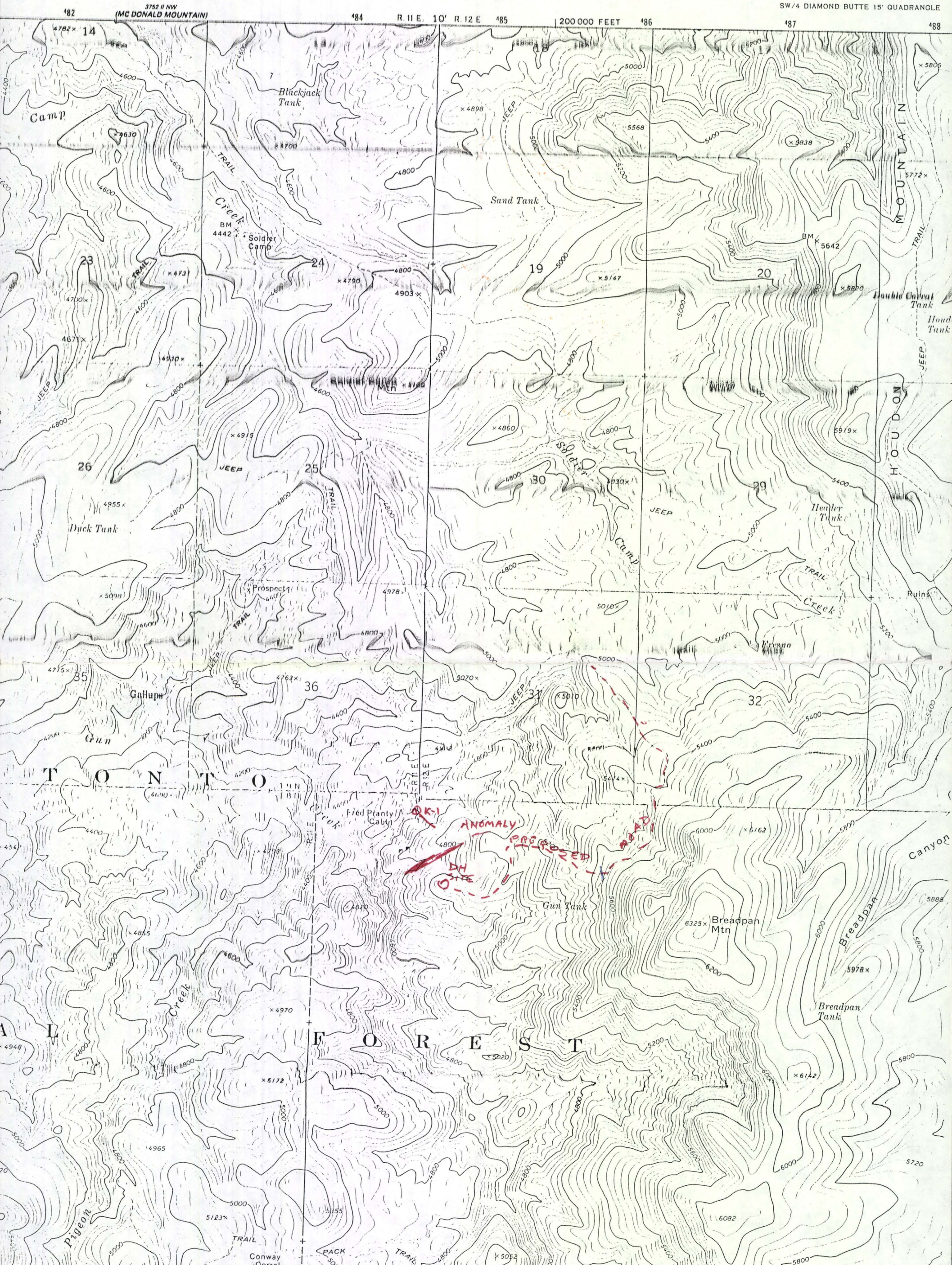
ROCK TYPE & STRUCTURES	Mineralization and Alteration	Hole Depth		%Rec	Intrvl	Rec ftg.	Nmbr.	SAMPLE				ASSAY		
(~701 - ~707) Finely bedded f.g. massive textured, non-mag., weakly siliceous interm. to mafic tuffs. Purplish-gray to green. V.F.G. to lapilli tuffs. Weak schistosity 4-5% chl. & $CaCO_3$ veining. (707-) Massive, f-m.g. grn. vesicular mafic flow basalts. Weak foliation.	Strong Chl. w/lesser $CaCO_3$ than host basalts minor qtz + ser (<2%/vol.) purple color from dissem hem. Chl - $CaCO_3$ (+ minor hem)	710		99%										
5-10% vesicles (1-5mm) Consistant dark grn to purple-gray color 3-4 veins (1-3mm)/foot ($CaCO_3$ + Chl.) sub-// folia. Speckled green character from Chl vesicles/xtal replacement.	Chl - $CaCO_3$ vesicles + veins (+ hem) very minor qtz + ser	720		99%										
(727-734) Intermed to siliceous bedded lithic tuff. (1mm-8mm lithic frags) Dk greens to purple-gray in color	qtz + chl + minor ser. w/very minor $CaCO_3$ + hem	730		99%										
(Distal felsite frags, includ. 3mm sub-rounded frags of hem. cherts ≤ <.1%/vol) Poorly developed schistosity, strong alignment of lithic material (bandening). Mafic tuff/lithic tuff w/no cherty chips. Strongly Chloritic w/5-7% qtz - $CaCO_3$ - chl. veins.	in veinlets. 3 2-3mm red cherty clasts Chl + qtz + $CaCO_3$ + hematite and minor epidote (ser.?)	740		99%										
No vesicles from 727 ↓ (744.6-757 TD) Chl - SiO_2 (Dacite) tuff f.g., intermed (silicified?) volc. tuff w/minor qtz - chl. - epidote veins w/abt $CaCO_3$ weak to mod. schistosity	qtz + chl + epidote + $CaCO_3$ Abt hematite on fractures Unmineralized qtz veins. Blk chlorite (?)/spec. hem.	750		99%										
	Last 10' should probably be assayed!	760												
		770												
		780												
		790												
		800												

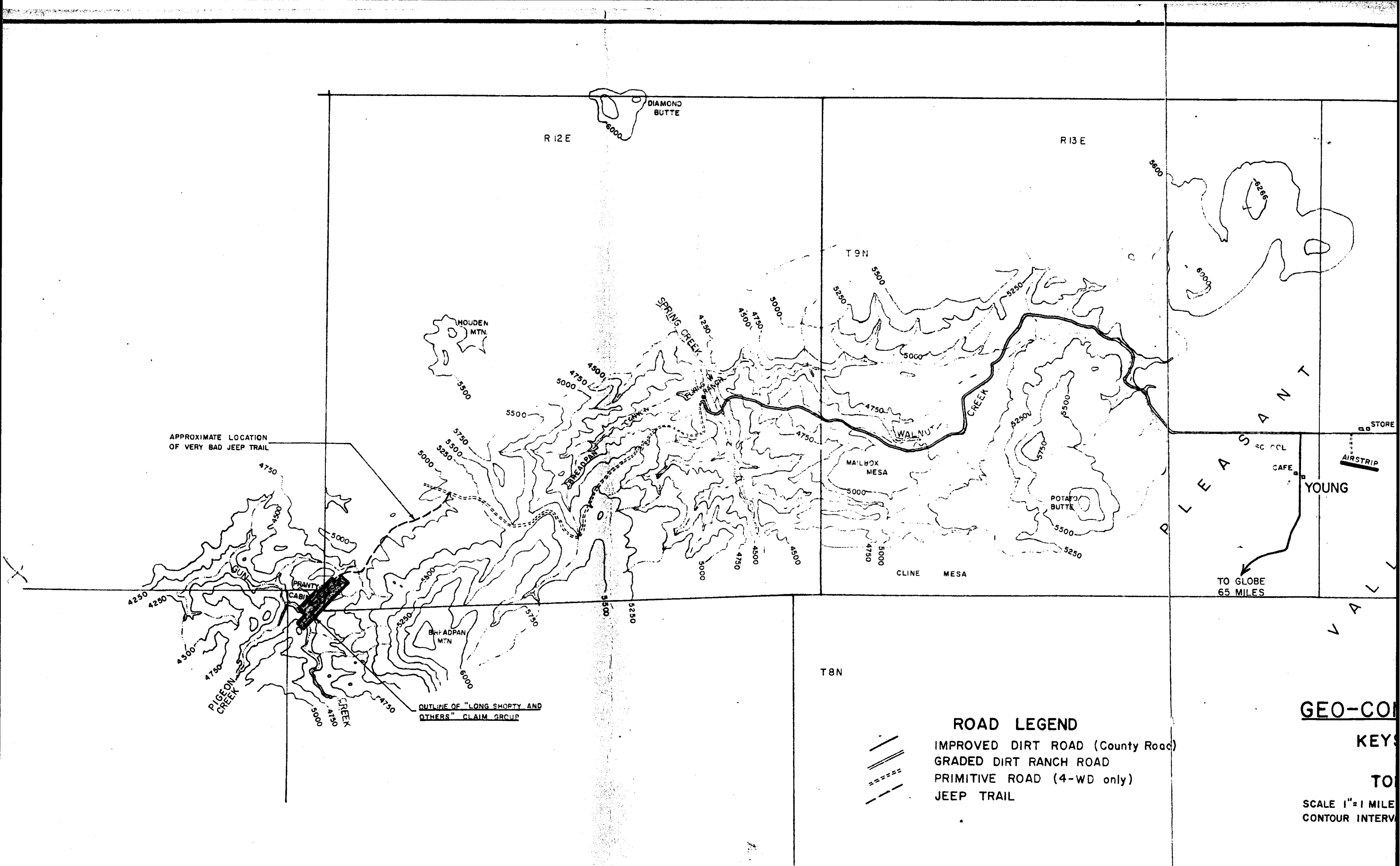

DDH K-1
FRANTY CABIN
FELSIC
MAFIC
UNTESTED ANOMALY
FELSIC
JASPER
MAFIC
PROPOSED DRILL SITE




T O
T9N
T8N
R11E
R12E
4200
4400
4600
4800
5000
5200
Fred Pranty Cabin
Creek
RICK EISENBERG SAYS OE IS AT COLLAR OF K-1
NOT HERE
OE HERE
DDH K-1
VERY ROUGH EXISTING ACCESS
NORANDA & VENTURES LTD DRILL AREA
BOTTOM OF K-1
UNTESTED EM ANOMALY
20E HERE
PROPOSED DRILL SITE
PROPOSED ROAD
Mass. Rhy. FP
Mafic Frag.
Source
Abundant fragmental Rhyolite float
Vesicolated Flatiers
Grn Sch.
Chl, Phy
Chl Ser Sch.
Chl Phyll.
Felsics
Mafic Unlike Flows ?
Phyllite - Talc
Phyllite w/ chat
Felsic Sch.
Qtz Ser. Sch w/ mt Smpl
Ca Cos
Chl Grn. Schist
Felsic Tuffs
Fragmental & Volc. Frags
Local Felsic gn. chl
Ref. fragmental
Abd Felsic Ca Carb. chert bds
Bdd Felsic lakes - Tuffs
Chl Sch Smp 3
Chl + Ser. Sch
Chl Phyll
Chl Sch
Chl Sch w/ Bndy - qtz. cht
Chl Sch Grades
Qtz. Ser Sch
Chl Sch w/ Talc
Chl Sch 2 Talc m.s.
Felsic Frags
Chl Grn. Schist
Sil. fill (No Talc)
Sil dike w/ mt in piece of Sch
Chl Sch w/ Bndy
Chl Sch w/ Talc
Chl Phyll
Chl Ser. Sch
Chl Sch Grades
Chl Sch w/ Bndy - qtz. cht
Chl Sch w/ Talc
Chl Sch w/ Talc
Chl Sch w/ Talc

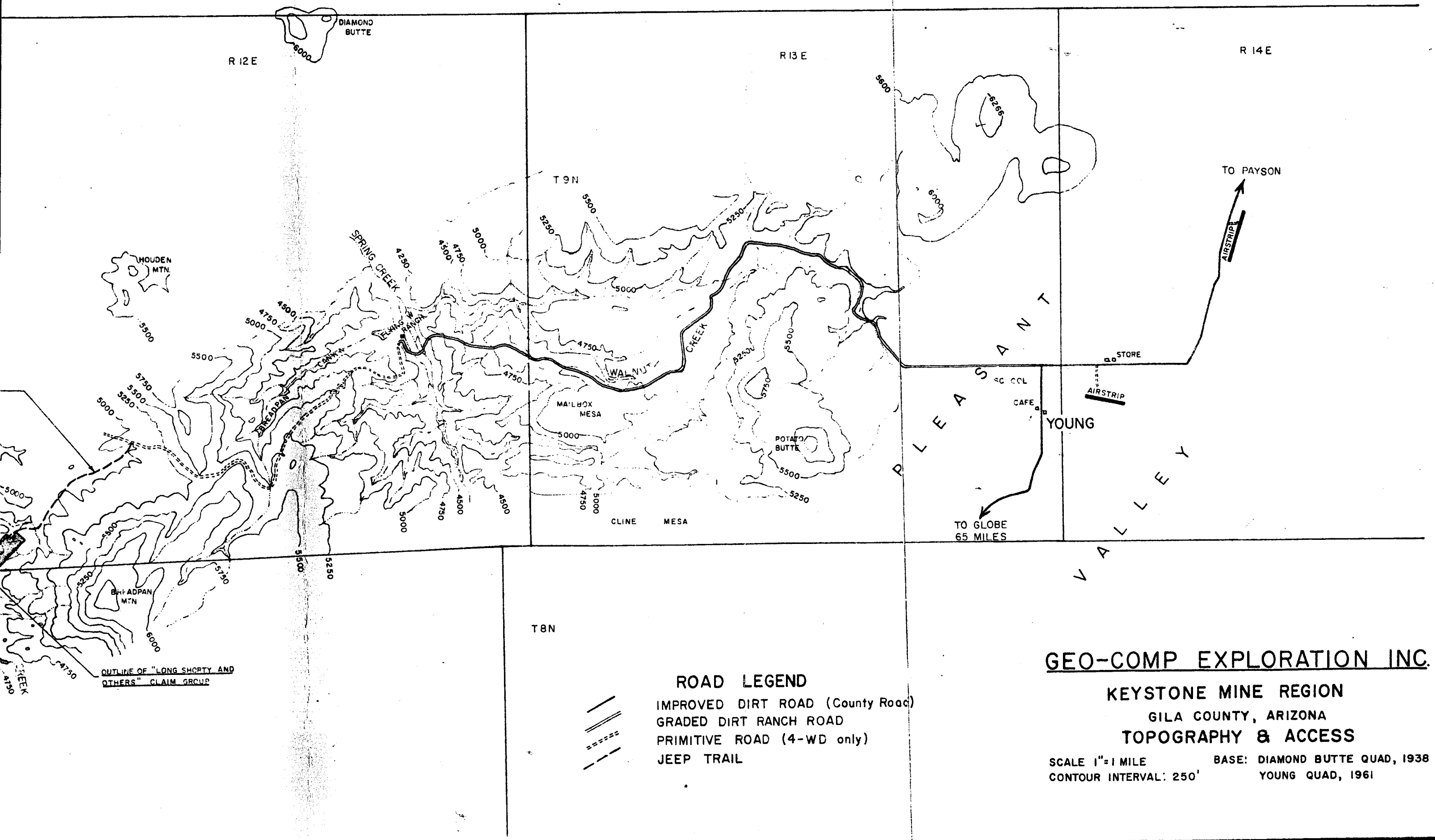
SHEEP BASIN MTN. QUADRA
ARIZONA—GILA CO.
7.5 MINUTE SERIES (TOPOGRAP
SW/4 DIAMOND BUTTE 15' QUADRANGLE





DIAMOND BUTTE
R 12 E
R 13 E
T 9 N
T 8 N
HOUDEN MTN.
SPRING CREEK
FLYING W RANCH
CANYON
BREADPAN
WALNUT CREEK
MAILBOX MESA
POTATO BUTTE
CLINE MESA
APPROXIMATE LOCATION OF VERY BAD JEEP TRAIL
GUN
PRANTY CABIN
BREADPAN MTN
PIGEON CREEK
CREEK
OUTLINE OF "LONG SHORTY AND OTHERS" CLAIM GROUP
STORE
SCHOOL
CAFE
AIRSTRIP
YOUNG
TO GLOBE 65 MILES
PLEASANT VALL
ROAD LEGEND
IMPROVED DIRT ROAD (County Road)
GRADED DIRT RANCH ROAD
PRIMITIVE ROAD (4-WD only)
JEEP TRAIL
GEO-CO
KEY
TO
SCALE 1"=1 MILE
CONTOUR INTERV

ATTACHMENT B-1



ROAD LEGEND

IMPROVED DIRT ROAD (County Road)
GRADED DIRT RANCH ROAD
PRIMITIVE ROAD (4-WD only)
JEEP TRAIL

GEO-COMP EXPLORATION INC.

KEYSTONE MINE REGION

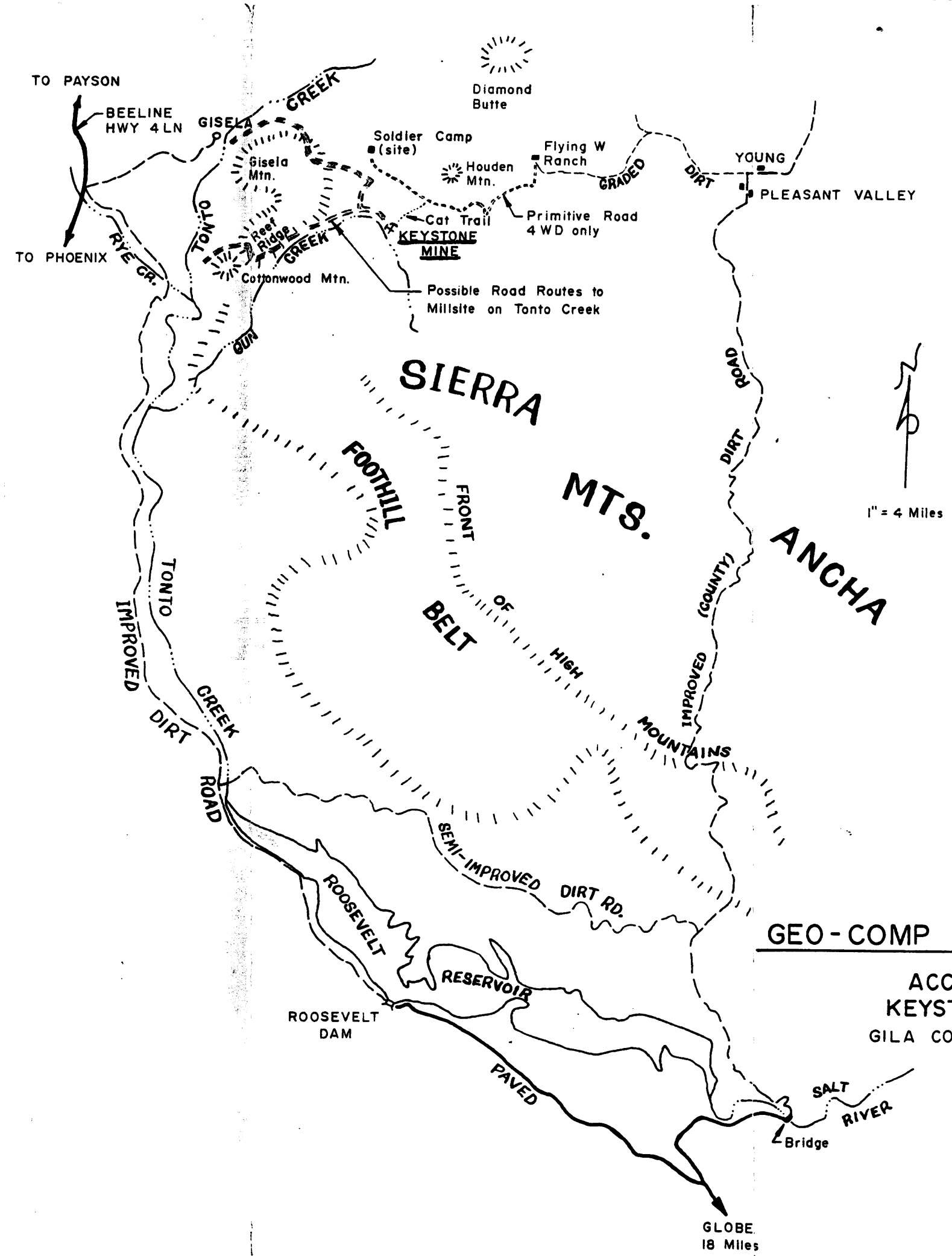
GILA COUNTY, ARIZONA

TOPOGRAPHY & ACCESS

SCALE 1"=1 MILE
CONTOUR INTERVAL: 250'

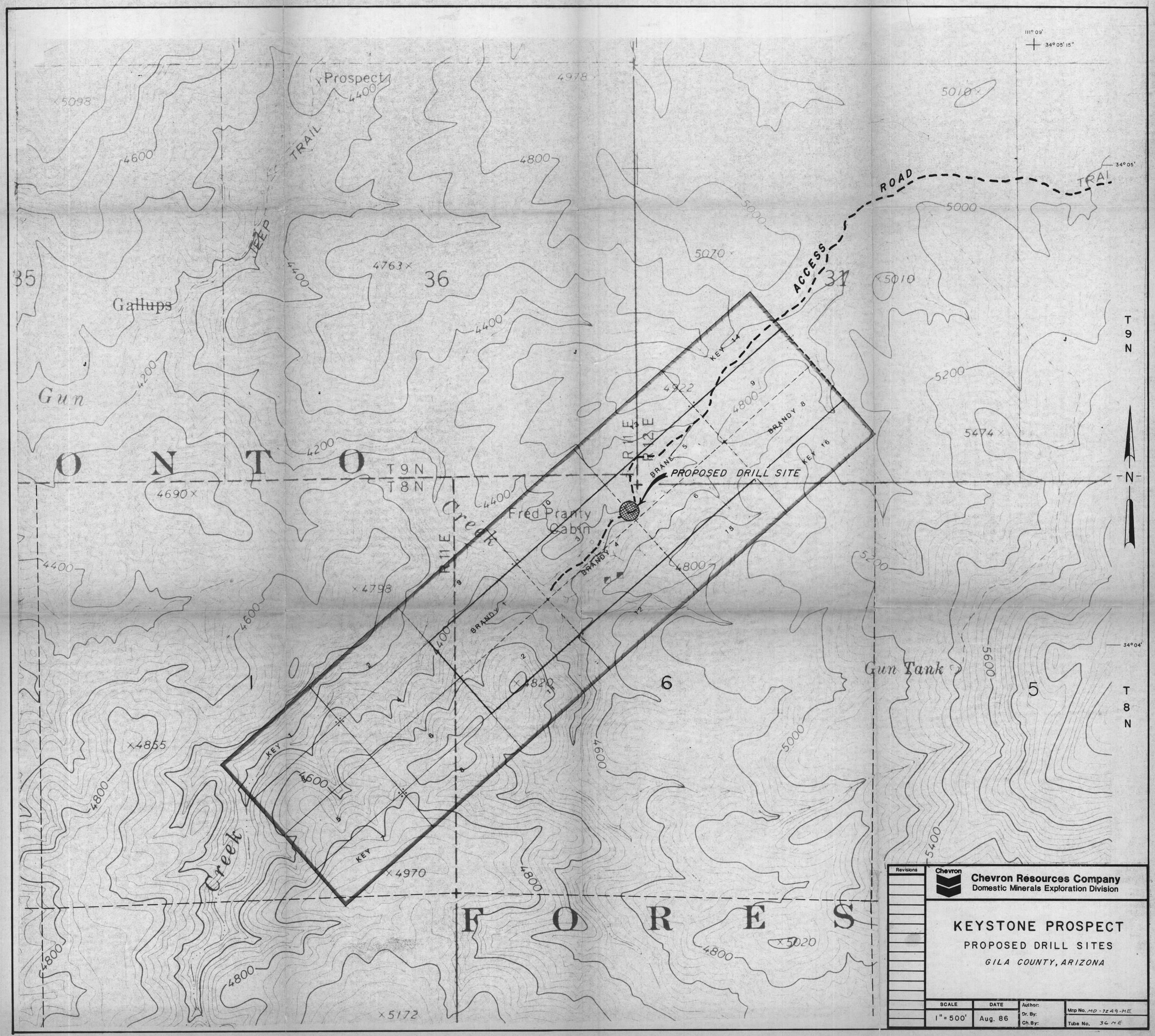
BASE: DIAMOND BUTTE QUAD, 1938
YOUNG QUAD, 1961

ATTACHMENT B



GEO-COMP EXPLORATION INC.

ACCESS MAP
KEYSTONE MINE
GILA COUNTY, ARIZONA



Revisions

Chevron

Chevron Resources Company
Domestic Minerals Exploration Division

KEYSTONE PROSPECT

PROPOSED DRILL SITES

GILA COUNTY, ARIZONA

SCALE	DATE	Author:	Map No. MD-7249-ME
1" = 500'	Aug. 86	Dr. By:	
		Ch. By:	Tube No. 36 ME