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ASARCO

EXPLORATION DEPARTMENT

JAMES D. SELL

June 20, 1994

Mr. Oliver B. Kilroy
Broadway Terrace, Suite 110
4625 East Broadway
Tucson, AZ 85711

Dear Mr. Kilroy:

After due consideration of your CWT property in Pima County and the NK property near Salome in La Paz County, Arizona, Asarco does not with to pursue any further interest in these properties.

As I explained to you when you were here, the targets presented are outside Asarco's interest at this time and your data confirmed such.

I do thank you for your time, your insight, and your explanation of the properties and the loan of the data for a more complete understanding and evaluation.

Sincerely,

James D. Sell

James D. Sell

JDS:brw

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T-44

P. O. Box 872
Douglas, AZ 85607
January 28, 1979

Oliver B. Kilroy
Investments
Suite 110 - 4625 East Broadway
Broadway Terrace
Tucson, AZ 85711

Dear Oliver:

I've reviewed those data pertinent to your questions, both in your letter and the ones you asked me to consider when you called. First, relative to your call:

1.) The leaching of plagioclase at 3094 is relatively high temperature - low pressure but we are probably talking of temperatures in the neighborhood of 200°C. The leaching is a precursor of sulfide deposition.
2.) "Is earthy hematite with calcite high T - low P?" Most I have seen is due to movement on fractures; the oxidized rock-forming magnetite is smeared to a visible stain. Its color may seem enhanced if late (low T - low P) calcite heals the fracture.
3.) You ask if I didn't see "iron" in the area of 1132-1160. You must mean 1160. Note in the description that large fractures were packed with granular pyrite, smaller ones with granular pyrite, smaller ones with iron-stained dolomite.

Now, for the questions in your letter:

1.) No, the quartz and sericite contents vary irregularly and even when fluorite is seen, it is clear that its presence is not related to growth or introduction of either quartz or sericite. Your deep fluorine anomaly is probably related directly to introduction of fluorite, probably Mo and W as well.
2.) I agree with you. Open structures younger than the mesozonal deformation are clearly what has permitted introduction of Cu, Mo, S, and F. While the thrust faulting can

explain values at ca. 800', I find it difficult to explain the deep anamaly in this way.

1a.) I reexaminaed 3094 in detail as you asked. You ask about "iron" but don't specify the mineral. On the fracture surface are thin crusts of chalcopyrite, and one of these is partly ringed with hematite which must be interpreted as a primary mineral. Also, along the vein oblique to the fracture, some magnetite occurs with bornite and again is a primary mineral. Finally, traces of original magnetite in the rock are usually altered to hematite but they do remain fresh near sulfides. In this sample there appears to be some sulfur deficiency, and I interpret the magnetite/hematite as proxies for pyrite which, of course, is absent here. Also, the answer is yes, some magnetite occurs in pegmatite dikes as a primary mineral. I don't know what you mean about chalcocite. I saw none here. As for barium, you will note that I saw barite at 2651. I believe that alteration in crushed zones may have released Ba from K-feldspars and your spectrographic analyses may see barium replacing potassium in feldspars where barite was not seen.

1b.) The hematite derives from jarosite here, merely by further oxidation.

1c.) The iron here is pulverized and oxidized magmetite, smeared out on fractures. Its visibility is due to mechanical powdering for the most part.

1d.) Note in the description of 1132 that "biotite books lie on grain boundaries with magnetite". The rock has fractured and slickensided these surfaces and the relatively high (2%) magnetite content reappears as highly visible red powdery hematite. This could easily explain what you saw.

2.) I am sure that the leaching seen in 3094 is of hydrothermal origin. Its character is quite unlike the deuteric and late magmatic effects reported elsewhere.

3.) There are indications of the metal zoning you ask about. Also, uranium occurs in minor amounts in Cu porphyries and seems related to F - migration. All evidence points to weak porphyry copper alteration, not to molybdenum porphyry.

4.) As I said earlier, the F introduction is not related to quartz/sericite. The original rock names given in the descriptions are younger minerals, and the changes they are associated with were ignored when giving the rock its 'original' name, i.e. what it was when perfectly fresh.

Best regards,

Sidney A. Williams

SAW:bj

T-44

P. O. Box 872
Douglas, AZ 85607
January 21, 1979

Oliver B. Kilroy
Investments
4625 East Broadway - Suite 110
Broadway Terrace
Tucson, AZ 85711

Dear Oliver:

Enclosed please find descriptions of 42 thin sections from CWT - 44 and a few other locations. I cut these sections so as to gain the most information, and in each description (where applicable) I have responded to what you may have circled on the samples.

You raised a few other questions that I shall refer to here:

1.) In the piece of ore from Continental Materials hematite occurs in the tactite with chalcopyrite. The metallization seems metamorphic; that at 3094 hydrothermal.

2.) The vein matter M.D. #1 is quartz with much pyrite, traces of tetrahedrite and sphalerite. A bit of sericite lies along the vein walls.

I have reviewed my older reports to you, and the work done on CWT - 44 last fall. I find my old letter of December 12, 1o73 still applicable here. The intrusive in CWT - 44 shows the old deformation with mesozonal healing, then the younger crushing with associated epizonal alteration (carbonates, sericite, clays, and occasional sulfides).

I think it odd that the older deformation was never seen below 1194'. The younger deformation is clearly evident from 651 to 1394; below there are only sporadic occurrences of crushing or brecciation.

You will note that rock names vary. Bassically there appears to be one intrusive event but the plution is of variable composition (granodiorite to quartz monzonite). I suspect the granites are dikes or segregations that are of approximately the same age.

As always, please feel free to call or write if you have questions about this study.

Best regards,

Sidney A. Williams

SAW:bj

encls:

CWT - 12 1116

The original rock was a quartz monzonite. Finely twinned plagioclase laths of crudely rectangular outline lie in a coarse matrix of nonperthitic microcline and quartz. Textural detail has been obliterated by strong crushing.

The rock is so severely broken along and through grains that few survive and they are badly deformed and strained. Quartz and plagioclase form an angular rubble where broken whereas microcline tends to recrystallize as orthoclase. Biotite and magnetite, which probably occurred on grain boundaries originally, are drawn out into crush zones. Biotite occurs as small crumpled flakes, magnetite is now a hematite dust staining the debris. Alteration along crushed areas is mainly that of feldspars to microcrystalline hydromicas while calcite fills open fractures.

CWT - 39 1201.5

The original rock was a granite hosting large squarish subhedra of plagioclase. These are widely scattered in a matrix of slightly perthitic microcline and clusters of coarse, granular quartz. Textural detail has been destroyed by severe crushing.

Although islands of strained or crackled grains survive, most of the fabric is reduced to angular rubble. Sinuous foliae of contorted biotite scales, now partly penninized, wind through the fabric but in some cases biotite also seems to have formed in adjacent plagioclase grains. Alteration of plagioclase is to fine sericite and less calcite while sericite attacks microcline only along microfractures. Healing of the quartz-feldspar rubble by recrystallization has been negligible. The fabric is riddled with late veinlets of calcite.

CWT Sur#1

The rock is a hornfels derived from a fine clastic sediment by mesozonal metamorphism. Little of original texture survives.

Much of the rock consists of microgranular fresh, clear orthoclase. These patches alternate with others in which enlarged quartz grains predominate and orthoclase beads survive only as inclusions or beads trapped on quartz grain boundaries. In the quartz-rich areas there are clusters of large poikiloblastic muscovite books. In these areas also there are occasional rounded grains of pyrite, now oxidized to jarosite. Veinlets of quartz and dark green tourmaline cut the fabric cleanly (probably on joint surfaces).

Mineral percentages are estimated as: quartz 43%, orthoclase 37%, muscovite 14%, jarosite 3%, tourmaline 0.5%, hematite 1%, leucoxene 1%.

CWT - 44 983

The rock is a mylonite derived from a coarse grained quartz monzonite. No trace of original texture has survived.

The rock carries angular remnants of microcline and quartz, fairly large and strained remnants, in a matrix of pulverized quartz and feldspars that shows a faint streakiness or foliation. Small biotite flakes are newly formed in the debris and they exhibit mimetic foliation. Orthoclase of fine grain size forms the matrix; it has recrystallized from microcline rubble. Plagioclase has been mechanically and chemically destroyed for the most part; that which survives is fresh.

The fabric is laced with a network of thin, irregular calcite veinlets that may carry pyrite.

The large area circled is a relatively uncrushed portion of the original rock.

CWT - 44 1094

The rock is a granodiorite with large, crudely zoned anhedra of plagioclase set in equally coarse microcline and quartz. Grains interlock in a jigsaw-puzzle texture. Microcline may host corroded remnants of plagioclase and is then highly perthitic. The rock has been mesozonally altered and weakly deformed.

Intergranular dislocation throughout the fabric has resulted in healing of grain boundaries by fine pebbly material, usually orthoclase. Small, newly formed biotite flakes tend to occur in these areas and are derived directly from primary biotite. Late hairline fractures carry calcite.

Fracture surfaces may be filmed with sericitic foliae (area circled).

Minerals are present in the following estimated amounts: quartz 14%, microcline 21%, plagioclase 55%, biotite 3%, magnetite 1%, sericite 3%, pennine 1%, calcite 1%, apatite tr..

CWT - 44 1132

The rock is a quartz monzonite with large, squarish, finely twinned plagioclase crystals set in equally coarse microcline and granular quartz. The quartz tends to segregate into pods. Biotite books lie on grain boundaries with magnetite. The rock is moderately deformed and has been mesozonally altered.

The fabric is riddled with crush zones that tend to be healed by fresh, clear, and fine granular orthoclase. Original grains between these zones are slightly strained, and plagioclase is lightly dusted with sericite. Biotite was originally drawn into crush zones. It reappears as clusters of small crystals. Late calcite veinlets riddle the fabric and may contain traces of pyrite.

Volume percentages of minerals are estimated as: quartz 28%, microcline 24%, plagioclase 35%, biotite 6%, pennine 0.5%, sericite 2%, calcite 2%, magnetite 2%, pyrite tr., apatite tr..

CWT - 44 1160

The original rock was a granite, almost a pegmatite, with a few squarish, finely twinned plagioclase crystals. These are isolated in a very coarse matrix of quartz and microcline. Grains are irregular with ragged borders. The microcline is perthitic and has partly digested the plagioclase. The rock has been severely crushed.

Breccia zones riddle the fabric and carry angular quartz or plagioclase rubble, but where they cut microcline, slightly oredered orthoclase has recrystallized from the debris. Even where unbroken, grains are severely strained and deformed. Minor fractures are filled with iron-stained dolomite but major ones are packed with massive granular (to cubic) pyrite. Where the pyrite adjoins the matrix feldspars may be embayed by cryptocrystalline montmorillonite.

CWT - 44 1194

The rock is a quartz monzonite carrying crudely rounded subhedral laths of finely twinned plagioclase in an equally coarse, granular matrix of quartz and microcline. When larger microcline crystals occur they tend to be perthitic and may host corroded remnants of plagioclase. Biotite books lie on grain boundaries with accessories. The rock has been deformed and mesozonally altered.

Crushing has occurred in an anastamosing network of seams that wind through the fabric on grain boundaries (well shown in the large circled area). The crushing is merely healed by recrystallization of local quartz/feldspar. The new K-spar is poorly oredered orthoclase. Biotite has broken down to reappear as fine, scaly biotite which is intergrown with siderite. Magnetite alters to hematite usually but may be replaced by pyrite. The fabric is riddled with hairline veinlets of siderite (and dolomite).

Original mineral percentages are estimated as: quartz 12%, microcline 49%, plagioclase 31%, biotite 5%, magnetite 2%, sphene 0.5%, apatite 0.5%, zircon tr..

CWT - 44 1294

The rock is a quartz monzonite. Plagioclase crystals are finely twinned anhedra of equant habit. Interstices are filled with equally large, irregular grains of microcline and quartz. Most microcline is flecked with perthite and may embay nearby plagioclase. Thick biotite books tend to cluster on grain boundaries. The rock has been mildly deformed and epizonally altered.

Plagioclase is lightly dusted with sericite. However, along fractures it is replaced by calcite and kaolin; a similar alteration afflicts microcline. Biotite is replaced by smectite that is dusted with leucoxene. Hematite derived from magnetite films slickensided surfaces.

Original percentages were approximately as follows: quartz 13%, microcline 32%, plagioclase 49%, biotite 5%, magnetite 1%, apatite tr..

CWT - 44 1394

The original rock was a granite carrying large, finely twinned squarish subhedra of plagioclase. These are clustered in an equally coarse matrix of graphically intergrown quartz and microcline. Thin biotite books and magnetite grains lie on grain boundaries. The rock has been weakly altered and moderately deformed.

The fabric is dislocated along a complex network of fractures. Feldspars and quartz near these are especially contorted or deformed. However, alteration of plagioclase to sericite is only incipient. Biotite is smeared out along fractures and replaced by smectite. The fabric is also riddled with calcite veins.

CWT - 44 1394 (con't.)

The large circled area is relatively rich in quartz.

The estimated mineral percentages are: quartz 38%, microcline 17%, plagioclase 30%, calcite 10%, sericite 2%, magnetite 2%, smectite 0.5%, apatite tr., zircon tr., leucoxene tr..

CWT - 44 1498

The rock is a quartz monzonite of almost granular texture. The finely twinned plagioclase grains barely show a tendency to be rectangular. Perthitic microcline and quartz fill the interstices. Biotite books cluster on grain boundaries with accessory magnetite and apatite. Alteration of the rock in the upper epizone has been modest.

Plagioclase hosts scattered and large flakes of sericite (muscovite) but is otherwise fresh and clear. Biotite is wholly replaced by streaky smectite and calcite (or dolomite). Calcite also occurs in thin fractures and in cavities but these seem unrelated to any other alteration excepting local replacement of microcline by calcite and hydromicas.

Circled areas are those in chich muscovite development is more pronounced.

Original mineral percentages were approximately as follows: quartz 26%, microcline 27%, plagioclase 39%, biotite 7%, magnetite 0.5%, apatite 0.5%.

CWT - 44 1537

The rock is a graphic granite. It is composed of extremely coarse microcline and quartz that interpenetrate in optical continuity. The microcline hosts thick, ragged stringers of plagioclase. There are also patches of granular quartz and microcline with lath-like sodic plagioclase crystals. Epizonal alteration has been weak.

Plagioclase crystals may be flecked with sericite and minor calcite. Calcite occurs in a crisscrossing network of fractures, occasionally spreading out along these as small crystalloblasts that replace the microcline. Traces of former biotite are replaced by sericite and accessory anatase. Traces of accessory magnetite are oxidized to hematite.

An estimate of the rock mode is: microcline 48%, quartz 42%, plagioclase 6%, calcite 3%, sericite 1%, anatase tr., hematite 0.5%.

CWT - 44 1571

The rock is a granite pegmatite carrying only a few crudely rectangular anhedra of plagioclase. Most of the rock consists of very coarse but irregular grains of quartz and microcline. The latter mineral is ribbon perthite and contains occasional corroded plagioclase laths. Traces of sphene and magnetite were noted on grain boundaries.

Although the rock is weakly brecciated it remains almost perfectly fresh. Plagioclase is only lightly disted with sericite. The breccia zones contain tiny angular chips of quartz and feldspar that show little healing. The breccias are occasionally cemented with calcite, however.

Original mineral percentages are estimated as: quartz 39%, microcline 56%, plagioclase 5%, magnetite tr., sphene tr..

CWT - 44 1594

The rock is a quartz monzonite with a typically granitic texture. Crudely lath-like plagioclase grains of barely subhedral habit lie in an equally coarse matrix of perthitic microcline and quartz. Thick biotite books lie at random on grain boundaries. Epizonal alteration has been mild.

Breccia zones cutting the fabric are filled with peculiar bladed albite laths or fine scaly kaolin. The rock on one side of this structure is more severely altered. Here plagioclase cores are leached and partially replaced by kaolin and calcite. On both sides, however, biotite is bleached and streaked with smectite and calcite. Calcite veinlets also riddle the fabric, cutting all other features.

Original mineral percentages are estimated as: quartz 18%, microcline 31%, plagioclase 43%, biotite 6%, magnetite 1%, sphene 0.5%, apatite 0.5%.

CWT - 44 1633

The rock is a quartz monzonite of variable texture. Some portions show coarse granitic texture with large plagioclase subhedra set in equally coarse, granular quartz and slightly perthitic microcline. Other portions of the rock are aplitic in texture and may crosscut the coarser unit. Biotite books occur sparingly in the granitic unit, loosely clustered with magnetite. Epizonal alteration of the rock has been weak.

Plagioclase is usually lightly dusted with tiny flecks of sericite and calcite grains. Calcite also occurs in veinlets and in pseudomorphs after biotite, in both cases with smectite.

Estimated original mineral percentages are: quartz 27%, microcline 40%, plagioclase 29%, biotite 3%, magnetite 1%, apatite tr..

CWT - 44 1694

The original rock was a coarse grained granodiorite featuring large, squarish and finely twinned plagioclase anhedra. Relatively small amounts of equally coarse quartz and perthitic microcline comprise the matrix. Textural detail has been destroyed by strong deformation.

The fabric is riddled with crush zones that are loosely filled with angular quartz-feldspar debris. The degree of healing by recrystallization or of alteration in these areas is virtually nil. Traces of former biotite, however, seem to have altered to smectite and calcite. The fabric is riddled with calcite veinlets that loosely cement the breccia.

CWT - 44 1794

The rock is a quartz monzonite featuring large blocky and complexly twinned plagioclase subhedra. These tend to form large tightly packed clusters scattered in a matrix of quartz and microcline. Microcline is slightly perthitic but large crystals that envelop plagioclase do not seem to embay it. Biotite books lie on grain boundaries.

The rock is cut by innumerable thin seams of calcite. Since these often lie on grain boundaries, cutting biotite, the biotite is invariably replaced by calcite and smectite. Where the seams cut plagioclase it is stippled with coarse sericite (muscovite) books but is elsewhere only lightly dusted with sericite and calcite.

Original mineral percentages are estimated as: quartz 22%, microcline 27%, plagioclase 44%, biotite 5%, magnetite 1%, apatite 0.5%, sphene tr., zircon tr..

CWT - 44 1893

The rock is a granodiorite, a leucocratic rock. It consists mainly of plagioclase and quartz. The plagioclase grains occur as corroded irregular islands that float in large, optically continuous quartz grains giving a graphic texture. Where microcline occurs it also is intergrown with quartz, or it may show replacement textures in plagioclase. Epizonal alteration has been weak.

Plagioclase hosts very rare flecks of sericite. Calcite and minor kaolin occur in hairline fractures that cut the fabric cleanly. Traces of pennine in these may derive from biotite.

The estimated mineral percentages are: quartz 34%, microcline 24%, plagioclase 39%, calcite 1%, magnetite 1%, leucoxene tr., sericite tr., pennine tr., kaolin tr..

CWT - 44 1988

The original rock was a granodiorite with clusters of coarse, rectangular plagioclase grains set in an equally coarse matrix of quartz and minor microcline. Biotite books lie on grain boundaries with accessory minerals. The rock has been deformed and moderately altered in the epizone.

The rock is cut by zones of severe crushing. These are filled with fine, angular quartz-feldspar rubble cemented by mimetically foliated sericite. In intervening areas where deformation was less severe plagioclase is strained and shows broad degenerate twinning. Much of it has been replaced by sericite and calcite. Calcite also fills late (post-deformation) fractures. Biotite is all replaced by muscovite and accessory leucoxene.

An estimate of original mineral percentages are as follows: quartz 25%, microcline 7%, plagioclase 62%, biotite 3%, magnetite 2%, sphene 0.5%, apatite tr..

CWT - 44 2094

The rock is a quartz monzonite. It carries rounded rectangular crystals of plagioclase in an equally coarse, almost aplitic matrix of microcline and quartz. Biotite books lie along crudely defined planes, giving the rock a layered appearance. Some bands may carry huge perthitic crystalloblasts of microcline. The rock has been mildly altered in the epizone.

Plagioclase cores tend to be flecked with sericite and calcite but in more extreme cases the core is replaced by montmorillonite. Biotite shows partial replacement along cleavages by smectite and ankerite.

Original minerals were present in the following estimated amounts: quartz 21%, microcline 46%, plagioclase 26%, biotite 4%, magnetite 2%, apatite 0.5%, sphene 0.5%, zircon tr..

CWT - 44 2192

The rock is a granodiorite of aplitic texture. Sodic plagioclase laths of stubby, lath-like habit are common and show broad twinning. These cluster in various ways in a granular matrix of quartz and microcline. Irregular pods of much coarser grain size are composed of quartz and highly perthitic microcline. Boundaries with aplitic areas are relatively sharp. Thick skeletal books of muscovite lie on grain boundaries throughout the fabric; somewhat smaller ones may be encased in plagioclase. The muscovite seems to be a late magmatic mineral derived from biotite and plagioclase. It is occasionally accompanied by calcite. Calcite also veins the fabric.

The estimated mineral percentages are: quartz 32%, microcline 19%, plagioclase 36%, muscovite 10%, calcite 2%, leucoxene 0.5%.

CWT - 44 2293

The rock is a granodiorite. It consists mainly of equant but anhedral grains of plagioclase that show fine twinning. Occasional interstitial areas carry granular quartz and somewhat poikilitic masses of slightly perthitic microcline. Thick biotite books occasionally lie on the grain boundaries; so, too, do a few clusters of magnetite. Epizonal alteration has been mild.

Plagioclase is stippled lightly but uniformly with shreds of sericite and small patches of calcite. Biotite is almost entirely altered to pennine and may be flanked with muscovite. A few probably late magmatic and skeletal muscovite crystals occur in both feldspars.

Original mineral percentages are estimated as: quartz 17%, microcline 13%, plagioclase 65%, biotite 4%, magnetite 1%, apatite tr..

CWT - 44 2394

The rock is a granodiorite with large equant plagioclase crystals that are finely twinned. Equally large, round quartz grains are present while poorly ordered microcline is finer grained and tends to lie along grain boundaries. Biotite flakes occur sparingly. The rock hosts a xenolith composed exclusively of fine granular (mildly sericitized) plagioclase. Epizonal alteration occurs mainly along hairline fractures.

These fractures carry calcite or are filled with fine scaly smectite where they lose identity. Biotite nearby is replaced by smectite and calcite while elsewhere it is only erratically penninized. Plagioclase generally shows little tendency to alter to sericite and calcite.

Estimated original mineral percentages are: quartz 23%, microcline 9%, plagioclase 63%, biotite 3%, magnetite 2%, apatite tr., sphene tr..

CWT - 44 2494

The rock is a granodiorite. All three major components - quartz, microcline, and plagioclase - occur as large equant but anhedral grains whose margins are indented by finer granular quartz and microcline. Microcline may also host larger, corroded remnants of plagioclase, and it is perthitic in the vicinity. Biotite flakes and clusters of magnetite/sphene lie in the matrix. Epizonal alteration has been mild.

Plagioclase is usually lightly flecked with sericite and calcite but some crystal cores have altered completely to a hydromica paste stippled with calcite. Biotite is usually streaked with pennine or sericite, ultimately calcite.

Original mineral percentages are estimated as: quartz 26%, microcline 25%, plagioclase 43%, biotite 3%, magnetite 2%, sphene 0.5%, apatite tr..

CWT - 44 2594

The rock is a quartz monzonite carrying large stubby laths of plagioclase. These are finely twinned and lie randomly in an equally coarse matrix of quartz and perthitic microcline. Some microclines have enlarged during late magmatic stages, now hosting plagioclase as inclusions. Biotite books lie on grain boundaries with accessories. Epizonal alteration has been mild.

Plagioclase cores are calcic zones carry sericite (or muscovite), less calcite, and minor epidote. Biotite books are mostly altered to pennine and may be mantled by muscovite.

Original mineral percentages were approximately as follows: quartz 9%, microcline 30%, plagioclase 55%, biotite 4%, magnetite 1%, sphene 0.5%, apatite 0.5%, allanite tr., zircon tr..

CWT - 44 2651

The original rock was probably a granodiorite. It clearly hosted clusters of large plagioclase subhedra but further textural detail has been obliterated by strong epizonal hydrothermal alteration.

Quartz has grown dramatically in some areas, ultimately to form very large prisms that may host sericite flecks inherited from former plagioclase. These large crystals are set in a "matrix" of smaller quartz prisms with interstitial calcite and sericite. The rock has a spotted appearance because remnants of albite cluster in some areas. These albites show attack by sericite, kaolin, and calcite. Biotite has altered to muscovite and accessory anatase.

An estimate of the rock mode is: quartz 46%, albite 18%, calcite 19%, sericite 14%, kaolin 2%, barite 0.5%, anatase tr., apatite tr..

CWT - 44 2694

The rock is a granite (nearly quartz monzonite) with a faintly porphyritic texture. Phenocrysts are usually square subhedra of plagioclase but a few large β quartz eyes were noted. The matrix is a granular quartz-microcline aggregate showing incipient graphic textures in places. Biotite books occur here in loose association with magnetite and other accessories. Mild epizonal hydrothermal alteration has occurred.

Plagioclase cores are most affected, showing decay to smectite with granular calcite and even rare grains of anhydrite. A few crystals also host muscovite books. Biotite is streaked with pennine and minor calcite.

Original mineral percentages are estimated as: quartz 25%, microcline 49%, plagioclase 22%, biotite 4%, magnetite 2%, sphene tr., apatite tr., zircon tr..

CWT - 44 2794

The rock is a quartz monzonite of equigranular texture. Plagioclase crystals show zoning and fine twinning. They tend to be squarish in a jigsaw-puzzle matrix of quartz and microcline. Myrmekitic overgrowths occur fairly frequently. Microcline is nearly non-perthitic and may occur as granular material on quartz-plagioclase boundaries. Thick biotite books tend to cluster on grain boundaries. Epizonal deuteric alteration has been weak.

Plagioclase cores or calcic zones are lightly dusted with sericite and calcite. Biotite is mostly fresh, showing little tendency to alter to sericite and microgranular calcite; pennine is still more uncommon.

Original mineral percentages were approximately as follows: quartz 30%, microcline 34%, plagioclase 31%, biotite 3%, magnetite 1%, apatite and sphene 0.5%.

CWT - 44 2831

The original rock was probably a quartz monzonite with clusters of stout, lath-like plagioclase subhedra set in equally coarse quartz and microcline. Some larger microcline crystalloblasts occurred. These are perthitic and enclose corroded plagioclase grains. Thick biotite books were fairly common here, tending to cluster on grain boundaries. Moderately strong upper epizonal alteration has occurred.

Plagioclase has been selectively replaced by coarse shreddy sericite. Only albitic rims survive. Coarser muscovite replaces all biotite in concert with dust-like leucoxene. The fabric is cut by broad veins of coarse, granular calcite.

Two areas are circled on a slickensided surface. One is a patch of shiny, foliated sericite; the otehr a patch of galena. Pyrite cubes (not seen in the slide) occur nearby.

Minerals are present in the following estimated amounts: quartz 18%, sericite 39%, calcite 7%, albite 5%, microcline 30%, leucoxene 0.5%, apatite 0.5%, hematite tr., zircon tr..

CWT - 44 2894.5

The rock is a quartz monzonite with clusters of crudely rectangular plagioclase subhedra set in an equally coarse matrix of quartz and slightly perthitic microcline. Biotite books lie on grain boundaries in the matrix with accessories such as magnetite. Epizonal alteration has been mild, probably wholly deuteric.

Plagioclase crystals, especially in their cores, are stippled with sericite, less calcite, and sometimes irregular patches of epidote. Biotite is interlayered with muscovite, pennine, and dotted with accessory leucoxene. Calcite fills hairline fractures, sometimes with traces of pyrite.

Original mineral percentages are estimated as follows: quartz 26%, microcline 31%, plagioclase 36%, biotite 4%, magnetite 2%, apatite 0.5%, sphene tr., zircon tr., allanite tr..

CWT - 44 2994.5

The rock is a quartz monzonite rich in loosely clustered, equant anhedra of plagioclase. Equally coarse quartz and perthitic microcline occur in the interstices but there are also a few very large microcline grains that host corroded remnants of plagioclase. Thick biotite books lie at random with accessory minerals (including a trace of chalcopyrite). Epizonal alteration has been mild.

Plagioclase is lightly and uniformly flecked with sericite, minor calcite, and montmorillonite. Biotite shows partial alteration to pennine, further to smectite and ankerite.

Original mineral percentages are estimated as: quartz 11%, microcline 29%, plagioclase 55%, biotite 3%, magnetite 1%, sphene 0.5%, apatite 0.5%.

CWT - 44 3094

The original rock was probably a granodiorite. Large, finely twinned and lath-like plagioclase crystals lie at random or cluster in an equally coarse matrix of quartz and microcline. Thick biotite books occasionally lie on grain boundaries. The rock has been moderately altered in the upper epizone.

Plagioclase is leached and porous, hosting clumps of coarse sericite or muscovite flakes and irregular blotches of calcite. These leached crystals may host a fine filigree of chalcopyrite with less molybdenite and bornite. These sulfides are also circled on a fracture surface. Biotite is replaced by muscovite and accessory rutile. Quartz has behaved passively.

The rock is cut by a crushed zone younger than the alteration described above. This is filled alternately with cherty quartz (and a few crumpled sericite flakes) and coarse, zoned rhombs of calcite.

CWT - 44 3198

The rock is a granodiorite of nearly aplitic texture. Equant plagioclase grains are somewhat rounded, finely twinned crystals that lie randomly in a granular matrix of quartz and microcline. Biotite books lie on grain boundaries with accessories such as magnetite and sphene. Epizonal alteration has been weak.

Plagioclase cores or calcic zones are altered mildly to sausserite and calcite. Those plagioclase grains hosting coarser sericite (muscivite) tend to be cloudy and show incipient albitization. Biotite is about half altered to pennine with accessory leucoxene. Some crystals are streaked with muscovite.

Estimated original mineral percentages are as follows: quartz 17%, microcline 22%, plagioclase 52%, biotite 8%, magnetite 0.5%, sphene 0.5%, allanite tr., apatite tr..

CWT - 44 3202

The rock is a quartz monzonite with equant, finely twinned anhedra of plagioclase set in an equally coarse matrix of quartz and microcline. The microcline is slightly perthitic and may show strong late magmatic growth, hosting corroded remnants of plagioclase. Biotite books lie randomly on grain boundaries with accessory minerals. Epizonal alteration has been weak and deuteric.

Plagioclase cores are clouded with sericite, epidote, and calcite. Coarser sericite (muscovite) occurs in some crystals or may lie in parallel with biotite. Most biotite is replaced by pennine with accessory leucoxene and calcite. Calcite also fills hairline veinlets throughout the fabric.

Original mineral percentages are estimated as: quartz 18%, microcline 29%, plagioclase 48%, biotite 4%, magnetite 0.5%, sphene 0.5%, apatite tr..

CWT - 44 3233

The rock is a quartz monzonite with finely twinned plagioclase subhedra set in a matrix of equally coarse quartz and perthitic microcline. Microcline also occurs as very large grains hosting corroded plagioclase remnants. Biotite books tend to cluster with accessories such as magnetite and apatite. Epizonal alteration has been mild.

Plagioclase cores especially are stippled with fine sericite and calcite or even coarser muscovite and traces of epidote. Although some biotite survives, most is replaced by pennine and accessory leucoxene.

The circled area is a patch of muscovite flakes.

Original mineral percentages are estimated as: quartz 24%, microcline 40%, plagioclase 30%, biotite 4%, magnetite 1%, apatite 0.5%, allanite 0.5%, zircon tr., sphene tr..

CWT - 44 3294

The original rock was a granodiorite carrying clusters of large, finely twinned, squarish plagioclase subhedra. Equally coarse to finer grained microcline and quartz occur in the interstices with thick books of muscovite. The rock has experienced moderate epizonal hydrothermal alteration and deformation.

The rock has been crackled, producing a network of anastamosing fractures that usually follow grain boundaries but may transect larger crystals. Feldspars are selectively sericitized along these fractures and microcline, in addition, carries calcite. Biotite is wholly replaced by sericite and accessory leucoxene while sphene alters to anatase and brookite.

Slickensided fracture surfaces carry calcite and smears of powdery pyrite. In the area circled, the pyrite is filmed with covellite.

Percentages of original minerals are estimated as: quartz 18%, microcline 14%, plagioclase 63%, biotite 4%, sphene 0.5%, magnetite 0.5%, apatite tr..

CWT - 44 3312

The rock is a granodiorite carrying large squarish and finely twinned subhedra of plagioclase. These are isolated or loosely clustered in a matrix of equally coarse quartz; finer granular microcline tends to lie along grain boundaries. Thick biotite books occur sparingly and seem to show an alignment. Epizonal alteration has been mild.

Plagioclase, especially crystal cores, alters to flecks of sericite and calcite. It may also host an occasional muscovite tablet. Weak zones of crackling carry calcite where they cut plagioclase, and the plagioclase is noticeably more albitic. Biotite shows partial decay to pennine, further to epidote, calcite and sericite.

The yellow patch circled is leucoxene (altered sphene).

Original mineral percentages were approximately as follows: quartz 30%, microcline 20%, plagioclase 45%, biotite 4%, magnetite 0.5%, apatite 0.5%, sphene tr., zircon tr..

CWT - 44 3350

The rock is a quartz monzonite. It consists of coarse, equant subhedra of plagioclase set in equally coarse but irregular grains of microcline and quartz. The microcline is very well ordered and rich in ribbon-like perthite stringers. There is little evidence of former biotite but coarse muscovite flakes lie on grain boundaries and may represent a late magmatic equivalent. Epizonal alteration has been modest.

The rock is riddled with fractures along which plagioclase is altered to sericite, microcline to sericite and calcite. Between fractures plagioclase is only lightly dusted with sericite flecks.

Mineral percentages are estimated as: quartz 22%, microcline 38%, plagioclase 26%, sericite/muscovite 10%, calcite 3%, leucoxene 1%, zircon tr., monazite tr..

CWT - 44 3372.5

The rock is a granodiorite with rectangular, crudely lath-like plagioclase crystals that are finely twinned. These are set in a matrix of equally coarse quartz and microcline. Further textural detail has been obscured by moderate epizonal alteration.

The rock is cleanly cut by breccia zones that originally carried loose, angular chips of qurtz and feldspars. In these, quartz has grown somewhat; feldspars are replaced by shreddy sericite and blotches of calcite. In the walls, quartz shows substantial growth while plagioclase is only uniformly dusted with sericite. Biotite appears to have altered to muscovite, accessory sphene to leucoxene. Later calcite veins cut the fabric cleanly.

Volume percentages of minerals are estimated as: quartz 28%, microcline 17%, plagioclase 31%, sericite 15%, calcite 8%, leucoxene 1%, zircon tr..

CWT - 44 3384

The original rock was doubtless a quartz monzonite or granodiorite. Little remains of its textures, however, due to strong epizonal alteration and crushing.

Quartz has grown substantially during or prior to crushing. Large round grains comprise much of the fabric and attack the few remnants of plagioclase and microcline seen. The quartz shows internal strain, however, and is crackled or crushed to angular debris in some areas. These zones are cemented with calcite and a sericite paste in most cases. The calcite may be red due to inclusions of earthy hematite. Remnants of feldspars were noted only in the least - disturbed areas.

An estimate of the rock mode is: quartz 53%, calcite 18%, microcline 1%, sericite 23%, hematite 1%, plagioclase 3%, leucoxene 0.5%.

CWT - 44 3385.5

The original rock was a granodiorite carrying large squarish and finely twinned plagioclase subhedra. These tended to cluster in a matrix of equally coarse quartz. Finer grained microcline tends to lie on grain boundaries. Remnants of a few thick biotite books were observed. The rock has been moderately crushed and altered in the epizone.

The fabric is laced with fractures and crush zones carrying fine angular quartz-feldspar rubble. The crushed zones tend to follow grain boundaries but may cut through crystals where better developed. Throughout the fabric, plagioclase is clouded with calcite and sericite; a few crystal cores are replaced by montmorillonite. Biotite is altered to smectite and ankerite. The fractures invariably carry calcite.

An estimate of the original mineral percentages are: quartz 28%, microcline 14%, plagioclase 54%, biotite 3%, magnetite 1%, sphene tr..

CWT - 44 3402

The rock is a granodiorite with numerous, randomly oriented plagioclase laths. These are slightly rounded with finely twinned cores. The matrix has equally coarse quartz while microcline tends to be granular, occurring along grain boundaries. Biotite tends to cluster with accessory minerals. There has been weak epizonal alteration.

Plagioclase crystal cores or calcic zones carry epidote, sericite, and calcite in highly variable proportions. Sometimes only one large epidote or muscovite crystal is present. Biotite alters to pennine and may be streaked with muscovite. Some crystals have patches of fluorite at their margins.

Two spots are circled; #1 is a metallic-looking biotite flake in feldspar, #2 is a spurious metallic film.

Original mineral percentages are estimated as: quartz 20%, microcline 7%, plagioclase 69%, biotite 3%, magnetite 0.5%, sphene 0.5%, allanite tr., apatite tr..

T-44

P. O. Box 972
Douglas, AZ 85607
October 5, 1978

Oliver B. Kilroy
Investments
4625 East Broadway - Suite 110
Broadway Terrace
Tucson, AZ 85711

Dear Oliver:

Was good to see you teday and I'm sorry I was so busy. I enclose descriptions of six samples. Additionally, I looked at the three you brought in. The fluorescence appears to be caused by drilling grease or some other foreign organic chemical. No intrinsically fluorescent mineral was found.

As for your specific questions:

A) The color gradations are due to alternating crushed zones stained pink by pulverized magnetite oxidized to hematite.
B) The blue-black material is smectite colored by finely pulverized pyrite. If molybdenite does occur, it is in minute traces for I saw none. The spectrograph should be able to see 2ppm!
C) No fluorine minerals found. The green is biotite beginning to alter to smectite.
D) The pinkish vein is a crushed zone (see A)
E) Again a crushed/uncrushed contact
F) The bornite-like color is slightly tarnished magnetite.

I am returning three pieces of core by parcel post - each with a circle and number. (1) shows crushed pyrite in a smear of smectite, (2) shows two magnetite grains adjoining biotite (mostly smectite now). One magnetite grain is relatively fresh, the other more oxidized with a brownish-red color for it has been pulverized along a grain boundary. (3) shows an unusually coppery-colored magnetite grain (slightly tarnished) set in a cluster of leucoxenized sphene crystals.

Best regards,

Sid

Sidney A. Williams

SAW:bj

encls:

CWT - 44 1466

The rock is a quartz monzonite with large rectangular subhedra of plagioclase in a matrix of equally coarse microcline and quartz. These grains are of irregular shape and may entrap smaller quartz or feldspar grains on their boundaries. Thick biotite books lie on grain boundaries with accessory magnetite. The rock has experienced mild epizonal alteration.

Plagioclase is lightly and evenly dusted with sericite and dolomite but microcline remains fresh. Biotite is altered to a streaky mix of smectite and less sericite with lenses of dolomite. Dolomite also fills occasional open fractures cutting the fabric.

The estimated mineral percentages are: quartz 19%, microcline 33%, plagioclase 43%, magnetite 1%, dolomite 1%, smectite 2%, sericite 1%, apatite tr., leucoxene tr..

CWT - 44 1472

The rock is a quartz monzonite with rectangular subhedra of plagioclase scattered or loosely clustered in an equally coarse, granular matrix of quartz and microcline. The microcline occasionally corrodes plagioclase and is then slightly perthitic. Biotite books cluster in the interstices with accessories such as splene and magnetite. The rock has been weakly altered in the epizone.

Plagioclase is very lightly and uniformly flecked with sericite while microcline remains fresh. Biotite is replaced by coarse smectite hosting lenses of dolomite. Dolomite is also common as a cement to open brecciated zones that course randomly through the fabric.

Minerals are present in the following estimated amounts: quartz 16%, microcline 32%, plagioclase 41%, sericite 2%, magnetite 0.5%, dolomite 5%, leucoxene 0.5%, apatite tr., smectite 3%.

CWT - 44 1481

The rock is a quartz monzonite of uniform grain size. Plagioclase crystals are finely twinned subhedra that tend to cluster loosely in a matrix of quartz and slightly perthitic microcline. Plagioclase beads often occur on grain boundaries in this matrix. Biotite occurs sparingly as small flakes lying on grain boundaries with accessories such as magnetite. Epizonal alteration has been mild.

The rock is slightly fractured and the cracks may cut across grains but tend to follow boundaries, especially those with biotite on them. The fractures are filled with dolomite and biotite along them is altered to smectite. Elsewhere the rock remains mostly fresh except for a stippling of sericite in the plagioclase.

An estimate of the rock mode is: quartz 17%, microcline 44%, plagioclase 32%, sericite 3%, magnetite 1%, dolomite 1%, smectite 1%, biotite tr., leucoxene 0.5%, apatite 0.5%, zircon tr..

CWT - 44 1492; 1287

The rock is mylonite, an aggregate of small angular chips of quartz, microcline, and plagioclase set in very fine grained quartz-feldspar rubble. A few coherent chunks of the quartz monzonite were noted. These appear to be in the act of disaggregation, surrounded by detached, slightly rotated crystal chips that eventually disappear into the chaos of the matrix. Although the rock has clearly been brecciated, there is no direction of shearing visible. There has been mild epizonal alteration.

Feldspars, especially plagioclase, show marginal alteration to hydromicas. This alteration particularly afflicts the finely pulverized debris. Portions of the matrix are cemented by fine grained dolomite.

The above description pertains to 1492. At 1287 the crushing-brecciation is less complete and more and larger coherent fragments of quartz monzonite survive. Alteration, however, is identical, and large portions of the matrix here are cemented by dolomite. A few voids occurred, now lined with coalescing dolomite euhedra.

CWT - 44 1502

The rock is a quartz monzonite with rectangular subhedra of plagioclase forming loose clusters in a matrix of coarser grain size. This is an intergrowth of somewhat irregular microcline grains and quartz. Microcline may be locally perthitic and host corroded, optically aligned remnants of plagioclase. Thick biotite books lie on grain boundaries with clusters of accessory magnetite grains. Epizonal alteration of the rock has been mild.

Plagioclase is dusted with tiny sericite shreds and flecks of calcite while microcline remains fresh. Biotite is replaced by coarse smectite, lenses of dolomite, and some sericite flakes interlayered with the smectite.

Mineral percentages are estimated as: quartz 17%, microcline 38%, plagioclase 33%, sericite 3%, dolomite 4%, smectite 3%, magnetite 1%, leucoxene 0.5%, apatite tr..

T-44

P. O. Box 372
Douglas, AZ 85607
September 21, 1978

Oliver B. Kilroy
Investments
4625 East Broadway - Suite 110
Broadway Terrace
Tucson, AZ 85711

Dear Oliver:

Enclosed is a description of the most recent core sample. As for those questions not answered there:

1) I view the fracturing/crushing in this sample as one episode but the crushing clearly took place under different physical conditions than the open fracturing. If we are seeing the effects of two periods of faulting, and this is possible, there was not an appreciably different chemical environment at the two times. From a petrographic standpoint, then, one episode has occurred.

2) Yes, magnetite is often in fractures because it occurred with biotite, and biotite is the weak mineral that induces intergranular slippage wherever it occurs. Therefore (question 3) magnetite has not been introduced.

4) The association clay/magnetite is not unusual.

As for your more general question, I have reviewed the older work and concluded that CWT - 44 is thus far consistent with earlier findings. Remember that although I recognize only one structural episode chemically, several faulting events are not ruled out. I have no reason to quarrel with or to support your statement that post-thrust high-angle faulting has occurred. Looking at the map, a major fault between T-41 and T-44 seems entirely plausible.

I think it is dangerous to attempt any correlation based on the quartz latite.

I hope these comments help some.

Best regards,

Sid

Sidney A. Williams

SAW:bj
encls:

CWT - 44 1035

The original rock was a coarse grained quartz monzonite composed of very coarse microcline and quartz with somewhat smaller subhedra of plagioclase that tend to cluster. Plagioclase enclosed in microcline tends to be corroded; plagioclase beads may also line grain boundaries between microcline grains. Biotite books also tend to lie on grain boundaries. The rock shows moderate alteration and crushing.

Irregular crush zones wind through the fabric tending to follow grain boundaries. As a consequence, somewhat distorted, disaggregated feldspars tend to occur here and they show only poor recrystallization. Since biotite usually occurred on grain boundaries it tends to be severely crumpled and altered, first to sericite, then smectite and cloudy, fine grained dolomite. Pyrite grains occur sparingly in these crushed zones; no gangue is associated.

The sample carries about 1% disseminated magnetite.

T-44

P. O. Box 872
Douglas, AZ 85607
September 8, 1978

Oliver B. Kilroy
Investments
4625 East Broadway - Suite 110
Broadway Terrace
Tucson, AZ 85711

Dear Oliver:

Enclosed are descriptions of the latest two samples, I think they answer most of your questions.

The alteration at 800.5 looks strong and yet it involves what I consider only one episode: following crushing there was a complex sequence of veins of quartz, orthoclase, ankerite. I think these are all of nearly the same age and that chloritization of the biotite in this case is retrograde.

Best regards,

Sidney A. Williams

SAW:bj
encls

CWT - 44 - 761

The sample shows the contact between two rock types. The older unit is a quartz monzonite with squarish subhedra of plagioclase set in equally coarse granular quartz and microcline. Microcline may host plagioclase but does not embay it. Small biotite books lie on grain boundaries.

The other rock type is a quartz latite, a dense chilled unit invading the older quartz monzonite. It carries squarish subhedra of β quartz and plagioclase as phenocrysts in a chilled, once glassy matrix. This is heavily replaced by lacy quartz crystalloblasts hosting undigested bits of feldspars.

Although the granodiorite shows some older deformation effects, both units are cut by zones of granulation now filled in part with fresh clear orthoclase. Since these veins often follow grain boundaries in the quartz monzonite, its biotite is consequently entirely altered to clay and calcite. Traces of fluorite appear and large pyrite subhedra are scattered along the veins.

CWT - 44 - 800.5

The original rock was a coarse grained quartz monzonite composed mainly of quartz, microcline, and plagioclase. It has been severely deformed (crushed) and recrystallized in the mesozone. Plagioclase is merely deformed but shows no particular alteration. Microcline likewise remains mostly fresh, only altering to calcite where crackled. The crushed material that traverses the fabric is recrystallized as fresh clear orthoclase with quartz and albite. Tiny new biotite flakes also lie in this material and are aligned to the former direction of shearing.

The fabric is then cut by a series of coarse quartz veins and others filled mainly with orthoclase. These veins carry fluorite and occasional pyrite anhedra. Slightly younger still are veins of ankerite. Where these are adjacent to biotite, the biotite is altered to pennine interleaved with ankerite.

CWT - 44   880

The rock is a quartz monzonite carrying small equant plagioclase subhedra set in a matrix of equally coarse, or much coarser microcline and granular quartz. Microcline may envelop and slightly corrode plagioclase. It is apt to be perthitic in the vicinity. Biotite tablets lie on grain boundaries with accessories such as magnetite and apatite.

The rock has been severely deformed. It is cut by zones of crushed quartz and feldspar rubble; less disturbed lenses of quartz monzonite lie between. The shearing has also led to a degree of segregation; quartz particularly tends to collect into bands of granular material crudely parallel to crush zones. Post-crushing alteration has been weak. Biotite tends to alter to dolomite and kaolin (dolomite also occasionally fills fractures) while plagioclase is only weakly sericitized. Pyrite occurs rarely in fractures but without associated gangue or alteration.

Only one rock type is represented here. The vein-like appearance is due to shearing alone.

CWT - 44 651

The nature of the original rock is uncertain due to heavy shearing. It now consists of grains of quartz, microcline, and plagioclase that interlock jigsaw-puzzle fashion. Individual crystals often show strain features, and there are smaller grains trapped between them because of some intergranular breakage during deformation. Occasionally the rock is reduced to a microcrystalline rubble along zones of crushing. A network of hairline veins of dolomite riddles the fabric filling late fractures. These veins carry grains of pyrite, chalcopyrite, and may be filmed with hematite.

An estimate of the rock mode is: quartz 36%, microcline 37%, plagioclase 19%, dolomite 7%, sulfides 0.5%, hematite 0.5%.

CWT - 44 701

The original rock was a coarse granite with large rectangular subhedra of plagioclase set in equally coarse microcline and granular quartz. Small biotite books occurred on grain boundaries.

The rock has been pervasively crushed, breaking into relatively undisturbed islands separated by anastamosing zones of crystal rubble. Although plagioclase is lightly sericitized and biotite is invariably converted to dolomite with accessory leucoxene, the rock remains generally fresh. Dolomite often invades crushed zones, cementing them, and a few pyrite crystals were noted forming in them.

Volume percentages of minerals are estimated as: quartz 12%, microcline 64%, plagioclase 17%, dolomite 4%, hematite 1%, leucoxene 1%, pyrite tr., sericite 1%, apatite tr..

CWT - 44 714

The original rock may have been much like above but here has been destroyed by crushing. Only angular bits of crystals remain in a matrix that is a paste of poorly healed crystal rubble. Quartz, microcline, and plagioclase are the major species and a few tiny flakes of biotite (or sericite) were observed. Grains of accessory magnetite appear as hematite pseudomorphs associated with cloudy leucoxene. One chunk of coarsely crystalline sericite was also noted.

Dolomite occasionally veins the fabric and may spread out into crushed zones acting as a cement. A few grains of pyrite also have formed in the matrix, and along late slip planes there are minute yellow crystals of sphalerite.

CWT-T-44

P. O. Box 872
Douglas, AZ 85607
June 11, 1974

Mr. Oliver B. Kilroy
Suite 212
Tucson Title Insurance Building
45 Pennington
Tucson, Arizona 85701

Dear Oliver:

Enclosed are descriptions of the six samples selected for study from hole CWT-44 (and 41).

As far as strength of alteration is concerned, there is little difference between CWT-44 and holes in the center of the claim group. As discussed in letter of last December 30, the rock in CWT-44 is a granitic one showing an "old" metamorphism and a younger event characterized by veining of calcite, chlorite (as in 44-551), and pyrite. In one sample tungsten occurred in this assemblage also; the first I've seen.

The dark material in CWT-44 is probably a xenolith of tonalite although it could be a dike. In either case, if the granite is Precambrian then the dark rock is too, for it also has suffered the "old" metamorphic event. It also has been hydrothermally altered along fractures just like the granite host, but was much more receptive to alteration than the granite as you will note from the description.

The sample from CWT-41 is doubtless from the upper plate and is a mildly metamorphosed arkose. I discussed this metamorphism in my letter of December 30.

I hope these comments help clarify the findings.

Sincerely,

Sid Williams

Sidney A. Williams

SAW:bjw
Enclosures

CWT-44-551

The sepcimen is a quartz monzonite composed initially of large subhedral plagioclase grains set among equally coarse granular quartz and orthoclase. Biotite may have been the mafite. The rock has been strongly altered in the epizone following an episode of moderate crushing.

Orthoclase shows strain and locally is ordered, exhibiting microcline twinning. It is coarsely perthitic and larger grains commonly envelop a corroded relict of plagioclase. That plagioclase which survives is stippled with calcite and sericite and is albitized, showing degenerate twinning. Relic plagioclase crystal cores may be replaced by kaolin and calcite. Quartz tends to be granulated and drawn out into crushed zones. Younger fractures carry scattered pyrite grains with vermicular pennine (chlorite) and calcite. There has been minor late movement along these fractures.

Minerals appear in the following estimated amounts: orthoclase 42%, quartz 6%, plagioclase 32%, sericite 4%, pennine 3%, pyrite 0.5%, calcite 6%, leucoxene 1%, kaolin 3%, hematite 2%, apatite 0.5%.

CWT-44-604

The original rock was a granite with subhedral plagioclase grains set among coarse anhedra of quartz and orthoclase. Some plagioclase occurred as corroded remnants enveloped in larger, perthitic orthoclase grains. Thick biotite books occurred sparingly. The rock has been severely crushed and mildly altered in the epizone.

Quartz and feldspars are severely strained with pulverized grain boundaries; sinuous crushed zones cut the fabric as well. Biotite is wholly altered to quartz with accessory sericite and leucoxene. While orthoclase is fresh it may show ordering; plagioclase, however, is totally sericitized. The sericite present is, for the most part, post-crushing. Later still are thin veinlets of calcite cementing the rock along fractures.

Mineral percentages are estimated as: quartz 30%, orthoclase 46%, sericite 14%, calcite 6%, leucoxene 1%, apatite 0.5%, plagioclase 2%.

CWT-44-608

The specimen is a granite composed of scattered anhedral plagioclase crystals set among equally coarse, or coarser quartz and microcline. Small biotite flakes are clustered with accessory magnetite and apatite; these clusters may represent prior hornblende. Biotite is also smeared out along grain boundaries.

Grain boundaries throughout the rock tend to be granulated and then recemented by recrystallization. An occasional grain of pyrite occurs in these older fractures. Biotite is mildly chloritized and plagioclase lightly dusted with sericite and epidote. Later open fractures tend to be filled with calcite.

An estimate of mineral percentages is: quartz 37%, microcline 35%, plagioclase 17%, biotite 4%, sericite 0.5%, pennine 2%, epidote tr., leucoxene 2%, calcite 1%, magnetite 1%, apatite 0.5%, zircon tr., pyrite tr..

CWT-44-614

The original rock was a tonalite composed of stout plagioclase laths and probably hornblende prisms set in a matrix of quartz, plagioclase, and biotite (?). The original texture and mineralogy have been much modified.

The rock has been mildly crushed and mesozonally metamorphosed. Coarse biotite replaces mafites. Retrograde effects include sausseritization of plagioclase and penninization of biotite. These effects seem related to veining and K-metasomatism in the epizone. The rock is riddled with veinlets of microcline (showing mild brecciation during veining) and microcline replaces the vein walls in places. Coarse pyrite grains are scattered in and near these veins. Accessories include traces of fluorite and coarse, Fe-rich epidote. Later veinlets of quartz and calcite cut the fabric but are devoid of sulfides.

Minerals are present in the following estimated amounts: quartz 12%, microcline 14%, plagioclase 44%, pyrite 4%, pennine 13%, biotite 5%, sericite 3%, calcite 1%, epidote 2%, apatite 0.5%, allanite tr., fluorite tr., sphene 1%, zircon tr..

CWT-44-617

The specimen is a quartz monzonite composed of large irregular to subhedral plagioclase grains set among equally coarse quartz and microcline grains. Grain boundaries are sutured or irregular implying some granulation prior to or following final consolidation. Some microcline crystals envelop isolated plagioclase crystals but do not appear to replace them. Microcline may, however, replace plagioclase along grain boundaries. Biotite occurs in clusters or is strung out along grain boundaries with accessory magnetite, allanite, etc.

The rock is relatively fresh. Plagioclase is dusted with sericite and calcite; biotite is mildly penninized. Thin fractures tend to be filled with quartz, calcite, and in one case, pyrite. This is a slickensided fracture with hydromicas developed and thin films of covellite coating some pyrite. Scattered scheelite grains were noted in this veins walls.

Mineral percentages appear as follows: quartz 19%, microcline 29%, plagioclase 40%, biotite 4%, sphene 1%, allanite 1%, magnetite 2%, zircon tr., scheelite 0.5%, pyrite tr., covellite tr., pennine 1%, calcite 1%, sericite 1%, apatite tr., clinozoisite tr..

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

T-44

Arizona Registered Assayer No. 9427
William L. Lehmbeck
Arizona Registered Assayer No. 9425
James A. Martin
Arizona Registered Assayer No. 11122

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Cu ppm	Mo ppm	F ppm	W ppm					
1	9334 627'-698' T-44	25	<2	1200	5					
2	9333 698'-776' "	40	<2	1700	7					
3	9332 776'-851' "	10	<2	1000	2					
4	9331 851'-925' "	15	<2	1100	5					
5	9330 925'-1001' "	20	<2	940	5					
6	9329 1001'-1079' "	10	2	960	4					
7	9328 1079'-1155' "	125	2	920	6					
8	9327 1155'-1234' "	50	<2	800	6					
9	9279 1234'-1310' "	30	2	660	3					
10	2489 1310'-1414' "	45	<2	630	<2					
11	9337 1414'-1517' "	5	2	510	<2					
12	9336 1517'-1621' "	20	2	460	<2					
13	9323 1621'-1725' "	5	2	500	<2					
14	9322 1725'-1836' "	5	2	620	<2					
15	9321 1836'-1939' "	5	2	730	<2					
16	9320 1939'-2049' "	5	<2	650	2					
17	9461 2049'-2154' "	5	<2	520	3					
18	9169 2154'-2259' "	5	2	340	<2					
19	9180 2259'-2357' "	5	2	500	<2					
20	9250 2357'-2454' "	5	2	450	<2					
21	9460 2454'-2551' "	5	2	400	<2					

TO:
CWT PROPERTIES
2239 La Mirada Street
Tucson, Arizona 85719
cc: Mr. O.B. Kilroy
4625 E. Broadway, Suite 110
Tucson, Arizona 85711

REMARKS:
Trace analysis

CERTIFIED BY:

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
10/31/78	11/18/78	YAQ 004

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

REPORT OF SPECTROGRAPHIC ANALYSIS

Values reported in part per million except where noted otherwise, to the nearest number in the series 1, 1.5, 2, 3, 5, 7 etc.

Element	9334 627'-698'	9327 1155'-1234'	9323 1621'-1725'	9250 2357'-2454'
	SAMPLE NUMBERS			
Fe	3 %	3 %	2 %	2 %
Ca	.3 %	.3 %	.5 %	.5 %
Mg	.2 %	.2 %	.15 %	.1 %
Ag	<1 ppm	<1 ppm	<1 ppm	<1 ppm
As	<500	<500	<500	<500
B	<10	<10	10	<10
Ba	1000	1000	1000	1000
Be	<2	<2	<2	<2
Bi	<10	<10	<10	<10
Cd	<50	<50	<50	<50
Co	<5	<5	<5	<5
Cr	30	20	50	30
Cu	10	20	<2	<2
Ga	20	20	30	20
Ge	<20	<20	<20	<20
La	<20	<20	<20	<20
Mn	1000	1000	1000	1000
Mo	<2	<2	<2	<2
Nb	<20	<20	<20	<20
Ni	<5	<5	<5	<5
Pb	20	20	10	10
Sb	<100	<100	<100	<100
Sc	<10	<10	<10	<10
Sn	<10	<10	<10	<10
Sr	200	200	300	300
Ti	3000	3000	2000	2000
V	30	20	20	10
W	<50	<50	<50	<50
Y	20	20	<10	<10
Zn	<200	<200	<200	<200
Zr	200	150	200	100

TO:
CWT PROPERTIES
2239 La Mirada Street
Tucson, Arizona 85719
cc: Mr. O.B. Kilroy
4625 E. Broadway, Suite 110
Tucson, Arizona 85711

REMARKS:
Spectrographic analysis

CERTIFIED BY:

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
10/31/78	11/18/78	YAQ 004

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
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William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Cu ppm	Mo ppm	F ppm	W ppm					
1	#9458 2551-2649 T/4"	10	2	500	< 2					
2	#9459 2649-2745 "	5	2	520	< 2					
3	#9457 2745-2859 "	5	2	430	2					
4	#9456 2859-2990 "	10	2	500	2					
5	#9454 2990-3104 "	5	2	480	< 2					

TO:
CWT PROPERTIES
2239 La Mirada Street
Tucson, Arizona 85719
cc: Oliver B. Kilroy
4625 East Broadway, Suite 110
Tucson, Arizona 85711

REMARKS:
Trace analysis

Project: CWT T-44

CERTIFIED BY: [signature]

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK DATE SIGNED ARIZONA U.S.A.

DATE REC'D: 12/4/78

DATE COMPL.: 12/26/78

JOB NUMBER: YAQ 005

SKYLINE LABS, INC.
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1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
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Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

REPORT OF SPECTROGRAPHIC ANALYSIS

Values reported in parts per million, except where noted otherwise, to the nearest number in the series 1, 1.5, 2, 3, 5, 7 etc.

Element	#9454 2990-3104
Fe	5%
Ca	1%
Mg	0.5%
Ag	<1 ppm
As	<500
B	10
Ba	1000
Be	<2
Bi	<10
Cd	<50
Co	<5
Cr	70
Cu	5
Ga	20
Ge	<20
La	<20
Mn	1000
Mo	2
Nb	<20
Ni	<5
Pb	20
Sb	<100
Sc	<10
Sn	<10
Sr	150
Ti	2000
V	<10
W	<50
Y	<10
Zn	<200
Zr	50 ppm

TO: CWT PROPERTIES
2239 La Mirada Street
Tucson, Arizona 85719
cc: Oliver B. Kilroy
4625 E. Broadway, Suite 110
Tucson, Arizona 85711

REMARKS:
Project: CWT T-44

CERTIFIED BY:

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK DATE SIGNED Arizona U.S.A.

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
12/4/78	12/26/78	YAQ 005

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
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Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	Cu ppm	Mo ppm	F ppm	W ppm	U ppm
1	9455 3103-3202 T-44	5	2	660	7	2
2	9127 3202-3302 T-44	5	<2	680	6	<2
3	9252 3302-3402 T-44	5	<2	1000	5	2
4	9095 1469-1540 T-9	50	10	620	9	<2
5	9187 1107-1291 T-11	25	<2	860	44	<2
6	9300 1046-1123 T-12	95	<2	600	8	4
7	9164 988-1003 T-18	5	<2	400	6	<2
8	9163 1230-1314 T-31	40	<2	330	9	<2
9	9094 1193-1203 T-39	40	2	1100	5	<2
10	9165 1048-1143 T-57	5	<2	440	6	<2

TO:

MR. O.B. KILROY
4625 E. Broadway, Suite 110
Tucson, Arizona 85711
cc: CWT PROPERTIES
2239 La Mirada Street
Tucson, Arizona 85719

REMARKS: Trace analysis

CERTIFIED BY: [signature]

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK Arizona U.S.A.

DATE REC'D: 1/2/79

DATE COMPL.: 1/26/79

JOB NUMBER: YAQ 006

SKYLINE LABS, INC.
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(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

REPORT OF SPECTROGRAPHIC ANALYSIS

Values reported in parts per million, except where noted otherwise, to the nearest number, in the series 1, 1.5, 2, 3, 5, 7 etc.

Element	SAMPLE NUMBER 9252 3302-3402 T-44
Fe	0.7 %
Ca	0.3 %
Mg	.07 %
Ag	<1 ppm
As	<500
B	<10
Ba	700
Be	<2
Bi	<10
Cd	<50
Co	<5
Cr	10
Cu	<2
Ga	20
Ge	<20
La	<20
Mn	1000
Mo	<2
Nb	<20
Ni	<5
Pb	150
Sb	<100
Sc	<10
Sn	<10
Sr	<50
Ti	700
V	10
W	<50
Y	<10
Zn	<200
Zr	20

TO:
MR. O.B. KILROY
4625 E. Broadway, Suite 110
Tucson, Arizona 85711
cc: CWT PROPERTIES
2239 La Mirada
Tucson, Arizona 85719

REMARKS: Spectrographic analysis

CERTIFIED BY:

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK ARIZONA

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
1/2/79	1/26/79	YAQ 006

SKYLINE LABS, INC.
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Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	U ppm
1	9334 627-698 F-44	< 2
2	9333 698-776 "	< 2
7	9328 1079-1155 "	< 2
15	9321 1836-1939 "	< 2

TO:
Oliver B. Kilroy
4625 East Broadway, Suite 110
Tucson, Arizona 85711

REMARKS:
Trace analysis

CERTIFIED BY:

DATE REC'D: 1/2/79

DATE COMPL.: 1/15/79

JOB NUMBER: YAQ-004 A

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James A. Martin
Arizona Registered Assayer No. 11122

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	U ppm								
4	9456 2859-2990 Trail	< 2								
5	9454 2990-3104 "	< 2								

TO:
OLIVER B. KILROY
4625 East Broadway, Suite 110
Tucson, Arizona 85711

REMARKS:
Trace analysis

CERTIFIED BY:

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
1/2/79	1/15/79	YAQ-005 A

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Arizona Registered Assayer No. 9427
William L. Lehmbeck
Arizona Registered Assayer No. 9425
James A. Martin
Arizona Registered Assayer No. 11122

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	F ppm	U ppm	W ppm						
18	9169 2154-2259 T-44	380	< 2	< 2						
21	9460 2454-2551 T-44	320	< 2	< 2						

TO: Mr. Oliver B. Kilroy
4625 E. Broadway, Suite 110
Tucson, Arizona 85711

REMARKS: Trace analysis

CERTIFIED BY: [signature]

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK SIGNED ARIZONA U.S.A.

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
1/30/79	2/9/79	YAQ 004-B

SKYLINE LABS, INC.
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James A. Martin
Arizona Registered Assayer No. 11122

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	F ppm	U ppm	W ppm						
5	9454 2990-3104 T-44	440	< 2	< 2		R				

TO:
Mr. Oliver B. Kilroy
4625 E. Broadway, Suite 110
Tucson, Arizona 85711

REMARKS:
Trace analysis

CERTIFIED BY:

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK DATE SIGNED Arizona U.S.A.

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
1/30/79	2/9/79	YAQ 005-B

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William L. Lehmbeck
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James A. Martin
Arizona Registered Assayer No. 11122

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	F ppm	U ppm	W ppm
1	9455 3103-3202 T-44	620	3	3
2	9127 3202-3302 T-44	560	< 2	3
3	9252 3302-3402 T-44	1000	4	< 2
5	9187 1107-1291 T-11	840	2	28
6	9300 1046-1123 T-12	560	3	2
9	9094 1193-1203 T-39	890	< 2	3

TO:
Mr. Oliver B. Kilroy
4625 E. Broadway, Suite 110
Tucson, Arizona 85711

REMARKS:
Trace analysis

CERTIFIED BY:

REGISTERED ASSAYER
CERTIFICATE NO. 9425
WILLIAM L. LEHMBECK
DATE SIGNED
Arizona U.S.A.

DATE REC'D: 1/30/79

DATE COMPL.: 2/9/79

JOB NUMBER: YAQ 006-A

CWT # 11
1997-2471

GLOBO DE PLOMO ENTERPRISES

P.O. BOX 872
DOUGLÁS, AZ 85607
USA

August 28, 1983

Oliver B. Kilroy
4625 E. Broadway
Tucson, AZ 85711

Dear Oliver:

Enclosed are descriptions of your 17 core samples. The statements marked with an asterisk are answers to specific questions associated with each sample.

The rock unit drilled (except a meta-limestone) is probably one intrusive phase although its composition varies somewhat, hence the different names. The deeper samples are coarser grained. The coarser rocks cooled more slowly, and may show development of pods or veins of pegmatitic character as a result. These are of late magmatic age, predating alteration. Also, two samples (2298, 2430) show diking by aplitic units that are likely genetically related to the main intrusion and of closely similar age to the host.

Early alteration is deuteric, biotite is chloritized, plagioclase dusted with sericite and carbonate. Later hydrothermal alteration relates to cracks, veins, etc. and may carry pyrite, chalcopyrite, galena. The alteration is carbonate-hematite-sericite (greenish)-smectite.

I hope these data are helpful. Remember, you can always call at noonhour Mon-Wed-Fri (364-9637) to discuss this, though I will be out of town until Sep. 2. I am returning the rocks and slides by parcel post.

Best regards,

Sidney A. Williams

SAW:bj

encls.

CWT11 - 2126.5

The original rock was an impure dolomite, subsequently katazonally metamorphosed to produce a calc-silicate marble, probably one composed chiefly of olivine set in coarsely crystalline calcite. Later retrograde metamorphism has been complete.

The matrix of the rock still consists of calcite, present as coarse, twinned grains that interlock in jigsaw-puzzle texture. The olivine (?) and possibly diopside that were once present have been completely replaced by scaly serpentine lightly dusted with traces of iron oxides. Phlogopite had formed during the katazonal event as large skeletal books and as small thickly scattered platelets in some areas, and it remains perfectly fresh. Thin slip planes cut the fabric and carry fine grained pyrite.

* The hematite is supergene and occurs in slip planes at the expense of pyrite.

CWT11 - 2254.5

The rock is a granodiorite. Plagioclase is the chief constituent and occurs as crudely squarish subhedra of various sizes that tend to occur in clusters. Quartz and microcline fill the remaining spaces and both minerals may occur as large, late magmatic crystalloblasts. Plagioclase is sometimes myrmekitic against the microcline. Biotite and hornblende once occurred sparingly on grain boundaries in loose clusters with the accessory minerals magnetite, apatite, and sphene. Epizonal alteration has been modest.

Mafites are entirely altered to antigorite and calcite. Calcite veinlets riddle the fabric,and calcite joins sericite in clouding plagioclase cores. Muscovite flakes occur in plagioclase in an ill-defined zone cutting the rock.

* The zone of weak, late magmatic alteration cutting the rock is not comparable to 2298.

* The blue-grey mineral is galena.

* The red-brown mineral is goethite just beginning to replace tiny pyrite specks.

CWT11 - 2266.5

The rock is a granodiorite carrying crudely retangular plagioclase crystals in an equally coarse matrix of quartz and minor orthoclase. Biotite appears to have been the major mafite.

The rock shows pervasive late magmatic alteration comparable to the band of alteration cutting 2254.5. As a result, plagioclase is sodic and shows degenerate twinning. Microcline originally present has been annealed to orthoclase, and muscovite books occur in both feldspars. Later epizonal alteration also occurred. Plagioclase cores are sericitized and sericite dusted with leucoxene replaces mafites. The rock is also riddled with calcite veinelts.

* The red-brown mineral is orthoclase dusted with colloidal hematite; the black is MnOx on its surface.

* The light green to emerald green is sericite. The sericite occurring in plagioclase and mafites is green due to some ferrous iron in it.

CWT11 - 2271

The rock is quartz monzonite carrying squarish or rectangular plagioclase subhedra clustered in an equally coarse matrix of interlocking quartz and microcline grains. Plagioclase may be myrmekitic against the microcline. Biotite is the mafite, present as slender books on grain boundaries. They cluster loosely with accessory magnetite and apatite. Epizonal alteration has been mild.

Plagioclase cores are dusted with sericite and minor calcite. Some biotite is fresh in protected spots but most has altered to antigorite and calcite clouded with accessory leucoxene. Numerous calcite veinlets cut the fabric.

* The chalcopyrite is unrelated to pegmatites but occurs along late calcite-filled fractures associated with the epizonal alteration.

* No other economic minerals were found.

* The yellow mineral is clay developed along a late fracture.

CWT11 - 2295

The rock is a quartz monzonite. The plagioclase occurs as large, thick rectangular subhedra dispersed in random orientation. The matrix is a mosaic of equally large quartz and microcline grains, often with smaller plagioclase subhedra trapped between them. Biotite books occur on grain boundaries in strings or clusters with accessory minerals. Some biotite clusters are replacements of earlier hornblende. Epizonal alteration has been weak.

Plagioclase cores are clouded with dust-like sericite and calcite while microcline remains fresh. Biotite is partly altered to pennine but in some areas has further altered to cloudy calcite and antigorite. In these areas, some smectite occurs in plagioclase cores.

* Smectite colors the plagioclase gray-green in some areas.

CWT11 - 2298

The slide shows contact between two rock types. The contact is gradational and the rock types similar and probably closely related genetically as well as in time.

The reddish unit is finer grained, a granodiorite aplite composed of uniform size grains of plagioclase, quartz, and less microcline. They interlock to a minor degree. Mafites are absent. The other rock unit is granodiorite (close to quartz monzonite) carrying thick rectangular plagioclase subhedra in an equally coarse matrix of quartz and microcline that interlock slightly. Small biotite books occur on grain boundaries.

Mild epizonal alteration affects both units. Plagioclase is dusted with sericite and calcite, and the calcic cores in the granodiroite also host (green) ferrous smectite. Microcline is fresh but most biotie altered to antigorite and calcite. Calcite veinlets also cut the rock.

* The emerald green is smectite.

* The splendent red is hematite stain along antigorite cleavages (altered biotite).

* The dark earthy red is hematite.

* Pyrite is the only sulfide noted.

CWT11 - 2308

The rock is a granodiorite. The plagioclase occurs as large crudely rectangular grains floating in random orientation in an equally coarse matrix of quartz. Microcline occurs sparingly as smaller grains though a few larger crystalloblasts have developed. Biotite books lie on grain boundaries in loose clusters with accessories such as magnetite and apatite. Epizonal alteration has been moderate.

Though microcline is fresh, plagioclase is clouded with sericite, and calcite fills cleavages and cracks. Alteration is especially heavy along veins of calcite and sericite cutting the rock. Biotite is replaced by coarse shreddy sericite interleaved with lenses of calcite.

* The green mineral is Fe-bearing sericite foliated on a fracture surface.

CWT11 - 2353

The rock is a quartz monzonite. Plagioclase occurs in it as thick, finely twinned rectangles of subhedral outline, and in random orientation. The matrix is a mosaic of equally coarse, interlocking grains of quartz and poorly ordered microcline. Against the latter mineral plagioclase may be myrmekitic. Microcline may host small plagioclase grains but does not corrode them. Biotite flakes are erratically disseminated on grain boundaries with accessory magnetite, apatite, etc. The rock is fresh, showing only weak deuteric alteration.

Biotite is partially altered to pennine and rare epidote. Microcline is perfectly fresh, and plagioclase cores are slightly corroded by sericite, calcite, and smectite.

* The dark green mineral is pennine (altered biotite) of deuteric age. The iron oxides in the vicinity are younger (supergene) and unrelated.

CWT11 - 2361

The rock is a quartz monzonite composed of quartz, microcline, and plagioclase in roughly equal abundance. The plagioclase tends to occur as subhedral rectangules whereas the other minerals, though equally coarse, form an interlocking mosaic in the matrix. Biotite occurs as small books entrained on grain boundaries in a faint synneusis structure. They occur with magnetite, apatite, and other accessories.

The rock is nearly fresh, showing only mild deuteric alteration. Much biotite is fresh but some crystals are penninized or even streaked with muscovite. A few muscovite books occur in plagioclase, and crystal cores are lightly corroded by sericite, calcite, and smectite. Most microcline is fresh; the few crystals hosting muscovite show fuzzy degenerate twinning.

* The grey mineral is dendritic Mn-oxide and the orange spots are goethite rings around tiny pyrite grains.

CWT11 - 2369

The rock is a granodiorite. Plagioclase occurs as rectangular subhedra that are randomly oriented and unevenly distributed. Equally coarse quartz and lesser amounts of microcline fill the interstitial spaces. Microcline may be perthitic or host corroded plagioclase remnants. Biotite books occur sparingly on grain boundaries or are even locked in matrix quartz. Accessory minerals usually occur in close association. The epizonal alteration of the rock has been mild.

Some biotite is fresh, other crystals exhibiting varying degrees of penninization. Microcline is perfectly fresh while plagioclase cores or calcic zones are clouded with sericite and calcite. Some crystal cores have decayed to a scaly paste of smectite. Fractures cutting the rock are filled with calcite.

* The greenish mineral is Fe-bearing sericite with minor Mn oxide. Thus it is similar to 2353.

CWT11 - 2398

The rock is a quartz monzonite. Plagioclase occurs as large, crudely rectangular subhedra while qually coarse microcline anhedra fill the interstices, the two minerals occurring in about equal amount. The microcline is perthitic, and plagioclase may be myrmekitic against it. Quartz occurs with microcline in the matrix. Biotite books and occasional hornblende prisms occur on grain boundaries with accessory minerals. The rock exhibits mild epizonal alteration.

A few flakes of muscovite occur in plagioclase, and many crystal cores are corroded by sericite, calcite, and smectite. Calcite also occurs in hairline veinlets cutting the rock. Biotite shows some streaking by pennine and hornblende is completely penninized.

* The grey-green mineral circled is pennine (replacing hornblende).

* The pegmatite spot circled is doubtless a cognate xenolith partly resorbed in the host rock.

CWT11 - 2430

The slide shows two rock types. The host rock is granodiorite carrying coarse rectangular plagioclase subhedra. The matrix is equally coarse, interlocking quartz and lesser amounts of microcline. Biotite flakes occur in loose clusters with accessory minerals on grain boundaries.

The pink band is a dikelet of aplitic quartz monzonite (nearly granite) composed chiefly of microcline, less plagioclase and quartz. Mafites are virtually absent. The contact of the dikelet with the host rock is gradational.

Alteration affecting the two units has been mild. Plagioclase is clouded with sericite and calcite, especially the more calcic plagioclase in the granodiorite. Biotite shows some penninization. Hairline calcite veinlets cut both units.

* Yes, the dikelet is similar in character and origin to that in 2298.

* It appears here that some increase in crystal size (microcline) may occur in the host due to proximity to the dike.

CWT11 - 2445.5

The rock is a granodiorite. Although plagioclase grains in it are crudely rectangular, they do interlock with the equally coarse quartz and microcline comprising the matrix. Biotite books lie on grain boundaries and occur in loose clusters. Accessories such as magnetite occur in the vicinity.

The rock shows a moderate degree of epizonal alteration. Plagioclase is quite uniformly clouded with calcite and sericite though the sodic rims tend to be a bit fresher. Biotite is altered entirely to coarse shreddy sericite dusted with leucoxene, Microcline is clouded and shows degenerate twinning. It is invaded by patches of granular calcite in places. Calcite also occurs with sericite as a selvage along crushed, cherty quartz veins.

* Yes, the vein is just like that in T44-3371.

* The calcite in the vein (visually) is pale carmel-colored.

* The yellow mineral is smectite lightly stained by goethite. It has replaced plagioclase cores along a fracture.

CWT11 - 2455

The rock is a quartz monzonite, an intrusive similar to those above but coarser grained. It contains large, squarish plagioclase subhedra set in equally coarse, interlocking quartz and microcline. Especially large microcline grains occur along ill-defined structures of late magmatic age. Biotite occur sparingly as relatively large plates on grain boundaries. Epizonal alteration has bee modest.

Plgioclase is lightly dusted with sericite and a few tiny calcite grains. Most biotite is fresh but some grains show marginal decay to sericite. Much of the microcline is partly annealed, showing degenerate twinning. In places it is nearly blotted out by clumps of coarse granular dolomite.

* The late magmatic or pegmatitic vein is present because this rock is more slowly cooled than examples seen higher in the hole.

* The yellow spot is surficial iron stain (drill bit steel?).

* Two mineral assemblages: deuteric sericite-calcite, then hydrothermal dolomite.

CWT11 - 2471

The rock is a quartz monzonite, nearly a granite, and is very coarse grained like 2455 above. Plagioclase occurs sparingly as crudely squarish grains. They interlock with and are isolated in a matrix of coarser microcline and quartz. Microcline is perthitic but does contain uncorroded inclusions of plagioclase. It may also be graphically intergrown with quartz. Biotite occurs sparingly on grain boundaries with accessory magnetite and apatite.

Alteration has been weak. Some biotite shows deuteric penninization. Other grains show later decay to calcite and sericite. Calcite was noted in plagioclase cores with kaolin and sericite. It also veins the fabric along cracks or grain boundareis and may invade microcline.

* Orange spots, as before, are iron oxides rimming pyrite. They seem of post-drilling age.

* The open vug signifies leaching (of carbonate) in this case and signifies at least low fluid pressure.

T44 - 3015

The rock is a quartz monzonite, a coarse grained intrusive similar to the bottom two samples in CWT11. Plagioclase grains are crudely rectangular and tend to cluster. The clusters float in a distinctly coarser matrix of quartz and microcline. Large microcline grains may host plagioclase but do not appear to corrode it. Biotite books occur sparingly on grain boundaries. Associated minerals include magnetite, apatite, allanite, zircon, and sphene. Alteration has been mild.

Plagioclase shows early deuteric alteration to clinozoisite or muscovite as well as later corrosion of calcic cores by smectite, sericite, and calcite. Biotite has been penninized, and shows minor late alteration to sericite-calcite as well. Hairline calcite veinlets cut the rock, and seem concentrated within microcline.

* The fracture is coated with sericite-hematite and represents the early part of your "characteristic assemblage".

T44 - 3371

The rock is a quartz monzonite (close to granite) and is a coarse grained intrusive like 3015. Plagioclase occurs as isolated grains of rectangular outline. They float alone or in small clusters in a coarser matrix of quartz and microcline. Plagioclase is often enveloped in microcline but does not show corrosion. Biotite occurs as clusters of books associated with the accessory minerals. Alteration has been moderate.

The rock is cut by veins of quartz, dolomite, and sericite similar to those in CWT11 - 2445.5. Some crushing has occured along them, converting quartz to cherty rubble. Throughout the rock microcline shows curious disordering and degeneration of twinning, and it may be invaded by dolomite. Plagioclase is dusted with calcite and sericite, sometimes hosting small muscovite plates. Biotite has been entirely sericitized.

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

REPORT OF ANALYSIS

JOB NO. UPA 001
November 30, 1983

CWT PROPERTIES
2239 La Mirada St.
Tucson, Arizona 85719

Analysis of 5 Rock Chip Samples

ITEM	SAMPLE NUMBER	Au (ppm)	Ag (ppm)
1	2107-2116	.27	<.2
2	2134-2143	.16	<.2
3	2143-2451.6	.02	<.2
4	2160-2169.6	<.02	.2
5	2463-2471	<.02	<.2

cc: Mr. Oliver B. Kilroy
4625 E. Broadway, Suite 110
Tucson, Arizona 85711

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

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. UPA 001
November 30, 1983

CWT PROPERTIES
2239 La Mirada St.
Tucson, Arizona 85719

Analysis of 4 Rock Chip Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

William L. Lehmbeck
Manager
11/30/83

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

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

JOB NO. UPA 001
PAGE 2

ITEM NO.		SAMPLE NO.
1	=	2107-2116
2	=	2134-2143
4	=	2160-2169.6
5	=	2463-2471

ITEM	1	2	4	5
ELEMENT				
Fe	3%	2%	3%	2%
Ca	>20%	>20%	1.5%	1.5%
Mg	10%	15%	.5%	.3%
Ag	<1	<1	<1	<1
As	<500	<500	<500	<500
B	10	50	<10	<10
Ba	<10	<10	700	700
Be	2	2	<2	2
Bi	<10	<10	<10	<10
Cd	<50	<50	<50	<50
Co	15	<5	5	<5
Cr	70	50	30	150
Cu	70	50	500	2
Ga	10	<10	15	10
Ge	<20	<20	<20	<20
La	20	<20	<20	<20
Mn	1000	700	300	300
Mo	<2	15	300	<2
Nb	<20	<20	<20	<20
Ni	15	<5	<5	<5
Pb	<10	<10	10	10
Sb	<100	<100	<100	<100
Sc	10	<10	<10	<10
Sn	<10	<10	<10	<10
Sr	100	<100	200	150
Ti	3000	1500	2000	1500
V	50	20	20	15
W	<50	<50	<50	<50
Y	30	10	<10	<10
Zn	<200	<200	<200	<200
Zr	150	100	50	100

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

REPORT OF ANALYSIS

JOB NO. UPA 002
December 23, 1983
1806-1814 TO 2116-2125.6

CWT PROPERTIES
2239 La Mirada St.
Tucson, Arizona 85719

Analysis of 10 Rock Chip Samples

ITEM	SAMPLE NO.	Au ppm	Cu ppm
1	1806-1814	<.02	N/R
2	1901-1910.5	<.02	N/R
3	1938-1947	<.02	N/R
4	1975-1982	<.02	N/R
5	2034.5-2044.5 *	<.02	N/R
6	2044.5-2053 **	<.02	N/R
7	2062-2071	<.02	320.
8	2080-2089	<.02	N/R
9	2098-2107	<.02	N/R
10	2116-2125.6	<.02	N/R

NOTE: N/R denotes analysis not requested.
*NOTE: Sample bag marked 2034.6
**NOTE: Sample bag marked 2044.6

cc: Mr. Oliver B. Kilroy
4625 E. Broadway, Suite 110
Broadway Terrace Bldg.
Tucson, Arizona 85711

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK DATE SIGNED Arizona U.S.A.

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

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

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. UPA 002
December 23, 1983
1806-1814 TO 2116-2125.6

CWT PROPERTIES
2239 La Mirada St.
Tucson, Arizona 85719

Analysis of 2 Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

REGISTERED ASSAYER
CERTIFICATE NO.
9425
WILLIAM L.
LEHMBECK
DATE SIGNED
Arizona U.S.A.

William L. Lehmbeck
Manager

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

JOB NO. UPA 002
PAGE 2

ITEM NO. SAMPLE NO.
1 = 1806-1814
5 = 2034.5-2044.5

ITEM	1	5
ELEMENT		
Fe	3%	.02%
Ca	1.5%	>20%
Mg	.7%	.1%
Ag	<1	<1
As	<500	<500
B	<10	<10
Ba	300	<10
Be	2	<2
Bi	<10	<10
Cd	<50	<50
Co	5	<5
Cr	100	<10
Cu	700	<2
Ga	10	<10
Ge	<20	<20
La	30	<20
Mn	500	50
Mo	15	7
Nb	<20	<20
Ni	<5	<5
Pb	10	<10
Sb	<100	<100
Sc	<10	<10
Sn	<10	<10
Sr	150	<100
Ti	3000	<20
V	30	<10
W	<50	<50
Y	20	<10
Zn	<200	<200
Zr	100	<20

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

CWT #11
1450 1997

P. O. Box 872
Douglas, AZ 85607
October 18, 1981

O. B. Kilroy
5 Calle Corta
Tucson, AZ 85716

Dear Oliver:

Enclosed are descriptions of your nine samples. I paid careful attention to you questions and hope they're all answered clearly.

Best regards,

Sidney A. Williams

SAW:bj

encls.

1457

The original rock was an andesite or similar basic rock, perhaps a dike or volcanic. It consisted of small plagioclase laths and hornblende prisms with abundant accessory magnetite and sphene. The rock has been epizonally metamorphosed, then sheared, so textures are nearly destroyed.

Fine scaly clinochlore replaces all hornblende, encroaching considerably upon plagioclase. Only scattered scales of sericite usualy survive as replacement of plagioclase. Accessory calcite dots the clinochlore along with abundant leucoxene and hematite pseudomorphs after magnetite. Late shears carry calcite with dust-like hematite, and some pyrite was noted in these.

The pyrite is younger than the chlorite-hematite in the shears.

Mineral percentages are estimated as: clinochlore 58%, calcite 21%, sericite 10%, hematite 7%, leucoxene 4%, apatite tr..

1469

The original rock was a granite porphyry, a severely chilled intrusive rock (not like 1457). Large orthoclase phenocrysts occur frequently with only a few of plagioclase, and they tend to be replacement perthite. The matrix is a chilled cherty aggregate of orthoclase, minor quartz and plagioclase. Strong autobrecciation occurred upon intrusion and there was additional brecciation prior to mesozonal metamorphism.

Although strained or disrupted, orthoclase remains generally fresh. Plagioclase is mostly sericitized and may be dusted with magnetite beads. Small green biotite flakes have developed in cracks and on grain boundar es throughout the rock. A network of much younger calcite-filled fractures carries pyrite and magnetite together. However, pyrite is also disseminated and may occur with sericite and green biotite.

1859

The rock is a quartz monzonite with large, crudely rectangular plagioclase crystals floating in an equally coarse quartz-orthoclase matrix. Large orthoclase grains tend to be perthitic, and they may corrode inclusions of plagioclase. They also show patchy ordering. Quartz tends to be segregated into pods. The rock has been mildly deformed and mesozonally altered.

Feldspars and quartz show strain and granulation but remain fresh except for traces of sericite in the plag oclase. Mafites are replaced by scaly biotite partly retrograded to pennine. Calcite fills irregular fractures.

One arrow points to a smear of chlorite (pennine), the other to a scale of molybdenite.

Mineral percentages are estimated as follows: quartz 24%, orthoclase 32%, plagioclase 38%, biotite/pennine 2%, sulfide ¼%, apatite ¼%, sphene tr., sericite 3%, calcite ½%.

1902

The rock is a tonalite, probably hypabyssal. It consists of stubby plagioclase laths and thick biotite books with some quartz filling the angular interstitial areas. Hornblende joins biotite in some fragments for the rock is brecciated, and slightly dissimilar fragments are juxtaposed. Epizonal alteration has been mild.

Plagioclase is lightly but uniformly dusted with sericite. Pennine may corrode the mafic minerals, but relatively slightly. In the breccia matrix, however, alteration is stronger and calcite joins in replacing plagioclase and mafites. Throughgoing shears carry calcite, pennine, hematite dust, and perhaps some cherty orthoclase. These resemble the late structures in 1457, and they carry pyrite as well.

1934

The original rock was a calc-shale. It was brecciated prior to intense mesozonal thermal metamorphism.

The rock matrix is a dense, fine grained aggregate of fresh clear orthoclase (occasionally with seams or pods of albite). Within most fragments, which represent argillic bands in the original rock, minute scales of brown biotite crowd the matrix. Within fragments of calc-shale lamellae, skeletal diopside prisms are present in the matrix. The brown (biotite) and green (diopside) represent coloring indicated by the arrows. Traces of pyrrhotite are disseminated in the rock, and a few late calcite veinlets cut the fabric.

The estimated mineral percentages are as follows: orthoclase 37%, biotite 34%, diopside 22%, pyrrhotite ½%, albite 4%, calcite 1%, actinolite ½%, pennine ¼%.

1947

The original rock was a shaly limestone. It has been thermally metamorphosed in the mesozone.

The rock now is a uniform aggregate of twinned calcite rhombs in which small diopside grains are thickly scattered. Phlogopite is also abundant as small flakes that lie with long dimensions roughly parallel to bedding. Thick books of amesite may be of retrograde age, and they often lie askew to bedding.

Shear zones of retrograde age are healed with scaly sepiolite and fibrous calcite. Clusters of pyrrhotite occur in these structures.

An estimate of the rock mode is: calcite 38%, phlogopite 22%, diopside 37%, amesite 5%, pyrrhotite 1%, sepiolite 3%.

1961

The original rock was a dolomite. It has been converted to a tactite by strong mesozonal metamorphism, then severely retrograded in the epizone.

At the peak of metamorphism, the rock consisted almost entirely of very coarse diopside prisms with occasional plates of phlogopite and patches of calcite in the interstices. However, the diopside has been severely corroded by fine, scaly serpentine hosting irregular blotches of cloudy calcite. Phlogopite scales survive in the serpentine with no ill effect.

The green serpentine is noted by your arrow, but the white is not quartz but is a mass of still-fresh diopside.

1968

The original rock was a black (organic-rich) limestone relatively free of shaly or detrital matter. It has been converted to a marble by mesozonal metamorphism.

Calcite is recrystallized to a coarse sugary mass of grains meeting on simple mutual boundaries. Black organic matter (including graphite) is trapped on grain boundaries and squeezed throughout the fabric on microfractures because of its soft, plastic nature. A few flakes of phlogopite occur on grain boundaries and one serpentinized grain observed was probably diopside originally.

1997

The original rock was a very pure limestone, subsequently metamoprhosed to a marble. It consists of coarse calcite grains that are twinned and show very slight deformation. They meet on simple mutual boundaries. Only quartz is present as an accessory, and it shows partial replacement by calcite.

The rock was subsequently fractured, and there has been slight but pervasive supergene leaching of the calcite. Mild though it has been, the leaching has caused pitting of the calcite responsible for its milky white appearance. More persistent fractures are filmed with dust-like hematite. This, then, is a secondary weathering effect unrelated to sulfides.

P. O. Box 872
Douglas, AZ 85607
May 10, 1980

O. B. Kilroy
Suite 110
4625 East Broadway
Tucson, AZ 85711

Dear Oliver:

Enclosed are descriptions of 15 samples you sent last week. Many of these show a young event consisting of brecciation and alteration to quartz-calcite-kaolin. I was intrigued by the scheelite vein but it may be a very old one (Precambrian?).

Best regards,

Sidney A. Williams

SAW:bj

encls:

CWT - 10 Surface #1

The rock originally was a sediment, a silty one with occasional pebbles or large detrital grains. The matrix was crudely layered fine grained quartz-feldspar debris with some interstitial argillic material. The rock has been metamorphosed but has not suffered strong recrystallization or destruction of original texture.

Quartz has recrystallized to granular aggregates in some places; elsewhere it has behaved passively. In places orthoclase remained fresh (subsequently weathering to allophane) but in other spots it is replaced entirely by fine scaly sericite. The sericite distribution is in spots, perhaps incipient crystalloblasts.

CWT - 10 60-80(2A)

The original rock was doubtless a silty sediment similar to the surface sample. It carried occasional small clasts (usually quartz) in a fine grained matrix of quartz, feldspars, and interstitial argillic material.

The rock was metamorphosed, causing quartz to recrystallize somewhat. It gathered into small pods or crosscut the fabric as discontinuous granular veins. Argillic matter and feldspars alike were replaced by fine wispy sericite.

Finally, the rock was severely crushed (perhaps in a fault zone). Montmorillonite attacks sericite, especially in the matrix. Pyrite grains are abundantly scattered in the breccia matrix, unassociated with any particular alteration.

CWT - 10 60-80(2B)

The original rock was a silty sediment, a crudely layered rock composed mainly of well-sorted quartz and feldspars. It has been hornfelsed by low mesozonal metamorphism.

Quartz and orthoclase are fresh, interlocking in a sugary texture but showing no evidence of strong growth or enlargement except along veins. In the walls of veins quartz may show crystalloblastic growth. It occurs in veins with sericite and a scattering of pyrite cubes. Sericite also occurs in a patchy way in the rock matrix, perhaps deriving from former plagioclase.

Mineral percentages are estimated as: quartz 38%, orthoclase 50%, sericite 9%, pyrite 2%, leucoxene tr., hornblende tr..

CWT - 10   120-130(3)

The original rock was a fine grained silty sediment. Consisting mainly of quartz-orthoclase debris, it contained a few crumpled laminae of coarser sandy material. The rock was subsequently hornfelsed by low mesozonal metamorphism.

Quartz and orthoclase are usually fresh and fine grained, interlocking in a sugary texture. Where quartz was originally coarser, or more abundant, it has grown considerably. Shreddy sericite is packed into the interstices, having replaced and feldspars formerly there. Pyrite is erratically disseminated, usually associated with especially coarse sericite and blotches of calcite. Orthoclase in the vicinity may alter to calcite and kaolin.

CWT - 10   465-485(4)

The rock is a granite, an equigranular rock composed mainly of quartz and microcline. Plagioclase laths tend to lie in microcline and they seem a bit corroded. Biotite books lie on grain boundaries with accessory minerals such as magnetite.

The rock is cleanly cut by a mylonitized zone replaced by extremely fine grained cherty quartz. Stringers of calcite parallel this zone, and blotches of calcite appear in the chert. Tiny angular pyrite grains are also embedded in the chert with lesser amounts scattered in the adjacent granite. However, alteration in the granite is negligible, limited to replacement of some feldspar by kaolin and calcite.

Original mineral percentages are estimted as: quartz 32%, microcline 47%, plagioclase 12%, biotite 8%, magnetite 1%, apatite tr., zircon tr..

CWT - 10   625-645(5A)

The rock is vein matter, probably within a granitic rock. It consists mainly of quartz, a mosaic of large, severely strained grains. Incipient rupture has caused granulation on almost all grain boundaries as well as within some grains.

Small muscovite books are crumpled into discontinuous bands. Where granulation has been severe, the muscovite is drawn out as minute scales. Very coarse, slightly strained scheelite occurs with the muscovite. Later fractures cutting all other features are filled with calcite.

Mineral percentages are estimated as: quartz 90%, muscovite 6%, scheelite 3%, calcite 1%.

CWT - 10 625-645(5B)

The rock is a quartz monzonite of equigranular texture. Plagioclase tends to be subhedral, occurring in a more granular matrix of quartz nad microcline. Biotite books cluster on grain boundaries. The rock has been mildly altered in the low mesozone.

Plagioclase is flecked with scales of muscovite and minor calcite. That which survives is albitic, showing degenerate twinning. Biotite is replaced by muscovite clouded with leucoxene. Microcline is fresher but may be corroded by hematite-stained hydromicas.

The estimated mineral percentages are: quartz 28%, microcline 37%, plagioclase 25%, muscovite 8%, calcite 1%, magnetite 0.5%, leucoxene 0.5%, apatite tr., zircon tr., hematite tr..

CWT - 10 665-685(6)

The original rock was probably a siltstone, a fine grained sediment composed mainly of quartz and interstitial argillic matter. The rock has been hornfelsed in the epi-mesozone.

Quartz grains are fresh and clear. They remain small although they have grown sufficiently to coalesce along simple grain boundaries. Just as often, however, scales of sericite derived from argillic matter are packed randomly into the grain boundaries. In some laminae fresh orthoclase is intergrown with the quartz. Traces of pyrite are sparingly disseminated.

Volume percentages of minerals are estimated as: orthoclase 15%, quartz 44%, sericite 40%, pyrite 1%.

CWT - 10 685-705(7)

The rock is a granite or acid quartz monzonite of equigranular texture. The plagioclase tends toward subhedral habit while interstitial quartz and microcline are more nearly granular. Very thick biotite books lie on grain boundaries.

The rock is laced with thin mylonite zones that cut cleanly through. These carry very fine angular quartz and feldspar rubble that show little alteration. In places calcite and kaolin may replace feldspars. These effects are most obvious in the walls where both plagioclase and microcline are heavily altered to coarse granular calcite set in a fine paste of kaolin. Calcite lenses may even develop in biotite.

CWT - 10 765-785(8A)

The rock is a granite. Scattered plagioclase grains are squarish subhedra set in a matrix of coarser microcline and quartz. The microcline is poorly ordered and stippled with perthitic plagioclase. Thin biotite books and strings of magnetite grains lie on grain boundaries. Epizonal alteration has been mild.

Plagioclase is dusted with tiny shreds of sericite and patches of calcite. Biotite is similarly but entirely altered. A network of hairline fractures cuts the fabric, frequently in microcline cleavages. These carry calcite set in a paste of kaolin. Where such fractures cut plagioclase cores, they are reduced to a scaly mush of kaolin.

The estimated original mineral percentages are: quartz 15%, plagioclase 21%, microcline 60%, magnetite 2%, biotite 1%, zircon tr., apatite tr., sphene 0.5%.

CWT - 10 765-785(8B)

The rock is a dacite, doubtless a thin hypabyssal unit. It carries a few cracked or broken plagioclase phenocrysts. These lie in a matrix that seems to have been streaky glass initially, devitrifying and autobrecciating during emplacement. The matrix also hosts crackled xenoliths of microcline granite. Epizonal alteration has been moderate.

The matrix is replaced by coarse cherty quartz with a web-like network of sericite scales trapped on grain boundaries. In more severely autobrecciated areas dense cherty quartz may occur almost exclusively. Plagioclase phenocrysts, however, are only lightly flecked with coarse sericite.

CWT - 10 785-805(9A)

The original rock appears to have been a clastic sediment. It carried trains of quartz clasts and small bits of granitic debris in a finer, thick-bedded silty quartz-feldspar matrix. The rock has been hornfelsed in the mesozone.

Generally quartz and orthoclase remain fresh and partly recrystallized, sometimes forming granophric aggregates. Sericite occurs with coarser detrital quartz or in pods suggestive of altered plagioclase clasts. It was also noted as a retrograde product replacing scattered andalusite prisms. A few lacy crystalloblasts of torumaline were also noted. Pyrite grains are widely scattered in the matrix.

CWT - 10 785-805(9B)

The rock is a granite of almost pegmatitic texture. Although hosting subhedral plagioclase laths, the fabric is dominated by much coarser microcline and quartz that interlock on angular or irregular grain boundaries. Small biotite books once clustered on grain boundaries. Epi-mesozonal alteration has been mild.

Muscovite replaces biotite entirely in situ. It is also commonly scattered heavily in plagioclase, the remainder now quite albitic. Highly irregular, branching veinlets of calcite cut the fabric, being especially well developed in microcline.

Minerals are present in the following estimated amounts: quartz 42%, microcline 32%, plagioclase 16$, muscovite 7%, calcite 3%.

CWT - 10 785-805(9C)

The rock is a pegmatitic granite containing very large anhedra of poorly ordered microcline. Plagioclase occurs as lath-like crystals embedded in microcline. They are somewhat corroded, and the nearby microcline is apt to be perthitic. Beads of quartz and clusters of small but thick biotite books occur as inclusions in the microcline. Epi-mesozonal alteration has been mild.

Microcline remains fresh while biotite is entirely replaced by muscovite. Coarse sericite shreds are scattered in the plagioclase. The fabric is cut by a network of very thin, irregular veinlets of kaolin and cherty quartz. Calcite blotches may occur in nearby plagioclase.

CWT - 10 785-805(9D)

The rock is a quartz monzonite aplite, probably a hypabyssal unit. It consists of nearly granular quartz, microcline, and plagioclase, the grains interlocking only slightly and of perfectly uniform size. Only a few thin biotite books are present on grain boundaries. Epizonal alteration has been feeble.

Although biotite is altered to sericite, quartz and feldspars remain perfectly fresh and wholly unrecrystallized. Thin veinlets of calcite cut the fabric or cement breccia zones. Plagioclase clasts caught up in them may be kaolinized.

An estimate of the rock mode is: quartz 38%, microcline 33%, plagioclase 24%, sericite 0.5%, calcite 2%, magnetite 1%, zircon tr., leucoxene tr., kaolin tr., apatite tr., hematite tr..

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

REPORT OF ANALYSIS

JOB NO. TYE 001
MAY 30, 1980

Mr. Oliver B. Kilroy
4625 E. Broadway, Suite 110
Tucson, Arizona 85711

Analysis of 9 Drill Cutting Samples

ITEM	SAMPLE NO.	Au ppm	Ag ppm	F ppm
1	CWT#10 4-20	<.02	2.2	1100.
2	CWT#10 100-120	<.02	.2	N/R
3	CWT#10 220-240	N/R	N/R	560.
5	CWT#10 400-420	<.02	.2	480.
7	CWT#10 605-625	N/R	N/R	520.
9	CWT#10 785-805	<.02	<.2	480.

NOTE: N/R denotes analysis not requested.

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

REPORT OF SPECTROGRAPHIC ANALYSIS

JOB NO. TYE 001
MAY 30, 1980

Mr. Oliver B. Kilroy
4625 E. Broadway, Suite 110
Tucson, AZ 85711

Analysis of 9 Drill Cutting Samples

The attached pages comprise this report of analysis. Values are reported in parts per million (ppm), except where otherwise noted, to the nearest number in the series 1, 1.5, 2, 3, 5, 7, 10, etc. within each order of magnitude. These numbers represent the approximate boundaries and midpoints of arbitrary ranges of concentration differing by the reciprocal of the cube root of ten. The 'accepted' value is considered to be within + or - 1 step of the range reported at the 68 % confidence level and within + or - 2 steps at the 95 % confidence level.

William L. Lehmbeck
Manager

Charles E. Thompson
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James A. Martin
Arizona Registered Assayer No. 11122

SKYLINE LABS, INC.

P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

ITEM NO.		SAMPLE NO.
1	=	CWT#10 4-20
2	=	CWT#10 100-120
3	=	CWT#10 220-240
4	=	CWT#10 300-320
5	=	CWT#10 400-420
6	=	CWT#10 505-525
7	=	CWT#10 605-625
8	=	CWT#10 705-725

ITEM	1	2	3	4	5	6	7	8
ELEMENT								
Fe	7%	3%	2%	3%	3%	3%	3%	3%
Ca	.02%	<.02%	.7%	.5%	.5%	.5%	.5%	.5%
Mg	.1%	.07%	.07%	.1%	.07%	.07%	.07%	.07%
Ag	2	<1	<1	<1	<1	<1	<1	<1
As	<500	<500	<500	<500	<500	<500	<500	<500
B	50	50	30	20	15	15	20	15
Ba	100	200	500	700	500	500	500	500
Be	5	2	3	3	3	3	3	3
Bi	15	<10	<10	<10	<10	<10	<10	<10
Cd	<50	<50	<50	<50	<50	<50	<50	<5
Co	<5	5	<5	<5	<5	<5	<5	<5
Cr	10	10	15	20	10	15	15	20
Cu	700	70	2	2	2000	10	<2	<2
Ga	<10	<10	<10	<10	<10	<10	<10	<10
Ge	<20	<20	<20	<20	<20	<20	<20	<20
La	<20	<20	<20	<20	<20	<20	<20	<20
Mn	500	700	700	1000	700	700	700	700
Mo	15	5	2	<2	<2	<2	<2	<2
Nb	20	<20	<20	<20	<20	<20	<20	<20
Ni	<5	10	5	7	7	7	7	7
Pb	300	20	20	20	50	30	50	70
Sb	<100	<100	<100	<100	<100	<100	<100	<100
Sc	15	<10	<10	<10	<10	<10	<10	<10
Sn	<10	<10	<10	<10	<10	<10	<10	<10
Sr	<100	<100	150	200	200	300	300	300
Ti	5000	1500	1500	1500	1500	1500	1500	1500
V	150	30	30	30	30	30	30	30
W	<50	<50	<50	<50	<50	<50	<50	<50
Y	20	30	<10	<10	<10	<10	<10	<10
Zn	<200	<200	<200	<200	200	<200	<200	<200
Zr	300	200	100	150	100	100	150	50

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

ITEM NO. SAMPLE NO.
9 = CWT#10 785-805

ITEM 9

ELEMENT	
Fe	2%
Ca	.5%
Mg	.07%
Ag	<1
As	<500
B	15
Ba	500
Be	2
Bi	<10
Cd	<50
Co	<5
Cr	10
Cu	<2
Ga	<10
Ge	<20
La	<20
Mn	1000
Mo	<2
Nb	<20
Ni	7
Pb	50
Sb	<100
Sc	<10
Sn	<10
Sr	200
Ti	1500
V	20
W	<50
Y	<10
Zn	<200
Zr	70

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James A. Martin
Arizona Registered Assayer No. 11122

P. O. Box 872
Douglas, Arizona 85607
December 30, 1973

Oliver B. Kilroy
Suite 212
Tucson Title Insurance Building
45 West Pennington
Tucson, Arizona 85701

Dear Mr. Kilroy:

I have reviewed the mass of material on the CWT property that you loaned me. Even more valuable was a review of the thin sections in my possession, including two new ones prepared from Anaconda holes 1208 and 1078. These two descriptions are appended.

From a review of the drill logs the section can be summarized as one capped with fanglomerate, then arkoses becoming more calcareous downward, passing into limestones and gypsiferous beds in places. Below these beds, when all or part are preserved, is a coarse quartz monzonite lying beneath the San Xavier thrust. Some thrust strands must pass through the sediments but these have no particular significance since rocks above and below show similar metamorphic effects. More important is the fact that the "granite" below has not been thermally metamorphosed at all and thus comes from a different premetamorphic environment completely.

As drill holes pass downward through the arkose-limestone section thermal metamorphic effects gradually increase. At lower grades the new metamorphic assemblage includes chlorite and epidote forming from mafites and plagioclase in the arkosic rocks and from clay- carbonates in impure limy rocks. This epizonal metamorphic assemblage at least is virtually universal throughout the area. Wherever more calcareous units are preserved below the arkoses and above the thrust zone they show variable degrees of metamorphism that invariably include upper mesozonal assemblages (i.e. -diopside or garnet). In the area of the CWT property, and in rocks above the thrust, metamorphism generally increases in grade and intensity with depth and shows no significant lateral zoning. Higher grade assemblages, where they occur, represent the presence of rocks more reactive to thermal metamorphism rather than thermal zoning.

Sulfides occur in the metamorphic rocks in veins and interstitial blebs that are related to retrograde metamorphism. There is no evidence I know of that proves that the sulfides were introduced hydrothermally - at least by solutions whose stability was at variance with the late metamorphic solutions inherently present in the metasediments following the peak of thermal metamorphism. This arkosic unit, in several areas in southern Arizona, carries anomalous values in Cu-Pb-Zn, and it seems quite plausible that some contribution by syngenetic sulfides may be present and that they have been remobilized (during retrograde metamorphism) in the metasediments. Metal zonation around a porphyry copper system precludes the possibility of uniform mixing of Pb with Cu-Zn as occurs in these rocks.

Because of the thrusting, the igneous rock probably responsible for the metamorphism in the upper plate was not seen in any holes, unless it be the diorite reported in some of the logs. Any hope of finding sizeable tonnages of ore in the upper plate seems unfounded, then, for the following reasons:

1) metamorphism was dry thermal baking with no active transfer of materials as is so common between intrusive and its walls in important contact metasomatic deposits

2) there is reason to believe that at least some of the Cu-Pb-Zn in the metasediments was syngenetic, implying the likelihood of even distribution and low concentrations of the metals in the meta-sediments

3) fairly complete drilling has shown no important concentrations of metals and has, of course, demonstrated that the "favorable ground" is truncated below

Turning, then, to the rocks and alteration below the thrust, the problem is a different one. The rock type below is everywhere the same - a coarse quartz monzonite. This was a deep-seated intrusive that cooled slowly and there is no evidence to refute the suggestion that it is Precambrian. This intrusive is thus a potential wallrock for metallization, or at least a possible recipient of alteration. Its uniform composition throughout the area should make alteration zoning studies simpler since no allowances need be made for original compositional variations or reactivity.

Most of the older drill holes penetrated this intrusive but were soon stopped. This results in a series of "peep-holes" that are never far below the thrust fault.

The fact that the intrusive has been altered twice has been discussed in my letter of December 12, 1973 and it need only be said that the earlier event is doubtless an old one that cannot be related to the metamorphism evident in the overlying sediments.

The second alteration episode is closely related to crushing or brecciation and this tectonic episode was undoubtedly the San Xavier thrusting. Sulfides (pyrite, chalcopyrite, rare molybdenite) were distributed throughout the quartz monzonite in minute amounts and always in or near open fractures. Sulfides also were distributed in the thrust zone itself, a fact generally recognized by other workers. Since the zone itself offers the best "conduit", sulfide abundance generally decreases below in the intrusive. There is evidence (especially in T-57) that this mineralization affected the upper plate as well, and the influence of this metallization on the preexisting mineralization is unknown but probably minor.

In the only well-studied vertical section (T-1) the sulfide abundance and amount of alteration decrease down hole but the *grade* of alteration increases. Hydrothermal alteration is exceedingly feeble in T-1 but it is present, and its slow change with depth suggests that T-1 is distant from a possible source worthy of search.

All of the other slides of the quartz monzonite were closely studied and compared with one another. These rocks fall essentially into two categories:

1) fresh, excepting carbonate veining in open "brittle" fractures (and excepting, of course, older alteration)

2) weakly altered hydrothermally with the assemblage kaolin-sericite-barite-anhydrite-fluorite-quartz.

The fresh, or least altered rocks occur in the south and center of the area. The hydrothermally altered rocks occur in the north and east with strongest effects in the Anaconda holes along the east-center boundary of the property.

The alteration zoning picture, then, is one of slightly increasing alteration to the east or northeast. This is a two-dimensional picture, however, for only T-1 penetrates an adequately studied column of intrusive. Based on the experience provided by T-1 it seems unlikely that vertical zoning will change significantly except possibly at prohibitive depths. It is more reasonable to assume that the zoning is indeed toward some source at considerable distance to the east-northeast. To prove that vertical zoning could lead to a deposit within the property boundaries would require deepening several older holes to a depth commensurate with T-1, a course I cannot recommend.

I shall now address myself to the specific questions you left with me.

1.) The epidote in CWT-3-634 is of metamorphic age derived from "albitization" of plagioclase during metamorphism in the upper plate. Epidote in T-1-2471 derives from albitization of plagioclase also, but this was an older event (first alteration of the quartz monzonite). In T-12-1140 epidote derives from alteration of biotite- this epidote is probably of identical age as in T-1-2471. The processes of epidote formation are numerous and occur often; in none of these three samples is it related to metallization.

2.) Most of the hematite referred to in T-1-2471 is "old" - derived from biotite during its destruction during the older alteration event. Some is supergene, derived by recent oxidation of minerals previously present in the rock, but not from sulfides.

3.) Sausserite usually forms from plagioclase during cooling of the rock. In the case of CWT-3-634 the cooling-down followed the metamorphism. In T-1-1975 the sausserite formed during the earlier alteration episode.

4.) The sericite that I relate to crushing is not deuteric. In these rocks crushing has reduced plagioclase grain sizes, thus enhancing the alteration of plagioclase to sericite.

I hope this adequately explains my findings. As always, please feel free to call to discuss this. I shall hold your reports until you are astisfied that the results of this study are clear to you; they can be mailed - if you wish.

Best regards,

Sidney A. Williams

SAW:bj

P. O. Box 872
Douglas, Arizona
January 3, 1974

Oliver B. Kilroy
Suite 212
Tucson Title Insurance Building
45 West Pennington
Tucson, Arizona 85701

Dear Mr. Kilroy:

In response to your call today, I will be happy to comment on alternatives to those mentioned in my report of last week. My conclusion was that alteration zoning seen in the granites below the thrust fault increases in grade to the east or northeast. There is no information available now to disprove my conclusion that the source of alteration lies in this direction; and the burden of proof really rests upon any theory that would place the source in another direction. An alternative explanation of the zoning I found is certainly conceivable, however.

The essence of the "burden" of proof for an alternative hypothesis is more drilling. In this event, I would recommend re-entering and deepening holes T-9 and A-1208 both with an additional 2000 feet of drilling. This would give three holes for "triangulation" of alteration effects horizontally as well as a test of alteration with depth. If this new information showed zonation of alteration back to the west, further drilling in the westerly portions of the property might be justified.

Best regards,

Sidney A. Williams

SAW:bj

9209

(1) PX-5 1500 Ft.

The specimen is a quartz monzonite composed of subhedral, well-formed plagioclase crystals in a matrix of equally coarse or coarser microcline and quartz. Biotite originally was a minor accessory clustered with apatite, magnetite, and sphene.

The microcline shows crystalloblastic growth and encloses perthitic stringers of optically oriented and twinned plagioclase. Biotite is partly altered to calcite, sphene to leucoxene, and magnetite to hematite. The plagioclase is speckled with sericite flakes and irregular patches of calcite. Alteration has been mild, and epizonal.

Minerals are present in the following estimated amounts: quartz 23%, microcline 33%, plagioclase 35%, sericite 3%, magnetite and hematite 1%, leucoxene 0.5%, biotite 0.5%, calcite 4%, and traces of apatite.

9219

(2) A 1209 1362 Ft.

The specimen is a granodiorite (despite the name, it is like 9209) composed of clusters of equant plagioclase subhedra set in a granular quartz matrix. Microcline occurs as crystalloblasts which are not perthitic but do contain isolated blebs of quartz and plagioclase. Biotite is quite fresh but is laminated with calcite. Sphene is wholly replaced by leucoxene and calcite. Magnetite is largely altered to hematite.

Hydrothermal alteration is feeble to nil and is related to mild granulation of the fabric. Here, especially, sericite shreds occur in plagioclase and calcite derived from plagioclase occurs in veinlets.

Minerals are present in the following estimated amounts: quartz 25%, plagioclase 45%, microcline 20%, calcite 5%, sericite 1%, magnetite 1%, biotite 2%, and leucoxene 0.5%.

9220

(3) T-57 1143 Ft.

The specimen is a quartz monzonite (like 9209) composed of large subhedral plagioclase crystals set in an equally coarse quartz-microcline matrix. The fabric has been crushed and alteration in the epizone related to this has been feeble.

Plagioclase is moderately sericitized and cut with late stringers of calcite. Biotite, originally a minor accessory, has merely been altered to hydrobiotite. Magnetite is replaced by hematite and sphene by leucoxene.

Minerals are present in the following estimated amounts: quartz 28%, plagioclase 38%, microcline (perthite) 25%, calcite 3%, magnetite 0.5%, sericite 2%, hydrobiotite 2%, and traces of leucoxene.

9221

The specimen originally was a quartz monzonite much like 9209. Extreme crushing and mild shearing has virtually destroyed the texture; only a few remnants of coarse quartz and microcline or plagioclase survive.

(4.)

The microcline is mostly just granulated, but crushed plagioclase is wholly altered to kaolin. Original biotite present is quite fresh but shows bleaching effects. It contains inclusions of sphene and epidote. It has not been "drawn" out into fractures and is but slightly bent where surrounded by relic quartz and feldspars.

T-12

1140 FT.

There is no evidence of hydrothermal alteration, and the minor amounts of calcite and sericite in the crushed feldspars are usual in such a case.

9223

The specimen is a granite (despite the name, very similar to 9209) composed of large perthitic microcline crystalloblasts with smaller quartz and subhedral plagioclase grains in the interstices. Plagioclase included in the microcline does not show optical continuity from one patch to another. Small biotite shreds are fresh; it is a minor accessory.

(5.)

Mild crushing has promoted alteration of plagioclase to kaolin. Magnetite is altered to hematite and sphene to leucoxene. Traces of sericite and calcite occur in surviving plagioclase. The fabric is cleanly cut by a later, vuggy calcite vein.

T-31

1311 FT.

Minerals are present in the following estimated amounts: quartz 26%, microcline 47%, plagioclase 22%, (includes kaolin), sericite 3%, calcite 1%, hematite 0.5%, and traces of leucoxene and biotite.

9225

The specimen is a quartz monzonite (like 9209) composed of clusters of subhedral plagioclase set in an equally coarse, or coarser matrix of quartz and microcline. Most of the microcline is not perthitic (some is) and does not show evidence of strong crystalloblastic growth; however, some may enclose plagioclase and quartz. Original biotite is replaced by pennine studded with small grains of epidote.

(6.)

Mild crushing has just crackled the fabric. Plagioclase is spangled with sericite and epidote grains as well as cut by short calcite veinlets. The pennine is "mashed" into interstitial, low pressure pockets. Magnetite is replaced by hematite, leucoxene replaces sphene.

T-39

1231 FT.

Minerals are present in the following estimated amounts: quartz 20%, plagioclase 37%, microcline 28%, sericite 6%, pennine 4%, epidote 2%, hematite 1%, and traces of leucoxene.

9226

The specimen is a quartz monzonite much like 9209. Subhedral plagioclase crystals are randomly oriented in a matrix of coarse quartz and microcline.

Mild crushing has granulated parts of the fabric; others have resisted granulation. Plagioclase is slightly sericitized and seamed with calcite-it is no more altered in heavily crushed areas than elsewhere. Biotite is still fresh but may be dragged out into sheared zones. It is associated with leucoxene and rutile after sphene and pyrogenic apatite. Later coarse calcite veins cut the fabric. There is no evidence of hydrothermal alteration.

Minerals are present in the following estimated amounts: quartz 26%, microcline 38%, plagioclase 20%, biotite 3%, rutile and leucoxene 1%, calcite 8%, sericite 3%, and traces of apatite.

(7.)

A1213

830 FT.

9228

The specimen is a quartz monzonite composed of equant plagioclase subhedra set in a coarse matrix of microcline and quartz. The microcline shows crystalloblastic growth and encloses patches of plagioclase and quartz grains. Quartz has been introduced both prior to and after mild crushing. The later quartz occurs in veinlets with pyrite. Plagioclase is feebly sericitized and contains rare calcite patches-probably related to the episode of crushing. Later alteration, to hydromicas, is closely confined to the walls of quartz-pyrite veins. Small biotite shreds appear to have been dragged into fractures but are fresh. Traces of apatite and magnetite (altered to hematite) are present.

Minerals are present in the following estimated amounts: quartz 50%, plagioclase 22%, microcline 22%, sericite 3%, calcite 1%, and hematite, biotite, and pyrite, 0.5% each.

(8.)

A1078

739 FT.

9229

The specimen is a granite composed of small, almost euhedral plagioclase crystals set in a matrix of coarser microcline and quartz. The microcline is often riddled with perthite stringers. Biotite is bleached and laminated with calcite-it is still associated with accessories such as apatite and magnetite (altered to hematite). Mild crushing in some areas contersts with almost complete pulverization elsewhere. The plagioclase is kaolinized, or spatted with sericite and calcite, especially in the pulverized zones. Sphene is replaced by leucoxene and calcite.

Minerals are present in the following estimated amounts: quartz 26%, plagioclase 16%, microcline 51%, calcite 3%, biotite, leucoxene, and hematite 0.5% each, and traces of apatite and sericite.

(9.)

A1212

1245 FT.

9230

The specimen is a quartz monzonite composed of small equant plagioclase crystals in a somewhat coarser matrix of quartz and microcline. Severe crushing has distorted the entire fabric; alteration associated with it has been virtually nil, however. Biotite is quite fresh; plagioclase is only slightly sericitized. Sphene is replaced by leucoxene and magnetite by hematite.

(10)

Pyrite occurs along fractures with quartz as gangue. Some quartz grains within the fabric also show some crystalloblastic growth.

A 1211

Minerals are present in the following estimated amounts: quartz 29%, microcline 41%, plagioclase 29%, pyrite 0.5%, sericite 0.5%, and traces of biotite, leucoxene, and hematite.

1784 FT.

9231

The specimen is a quartz monzonite composed of coarse quartz with crushed but not disaggregated plagioclase and microcline interstitial. The plagioclase is as thick laths with ragged ends; microcline is only slightly perthitic. Alteration of plagioclase to clays, sericite, and calcite is minor.

(11)

Biotite is quite fresh, only slightly bleached, and occurs with traces of apatite and altered magnetite. Veins of very fine-grained quartz cut crushed zones. Calcite in the interstices of the fabric may be stained with hisingerite.

A 1210

1766 Ft.

Minerals are present in the following estimated amounts: quartz 30%, microcline 35%, plagioclase 30%, biotite 1%, calcite 3%, and traces of apatite, hematite, hisingerite, and sericite.

9232

The specimen is a granodiorite composed of large clusters of coarse, slightly lath-like plagioclase with finer grained interstitial microcline and quartz. Sphene, once common, and as large euhedra, is replaced by calcite and leucoxene.

(12)

The fabric is cut by a band of mylonitization. All minerals are pulverized beyond recognition in this zone. Later siderite occurs as inclusion-filled crystalloblasts in this zone along with small anhedra of anhydrite. Hydrothermal alteration has been epizonal.

A 1208

Minerals are present in the following estimated amounts: quartz 15%, plagioclase 60%, microcline 18%, siderite 4%, anhydrite 2%, and leucoxene 0.5%.

1571 FT

9338

The specimen is a microbreccia (sediment) composed of angular quartz, microcline, and plagioclase fragments set in a recrystallized, fine-grained matrix of quartz and feldspars. Detrital heavy minerals occur in small amounts and are less angular.

Mild hydrothermal alteration in the epizone has resulted in replacement of plagioclase by sericite <u>in situ</u>. Small calcite grains occur in the interstices throughout. Late gypsum veins cut the fabric but do not appear to have replaced anhydrite in place.

Minerals are present in the following estimated amounts: quartz 35%, microcline 34%, plagioclase 15%, pyrite 1%, calcite 6%, sericite 5%, gypsum 0.5%, and traces of apatite, zircon, magnetite, and tourmaline.

(13)
T-1
1109 FT.

9353

The specimen is a quartz monzonite composed of subhedral plagioclase crystals set in a coarser matrix of microcline and quartz. Quartz tends to be segregated. The microcline contains optically oriented plagioclase perthite stringers.

Intense crushing has destroyed textures in some areas; elsewhere it is incipient and appears as granulation along grain boundaries. Plagioclase is veined slightly with calcite where fractures but sericite is virtually absent. Biotite is sheared and bleached but has not migrated and still occurs with apatite and other accessories.

Minerals are present in the following estimated amounts: quartz 18%, microcline 45%, plagioclase 28%, biotite 2%, leucoxene 1%, calcite 5%, hematite 0.5%, and traces of apatite and sericite.

(14.)
T-11
1255 FT.

9396

The specimen is a meta-diabase composed of small plagioclase laths with abundant small hornblende prisms filling the interstices. Orientations are random.

The hornblende is the product of mesozonal metamorphism. Plagioclase has been only modestly affected-crystal cores are filled with inclusions of sericite and epidote. Sphene and apatite are accessoires. Small patches of calcite locally occur in the interstices of the matrix.

Veins of analcime, laumontite, and calcite cut the fabric. Some analcime is also disseminated in the fabric.

Minerals are present in the following estimated amounts: plagioclase 39%, sericite 5%, hornblende 44%, biotite 3%, sphene 0.5%, orthoclase (in veins) trace, apatite 1%, epidote 2%, calcite 2%, analcime 2%, and laumontite 0.5%.

(15.)
T-33
334 FT

9482

(16.)

T-9

1540 FT.

The specimen is a granite showing effects of severe crushing. Most stable has been microcline which occurs as large, non-perthitic relics which are the last mineral to be disaggregated. Quartz is partly to severely crushed and plagioclase, whether wholly or partly crushed, is now altered to sericite and calcite as a result. Biotite is also wholly gone, and may be represented by the traces of hematite and hisingerite now present.

Pyrite occurs in late veins, unrelated to the feeble alteration attendant upon crushing. Clay is the gangue for the pyrite. Late calcite veins all.

Minerals are present in the following estimated amounts: quartz 28%, microcline 44%, plagioclase 5%, sericite 7%, calcite 15%, and traces of pyrite, leucoxene, and hematite.

9483

(17.)

T-27

197 FT.

The specimen is a granite composed of subhedral plagioclase set in a matrix of microcline and granular quartz. The microcline is non-perthitic and occurs as large crystals which may envelop quartz but do not replace plagioclase. Biotite is not in evidence but there are clusters of magnetite and apatite.

The rock has been slightly fractured with no crushing. Calcite and sericite occur in veins in these fractures-there is no alteration of the walls.

Minerals are present in the following estimated amounts: quartz 30%, microcline 48%, plagioclase 15%, sericite 1%, calcite 4%, magnetite 1%, and apatite 0.5%.

9488

(18.)

Russ Todd
Sec. 21 Hole

450 FT.

The specimen is a quartz monzonite composed of subhedral plagioclase crystals set in a coarser, xenomorphic - granular matrix of quartz and microcline. The microcline is slightly perthitic and may enclose quartz and plagioclase. The plagioclase is slightly altered to sericite in the crystal cores.

Biotite is heavily altered to pennine which is laminated with calcite. The usual accessories-apatite, fresh magnetite, etc. are clustered with the biotite. Sphene is altered to rutile.

The rock shows no evidence of alteration or crushing.

Minerals are present in the following estimated amounts: quartz 23%, microcline 26%, plagioclase 38%, pennine 5%, biotite 1%, rutile 1%, calcite 3%, magnetite 0.5%, sericite 2%, and traces of apatite.

9489

(19)

A. 1213

1480 FT.

The specimen is a quartz monzonite composed of well-formed plagioclase crystals set in a slightly coarser matrix of quartz and microcline. The microcline is slightly perthitic but shows complex, mutual bouddaries with quartz and plagioclase. Biotite is quite fresh and tends to be clustered with magnetite, zircon, magnetite, and rutile-calcite pseudomorphs after sphene.

Alteratinn is only deuteric and shown by slight sericitization of plagioclase.

Minerals are present in the following estimated amounts: quartz 33%, plagioclase 33%, microcline 28%, biotite 4%, leucoxene and rutile 0.5%, magnetite 0.5%, and traces of calcite, apatite, and sericite.

A-1078 733'

The specimen is a quartz monzonite with a gneissose structure. Large equant plagioclase grains and microcline crystalloblasts are set in a finer grained xenomorphic-granular quartz orthoclase matrix. Microcline crystalloblasts may enclose corroded remnants of plagioclase.

The rock has been granulated, and small (recrystallized) round grains of quartz and feldspars line grain boundaries and fill discontinuous or branching crushed zones. Small flakes of new biotite and granular magnetite tend to occur here. In places biotite has demonstrably replaced plagioclase. Plagioclase is otherwise quite
20 fresh with only minor sericitization. Late ankerite veins fill fractures.

Minerals are present in the following estimated amounts: quartz 26%, microcline 42%, plagioclase 24%, biotite 4%, magnetite 2%, sericite 1%, ankerite 1%, and traces of apatite and sphene.

A-1208 1564'

The specimen is a quartz monzonite composed of large equant plagioclase subhedra set among equally coarse interstitial quartz and microcline grains. Some large microcline crystalloblasts occur
21 and are perthitic. Thick biotite books occur sparingly in the matrix. Epizonal hydrothermal alteration has been pervasive.

Plagioclase is heavily but not totally altered to dense scaly kaolin dotted with irregular calcite grains. Usually the cores are replaced while a thin rim of albitic plagioclase is left unaffected. Biotite is bleached and partly replaced by calcite. Late fractures carry kaolin and coarse granular anhydrite.

Mineral percentages are estimated as: quartz 17%, microcline 28%, plagioclase 5%, kaolin 35%, calcite 8%, biotite 3%, magnetite 1%, leucoxene 1%, apatite 0.5%, anhydrite 1%, and traces of zircon.

28

The rock is a coarse arkose with numerous pebbles of granitic rock and clasts of quartz, plagioclase, and microcline similarly derived. There are fewer pebbles of chert, sandstone, and siltstone. The rock was mildly crushed prior to epizonal metamorphism.

As a result of this the matrix is cemented with coarse calcite enveloping scattered subhedra of epidote and pyrite. Bunches of coarse pennine line the "vein" walls and may replace adjacent plagioclase as well as mafites. Plagioclase also tends ot be selectively replaced by calcite, sericite, and epidote. Quartz is recrystallized throughout the rock and may indent matrix calcite as euhedral crystals.

CWT- T41- 974/984

CWT PROPERTY
PETROGRAPHIC
WORK [illegible]
THRU T-[illegible]
AND T-1[illegible]

P. O. Box 872
Douglas, AZ 85607
June 22, 1974

Oliver B. Kilroy
Suite 212
Tucson Title Insurance Building
45 West Pennington
Tucson, AZ 85701

Dear Oliver:

Enclosed are the last three rock descriptions. The rock in T-56 and T-19 is again the "granite" of supposed Precambrian age. Alteration (pyrite-calcite) in both is much like elsewhere in the property, but the grade of alteration is lower in T-19 than in most places.

Pyrite occurs in calcite-filled fractures in the T-23 sample, just as it does in the "granite". Other alteration effects are stronger (zeolites in this case) as they were in the other basic sample I studied last week. Again, I interpret this as due to the greater "reactivity" of the rock. Again, this rock is a tonalite and is, in my opinion, a Precambrian dike or an inclusion of Precambrian age in the "granite".

Best regards,

Sid

Sidney A. Williams

SAW:bj

T-12 1138/48

The specimen is a quartz monzonite composed originally of subhedral plagioclase and equally coarse interstitial quartz and microcline. Biotite books doubtless occurred along grain boundaries with accessory magnetite and sphene. Textural detail has been obliterated by strong crushing.

Most surviving quartz and feldspar grains are strained or cleaved into subparallel mosaics. Thin anastamosing seams of pulverized and poorly healed quartz and feldspars cut the fabric, usually along grain boundaries. Biotite is usually dragged out in these zones as clusters of small flakes. Subsequent alteration was mild and confined to partial chloritization of biotite and sericitization of plagioclase. Late barren calcite veinlets fill fractures.

(22)

An estimate of mineral percentages is: quartz 16%, microcline 35%, biotite 5%, magnetite 1%, leucoxene 1%, sericite 1%, calcite 3%, pennine 3%, apatite 0.5%, plagioclase 32%.

Question by OBK: Does the tan feldspar at the end of the specimen indicate it was basement quartz monzonite or granite prior to alteration, similar to T-44? Previous sample 9221 done in first batch several years ago was in this same zone.

I agree that this is the "basement" granite as in T-44 but fear that the tan feldspar (microcline) you correctly noted is not a reliable indicator of this fact.

6/19/76

T-11 1066

The original rock was a calc-siltstone composed of small subangular detrital grains of quartz, plagioclase, and less orthoclase. The matrix consisted of similar but finer debris and calcite. The rock was subsequently metamorphosed in the mesozone.

Quartz and orthoclase seem little affected but show minor recrystallization. Plagioclase, however, is replaced by micro-
23 crystalline hydromicas and epidote. Scattered throughout the matrix are lacy crystalloblasts of calcite and epidote. In other areas patches of grossularite replace the matrix. Cloudy, irregular epidote grains also occur in healed fractures cutting the fabric, and epidote may vein and replace grossularite. Iron-rich epidote grains occur in veins with pyrite; these veins are filled with coarse anhydrite that was subsequently altered for the most part to gypsum.

Late (recent) crushing has severely deformed and brecciated the rock.

T-11 1283

The specimen is a quartz monzonite composed of large subhedral plagioclase grains and equally large, or larger microcline and quartz anhedra. Microcline encloses ragged perthitic stringers but shows only mild marginal replacement of enclosed plagioclase. Clusters of randomly-oriented biotite flakes occur along grain boundaries with accessories such as magnetite.

The rock is laced with thin crushed zones that need not follow grain boundaries but may cut directly across. These tend to be filled with fresh (healed) microcline. Plagioclase is flecked with irregular grains of calcite and sericite flakes. Biotite tends to alter to smectite and calcite.

24 Pyrite is scattered in grain boundaries and fills crushed zones (fractures) younger than those described above. Additional post-pyrite crushing has been healed by calcite.

Minerals appear in the following estimated amounts: quartz 18%, microcline 33%, plagioclase 37%, calcite 4%, sericite 2%, biotite 3%, smectite 1%, apatite 0.5%, leucoxene 0.5%, pyrite 0.5%, magnetite 1%, zircon tr.

Question by OBK: Is mineral assemblage in vein at arrow of same age as sulphide veins in T-44? What is black gangue mineral(s)?

The dark material in the seam is crushed pyrite. These veins do indeed correlate with those in CWT-44.

T23 411-419

The original rock was a tonalite with large subhedral plagioclase crystals and some coarse interstitial quartz. Splintery hornblende prisms and younger biotite occur in clusters between leucocrates. The rock has been severely crushed, almost mylonitized.

As a result of crushing the rock has taken on the appearance of an augen gneiss, with large cracked and strained eyes of plagioclase set in a pulverized mush of quartz-feldspar rubble that streams around the grain boundaries of plagioclase eyes. Hornblende and particularly biotite tend to
25 be drawn out in, or into crushed zones. (~~in the most severely crushed zones~~.) In the most severely crushed zones the plagioclase is replaced by matted aggregates of stilbite prisms. Elsewhere plagioclase is mildly sausseritized. Pyrite occurs in thin, discontinuous fractures that are post-crushing and is associated with calcite.

Mineral percentages are approximately as follows: quartz 18%, plagioclase 48%, hornblende 9%, biotite 4%, stilbite 15%, hematite 1%, pyrite tr., apatite 0.5%, calcite 1%, orthoclase 0.5%, epidote tr., sericite 2%.

T56 416-425

The specimen is a quartz monzonite composed of large equant but anhedral plagioclase grains set among equally coarse quartz and microcline. The microcline may be streaky perthite or devoid of plagioclase. Thick biotite books lie among grains and tend to cluster with accessories such as magnetite. Epizonal alteration has been weak and related to fracturing.

The rock is crisscrossed with thin, discontinuous fractures that cut grains as well as lying in grain boundaries. These fractures are invariabl filled with calcite, sometimes accompanied by pyrite. Plagioclase is occluded by dust-like calcite and sericite but is relatively fresh; quartz and microclin are fresh and unrecrystallized. Biotite is bleached and shows partial
26 replacement by calcite and smectite.

An estimate of mineral percentages is: quartz 17%, microcline 24%, plagioclase 35%, biotite 4%, calcite 6%, hematite 1%, pyrite 0.5%, leucoxene 0.5%, smectite 0.5%, sericite 1%, apatite tr..

T19 230-234

The original rock was a quartz monzonite of coarse grain size. Subhedral plagioclase grains are set among equally large microcline and quartz anhedra. Larger microcline grains tend to be perthitic, smaller ones are not. Small biotite books lie along grain boundaries. Epizonal alteration is related
27 to shattering and disorientation of grains.

The broken areas are cemented with coarse but irregular calcite grai usually these are heavily stained with hisingerite. Biotite is bleached and shows incipient alteration to smectite. Quartz and microcline are unaffected, showing neither growth nordecay. Plagioclase crystal cores are heavily replace by a mush of microcrystalline kaolin stippled with calcite.

Mineral percentages appear as follows: quartz 26%, microcline 28%, plagioclase 6%, biotite 1%, calcite 22%, hisingerite 2%, kaolin 11%, hematite leucoxene 0.5%, sericite 2%, apatite tr..

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	F ppm	W ppm							
1	* 9314 → 29	330	14							
2	** 9462 → 30	240	<2							

* QUARTZ – TOURMALINE – IRON OXIDES
OUTCROP – 1¼ mi WEST OF T-44
** MINE DUMP – ¾ mi NW T-44
WEST OF GAS PIPELINE

TO:
MR. O.B. KILROY
4625 E. Broadway, Suite 110
Tucson, Arizona 85711
cc: CWT PROPERTIES
Tucson, Arizona 85719

REMARKS: Trace analysis

CERTIFIED BY:

DATE REC'D: 1/9/79
DATE COMPL.: 2/8/79
JOB NUMBER: YAQ 007

SKYLINE LABS, INC.
Hawley & Hawley, Assayers and Chemists Division
1700 W. Grant Rd., P.O. Box 50106, Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

CERTIFICATE OF ANALYSIS

REPORT OF SPECTROGRAPHIC ANALYSIS

alues reported in parts per million, except where noted otherwise, to the nearest number
n the series 1, 1.5, 2, 3, 5, 7 etc.

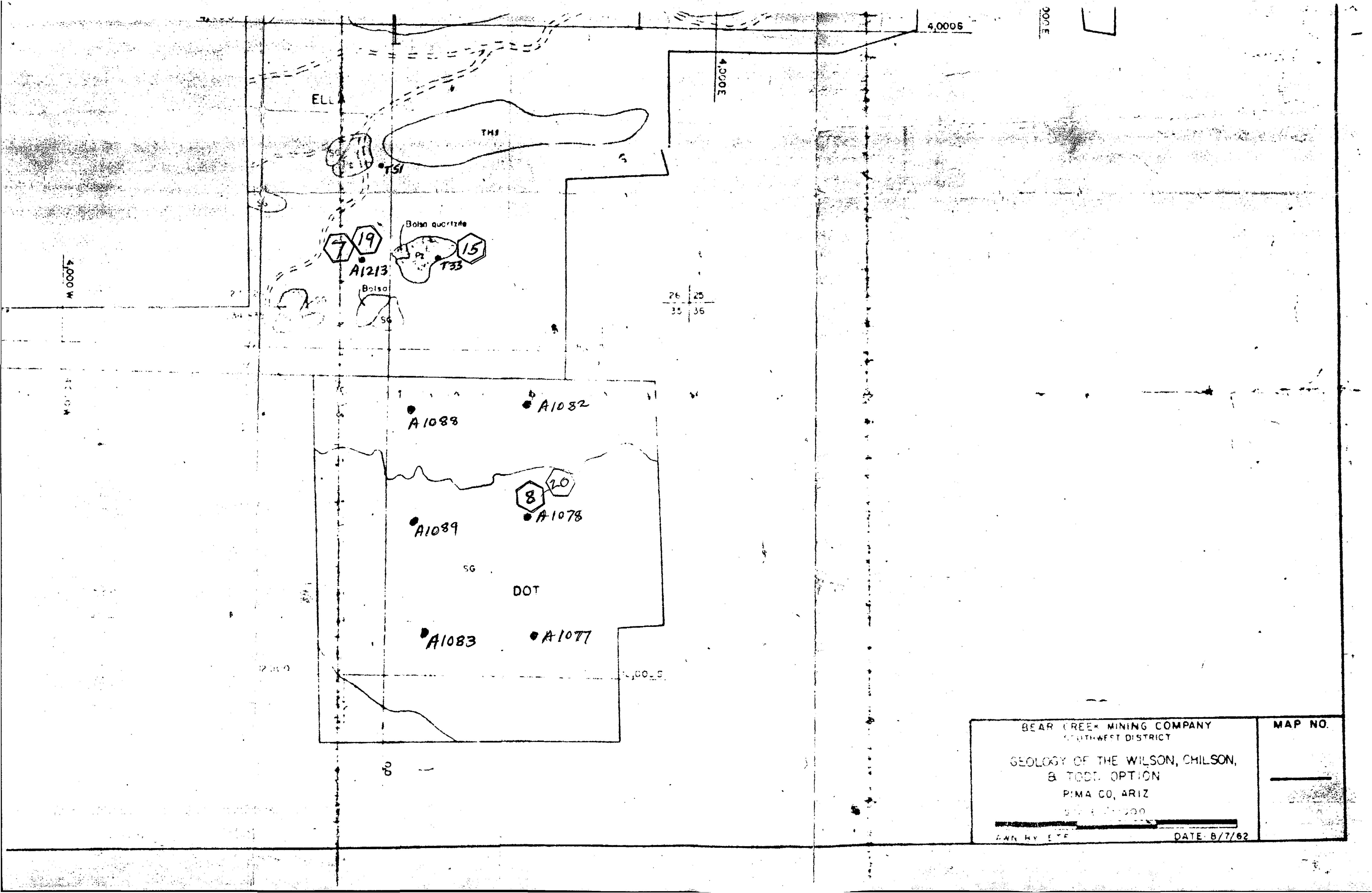
ELEMENT	SAMPLE NUMBERS 9314	9462
Fe	1 %	7 %
Ca	.02 %	<0.02 %
Mg	.05 %	.02 %
Ag	<1 ppm	50 ppm
As	<500	1500
B	100	20
Ba	500	<10
Be	<2	<2
Bi	<10	300
Cd	<50	<50
Co	<5	10
Cr	10	10
Cu	30	2000
Ga	10	<10
Ge	<20	20
La	<20	<20
Mn	200	300
Mo	10	5
Nb	<20	20
Ni	5	10
Pb	100	1000
Sb	<100	500
Sc	<10	<10
Sn	<10	<10
Sr	<50	100
Ti	700	50
V	20	<10
W	<50	<50
Y	<10	<10
Zn	<200	>10000
Zr	200	<20

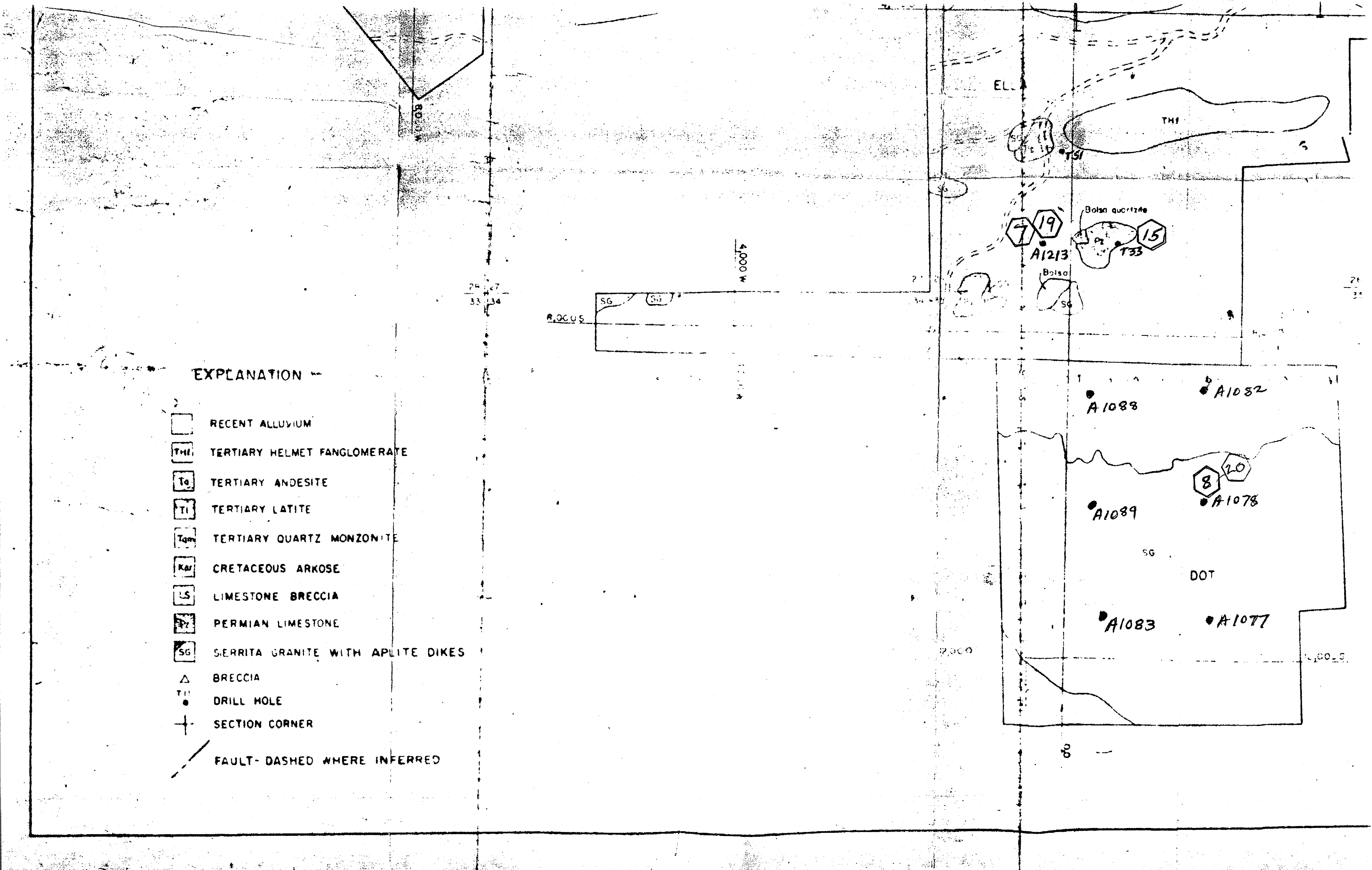
TO:
MR. OLIVER B. KILROY
4625 E. Broadway, Suite 110
Tucson, Arizona 85711
cc: CWT PROPERTIES
Tucson, Arizona 85719

REMARKS:
Spectrographic analysis

CERTIFIED BY:

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
1/9/79	2/8/79	YAQ 007


4,000S
4,000E
ELL
THI
SG
TS1
7
19
Bolsa quartzite
15
A1213
T33
Bolsa
26
25
35
36
4,000 W
A1082
A1088
8
20
A1089
A1078
SG
DOT
A1083
A1077
BEAR CREEK MINING COMPANY
SOUTHWEST DISTRICT
GEOLOGY OF THE WILSON, CHILSON,
& TODD OPTION
PIMA CO, ARIZ
DATE 8/7/62
MAP NO.



EXPLANATION
RECENT ALLUVIUM
THf TERTIARY HELMET FANGLOMERATE
Ta TERTIARY ANDESITE
Tl TERTIARY LATITE
Tqm TERTIARY QUARTZ MONZONITE
Kar CRETACEOUS ARKOSE
LS LIMESTONE BRECCIA
Pz PERMIAN LIMESTONE
SG SIERRITA GRANITE WITH APLITE DIKES
BRECCIA
DRILL HOLE
SECTION CORNER
FAULT- DASHED WHERE INFERRED
8,000 W
4,000 W
8,000 S
12,000
ELL
THf
Bolsa quartzite
Bolsa
SG
Pz
DOT
T51
T33
A1213
A1088
A1082
A1089
A1078
A1083
A1077
7
19
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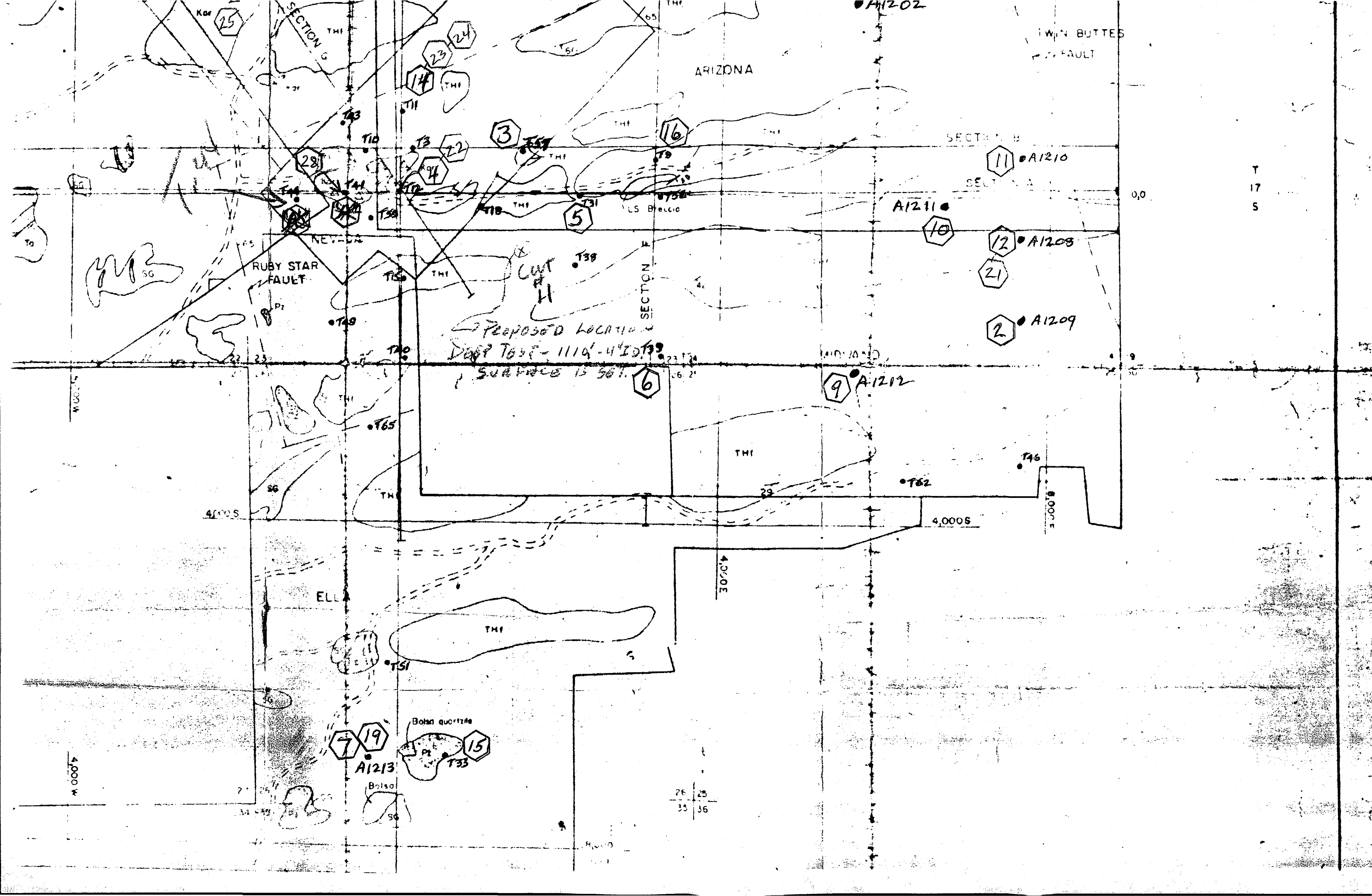
ARIZONA
NEVADA
RUBY STAR FAULT
TWIN BUTTES FAULT
SECTION B
SECTION A
SECTION C
SECTION
Cut #4
Proposed Location
Deep Test – 1110' - 4"ID
Surface is set.
A1202
A1210
A1211
A1208
A1209
A1212
A1213
T17S
0,0
4,000 S
4,000 E
4,000 W
Bolsa quartzite
Bolsa
LS Breccia
THI
SG
T33
T46
T62
T65
T51
T49
T38
T31
T9
T3
T10
T11
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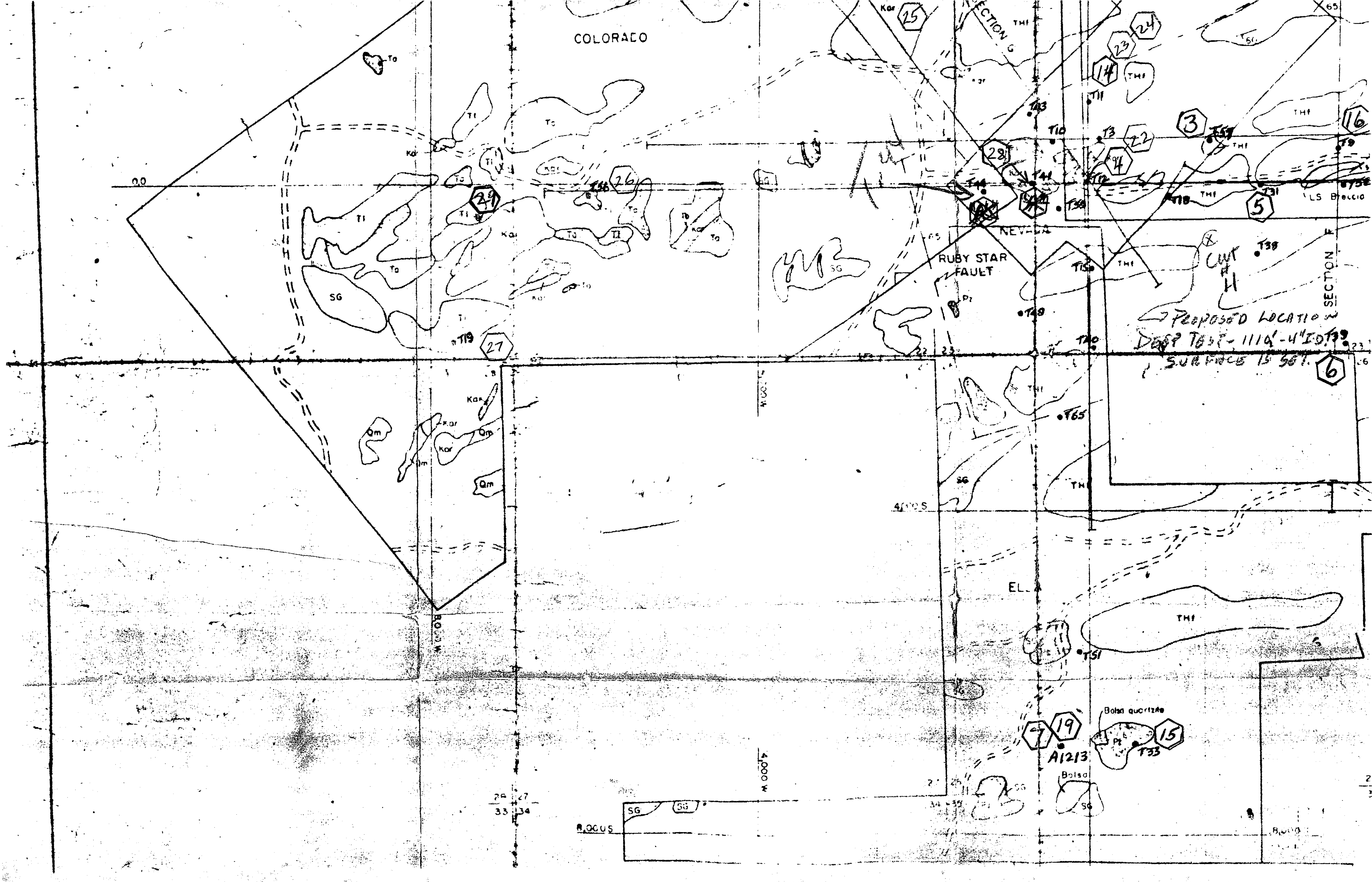
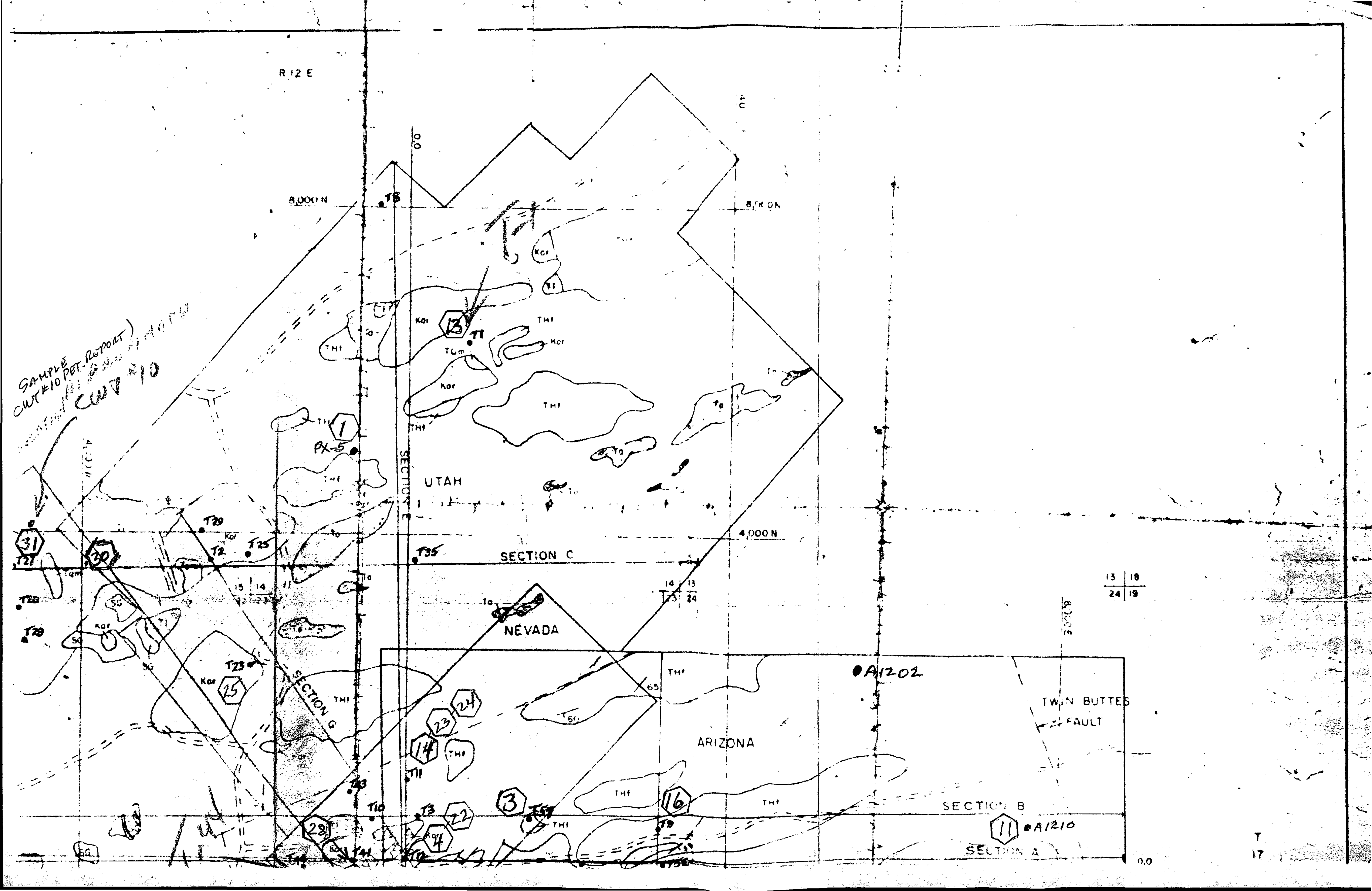
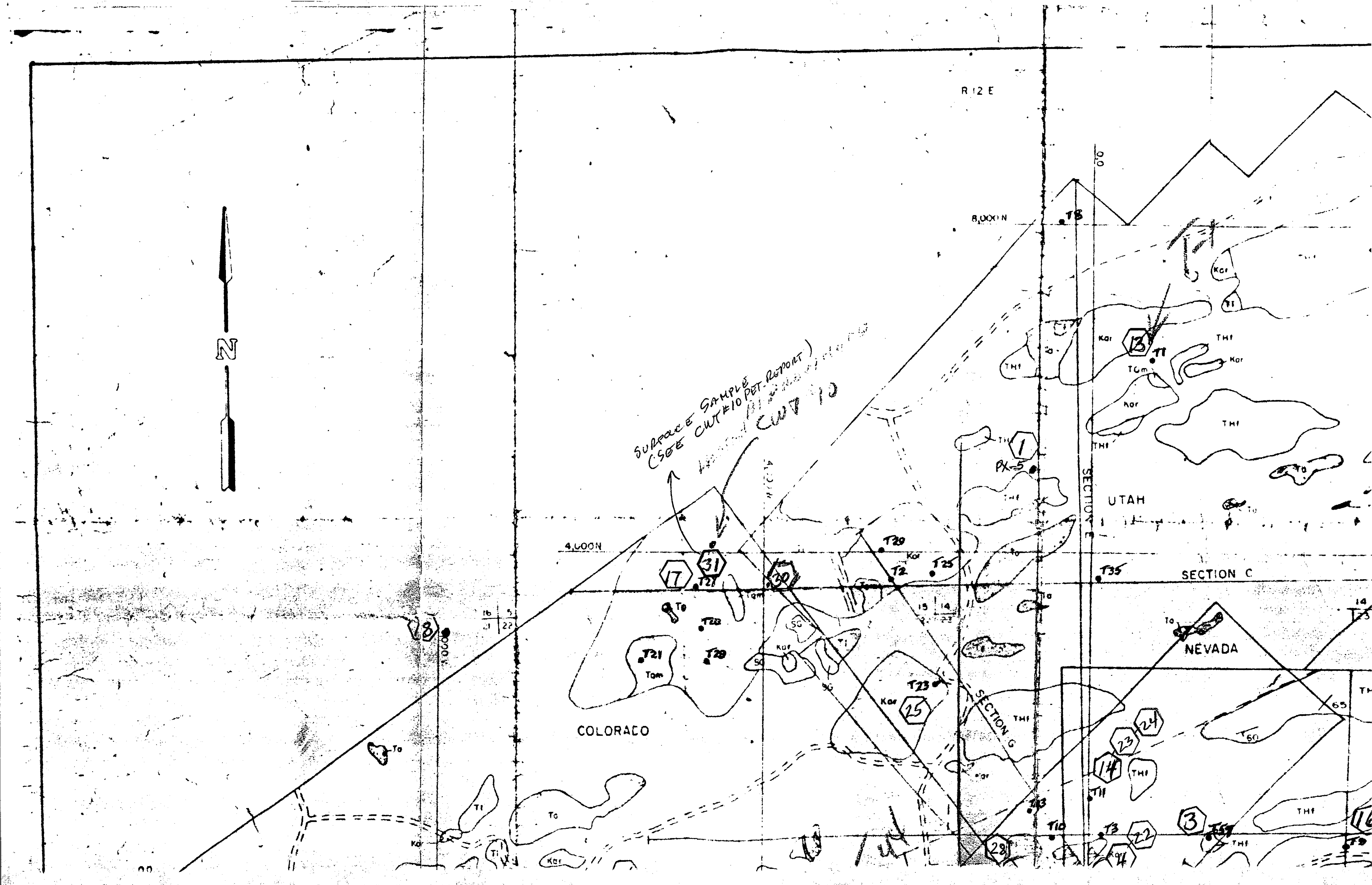
T41
T12
T18
T39


COLORADO
NEVADA
RUBY STAR FAULT
SECTION G
SECTION
LS Breccia
Bolsa quartzite
Bolsa
CUT H
PROPOSED LOCATION
4000 S
4000 W
SG
Thi
Kar
Qm
Ta
Ti


R 12 E
8,000 N
8,000 N
4,000 N
SECTION C
SECTION E
SECTION G
SECTION B
SECTION A
UTAH
NEVADA
ARIZONA
TWIN BUTTES
FAULT
SAMPLE
CWT#10 PET. REPORT)
CWT #10
A1202
A1210
PX-5
0.0
T
17


R12E
8,000N
N
4,000N
SURFACE SAMPLE
(SEE CWT #10 PET. REPORT)
CWT 10
PX-5
UTAH
SECTION C
SECTION E
SECTION G
NEVADA
COLORADO
T8
T1
T29
T2
T25
T35
T27
T21
T23
T10
T3
T11
Kar
THf
Ta
Ti
Tam
SG

T-1

ARTHUR R. STILL
CONSULTING MINING GEOLOGIST
TUCSON, ARIZONA 85704

5115 N. ORACLE (602) 887-5341

December 7, 1973

Mr. Oliver Kilroy
212 Tucson Title Building
Tucson, Arizona

RE: Drill Hole CWT-1-WO

Dear Mr. Kilroy:

In response to your request, I have examined and logged the core from the above hole for the intervals of 1110 feet to 1938 feet, and 1949 feet to 2180 feet. This logging was done during two periods; the uppermost interval on October 6, 1973, at the core shed on your CWT property, and the lower interval at our office in Tucson on October 22, 1973. It appears - from your geochem results - that the hole was taken to a total depth of (at least) 2475 feet. I have not seen the core below 2180 feet, but from the thin section report submitted by Sidney A. Williams (attached) and from your geochem samples 9287-9293 (also attached) it is evident that the hole remained in essentially barren quartz monzonite of the same general character as the last core examined by me.

For background information, this hole was initially started some years ago by Bear Creek Mining Company. It was designated T-1 by Bear Creek, and is located near the center of Section 14, T17S, R12E, as shown in red on the attached map. Bear Creek drilled the hole to a depth of 1109 feet, and for assessment work purposes you deepened the hole during 1973 to a depth of 2475± feet.

I am enclosing herein a Geologic Log (typed, pages) of my own logging (1110-2180), at the beginning of which I have summarized data on the upper part of the hole as taken from a Bear Creek log which you have in your possession. I am also enclosing a graphic log of the 1973 portion of the hole upon which I have shown values for copper (as run by Rocky Mountain Geochemical Corp.) and for copper, lead and zinc (as run by Southwestern Assayers and Chemists). A total of 18 samples were taken by me and these were run - at my request - by Rocky Mountain for copper and molybdenum. The 18 sample intervals were based upon material types, or in uniform lithology were based on even 50 foot or 100 foot intervals. You later took 5 additional samples (from 2209 feet to 2475 feet), obtained the pulps of my earlier 18 samples, and had additional geochem assaying done by Rocky Mountain, Southwestern Assayers and Chemists, and Skyline Labs, Inc., as shown tabulated on the following page:

Geochemical Assays - Hole CWT-1-WO

Interval(1)	Rocky Mountain						SW Assayers				Skyline					
	Cu	Pb	Zn	Au	Ag	Mo	Cu	Pb	Zn	Mo	Au	Ag	Cu	Pb	Zn	Mo
1110-2180(2)	x	x	x	x	x	x	x	x	x	x						
2209-2475(3)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

(1) Two missing intervals; 1938-1949 and 2180-2209
(2) Taken by ARS, 18 samples
(3) Taken by Oliver Kilroy, 5 samples

Copies of all geochemical assay certificates are attached. Only one anomalous molybdenum value was obtained (sample CWT-6, 6ppm by Rocky Mountain and 8ppm by SW Assayers) and this correlates with the area of highest copper, lead and zinc values just above the San Zavier Thrust plane. No anomalous values of gold (all less than 0.1ppm) or silver (all less than 1ppm) were obtained. While the Rocky Mountain values of lead and zinc are somewhat higher than those reported by Southwest they all reflect exactly the same pattern, i.e. a buildup with depth in the sediments and then a rapid drop to background in the underlying quartz monzonite.

I would like to make the following brief comments on the hole. The hole was collared in Cretaceous sediments and remained principally in those sediments (arkose, siltstone, hornfels and very minor limestone) from the collar to a depth of 1356 feet. During this interval at least two small porphyry dikes (1192-1239 and 1293-1306) were intersected by the hole. The sediments display on increasing (geochemical range) content in copper, lead and zinc with depth but they are terminated at depth by the San Xavier Thrust. Below the thrust fault (i.e. below 1384 feet) the hole for the remaining 1091 feet is in an essentially barren quartz monzonite intrusive (probably the Precambrian granite of Cooper USGS Bull. 1112-C, 1960). This intrusive is essentially fresh except for the first few feet under the San Xavier Thrust - where it is crushed and argillized - and within and adjacent to an iron stained shear zone in the interval of 2029-2079. For all intents and purposes the intrusive would, in my opinion, be considered to be unmineralized. There are a very few small grains of visible pyrite and/or chalcopyrite, but such occurrences are in the order of tens of feet, or even hundreds of feet, apart. Geochemically the intrusive contains only background quantities of copper (-10ppm), molybdenum (-1ppm), lead (-15ppm) and zinc (-50ppm). A small rise above background copper values (up to 25ppm) does occur adjacent to the iron stained shear (2029-2079 feet) encountered at depth, but the copper values drop again to 10ppm or less below that structure.

The weakly mineralized sediments (at least having disseminated pyrite) in the upper part of the hole are in the upper plate of the San Xavier Thrust and would be situated about 2-3/4 miles from the center of the Pima-Mission deposit which is also in the upper plate. The fine grained pyritization - as well as weakly anomalous geochem values - found in the sediments are compatible with such a location relative to a major porphyry copper center. The granite rock (quartz monzonite) found below the San Xavier Thrust (i.e. the lower plate) is situated about 5 miles from the center of the Twin Buttes deposit, which is also in the lower plate. The geochemical metal content found in the quartz monzonite by hole CWT-1-WO appears to be compatible with that setting.

Fourteen core samples - all of the quartz monzonite - were submitted (by yourself) to Mr. Sidney A. Williams, a well known petrographer. A copy of his letter report of November 17, 1973, is attached. In his letter Mr. Williams states "alteration in the hole is directly related to crushing and fracturing ...". I am in agreement with this statement, since alteration attributable to hydrothermal processes appears to be entirely lacking. *

It appears to me that this hole was a worthwhile assessment work project since it did constitute a deep test below the San Xavier Thrust in the northern part of your CWT property.

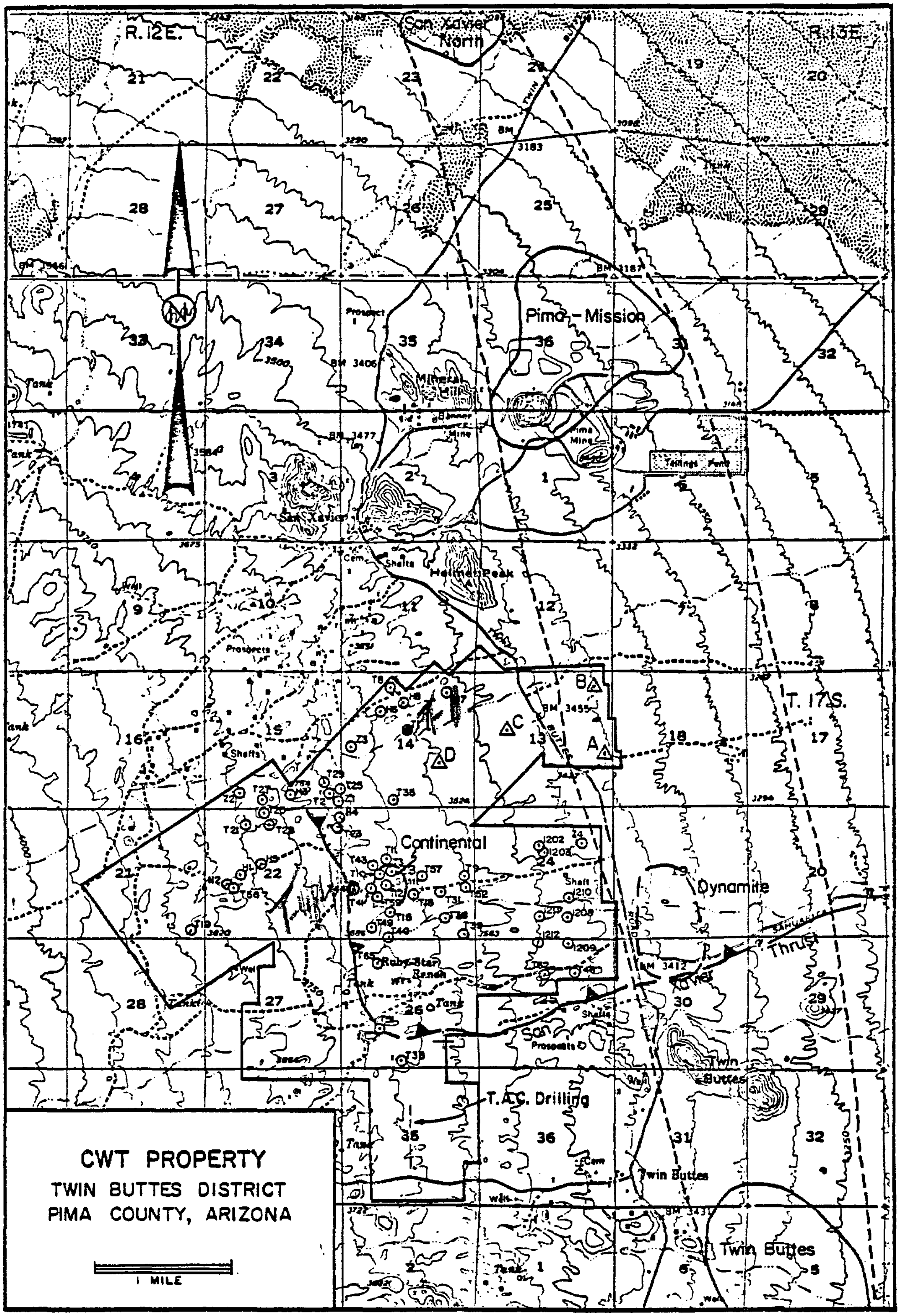
Very truly yours,

[signature]

Arthur R. Still

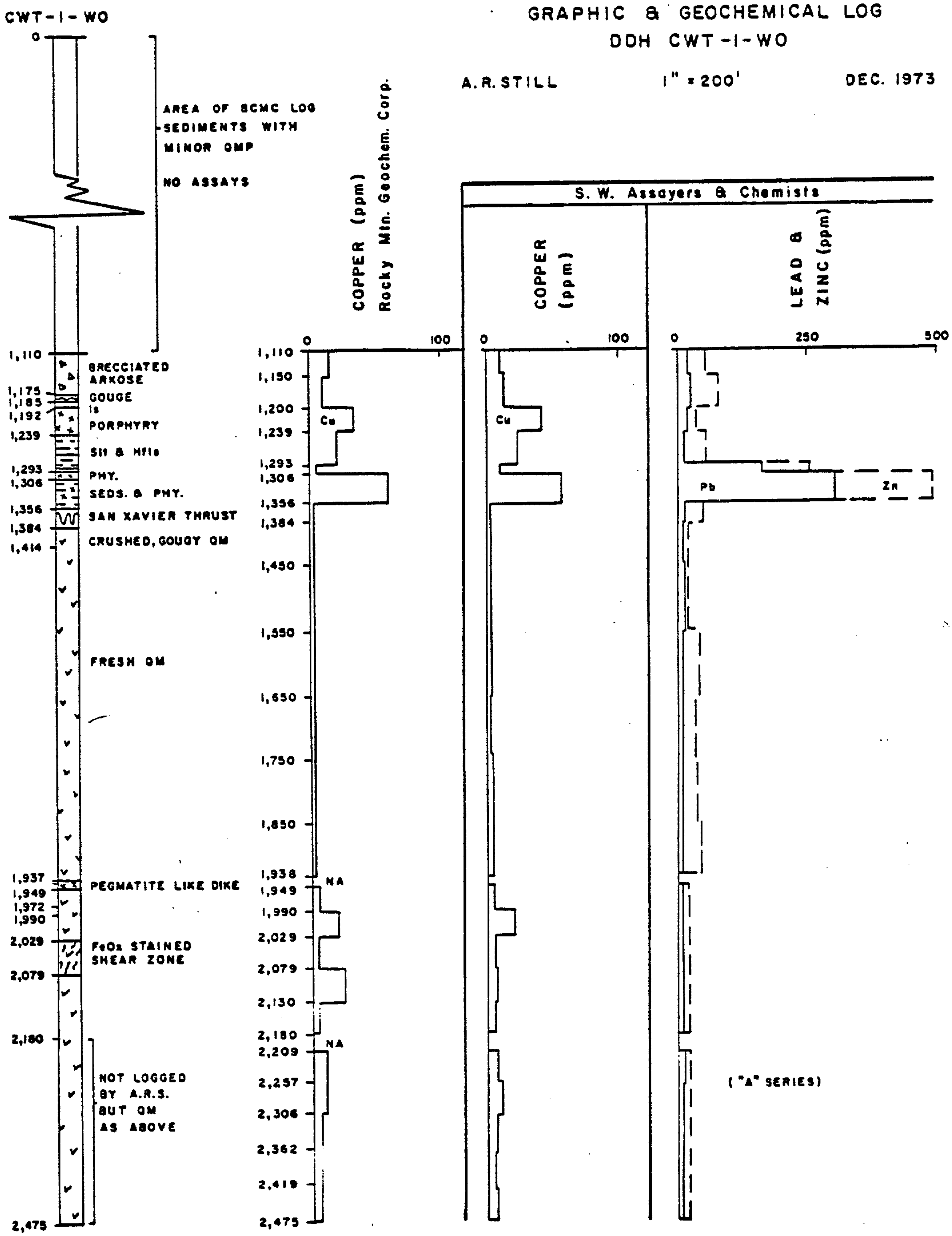
ARS:mw
Attachments

* SEE DR. WILLIAMS' COMMENTS ON THIS INTERPRETATION OF HIS MEANING


R. 12 E.
R. 13 E.
San Xavier North
Pima - Mission
Mineral Hill
Banner Mine
Pima Mine
Tailings Pond
San Xavier
Helmet Peak
T. 17 S.
Continental
Dynamite
San Xavier Thrust
Ruby Star Ranch
Twin Buttes
T.A.C. Drilling
CWT PROPERTY
TWIN BUTTES DISTRICT
PIMA COUNTY, ARIZONA
1 MILE

GRAPHIC & GEOCHEMICAL LOG
DDH CWT-I-WO

A.R. STILL 1" = 200' DEC. 1973



GEOLOGIC LOG - HOLE CWT-1-WO

Interval	Ft. of Core	% Core Rec	Description	
0-109	--	--	Arkose (oxide zone to 55 feet)	)
109-118	--	--	Arkose to siltstone	)
118-171	--	--	Arkose, siltstone and quartz monzonite porphyry	)
171-212	--	--	Arkose	)
212-223	--	--	Siltstone	)
223-254	--	--	Quartz monzonite porphyry	)
254-337	--	--	Qmp to siltstone or arkose	)after Bear Creek
337-361	--	--	Arkose to siltstone	)Mining Co. log
361-471	--	--	Siltstone	)
471-579	--	--	Arkose to Qmp	)
579-609	--	--	Silty arkose	)
609-658	--	--	Arkose	)
658-679	--	--	Siltstone or arkose to Qmp	)
679-1109	--	--	Arkose	)
			(Note: Traces of sphalerite and galena [1/4" stringers, etc.] recorded at 109-212, at 461, 669, 832 and 933-935. Pyrite as "fine disseminations" are noted for several hundred feet above 1109.)	
1110-1175	63.5	98	Brecciated arkose, large angular fragments (2"-3"); light tan quartzitic looking arkose mixed with mottled brown fragments. Some Qmp fragments in interval 1120-1130. Red iron stained bands (1"-2") associated with gypsum stringers (1/4") at 1136, 1136-1/2, 1139, 1140 and 1152 (crossing core at 45° angle). Epidote (2") at 1145. Disseminated pyrite (1/4%) throughout.	
1175-1185	9	90	Gray gouge and strongly brecciated arkose. Most prominent slips at 45°-60° to core axis. More abundant pyrite (1-2%)	
1185-1192	7	100	Strongly silicified brecciated gray limestone with fine pyrite cementing fragments. Cut by fine quartz stringers and some pyrite stringers	
1192-1238	45	98	Mainly fine, light gray porphyry; 2-3 mm white feldspar phenocrysts in gray silicious matrix, only rare fine pyrite. Local areas of fine grained sediments (arkose?). Porphyry cut by local nearly horizontal bands (1/8"-1/2") of pink gypsum. Local small zones (2"-3") with irregular clusters of pyrite Moderate fracturing at about 45° to core axis.	
1238-1239	1	100	Gouge, FW contact at 30° to core	

Interval	Ft. of Core	% Core Rec	Description
1239-1285	45.5	99	Fine grained, mottled (gray, tan, red, green) siltstone - dip probably at 45±°; flat (1/4") gypsum stringers; gougy 1265-1267. Minor fine disseminated pyrite throughout. Dark gray compact hornfels from 1279-1285. A few blebs of chalcopyrite at 1284.5.
1285-1293	6	75	Extremely broken light gray siltstone, gougy, last 2 feet all gouge with slips at 85° to core axis (i.e. near vertical)
1293-1306	10	77	Badly sheared porphyry dike, 1-2% pyrite, last 2 feet gouge with slips vertical to 85°
1306-1356	48	96	Sediments and porphyry all crushed and broken, cut by many flat gougy shears and flat (0°-15°) 1/8"-1/2" gypsum bands. Mixed siltstone and conglomerate 1306-1324 (fanglomerate?); 1324-1346 is fine grained light colored porphyry; 1346-1348 is gray siltstone; 1348-1351-1/2 white marble; 1351-1/2-1356 siltstone. Minor disseminated pyrite throughout.
1356-1384	25	89	White gouge, flat slicks and talc layers. No included rock fragments only multiple rounded white quartz pebbles (San Xavier Thrust)
1384-1414	28	93	Badly crushed, gougy, argillized quartz monzonite. No visible sulphide.
1414-1421	0	0	No core - reported stolen from rig
1421-1937	490	95	Somewhat fresher (completely fresh by 1450) quartz monzonite, coarse grained,low mafic content. Feldspars white to pink. Quartz gray to lavender. Light colored muscovite. A few zones of greenish talc(?). A few 1 mm grains of pyrite at 1616; 1/16" qtz-ser-py stringers (45°) at 1625 and 1627; trace py at 1929. One-half % magnetite (and hematite). Broken and gougy at 1485-1487, 1490-1492, 1451-1453, 1818 (2"), 1822-1824 and 1856-1858. With depth this rock is becoming fresher looking and somewhat coarser grained (Peg. ? →) with 2-3% fine (1-2 mm) biotite(weakly altered to lighter colored minerals).
1937-1949	12	100 (Peg →)	First 3" greenish talc-like (chlorite and sericite?) at 45° to core, balance of core very coarse, nearly pegmatitic, predominantly a pink feldspar granite (dike?). Greenish talc (1/4") at 1946.5.
1949-1972	22	97	Quartz monzonite, coarse, fresh looking. Local small greenish (chlorite plus sericite) bands at 1947 (1"), 1957-1/2" (1"), 1959 (1"), 1964 (2"), 1965 (1/2"),1967 (1"), 1970-1/2 (4"), 1971-1/2 (1"), and 1972 (1").
1972-1990	17	94	As above, but lesser small greenish bands. About 1/4% magnetite (or magnetite plus hematite), very low biotite and biotite altering to light color.

Interval	Ft. of Core	% Core Rec	Description
1990-2029	37	95	Quartz monzonite, badly broken and gougy
2029-2079	48	96	An oxidized weakly mineralized fault zone. Rock is badly broken, iron stained quartz monzonite. Essentially solid gouge from 2048-2060. Fe Ox boxworks appear to be largely after pyrite. Some of strongest Fe Ox zones dip at ± 70°.
2079-2180	97	96	Coarse, fresh quartz monzonite. Higher biotite content (2-3%) than above. Biotite in part altered to sericite and chlorite(?). Some small pegmatic zones (with associated greenish chlorite-sericite) at 2086-2088 and at 2107 (4"). Trace chalcopyrite at 2107. Local bands of red specks of hematite (?) at 2128-1/2 (3"), 2131-1/2 (1"), 2148-1/2 (1") and 2149 (2"), 2156 (1"), 2159 (1/2"), 2169 (1") and 2169-1/2 (1"). There is a band of (10%) fresh biotite at 2173.
2180-2475	--	--	Not logged by ARS but thin sections examined by S.A. Williams (report of 11/7/73) describes rock as quartz monzonite.

Note:

1) This hole from 0 to 1109 feet was drilled by Bear Creek Mining Co. and was known as T-1. The log for that interval was abstracted from a BCMC log.

2) The hole was deepened from 1109 feet to 2475 feet in 1973 by the property owners. That portion of the hole from 1110-2180 was logged by A.R.S. on October 6 and October 22, 1973. Hole size 1110-1175 AX, (reamed to 1175), 1175 to 1414 BX, below 1414 AX.

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

CERTIFICATE OF ANALYSIS

CORRECTED REPORT

T-1

ITEM NO.	SAMPLE IDENTIFICATION		Our Job	W ppm
	Series: NK-WO-6:			
1	Composite:	1665-1725	YAQ001	3
2	Composite:	1725-1785		5
3	Composite:	1785-1843		5
4		1843-1851		2
5	Composite:	1851-1909		4
6	Composite:	1909-1941		8
7	Composite:	1941-2009		3
8	Composite:	2009-2070		2
1	CWT T-1	1805-1917	YAQ002	7
2		1917-2031		7
3		2031-2143		6
4		2143-2257		2
5		2257-2362		2
6	T-1	2362-2475		2
7	T-44	451-501		2
8		501-547		4
9		547-592		5
10	CWT T-44	592-625		20
1	CWT T-1	1150-1259	YAQ003	<2
2		1259-1352		3
3		1352-1450		3
4		1450-1563		2
5		1563-1688		4
6	CWT T-1	1688-1805		2

TO: Mr. Oliver B. Kilroy
Suite #110, Broadway Terrace
4625 East Broadway
Tucson, Arizona 85711

REMARKS: CORRECTED REPORTS

CERTIFIED BY: [signature] (Seal: Registered Assayer Certificate No. 9425 William L. Lehmbeck, Arizona U.S.A.) 78

DATE REC'D:	DATE COMPL.:	JOB NUMBER:
	5/19/78	YAQ-001, -002, -003

SKYLINE LABS, INC.
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Tucson, Arizona 85703
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Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	W ppm								
	CWT T-1									
1	1150-1259	< 2								
2	1259-1352	< 2								
3	1352-1450	2								
4	1450-1563	< 2								
5	1563-1688	< 2								
6	1688-1805	< 2								

TO:
Oliver B. Kilroy
4625 E. Broadway, Suite #110
Tucson, Arizona 85711
cc: CWT Properties
2239 La Mirada Street
Tucson, Arizona 85719

REMARKS:
Trace analysis

CERTIFIED BY:

DATE REC'D: 4/8/78

DATE COMPL.: 4/26/78

JOB NUMBER: YAQ 003

SKYLINE LABS, INC.
P.O. Box 50106 • 1700 West Grant Road
Tucson, Arizona 85703
(602) 622-4836

Charles E. Thompson
Arizona Registered Assayer No. 9427

William L. Lehmbeck
Arizona Registered Assayer No. 9425

James A. Martin
Arizona Registered Assayer No. 11122

CERTIFICATE OF ANALYSIS

ITEM NO.	SAMPLE IDENTIFICATION	W ppm
1	CWT T-1 1805-1917	10
2	1917-2031	12
3	2031-2143	10
4	2143-2257	13
5	2257-2362	9
6	T-1 2362-2475	8
7	T-44 451-501	8
8	501-547	6
9	547-592	12
10	CWT T-44 592-625	13

TO:
OLIVER B. KILROY
4625 E. Broadway, Suite 110
Tucson, Arizona 85711

cc: CWT Properties
2239 LaMirada Street
Tucson, Arizona 85719

REMARKS:
Trace analysis

CERTIFIED BY: [signature]

REGISTERED ASSAYER CERTIFICATE NO. 9425 WILLIAM L. LEHMBECK DATE SIGNED Arizona U.S.A.

DATE REC'D: 3/17/78

DATE COMPL.: 3/31/78

JOB NUMBER: YAQ 002

T-1

P. O. Box 872
Douglas, Arizona 85607
November 17, 1973

Oliver B. Kilroy
Suite 212
45 West Penninton Street
Tucson, Arizona 85701

Dear Oliver:

Enclosed are descriptions of the fourteen (14) samples you sent last week. Alteration in the hole is directly related to crushing and fracturing. Since these structures decrease down-hole, the alteration of course decreases in intensity as well. However the grade of alteration increases down-hole, looking most attractive in the area 2200-2300 feet. The intrusive, with minor variation, is the same in all samples.

I hope this information is helpful.

Best regards,

Sid Williams

Sidney A. Williams

SAW:bj

1375

The original rock was a quartz monzonite with subhedral plagioclase grains embedded in equally coarse quartz and microcline. Often the plagioclase was mantled with microcline. As a result of strong silicification quartz has grown at the expense of feldspars and the rock consists essentially of coarse granular quartz enclosing corroded relicts of feldspars.

Severe crushing affecting the rock has not been followed by healing or recrystallization. Instead, the brecciation is cemented loosely by coarse anhedral calcite and traces of chalcopyrite.

Minerals appear in the following estimated amounts: quartz 69%, plagioclase 10%, calcite 12%, microcline 8%, magnetite 0.5%, chalcopyrite tr., sericite tr..

1475

The rock is a quartz monzonite composed of blocky plagioclase anhedra that may be crowded together in clusters, and equally coarse interstitial quartz and microcline. Some larger microcline crystalloblasts occur and may envelop and corrode plagioclase; some enclose corroded remnants of plagioclase. Biotite books lie along grain boundaries.

The rock has been moderately crushed and altered in the epizone. As a result biotite is altered to hydromicas and anatase. Hydromicas and dolomite locally attack plagioclase and also cement crushed zones. Locally quartz invades tension fractures and may replace broken or crackled feldspar crystals.

Mineral percentages are estimated as: quartz 30%, plagioclase 29%, microcline 22%, hydromicas 6%, magnetite 2%, muscovite 3%, apatite 0.5%, dolomite 7%, anatase tr..

1575

The specimen is a quartz monzonite composed of clusters of blocky plagioclase subhedra set in a matrix of coarser quartz and microcline (and orthoclase). Some large microcline crystalloblasts occur; these may enclose plagioclase and biotite but they show little tendency to replace plagioclase and are not perthitic.

Epizonal alteration seems related to zones of mild crushing cutting the fabric. These may be filled with dolomite; if not, the rubble (quartz-feldspar) in them shows little tendency to recrystallize. Hydromicas replace plagioclase, especially in these zones. Biotite is altered to dolomite and sericite, magnetite to hematite. Occasionally barite accompanies dolomite in the veins.

Minerals are present in the following estimated amounts: quartz 18%, plagioclase 40%, microcline 25%, dolomite 9%, sericite 6%, apatite 0.5%, hematite 1%, anatase tr., barite 0.5%.

1674

The rock is a quartz monzonite composed of blocky plagioclase anhedra set in an equally coarse matrix of quartz and microcline. Although microcline may envelop plagioclase it rarely contains perthitic stringers or corroded remnants. Mafites lie along grain boundaries in the matrix.

Epizonal alteration is related to mild crushing. The crush zones are filled with microcrystalline quartz and flakes of kaolin. Kaolin, with dolomite, also replaces mafites. Plagioclase is stippled with sericite and may show degenerate twinning indicative of albitization.

Mineral percentages appear as follows: quartz 18%, plagioclase 36%, microcline 28%, kaolin 2%, hydromicas 10%, hematite 1%, anatase tr., apatite tr., dolomite 5%.

1770

The specimen is a quartz monzonite composed of isolated or loosely aggregated plagioclase subhedra in a coarser matrix of microcline and minor quartz. The microcline may enclose optically aligned ragged remnants of plagioclase but also envelops seemingly unaffected plagioclase subhedra. Biotite lies along grain boundaries or within microcline.

Epizonal alteration has been weak. Biotite is locally altered to kaolin and dolomite. Kaolin also replaces the cores of larger plagioclase grains. Plagioclase may also be stippled with dolomite and sericite. Thin dolomite veinlets fill fractures.

An estimate of mineral percentages is: quartz 8%, microcline 52%, biotite 1%, sericite 3%, kaolin 4%, magnetite 1%, zircon tr., apatite 0.5%, allanite tr., dolomite 2%, plagioclase 28%.

1875

The specimen is a quartz monzonite composed of blocky to lath-like plagioclase grains with smooth, rounded outlines embedded in an equally coarse matrix of quartz and microcline. Plagioclase may show thin myrmekite rims. Some microcline contains ragged stringers of plagioclase. Biotite books lie along grain boundaries. Epizonal alteration has been weak.

Thin veinlets of dolomite cut the fabric. Dolomite, with kaolin, replaces biotite. It also occurs in plagioclase sparingly along with sericite.

Minerals percentages are approximately as follows: quartz 15%, plagioclase 47%, microcline 28%, sericite 2%, dolomite 5%, hematite 1%, apatite 0.5%, leucoxene 0.5%, biotite 0.5%, kaolin 0.5%, zircon tr..

1975

The specimen is a quartz monzonite. Blocky plagioclase subhedra of variable size are clustered together in a matrix of coarser quartz and microcline. Some very large microcline crystalloblast occur. These tend to be riddled with irregular perthitic stringers. Thick biotite books occur along grain boundaries in the matrix.

Deuteric alteration resulted in mild sausseritization of plagioclase crystal cores. Biotite was replaced by pennine. Later epizonal alteration was weak. As a result, pennine is partly replaced by kaolin and dolomite. Dolomite also occurs with sausserite. Thin discontinuous dolomite veinlets occur in fractures.

Minerals appear in the following estimated amounts: quartz 8%, microcline 42%, plagioclase 37%, sericite 3%, dolomite 3%, kaolin 1%, pennine 3%, hematite 1%, apatite 0.5%, leucoxene 0.5%, epidote 1%.

2077

The rock is a granodiorite (a compositional variant of the quartz monzonite) composed largely of equant plagioclase anhedra. These interlock along irregular borders, and interstitial areas are filled with equally coarse microcline and quartz. Rarely does myrmekite rim plagioclase.

The rock has been crushed and quartz-feldspar rubble is poorly healed. The crush zones are apt to be filled with hisingerite-stained dolomite as well. Dolomite and kaolin replace biotite. Plagioclase crystal cores are stippled with fine-grained sericite.

Mineral percentages are estimated as: quartz 8%, plagioclase 57%, microcline 26%, dolomite 3%, sericite 3%, kaolin 1%, hisingerite 2%, hematite tr., apatite tr..

2107

The rock is a metasomatic one derived from a quartz monzonite by strong epi-mesozonal alteration. Original textures are almost obliterated.

The rock consists of angular but equant plagioclase anhedra and equally coarse quartz in the interstices. The plagioclase is in the process of replacing microcline and only corroded remnants of this mineral remain; the plagioclase is albitic. Coarse muscovite flakes lie in random orientation in the feldspars. They may be enveloped in coarse, irregular calcite crystalloblasts.

The steely mineral marked is muscovite (adjacent to chalcopyrite).

Mineral percentages are estimated as: quartz 26%, microcline 3%, plagioclase 34%, muscovite 26%, calcite 9%, magnetite 1%, rutile tr., apatite 0.5%, chalcopyrite tr., zircon tr..

2123

The specimen is a granodiorite composed of blocky plagioclase subhedra clustered together in a coarse quartz matrix. Some microcline occurs in the interstices and biotite flakes lie along grain boundaries. Rarely is the plagioclase mantled with myrmekite.

Epizonal alteration has been mild. Plagioclase crystal cores are stippled with dolomite and sericite. Dolomite also replaces biotite, occuring in kaolin pseudomorphs. Thin, irregular veinlets of dolomite crisscross the fabric.

Minerals are present in the following estimated amounts: quartz 32%, microcline 18%, plagioclase 42%, dolomite 3%, kaolin 2%, sericite 3%, magnetite tr., zircon tr., apatite tr..

2176

The specimen is a quartz monzonite composed of blocky subhedral plagioclase crystals set among equally coarse xenomorphic-granular quartz and microcline. There are scattered microcline crystalloblasts of large size. These are but slightly perthitic although they envelop numerous plagioclase grains as well as biotite. Biotite also occurs along grain boundaries with accessory minerals such as magnetite.

Deuteric alteration has been weak. Biotite is partly penninized. Plagioclase is slightly stippled with sericite and rare epidote. Calcite fills minute fractures.

Mineral percentages appear as follows: quartz 8%, microcline 50%, plagioclase 35%, sericite 1%, biotite 2%, pennine 2%, magnetite 0.5%, zircon tr., epidote tr., calcite 0.5%, sphene tr..

2262

The specimen is a quartz monzonite. The texture approaches porphyritic with vestiges of β quartz and plagioclase phenocrysts in a xenomorphic-granular quartz-microcline matrix. Close crowding of phenocrysts and growth of microcline crystalloblasts tend to obscure the original texture. Microcline is laced with perthitic stringers and stippled with fresh to partly corroded inclusions of plagioclase. Biotite, sphene, and magnetite tend to lie along grain boundaries.

Epizonal alteration has been weak and has not obliterated deuteric alteration. Biotite is partly penninized and then may be dolomitized. Plagioclase is flecked with sericite but locally attacked by kaolin as well. Calcite fills thin, discontinuous fractures.

An estimate of mineral percentages is: quartz 18%, plagioclase 45%, microcline 32%, biotite 1%, pennine 0.5%, dolomite tr., magnetite tr., sericite 1%, leucoxene tr., calcite 1%, kaolin 1%.

2374

The specimen is a quartz monzonite composed of equant subhedral plagioclase grains set in an equally coarse matrix of interstitial quartz and microcline. Rare myrmekite rims the ends of plagioclase laths. The microcline may be coarse and riddled with patches and stringers of plagioclase although inclusions of this mineral do not appear corroded. Biotite books lie along grain boundaries.

Epizonal alteration has been mild. Plagioclase is clouded with minute inclusions of dolomite and sericite. Biotite is wholly altered in most cases to kaolin and dolomite. Irregular veinlets and patches of dolomite and fluorite occur throughout the fabric.

Minerals appear in the following estimated amounts: quartz 14%, microcline 28%, plagioclase 47%, dolomite 5%, sericite 3%, magnetite 0.5%, leucoxene 0.5%, apatite tr., zircon tr., fluorite tr., kaolin 1%, biotite tr..

2471

The original rock was a quartz monzonite but metazomatism (epi-mesozonal) has almost destroyed original textures.

Plagioclase has been albitized and exhibits degenerate twinning and some growth at the expense of the few microcline relicts left. Coarse, randomly oriented sericite is scattered in these crystals along with corroded grains of epidote in the plagioclase crystal cores. Veins of sericite and smectite cut the fabric. Quartz is coarsened, showing growth at the expense of both feldspars. Biotite is altered to pennine and calcite. Irregular patches and veins of calcite occur throughout the fabric.

Mineral percentages are estimated as: quartz 28%, microcline 6%, plagioclase 41%, sericite 11%, epidote 5%, hematite 1%, pennine 3%, calcite 2%, apatite tr., biotite tr., smectite 2%.

P. O. Box 872
Douglas, Arizona 85607
December 12, 1973

T-1

Oliver B. Kilroy
Suite 212
Tucson Title Insurance Building
45 West Pennington Street
Tucson, Arizona 85701

Dear Oliver:

In response to your call today I have reviewed the slides with an aim to interpreting my work of November 17.

The intrusive seen in the fourteen (14) samples is the same one all the way down hole. It has been altered twice.

The first episode, and the most pervasive alteration, was pre-mineralization. In my opinion it had nothing whatever to do with the presence of sulfides in the rock. This alteration is characterized by the following features: silicification, albitization, and growth of muscovite/coarse sericite. Such alteration is spotty, for some samples evince only deuteric alteration while others above and below may show more severe effects. The intrusive is a slowly cooled one, and these effects may have been imposed on the intrusive during cooling.

The second alteration event is related to introduction of sulfides - I think evidence points to an outside source. This alteration occurred following brecciation and crushing in the intrusive and is usually closely confined to structures. Furthermore this alteration was weak and mostly of very low temperature. In a few cases, with increasing depth, the alteration grade (temperature) is higher but not necessarily so. I interpret this to mean a grade increase with depth in more open or throughgoing structures.

This second alteration event involves the formation of the following new alteration minerals: barite, hydromicas (a general term for mixed clay-sericite), kaolin, sericite, dolomite, fluorite, and quartz. Note that quartz and sericite occur in both alteration episodes. Most are in the older event. As implied in the previous paragraph, there is a tendency for clay to give way to sericite with depth.

Alteration this weak is difficult to characterize, and I can't be sure of its significance. Sampling at some distance around the hole would be necessary to provide any possible evidence relating to mineralization closer to its source.

I hope these comments serve to clarify the previous work. Feel free to call if you have any questions.

Best regards,

Sidney A. Williams

SAW:bj

THE ANACONDA COMPANY

940 WEST PRINCE ROAD, TUCSON, ARIZONA 35705

GEOLOGICAL DEPARTMENT
GEOPHYSICAL BRANCH OFFICE

3 November 1967

Mr. John G. Roscoe
Manager, Continental Exploration
4202 East Poe Street
Tucson, Arizona 85711

Dear John:

The inclosed drawings are the results of our IP work on your property this year. There is a good possibility that the results have been influenced by fences, pipelines, and buildings in the immediate area of your workings.

Unless the anomaly is influenced by surface effects it appears to be representing a sulfide concentration 500 to 700 feet SSE of your shaft. The anomaly trends roughly N 30° W including your present shaft location.

This work should be considered as a recon coverage. If it were not for the buildings, etc. the anomaly would appear significant and would warrant additional detail work.

Sincerely,

George S. Ryan

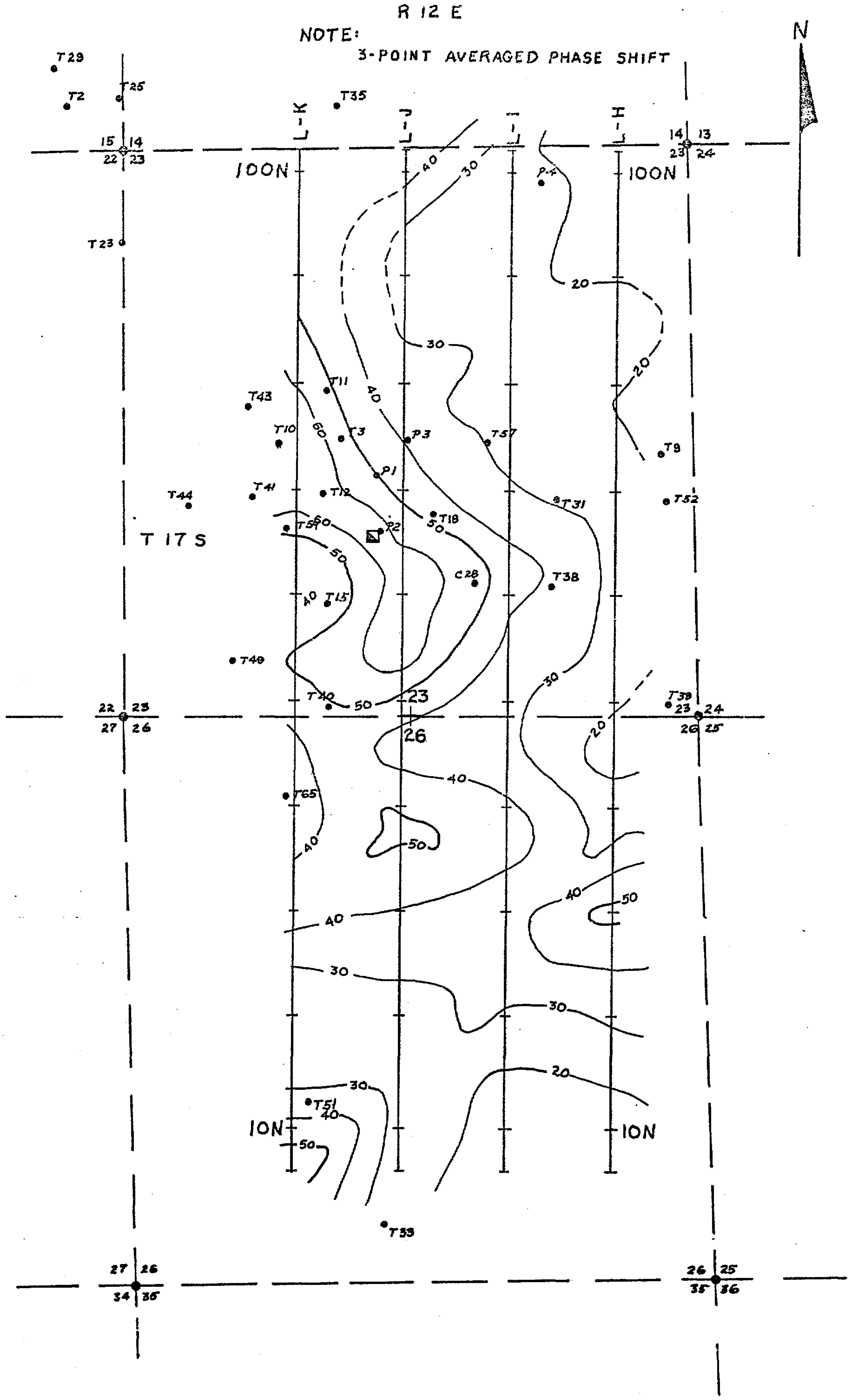
George S. Ryan
Senior Geophysicist

cc: E. O. McAlister

inc: 1 map

GSR:sa

1200 FOOT SEARCH DEPTH



SCALE:

1inch = 1000feet

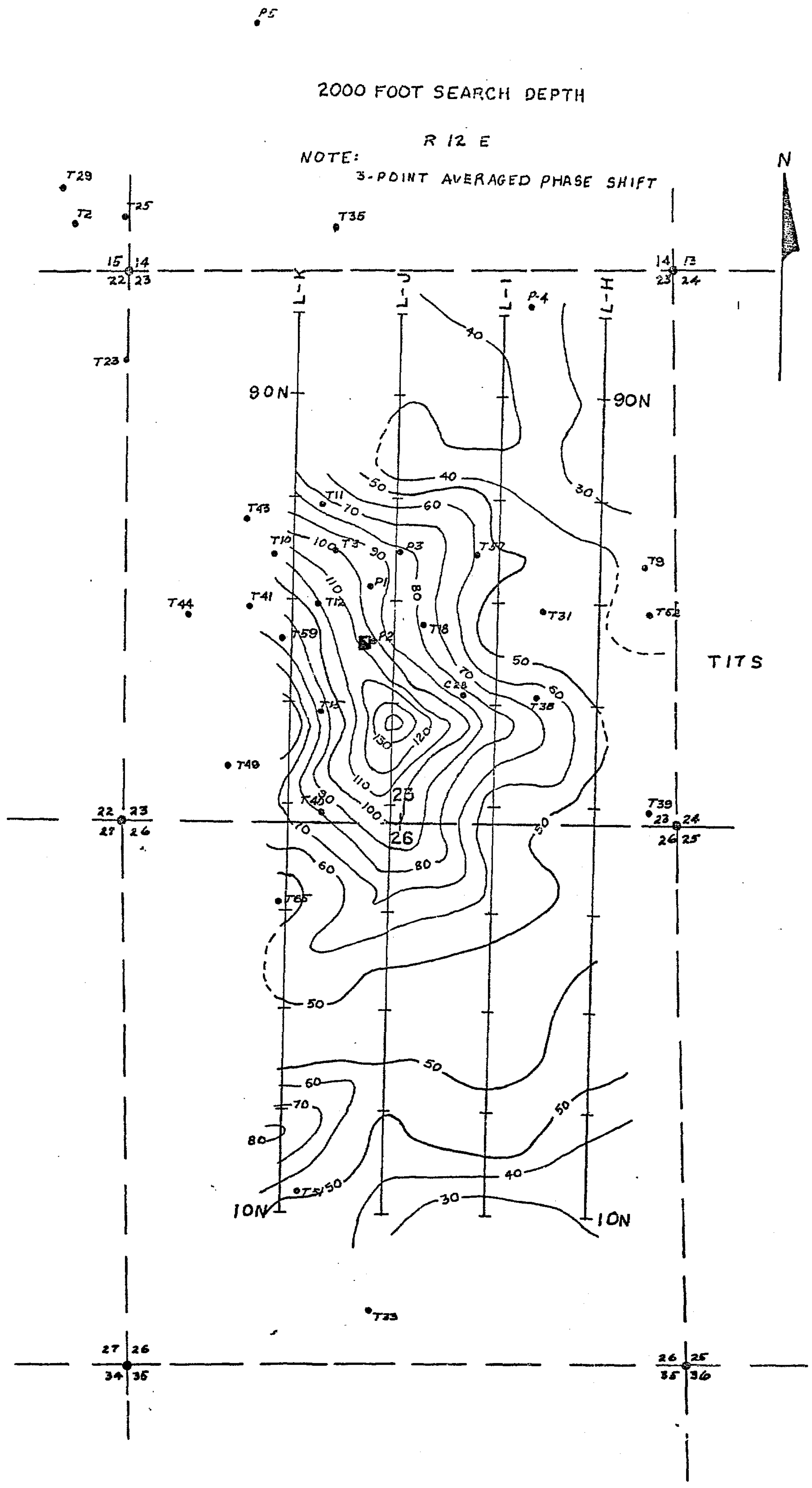
CONTOUR INTERVAL:

10 MINUTES

2000 FOOT SEARCH DEPTH

R 12 E

NOTE:
3-POINT AVERAGED PHASE SHIFT



SCALE:
1 inch = 1000 feet

CONTOUR INTERVAL:
10 MINUTES

23.5 % PHOTOCOPY REDUCTION

OLIVER B. KILROY
INVESTMENTS
SUITE 110 - 4625 EAST BROADWAY
BROADWAY TERRACE
TUCSON, ARIZONA 85711

TELEPHONE 795-6114

May 13, 1994

Mr. Mike Lee
Manager, Development Projects
& Services
ASARCO
P. O. Box 5747
Tucson, AZ 85703

Dear Sir:

Your secretary told me that you were going to be out of town for a while so this letter is to give preliminary information about the reason for my call.

It is my understanding, from a telephone conversation with Mr. Sid Lloyd at your Leadville, Colorado office, that your firm has a mine in Idaho, I believe, which has a deep shaft - over three thousand feet - with multiple levels, presently making water and which is presently shut down or restricted in production.

If this is so, my inquiry is to find out whether or not your firm would lease the mine site for a research and development project or, upon reviewing my project, would become a partner with other mining firms in it. Alternatively, a separate entity could be formed with a stock issue to raise R & D and other funds.

I call myself an independent in mining exploration and am involved with two prospect areas on which considerable information has been developed including geologic mapping, I.P., gravity work, drilling, assaying and petrography done by Sid Williams, chief petrographer for Phelps Dodge at the time the work was done.

Both will require underground mining. One, the CWT Prospect, may contain the "magma chamber" source of the Pima Mining District, south of Tucson, where you have your mine. The "magma chamber" should be large volume and higher grade than the surrounding porphyries but deep, probably over 4,000 feet. The second prospect is in the Granite Wash Mtns. of La Paz County, AZ. Heinrichs and Canadian Aero did considerable I.P. for me and two anomalous areas are involved. The shallower target is around 1,000-1,500 feet. Again, mapping, drilling, assay work and petrography support the target definition.

One reason for mentioning the above is that at the time of doing the prospecting, I realized underground mining would be involved. This led to the obtaining of several patents relative to a concept for a hydraulic mining system. The other reason is that if subsequent drilling defines ore bodies, especially at the shallower G. W. Mtns. prospect, one might provide a R & D mine site.

Up until the present, I had hoped to get a major mining company to drill either or both of the prospects and, upon success, to use one as a R D project site to develop a "state-of-the-art" underground hydraulic mining system incorporating my concept, as mentioned above. However, in light of Magma's Superior Mine accident, which might have been avoided by using my intermediate (time) multiple level patent, I have decided to see if I can find a deep mine shaft, open for entry, with multiple levels; one having an encroaching water problem would be even better.

To get to the crux of my letter, taking my patents together, I have an enslurrying (from multiple levels), transportation and lifting system utilizing my mobile mining machine and hydro-electric pumped storage technology whereby the kinetic energy from the downflowing waters from an upper to a lower reservoir is used to operate a slurry pump to move the slurried ore, coming from the mobile mining machine at the the mine face, to the surface with additional energy input to the pump to overcome friction. I have letters from Harza Engineering in Chicago which comments favorably on the concept; the firm, at the time as I under stand it, was considered one of the leading engineering firms relative to pumped storage technology. Also, Kaiser's Grimley patent reflects favorably on my mobile mining machine.

Some additional comments about the potential of my concept:

1. The stored water in the underground reservoir should be looked at as a way of absorbing some of the heat in an underground mine where such heat would be dissipated at the surface when the reservoir water is pumped up at night to take advantage of off-peak electric rates.

2. Salvage value of the mine site may be significant if the original construction includes a large enough underground reservoir so that, after, ore depletion, a pumped storage facility is available to sell power to the utilities which should be able to project needs 10-20 years out.

3. The water used to enslurry the ore at the mine face in my mobile mining machine could be encroaching or other available water so that there should be economic potential for using the developed mining system in other hard rock ore, coal and oil shale mines having such problems.

4. Included in a submittal packet is a copy of an article relative to a tube autoclave developed by the Germans which

I would like looked at relative to treatment of hard rock ores as well as coal gasification and the conversion of oil shale kerogen to oil and other products.

5. One of my patents makes reference to Duncan's use of bacteria to treat sulphide ores. I would want to have this looked at relative to heap leaching and/or treatment of slurried ore in my conceptualized system.

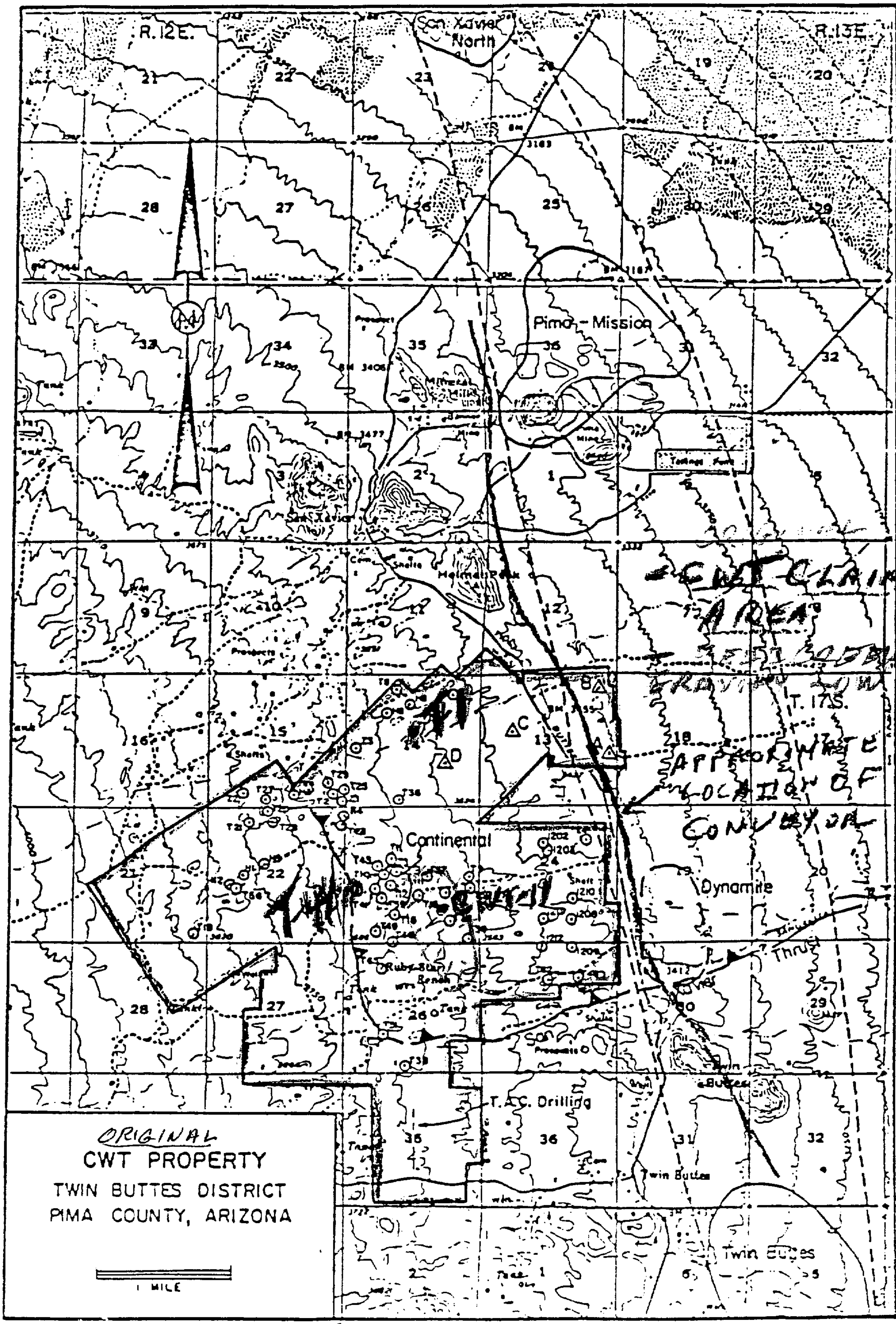
Taking all of the foregoing together represents the scope of the project, as I see it. I will appreciate hearing from you as to whether or not you would like to discuss the matter further. I will provide my submittal packet that has my back-up information.

In any event, I would appreciate knowing more about the mine referred to by Mr. Lloyd, if you care to discuss it. Also, if it would be available for lease or other arrangement.

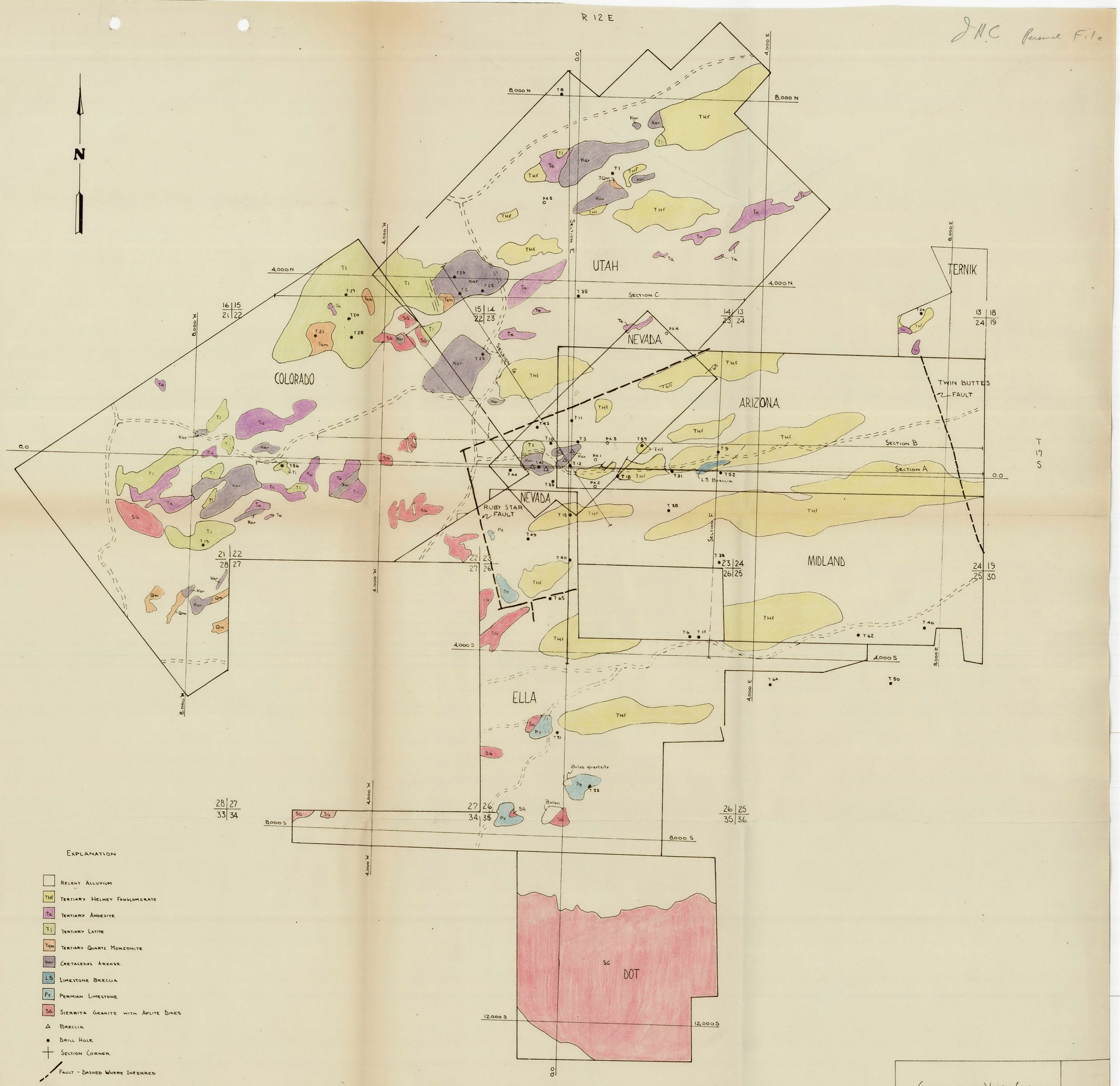
Sincerely,

Oliver B. Kilroy

OBK/ed



SIERRITA -
ESPERANZA



Geology of the Wilson, Chilson & Todd Option

Pima Co. Arizona

1" = 1000'

These should be attached
to Mr. Richard's letter of
April 9 on the Wilson-Chilson-
Todd property

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

April 9, 1956

Mr. W. R. Landwehr, Chief Geologist
American Smelting and Refining Company
600 Crandall Building
Salt Lake City 1, Utah

WILSON-CHILSON-TODD PROPERTY
Southwest of Helmet Peak, Pima
District, Pima County, Arizona

Dear Sir:

On the basis of aerial observations and some ground reconnaissance in the past three years, the area west and southwest of Helmet Peak was considered to contain small areas of alteration and disseminated mineralization with outcrop evidence of only minor amounts of copper sulphides. No commercial possibilities were recognized. A few weeks ago in the course of his mapping in the Pima-San Xavier region, Mr. Evans determined that some of these alteration zones actually were rather large and might have ore possibilities.

Last fall a block of 100-odd claims was staked in this area by Messrs. Wilson, Chilson and Todd. About three weeks ago Mr. Snedden and I talked with Wilson and Chilson, who claimed they spoke for Todd also. They had shown the ground to representatives of three companies, including Phelps-Dodge. All wanted options with several months' free exploration time. This was refused, so negotiations never became serious with anyone. (As you know, Wilson made the deal with Duval Sulphur for the New Years Eve porphyry copper property which they now are drilling. For an option without an upset price, he received $50,000 cash before Duval did any drilling, another $50,000 a few months later. He is obviously conditioned to deal on an exorbitant basis.)

Wilson and Chilson offered us an option on their Utah, Nevada and Colorado claims (approximately 114 in number) on the following basis:

1. $15,000 down as advance royalty. (Theoretically, this would represent the cost of location work and staking which they have completed.)

2. Beginning at the end of 6 months, $2,500 advance royalty per month.

3. 5% royalty on production less costs of transportation and treatment including milling.

4. A purchase price to be negotiated after the value of an ore body is known, and in any case the price to be less than the total value of the 5% royalty. (This is an odd approach, to say the least; but indications are that Wilson's Duval deal is set up this way.)

This would be an expensive deal because it might not be possible to perform conclusive exploration in a few months. Such a deal would be acceptable only if particularly attractive exploration odds were recognized. This is not the case.

Wilson and Chilson gave us a first refusal for the remainder of the month of March. During that time Mr. Evans made every effort to complete preliminary mapping in this area with a view toward evaluating exploration possibilities on their claims. Mr. Courtright and I spent several days in the field with him, as you did. The results of his work are well summarized on the attached Preliminary Map and Geological Notes.

As you know, geological relationships are complex, and there are many uncertainties. Because of this, it is considered that an open-and-shut recommendation regarding exploration on the Wilson-Chilson-Todd claims cannot be made. Rather, it is suggested that a certain amount of drilling (presumably following geophysical surveys) is warranted provided a drastically improved deal can be arranged.

The Wilson-Chilson group is within a district in which porphyry copper ore bodies are known and in which this type of mineralization is becoming increasingly significant. Duval's New Years Eve property lies 4 miles south of the group; and the Pima and East Pima desposits, 2 miles northeast. The gological environment is typical of porphyry copper deposits in general.

As can be seen on Evans' map, most of the area of the claims is gravel-covered; but several alteration zones are exposed and at least three small areas show outcrop evidence of copper sulphides, principally chalcopyrite. None of these three areas has positive indication of material of ore grade, but there is a possibility that such exists beneath these outcrops. Showing number 2 is the best on the claims. It has a possible southeasterly extension beneath shallow gravel cover. It should be noted that several of the zones of alteration-mineralization extend into rather large gravel-covered areas.

Most of the alteration-mineralization is in Cretaceous arkose. Although some ore-grade mineralization is found in this formation in the Pima and East Pima ore bodies, the limey sedimentary formations there are more favorable to mineralization. Unfortunately, no basis is recognized upon which to project formations of this type into the

Wilson-Chilson claims at a reasonable depth; although, of course, their occurrence in the gravel-covered areas is not precluded.

Another somewhat unfavorable feature is that the post-mineral basalt porphyry intrusive fills a large area in the eastern part of the claims. It may extend outside of the group of outcrops shown on the map.

Since no really good ore indications are recognized, the evaluation of ore possibilities must depend largely on the fact that the occurrence of ore bodies is geologically permissible in the large areas of gravel cover.

Geophysical surveys would probably provide targets for exploration, but there is not time to obtain this information before an option commitment would have to be made. Mr. Lacy may feel that the opportunity for successful application of geophysical surveying is such that this factor should be taken into account in deciding what kind of deal would be justifiable. If so, his comments will be appreciated. In this connection it should be noted that the depth to sulphides over most of the area is expected to be less than 100'. Bedrock is shallow, but probably it has an irregular surface with gullies and ridges. Presumably, electromagnetic and/or induced potential methods would outline the alteration zones and point up any areas of concentrated sulphides; and magnetometer and gravity would detect concentrations of sulphide-bearing lime silicate zones (such as East Pima) if deposits of this type happen to occur due to some presently unrecognized structural situation in the gravel-covered areas.

To summarize, on the basis of geological permissibility and the possible efficacy of geophysical surveys, the Wilson-Chilson property would be worth six 400' exploratory drill holes if terms can be arranged on either of the following bases:

(a) Only the northeastern one-third of the group is optioned, with the down payment and advance royalties being proportionately reduced. (This would permit exploration of zone number 2.)

(b) If our cost of drilling (contractor's invoice ?) can apply in lieu of the $2,500 monthly advance royalties.

In either case an upset price should be set.

I do not anticipate that either of these arrangements will be acceptable to Wilson and Chilson, but we plan to approach them with these propositions as soon as a meeting can be arranged. If they refuse, our consideration of the property should be set aside.

Zone number 1 on the map actually is the best looking mineralization in the area. The property ownership situation here is now being investigated. It is very complicated because in the past many claims and claim groups have repeatedly lapsed and been restaked. When we have cleared up the ownership in this area, an attempt will be made to acquire some ground. If terms are reasonable, limited exploration drilling possibly will be recommended.

Very truly yours,

Original Signed By
K. Richard

KENYON RICHARD

Att: Evans Report and Map
KR:S
cc: LHHart -w/att.
FVRichard -w/att.
JHCourtright-w/att.
RJLacy -w/att.
ODEvans -w/att.

SOUTHWEST HELMET PEAK AREA

Geological Notes by Owen Evans

The following notes supplement the attached Preliminary Geologic Plan of the Southwest Helmet Peak Area. This area joins ASARCO's East Pima property on the southwest. The three principal zones of mineralization have been numbered for easy reference in the notes.

SEDIMENTARY ROCKS:

Post Mineral

Qal. Quaternary alluvium is largely a channel wash composed of granitic fragments derived from the large body of Sierrita granite to the west. Some of the more extensive areas of talus are included. The thickness is variable but generally shallow compared to that of the gravel cover over the broad piedmont to the east. Due to its large areal extent within the mapped area, the alluvium is of great importance as post-mineral cover over possible mineral deposits.

Tal. Tertiary alluvium is known locally as the San Xavier conglomerate. It is composed of weakly consolidated angular to subrounded fragments and an occasional tuffaceous bed. In places it has a rude but distinct bedding with dips as steep as 70 degrees. It is probably of much greater extent beneath Quaternary alluvium than the few exposures along dry wash channels indicate. The degree of rounding of the fragments indicates transportation over short to moderate distances. Fragments of altered rock are present in the conglomerate in several places within the mapped area. These are derived from the several exposed alteration zones. In other localities where no source is exposed, the presence of altered rocks in the conglomerate may indicate a nearby buried alteration zone.

Pre-mineral

Tsb. Tertiary Silver Bell formation overlays the Cretaceous sediments unconformably. It is a conglomerate composed of fragments of purplish to dark gray andesite-porphyry and other earlier rocks in a fine-grained matrix of similar material. The widespread nature of this formation is shown by the occurrence of similar material in the Tucson and Silver Bell Mountains. In the Southwest Helmet Peak area it is host to many pyrite-galena veins such as those in the Dogtown and Paymaster mines.

Ks. Cretaceous sediments are composed of a great thickness (possibly 10,000 feet) of moderately thick-bedded siliceous units including arkoses, quartzites, siltstones and conglomerates. Limy beds are scarce, the thickest being a 30-foot bed of thin-bedded limestone that crops out south of Helmet Peak. Large blocks of sediments have generally steep dips and divergent strikes. Bordering Helmet Peak on the east is a series of red siltstones and arkoses. Their relation to the lighter colored sediments to the west is not clearly demonstrated. Most of the alteration in the Southwest Helmet Peak area is in Cretaceous sediments.

Ps. Paleozoic sediments form large outcrops on the north and are made up of formations varying in age from Cambrian Bolsa quartzite through the Permian Snyder Hill group. Thick-bedded massive limestones predominate. The ore bodies of the Banner and San Xavier mines and portions of the Pima and possibly East Pima orebodies are replacements in the Paleozoic limestones. In the southeastern part of the mapped area Permian limestone and quartzite crop out in two narrow bands. Here the rocks are strongly crushed and recemented, yet retain their identity as separate rock units.

IGNEOUS ROCKS:

Post-Mineral

Tha. Tertiary hornblende-andesite is a light brown rock with crystals of feldspar and hornblende in an aphanitic groundmass. It occurs as narrow dikes, and cuts the San Xavier conglomerate and older rocks.

Tbp. Tertiary basalt-porphyry is a greenish gray, amydaloidal rock with an aphanitic to glassy groundmass and abundant large plagioclase phenocrysts and smaller crystals of pyroxene. It occurs typically as large elongate intrusive masses. It is closely related in age with the hornblende-andesite.

Pre-Mineral

Td. Tertiary diabase is a dense, black intrusive composed of small feldspar crystals in a black, aphanitic groundmass. It occurs as small dike-like bodies cutting Tertiary and Cretaceous rocks. It does not appear favorable to mineralization.

Tm. Tertiary monzonite is composed of small to moderate-sized, tabular feldspar crystals in a greenish aphanitic groundmass. Small quartz crystals and euhedral books of biotite are common. It occurs in small irregular bodies that cut Tertiary and Cretaceous formations. Three and possibly four small pipes of brecciated monzonite have been found. When moderately fresh, the monzonite weathers easily, and is found in minor surface depressions. It no doubt is more abundant than available outcrops indicate. The marked coincidence between the occurrence of monzonite and the stronger indications of copper mineralization indicates a genetic relationship, as would be expected.

Tsg. Tertiary Sierrita granite is composed of very coarse quartz, feldspar and mica. It is commonly assumed to be the oldest of the Tertiary intrusive rocks. It occurs as a large mass extending well beyond the western border of the mapped area into the Sierrita Mountains. It is not favorable to mineralization.

ALTERATION AND MINERALIZATION:

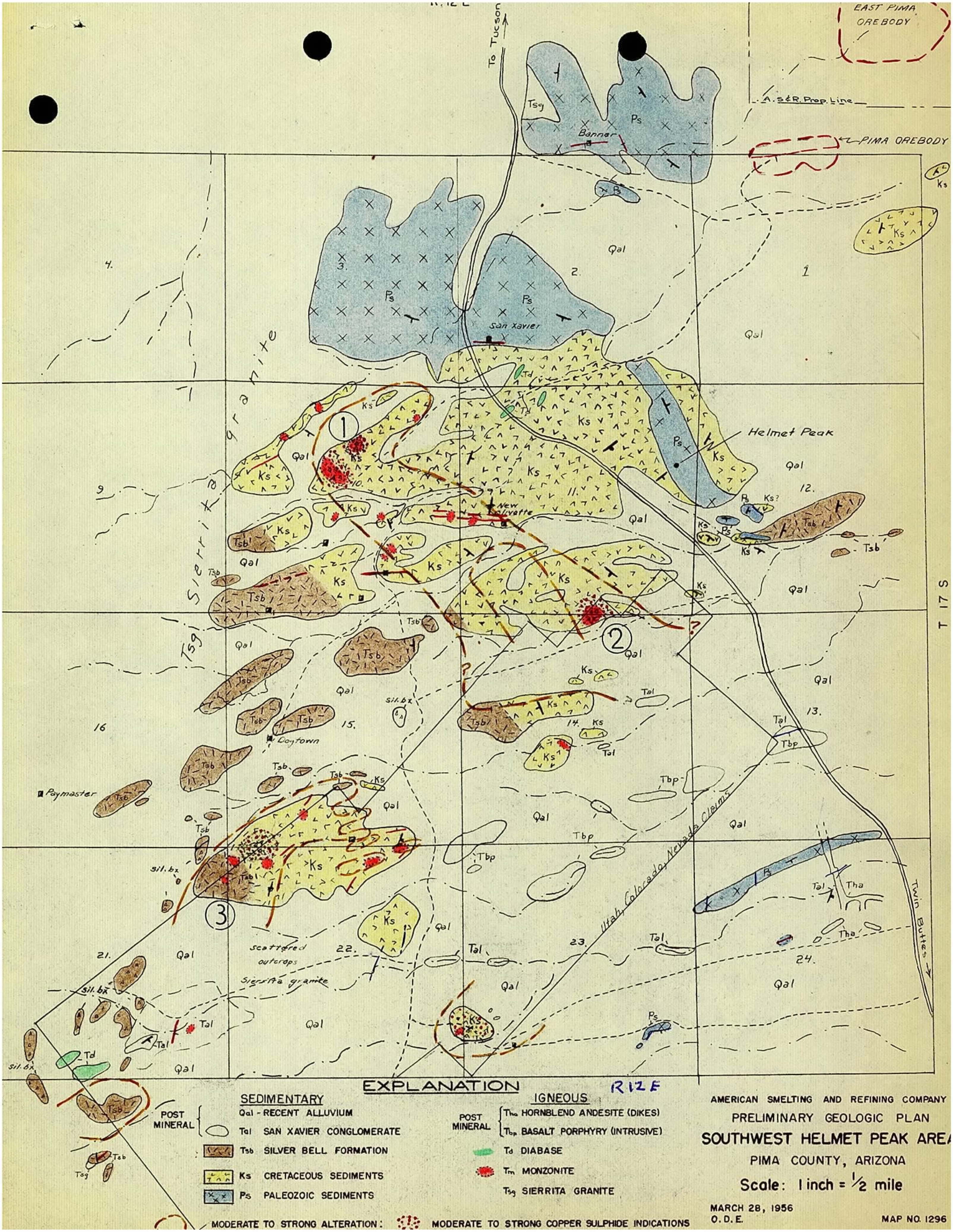
Four areas of alteration have been outlined. Within them, small brecciated monzonite plugs appear to be the most important structural feature controlling alteration and mineralization. Solutions spreading outward from these centers produced a more or less pervasive alteration of the rocks to quartz, sericite and clay. In the northern, and largest, zone (see number 1 and 2 on map) the alteration is rather sharply confined to the medium to coarse grained arkosic beds. The northwest trend of the alteration zone reflects the strike of the Cretaceous sediments. In the alteration zone to the south (see number 3 on the map) the sediments are disturbed so that beds are difficult to distinguish, and control of alteration by sedimentary features is less apparent. Quartz veins are common, so fractures controlled alteration to some extent. The eastern edge of the alteration zone is ragged where veins with strong alteration are separated by fresher rock. The zone in section 23 (unnumbered on map) centers around what appears to be a small breccia pipe, and alteration throughout the zone is strongest along northeast trending, steeply dipping quartz veins and stringers. The southwesternmost zone shown on the map (just south of Section 21) is the weakest of all. No pipe-like body was found here. Small quartz veins trending north to northeast are common but not abundant.

Outcrops are leached to a shallow depth. The nature of sulfide mineralization is shown in mine dumps and two drilled hole sludges. Pyrite is the most common sulfide, and chalcopyrite, chalcocite, galena and sphalerite are also present. Copper oxide minerals are present in all zones in minor amounts. Specularite is abundant in the zone 3 and finely disseminated in zone 2.

Indications of strongest sulfide mineralization are in and adjacent to the small (500' diameter) brecciated monzonite plugs. Here, cavities and limonite after sulfides occur as irregular blebs, and as fine disseminations and fracture fillings. Indications of both chalcocite and chalcopyrite are present. However, neither is abundant and evidence indicates little secondary enrichment. The evaluation of the leached zones is uncertain, as is usually the case when one is dealing with the inconspicuous oxidation products of low grade chalcopyrite. The problem is further complicated by the similarity of the limonites produced from chalcopyrite and specularite.

The mineralized zones shown on the attached map are numbered in decreasing order of strength of indicated sulfide mineralization. Zone 3 is surrounded by weaker mineralization, but its alteration zone is open to the southwest. Zones 1 and 2 border alluvium and therefore may be partially concealed. The alteration zone surrounding them is limited to the north, but on the south it extends for an unknown distance beneath alluvium.

Owen D. Evans



EAST PIMA OREBODY
A.S.&R. Prop. Line
PIMA OREBODY
To Tucson
Banner
San Xavier
Helmet Peak
New Olivette
Sierrita granite
Dogtown
Paymaster
Utah, Colorado, Nevada Claims
Twin Buttes
scattered outcrops
Sierrita granite
T 17 S
R12E
EXPLANATION
SEDIMENTARY
POST MINERAL
Qal - RECENT ALLUVIUM
Tal SAN XAVIER CONGLOMERATE
Tsb SILVER BELL FORMATION
Ks CRETACEOUS SEDIMENTS
Ps PALEOZOIC SEDIMENTS
IGNEOUS
POST MINERAL
Tha HORNBLEND ANDESITE (DIKES)
Tbp BASALT PORPHYRY (INTRUSIVE)
Td DIABASE
Tm MONZONITE
Tsg SIERRITA GRANITE
MODERATE TO STRONG ALTERATION:
MODERATE TO STRONG COPPER SULPHIDE INDICATIONS
AMERICAN SMELTING AND REFINING COMPANY
PRELIMINARY GEOLOGIC PLAN
SOUTHWEST HELMET PEAK AREA
PIMA COUNTY, ARIZONA
Scale: 1 inch = ½ mile
MARCH 28, 1956
O.D.E.
MAP NO. 1296

AMERICAN SMELTING AND REFINING COMPANY
Tucson Arizona

May 1, 1956

Mr. L. B. Hart, Chief Geologist
American Smelting and Refining Company
120 Broadway
New York 5, New York

WILSON-CHILSON-TODD PROPERTY
Pima County, Arizona

Dear Sir:

Reference is made to your letters of April 23 and 26.

A couple of days ago I talked again with Todd, who appears to be a more reasonable person to deal with than either Chilson or Wilson. He was attempting to determine if there was any middle ground which would provide him a basis for persuading Wilson and Chilson to be more reasonable. After talking this over later, Mr. [illegible] and I decided there still would be no hope of obtaining terms which the Company could consider reasonable. I plan so to advise Todd when I am again able to get in touch with him.

Mr. Todd also offered us two other groups of claims which he holds alone. One of these is the Paymaster Group of 13 claims. These are situated west and north of area (3) on Evans' map. This is an old, small, vein mine outside of the alteration zone, and the claims are of no interest. Todd also said he could get together a package of about a dozen claims lying between the Paymaster and the Wilson-Chilson-Todd Group. These claims are the Antelope Group owned by Mills, the Vivian Group owned by Ortiz, and the "21" Group owned by Puryear. These groups would be of interest only if we were to make a deal on the Wilson-Chilson-Todd Group.

Todd has another group of 11 Fox claims which cover the NE quarter of Section 13 and are east of area (2) on Evans' map. This Fox group is in a gravel-covered area which has a certain speculative value inasmuch as it could be underlain by the easterly continuation of alteration zone (2). However, it seems to me that this is a rather long-range possibility, and I do not regard the claims as being of much interest at the present time. They could become of interest in the future if our continuing geological mapping points up mineralization possibilities not now recognized. Also, these claims would be worth consideration if a deal is ever made on the Wilson-Chilson-Todd Group.

Todd's terms on the Fox Group are:

1. $1,000 down.
2. $20 per claim per month for first year, thereafter $40, as advance royalty to apply on a 5% royalty on production less costs of transportation and treatment including milling.

His terms on the Paymaster and other groups would be the same as above, but without the $1,000 downpayment, in lieu of which we would have to perform this year's assessment work.

In regard to the area designated (1) on Mr. Owen Evans' map, we have checked claim locations in the field and in the County records and find that there are several ownerships in that immediate area. However, Mr. Pemberton, whom we know, appears to hold the key ownership. I have contacted Pemberton, and today Mr. Courtright and I will check over with him the position of his claims in the field.

The Sierrita granite contact you asked about was not shown on the map because its position was very incompletely known at the time the map was compiled. Since then Mr. Evans has done more work in that area and this contact will be shown on a regional map which he is now compiling. This map and an accompanying report should be finished in a few days.

Your question about structural control of alteration is answered, it seems to me, by the last paragraph on page two of Evans' report wherein he states,

> "In the northern, and largest, zone (see number 1 and 2 on map) the alteration is rather sharply confined to the medium to coarse grained arkosic beds. The northwest trend of the alteration zone reflects the strike of the Cretaceous sediments."

In respect to your suggestion about additional mapping, we are having aerial photographs made by a local firm covering 42 sections in this area. These contact prints will be on the scale of 1" = 600' and will cost us approximately $1,040. Using these photographs, Mr. Evans will remap several of the more complicated areas, including the vicinity of (1), where more detail is needed.

Yours very truly,

KENYON RICHARD

kr/da
cc: PFRichard
WHLandwehr
JECourtright
OEvans