GEOLOGICAL AND GEOCHEMICAL REPORT

ON THE

KING AND QUEEN CLAIMS

COPPER MOUNTAIN PROPERTY

Greenwood Mining Division, British Columbia
NTS 82E/2W
Latitude 49°~~43~~'N
Longitude ~~123~~°~~46~~'W

by

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December 11, 1990

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INTRODUCTION

The King and Queen claims of the Copper Mountain property were staked to cover ground believed to have the potential of hosting an epithermal gold deposit and/or a copper-silver-gold skarn deposit. The Copper Mountain property may be spatially associated with a major northeasterly trending graben fault zone (Turoda Graben) and a coincident magnetically anomalous trend (Airborne Magnetic Survey Maps). The Crown Jewel, a gold skarn deposit being developed by Battle Mountain Gold at Buckhorn Mt., Washington, is located 12 miles southwestward along this trend. As of November 1990 the Crown Jewel's preliminary reserve estimate 8.25 million tons averaging 0.10 ounce per ton (opt.) gold. The Midway property which is being explored by Minnova Ltd. for an epithermal-type gold deposit is adjacent to the Copper Mountain property and believed to lie along this same magnetic trend. The preliminary evaluation of the Copper Mountain property's Queen claim consisted of geological mapping conducted concurrently with a geochemical soil survey. A total of 121 soil samples and 17 rock samples were collected and analyzed for gold and a 30 element I.C.P. package. The exploration program was conducted between October 23 and 29, 1990 by A.J. Boronowski.

Location and Access

The Copper Mountain property is located 8 km. northwest of Greenwood, British Columbia (Figure 1). Access from Greenwood is by a well maintained logging road along Motherlode Creek. Numerous branch roads and skid trails access most parts of the property. Also the property can be accessed from the southwest by a logging road along Ingram Creek and from the north by a logging road along Wallace Creek. The claims are situated within N.T.S. map sheet 82E/2W and are centred about 49°08' North latitude and 118°48' West longitude.

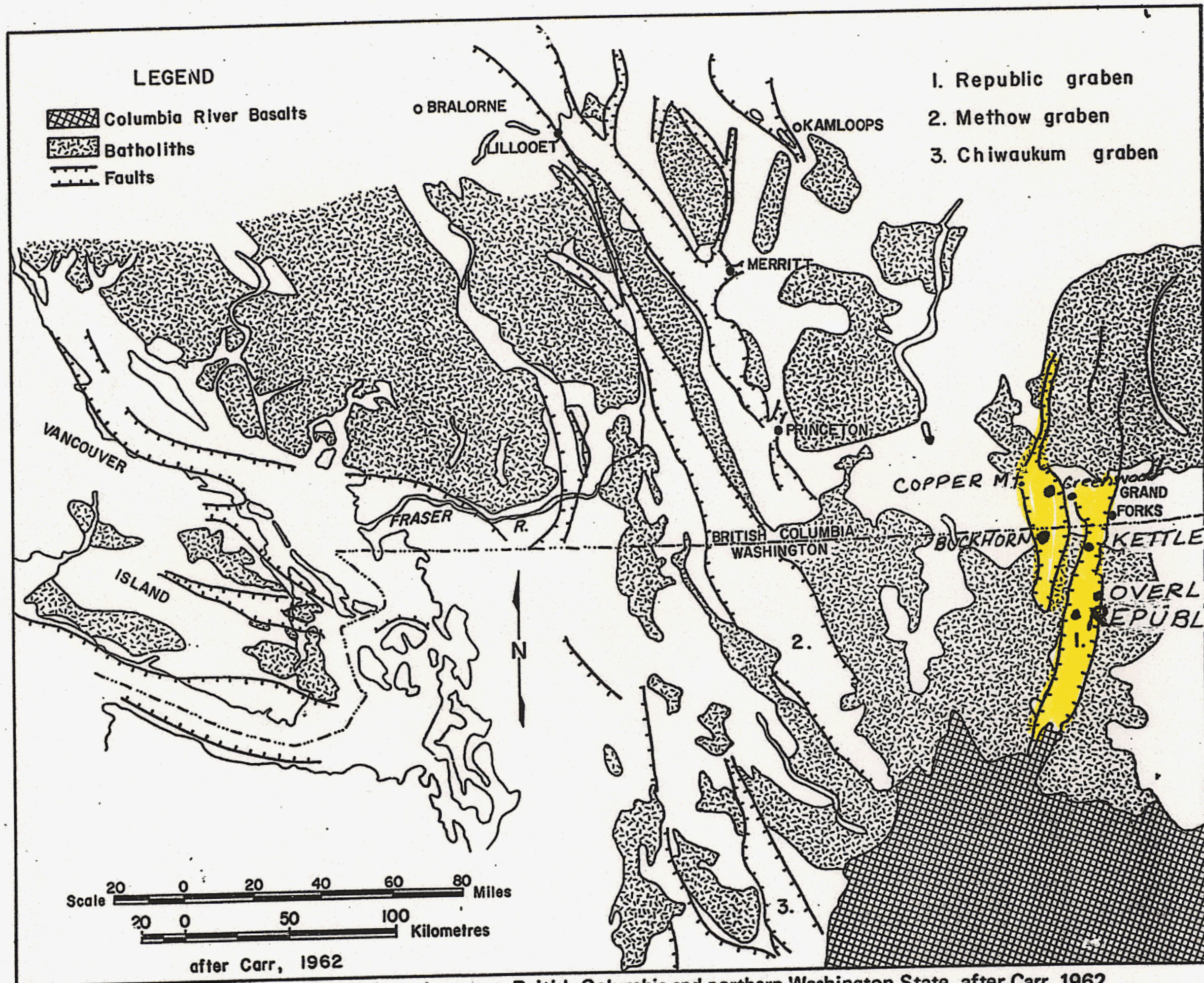


Figure 1.0 Grabens of southwestern British Columbia and northern Washington State, after Carr, 1962.

Property Status and Ownership

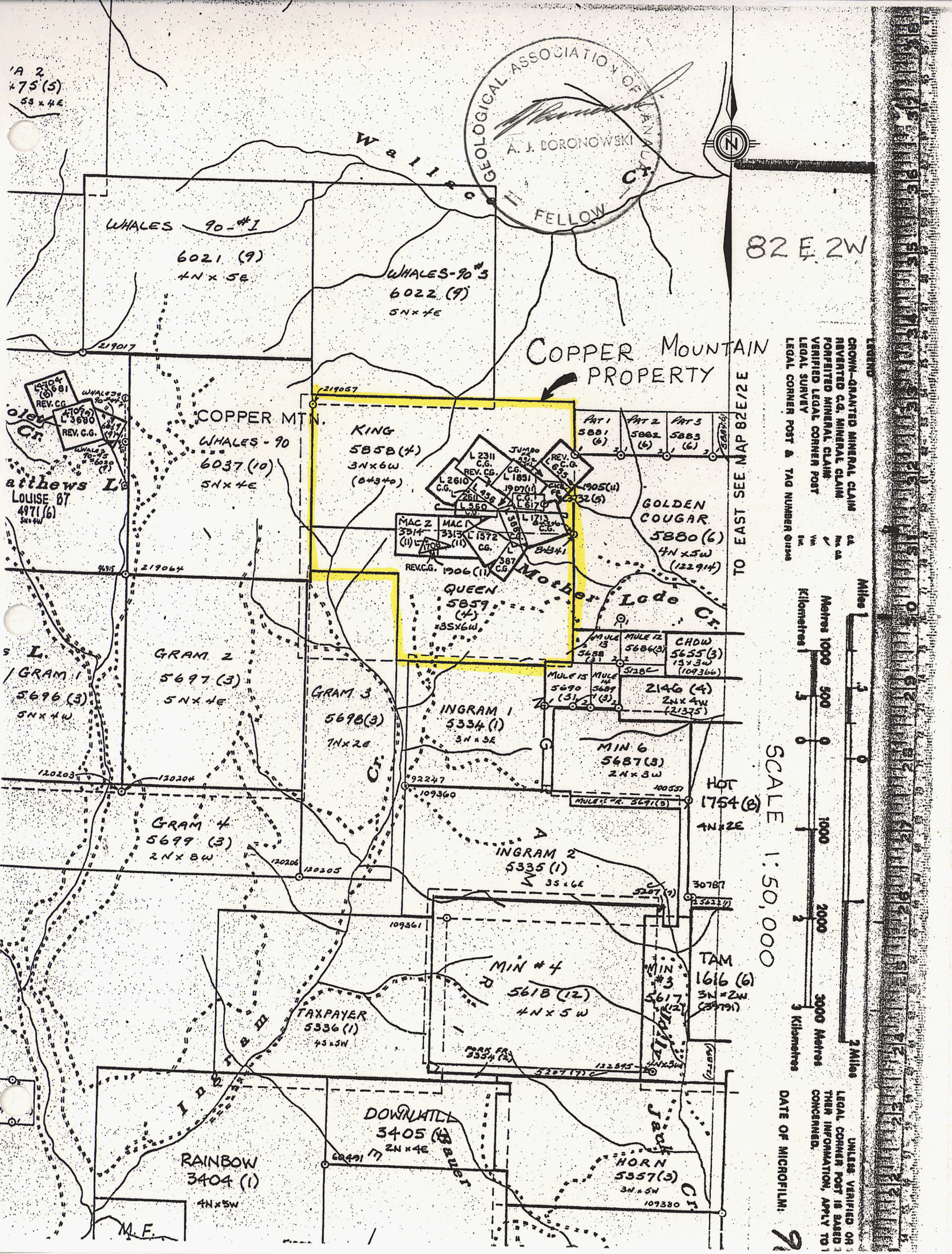
The Copper Mountain property comprises ten crown grants, five reverted crown grants, and four mineral claims (38 units) located within the Greenwood Mining Division. The King and Queen claims, which are the subject of this assessment report, comprise 36 units of the Copper Mountain property (Figure 2).

Claim Name	Record No.	Units	Date of Record	Expiry Year	Owner
KING	5858	18	April 4, 1990	1991	A. Boronowski
QUEEN	5859	18	April 4, 1990	1991	A. Boronowski

Physiography and Climate

The physiography of the Copper Mountain area is comprised of gentle southern interior topography and a typical dry interior climate. Elevations on the property range from 3,800 feet (1,158 metres) to 5,000 feet (1,524 metres). Slopes range from steep to gentle. Most of the slopes are covered by widely-spaced forest. Larger open grassed areas occur along the ridge tops. The property straddles a southwest-northeast trending ridge. A northwesterly trending spur leaves the ridge in the central part of the property.

The climate is typical southern interior with dry summers and very little snow in the winter. Work can be conducted on the property between April and November.



GEOLOGICAL ASSOCIATION OF CANADA
A. J. BORONOWSKI
FELLOW
82 E 2W
COPPER MOUNTAIN PROPERTY
Wallace Cr.
WHALES 90-#1
6021 (9)
4N x 5E
WHALES-90 #3
6022 (9)
5N x 4E
COPPER MTN. WHALES-90
6037 (10)
5N x 4E
KING
5858 (4)
3N x 6W
QUEEN
5859 (4)
3S x 6W
Mother Lode Cr.
GOLDEN COUGAR
5880 (6)
4N x 5W
PAT 1
5881 (6)
PAT 2
5882 (6)
PAT 3
5883 (6)
LOUISE 87
4971 (6)
Matthews L.
GRAM 2
5697 (3)
5N x 4E
GRAM 1
5696 (3)
5N x 4W
GRAM 3
5698 (3)
7N x 2E
GRAM 4
5699 (3)
2N x 8W
INGRAM 1
5334 (1)
3N x 5E
INGRAM 2
5335 (1)
3S x 6E
MIN 6
5687 (3)
2N x 3W
HOT
1754 (8)
4N x 2E
CHOW
5655 (3)
2146 (4)
2N x 4W
MIN #4
5618 (12)
4N x 5W
MIN #3
5617
TAM
1616 (6)
3N x 2W
TAXPAYER
5336 (1)
4S x 5W
DOWNHILL
3405 (8)
2N x 4E
RAINBOW
3404 (1)
4N x 5W
HORN
5357 (3)
3N x 5W
Ingram Cr.
Bauer Cr.
Jack Cr.
TO EAST SEE MAP 82E/2E
SCALE 1:50,000
Miles
Metres
Kilometres
LEGEND
CROWN-GRANTED MINERAL CLAIM
REVERTED C.G. MINERAL CLAIM
FORFEITED MINERAL CLAIM
VERIFIED LEGAL CORNER POST
LEGAL SURVEY
LEGAL CORNER POST & TAG NUMBER
UNLESS VERIFIED OR LEGAL CORNER POST IS BASED ON THEIR INFORMATION, APPLY TO CONCERNED.
DATE OF MICROFILM:

Previous Exploration and Implications

The following information has been compiled from assessment reports and the bibliographies listed on Minfile Reports 082ESE053 & 054. Information obtained directly from other sources will be in *italic* form in this section.

1894 *B.C. Dept. of Mines reported that an 18 ft. shaft and a 40 ft. tunnel had been developed on the Copper Mine. Mineralized widths are reported to have been 40 ft. at the Copper Mine showing and 26 ft. at the King Solomon showing in which grades are reported to have ranged between 15% and 20% copper.*

1901-02 *The B.C. Dept. of Mines report 850 tons of ore shipped in 1901 and "about 1,000 tons" in 1902.*

1903-17 *Tunnelling (probably amounting to three or four hundred feet), shaft sinking (tens of feet), and mining of a few thousand tons of oxidized copper ore from the Upper Brooklyn limestone.*

1917 *The King Solomon and Big Copper (Copper Mine) shipped 950 tons of ore.*

1950 *Mr. W.E. McArthur conducted a program of strip trenching and diamond drilling.*

1953-54 *Mr. W.E. McArthur conducted a program of trenching and diamond drilling on King Solomon and Copper Mine claims. Two carloads of ore were shipped to the Tacoma Smelter.*

1954 *Noranda tested for the extension of the roughly-conformable mineralized zone passing through the King Solomon and Copper Queen claims. A total of four holes? were* *drilled.*

1955 *Consolidated Mining & Smelting Company (Cominco Ltd.) drill tested for the extension of this conformable orebody with another four diamond drill holes. Low-grade mineralization in limestone was encountered.*

1967 *McIntyre Porcupine Mines conducted geological mapping, soil sampling, I.P. surveying, bulldozer stripping, and four diamond drill holes.*

DDH M-1 was drilled at an angle of -50° towards the IP anomaly on Line 19. According to a previous interpretation the drill hole was directed down-dip (Longe, rpt. 6436). This conclusion is in accordance with the drill logs which indicate that the "Knob Hill" unit was intersected. The conformable ore bodies within the Brooklyn Limestone lie unconformably above the Knob Hill unit.

DDH M-2 was drilled on line 18 at an angle of -60° towards the I.P. anomaly. The drill hole intersections included sharpstone and cherts.

DDH M-3 was drilled vertically on Line 13. The 520 ft. long drill hole intersected only Tertiary volcanic rocks. Possibly the sudden increase in thickness of the Eocene age volcanics is due to normal faulting along graben structure.

DDH M-4 was drilled vertically on Line 16. After penetrating 557 feet of Tertiary volcanic rock the drill intersected massive white limestone. The last 53 feet of the hole were in skarn including a rock described as "green epidote brecciated sections in fine grained dense *purplish rock (hornfels), 587-590 limestone, 1-2% finely disseminated pyrite". The limestone intersected in this hole was very possibly the Lower Limestone but the hole was stopped too soon for an answer to this question. Equally certainly, the base of this limestone unit was not reached. The skarn rock described form the bottom of the hole sounds remarkably similar to the purple skarn rock found in the vicinity of the Phoenix orebody.*

Assessment Report # 1082 describes the I.P. and Resistivity Surveys conducted over the Crown Granted claims and immediate area. Three areas were outlined where *increases in frequency effect were found with accompanying drops in apparent resistivity to values similar to those on the test profiles.* The test profiles were collected over the Greyhound deposit with a battery powered I.P. system. The results indicated lower apparent resistivities in the test area when compared to the Copper Mountain property. If the Copper Mountain I.P. survey utilized a battery powered I.P. survey, then the depth penetration of the survey can not be very great (<50 metres?). The IP measurement were made with a X = 200 feet electrode interval. The three anomalous areas are described as follows:

1. *The east end of lines 15 & 16 showed best on closer separations, indicative of a narrower, and probably shallow zone. It lies immediately to the east of the Copper Queen workings in limestone.* This zone warrants trenching.

2. *The zone at the west end of line 16 was difficult to define as sandy overburden and rock debris to the west gave serious contact problems.* This zone has never been

tested but lies in the vicinity of the exposures of the Rawhide formation. The Rawhide Shale was deposited in a deep basin environment. Very few exposures of the shale exist and one of them is beneath and within 2,000 feet of the Phoenix Pit.

3. *The zone around 15E on lines 18, 19 and 20 has the best chance of indicating an economic copper deposit. The source of the anomaly may not outcrop, or if it does, only on line 18. A weak, deep response on line 17 may also be related to this zone.* DDHs 77-1, M-1 and M-2 tested these I.P. responses. The conclusions for DDH 77-1 stated that *"the 100 metres of pyrite-bearing rocks, together with the two samples with significant values of gold, one of which contains significant zinc, indicate that the rocks intersected a the bottom of DDH 77-1 are within part of a sulphide system of some magnitude".* The drill hole intersected a Tertiary dyke swarm, then the pyritiferous zone containing two significant intersections which assayed **0.31 opt.Au. 3.16% Zn, and 3550 ppb gold**, and then bottomed in 125 metres of Tertiary dyke. The I.P. anomaly was explained by the pyrite and graphite in the cherty rocks. Follow up testing of this drill hole or the remaining I.P. anomalies has not been conducted.

Several other possible anomalies occur throughout the tested area. Particularly, interesting is that during 1980 Rio Tinto conducted an I.P. orientation survey over lines 18, 19 and 9A and a strong anomaly on line 9A picked up by Rio Tinto had not been identified by the earlier McIntyre survey. This anomaly would lie along the extrapolated Ingram fault zone a major graben structure? extending southwestward to the Crown Jewel deposit and the Midway property. The Copper Queen and King Solomon deposits lie along this trend. Once again, if the battery powered I.P. survey was utilized for the Copper Mountain survey, then it may have failed to identify all the massive and disseminated sulphide zones deeper than approximately 50 metres from surface.

1970 Assessment Report 2453 by Pechiney Development Ltd describes a geological, geophysical and geochemical survey conducted to the east of the Copper Mountain property. The report refers to a *limestone which has been nearly fully replaced by pyroxene-garnet-fluorite bearing skarn.* The report states that the fluorite is a yellow variety. The author also noted that the "pulaskite" dykes are trending NNE to NE which is in agreement with the trend of the Tertiary age graben structures. Also of interest is that the units within one kilometre of the eastern Copper Mountain property are dipping to the NW rather than to the SW as on the Copper Mountain property. This abrupt change may be a synform or more likely deformation due to normal faulting. The Pechiney geologist has problems correlating units over short distances and concludes that NE trending faults must be present to explain these enigmas. The only significant showing on the property occurs within non-replaced limestone. *This showing is located in a fractured zone and consists of chalcopyrite plus bornite and chalcocite. The fracture trends north-east, but has not been traced for more than 50 ft. eastward whereas westwards it proved to be connected to an identical showing previously discovered on the adjoining property.* The adjoining property is the Copper Mountain property.

1975 Assessment Report 5842 by Rio Tinto Canadian Exploration Ltd. reports on a drill program conducted on the Pen claims. The main pyrite-sphalerite showing which was tested by two diamond drill holes is located 2 km. north of the northern boundary of the Copper Mountain property. A total of 1,302 feet of drilling, geological mapping and an I.P survey were conducted on the main showing. The diamond drilling did not reach the base of the limestone unit. *The main showing occupies a near-vertical, north-striking, fault system cutting the limestone of probable Brooklyn age.* No significant economic mineralization was encountered.

1976 Assessment Report 6017 by Rio Tinto reported the results of a geological mapping and geochemical (copper, zinc) soil sampling program conducted on the Joe claims, which were situated 2 km. northeast of the Copper Mountain Property. *A minor anomaly was detected but did not warrant retention of the claims. Geological mapping indicated a belt of sharpstone conglomerate, quartzite, and limestone belonging to the Brooklyn formation overlying metamorphic rocks of the Knob Hill Group.*

1976 Assessment Report 6394 by Rio Tinto describes a geological and geochemical program conducted on the Pen, AB, and Joe claims located adjacent to and north of the Copper Mountain Property. The program continued to explore for conformable zinc or copper sulphide in limestone. The Brooklyn Limestone was not found to outcrop on the property.

1977 Assessment Report 6436 by Rio Tinto reports on a drilling program consisting of 304.19 metres within DDH 77-1. The drill hole tested the I.P. anomaly which had been tested previously by McIntyre's holes M1 & 2. *The drill hole intersected a Tertiary dyke swarm, then the pyritiferous zone which yield two significant intersections of which one assayed* ***0.31 opt.Au. 3.16% Zn, and the other*** *intersection assayed 3550 ppb gold, and then bottomed in 125 metres of Tertiary dyke. Sulphide average between 1% and 2% in the sharpstone and related cherts and are most abundant between 175 metres and 190 metres, providing an adequate explanation for the I.P. anomaly. Although DDH 77-1 was drilled to a depth of 304 metres, it intersected only 140 metres of the Triassic sediments it was designed to test. The remainder of the hole penetrated Tertiary intrusive, in the form of dykes or sills, which appear to have expanded the thickness of the Triassic sediments more than twofold.* If graben-style structures are considered to have been active in the area, then the abundant dykes and sills in the area may have intruded along these structures and the apparent thickening of the sediments can be explained by drilling into several individual fault blocks. Such an extensional tectonic setting is an ideal environment for the deposition of an epithermal gold deposit. The presence of limestone and *massive to fragmental chert in chlorite, biotite, graphite rich matrix* would make an ideal host for an epithermal Carlin-type deposit. In the discussion section of the report, *the geophysical anomaly was accounted for by the sediments which below a depth of 130 metres contained in excess of 1% pyrite with patches of graphite. The drill hole stopped in a pyritiferous zone at least some of which contained significant values in zinc and gold. The last 125 metres of the hole intersected a Tertiary intrusive.* Extending the depth of this diamond drill hole was recommended in order to test the sulphide system at depth, test the theory that the pyrite zone may represent a "pyrite halo" such as occurs surrounding the Phoenix orebody, and test for the economically favourable Brooklyn Limestone at depth.

Other interesting comments contained within the report are descriptions and assays from the Copper Mine (Big Copper), Copper Queen and King Solomon claims. The ore at the Copper Mine appears to have consisted of an oxidized cap with native copper, chalcocite and hematite lying as a ledge, presumably sub-horizontal, underneath Tertiary volcanics. *Reported grades are improbably high (in one case 8% Cu was described as "low grade"). The width in 1894 was described as 26 feet, the strike length 750 feet.* During the exploration program the showing was sampled and grades range between 0.64% and 2.75% Cu. The Copper Queen and King Solomon claims also contain oxidized mineralization with limestone. These oxidized pods may have been originally mineralization which had pounded beneath a volcanic capping during the hydrothermal event which introduced the mineralization. A petrographic examination of sample Q-1 by J. Payne of Vancouver Petrographics Ltd. indicated that chalcopyrite grains occur within a second vein set mainly in quartz in the central parts of the veins. Thereby suggesting that the copper is related to a late (Eocene?) epithermal event and that the hydrothermal solutions may have been confined by a volcanic cover.

An inter-office memorandum by J. McCance on the Queen claims - Geophysics made the following remarks, *It is quite permissable to assume from these IP results that both disseminated and massive sulphide mineralization as tabular bodies and intermittent lenses are present near both the upper and lower contacts of a basal (Brooklyn) Limestone unit and the surrounding Sharpstone lithologies. Unfortunately the evidence is complex and alternatives to the following interpretation such as mineralized zones in the overlying volcanic rocks should not be dismissed lightly. Certainly drilling is warranted to test both the geological hypothesis and geophysical anomalies as a next and perhaps final stage of exploration.* His report recommends a total of 6 holes on lines 18 and

19 to test anomalies A through D, and one hole on line 9 to test a McIntyre response. I recommend that an I.P. and magnetic survey be conducted over the most favourable part of the property prior to conducting a drill program.

1977 Assessment Report 6378, describes Rio Tinto's geophysical IP survey conducted as an orientation survey over lines 18, 19, and 9A. The test survey on Line 18 and 19 was made using X = 30 metres (100 feet). The survey confirmed McIntyre's anomalies on Lines 18 & 19. *On Line 18S, the anomalous pattern suggests a narrow, more definite source, at depth, within the broad, weaker anomaly.* This may represent a skarn deposit surrounded by an epithermal deposit. The report recommended a drill hole to test this anomaly, which was later executed by DDH 77-1. *The drill hole intersected a Tertiary dyke swarm, then the pyritiferous zone which yield two significant intersections of which one assayed* ***0.31 opt.Au. 3.16% Zn, and the other intersection assayed 3550 ppb gold****, and then bottomed in 125 metres of Tertiary dyke.* The geophysicists state that, *If the drill hole is drilled on Line 18S, and sulphide mineralization of economic interest is intersected, further work would be warranted in this area, and also in the area from Line 9A to Line 11, surrounding the Pasco showing.* The Pasco showing is reported to contain hydrothermal flourite mineralization.

1980 Assessment Report 8497 (8823), describes a diamond drilling and geological mapping program conducted by Utah Mines Ltd. and W.R. Financial Consultants Ltd. The introduction to this report reiterates that the *Triassic Brooklyn rocks of the Greenwood area contained two separate limestone beds and that the Phoenix and probably the Motherlode orebodies occurred in the lower of* *these two limestone units. At the Copper Queen camp, 8 km. NW of Greenwood, copper showings occur in the upper limestone unit.*

By analogy with Phoenix, where small relatively high grade orebodies occur stratigraphically above the main orebody, the Copper Queen camp was thought to be prospective on account of indications of the lower limestone beneath the upper, copper-bearing units.

Therefore the highly prospective lower limestone at the Copper Mt. property remains essentially unexplored. If the concept of graben structures and an epithermal system occurring in the area is considered, then the potential of the property for hosting a deposit increases substantially since now one would explore for both skarn and epithermal deposits in the limy units. Once again, the petrographic examination by Vancouver Petrographics which identified copper sulphide mineralization within the centres of late stage quartz veins and the high-grade gold mineralization within DDH 77-1 suggest the presence of an epithermal system.

Two holes were drilled in 1980 totalling 502 metres. DDH 80-1, intersected 45 metres of Tertiary dyke and then a fault followed by grey siliceous sediment with chlorite and carbonate. The top of the hole contained massive white crystalline limestone and sections of grey white chert. The report concluded that the rocks represent the Knob Hill "basement rocks". This could easily be the case since the northwestward directed hole intersected a fault zone and then may have passed in to a "graben fault block" of lower stratigraphy (refer to sketch on the bottom of the accompanying compilation map). DDH 80-2 extended McIntyre M-3 to 298.09 metres. The hole intersected either the Knob Hill rocks or the Brooklyn chert. Either may be the case if faulting is considered.

The report concludes that the Upper Sharpstone lies on basement (Knob Hill) and not on the Lower Limestone as found directly to the north, west, and 400 metres southwest in DDH M-4. Rather the Lower Limestone is probably present, but the holes passed into fault blocks containing lower stratigraphy. Possibly a combination of magnetics and IP would define both skarn and epithermal gold targets within the property.

No core was split for assaying. The drill logs indicate pyrite and chalcopyrite along fractures and disseminated pyrite locally up to a visual estimate of 10% pyrite. This core was not located in November 1990.

1981 Assessment Report 9742, is a report on a diamond drill program conducted by D.F. Pasco on the Jr. 1 & 2 claims, which are situated to the east of the Copper Mt. property. The "hydrothermal" fluorite showing is located approximately 100 metres east of the Copper Mt. claim boundary. The showing *consists of massive pods of bornite with some sphalerite and carrying good silver values hosted by white crystalline limestone.* A total of 76.5 metres of drilling was completed in two holes. *Both holes were collared in white crystalline limestone of the Brooklyn Formation and were stopped in palaskite dike.* No core was split for assaying.

1983 Assessment Report 12,328, is a diamond drilling report by McKinney Resources Incorporated. A total of 652 feet (198.73 m.) were completed in two drill holes . *The purpose of this drilling program was to try and intersect the projected extensions of the zones of mineralization that had been found on the King Solomon and Copper Mine claims. The two diamond drill holes that were drilled did not intersect any mineralization.*

The first drill hole tested a zone between two past producing open cuts on the King Solomon claim. The drill hole was drilled at -50° in the N15W direction. The first 115 feet encountered 5 feet of overburden and then 110 feet of casing. If the drill hole was collared on or close to the assumed extension between the open cuts, then the possibility exists that the mineralized horizon was cased.

The second drill hole was a vertical hole designed to test the *downward extension of the open cut that produced high grade ore in early in the century. A small intersection of red bed was intersected at 75.5 to 82 feet. This section was assayed for copper, gold and silver but the results were very low.* The logs indicate a *Copper zone? brecciated* where the best 2 feet intersection assayed 0.20 opt Ag., 0.08% Cu., and 0.003 opt. gold. This drill hole should be located and the dip of the open cut mineralization should be measured in order to determine whether the above intersection represents the extrapolated extension of the mineralized zone.

Summary of Work Completed in 1990

Geological mapping at a scale of 1:10,000 was conducted concurrently with a geochemical soil sampling survey. A total of 121 soil samples and 17 rock samples were collected from the property.

The southeast and southwest surveyed corners of the Copper Queen claim were located and base station 00 + 00 was established at the southwest corner of the claim. The Copper Queen Grid was established by hip-chain, compass, and altimeter. The baseline trends 205° from the 00 + 00 base station. Samples were collected at 100 metre intervals and lines are spaced at 100 metres. The stations were flagged and marked (Figure 3 & 4).

The samples were placed in gusseted, kraft soil sample bags and sent to Acme Analytical Laboratories Ltd. (Acme Lab.) for analysis.

Acme Lab. dried and sieved the samples to a -80 fraction size. The prepared samples were analyzed for a 30 element I.C.P. package utilizing the following procedures. Refer to Appendix 1 - Analytical Results for detail.

Gold: MIBK acid leach extraction of a 10 gram sample followed by an AA analysis yielded a lower detection limit of 1 ppb.

A 30 element I.C.P. package:

Hot HNO3-HCl extraction of 0.500 gram sample followed by an Induction Coupled Plasm analysis of a 10 ml. diluted sample. The leach is partial for Mn, Fe, Sr, Ca, P, La, Cr, Mg, Ba, Ti, B, W, and limited for Na, K, and Al.

REGIONAL GEOLOGY

The most recent published description of the geology of the Greenwood-Grand Forks area indicates that the map area, contains Late Paleozoic and Mesozoic volcanic and sedimentary rocks, mainly in the greenschist facies of regional metamorphism, which are intruded by Mesozoic plutons and unconformably overlain by Tertiary volcaniclastic and flow rocks (Fyles, 1990). Refer to the Table 1. Table of Formations for more detail.

According to Fyles this stratigraphy is contained within five, north-dipping thrust slices with bounding faults which at many places are marked by layers and lenses of deformed serpentinite (Fyles, 1990). The Copper Mountain property appears to lie to the west of these five thrust slices. The thrust slices lie above

TABLE 1. TABLE OF FORMATIONS

AGE	NAME	MAP SYMBOL	LITHOLOGY
Eocene	Penticton	Epi	Dikes, sills & irregular plutons of pulaskite syenite, monzonite & diorite. (Coryell intrusions).
		Eps	Stratiform units, arkosic, volcaniclastic sediments (Kettle River Formation), flows of andesite, trachyte & phonolite (Marron Formation).
Unconformity			
Cretaceous	Nelson	qd	Mainly granodiorite & quartz diorite, minor diorite (d) & gabbro (g).
Jurassic	Lexington	qfp	Quartz feldspar porphyry.
Triassic	Brooklyn	TRb	
		TRBv	Fragmental greenstone & related microdiorite.
		TRb1	Limestone, calcareous sandstone & conglomerate & skarn.
		TRbs	Green & maroon tuffaceous sandstone, siltstone & hornfels.
		TRba	Dark grey to black siltstone & argillite.
		TRbbx	Chert breccia or sharpstone conglomerate & minor tuff, tuffaceous siltstone, sandstone & breccia & maroon & green limestone-cobble conglomerate.
Unconformity			
Carboniferous or Permian	Attwood Group	Pa	
		Paa	Black cherty siltstone, phyllite & argillite.
		Pal	Grey to white limestone, cherty limestone & minor dolomite.
		Pav	Andesitic volcanics.
	Fault contacts		
	Knob Hill	Pkc	Chert, grey argillite, siliceous greenstone &minor limestone.
		Pkv	Greenstone, pillow lava & breccia, amphibolite & minor limestone.
		Pkx	Fine chert breccia & conglomerate.
		Pkm	Grey & green schist and phyllite, buff to white quartzite, minor crystalline limestone, white dolomite, fine-grained calcsilicate gneiss, quartz biotite gneiss & amphibolite.
	Serpentinite	sp	Serpentinite & listwanite.
	Old Diorite	od	Coarse & fine-grained hornblende diorite.

high-grade metamorphic complexes exposed to the south in northern Washington and to the east beyond the Grandby River fault (Fyles, 1990).

The Late Paleozoic rocks in the Greenwood area are the Knob Hill Group of chert, greenstone and related diorite and serpentinite, and the Attwood Group of dark grey argillite, limestone and minor volcanic rocks. These Carboniferous or Perimian rocks are believed to represent the obducted parts of an ophiolitic sequence. These rocks are unconformably overlain by the Triassic age Brooklyn Formation of clastic sedimentary rocks, limestone and largely submarine pyroclastic breccias and related dioritic intrusions (Fyles, 1990). These rocks probably formed in an environment of growth faulting and explosive vulcanism (Fyles, 1990).

A combination of the conglomerates within the Triassic age Brooklyn Formation marking unconformities, the lack of sediment deposition between the Triassic and Eocene periods, and the intrusions of the Jurassic and Cretaceous periods attest to the major tectonic and hydrothermal activity that has effected this geological setting since Triassic time. Such large scale tectonic and hydrothermal events often indicate areas that are favourable for hosting economic mineral deposits.

The distribution of Tertiary rocks is controlled by a complicated array of extension faults (Fyles, 1990). According to Fyles, three sets are recognized. The oldest are gently east-dipping, at or near the base of the Tertiary. Later, dominantly west-dipping listric normal faults have caused rotation so that the Tertiary strata dip to the east at moderate angles. The apparent offset on each of five of these faults is measured in kilometres. The third and latest faults are north to northeast trending, steeply dipping, strongly hinged and influenced by the earlier faults.

DETAILED TECHNICAL DATA AND INTERPRETATION

Property Geology

The Copper Mountain property is underlain by a fault bounded northeast trending block of the Late Paleozoic Knob Hill Group and Brooklyn Formation (Figure 3). On either side of this block of Late Paleozoic rocks are Eocene age arkosic, volcaniclastic sediments, and flows of andesitic to phonolitic composition. Small islands of andesite flows occur within the Paleozoic block and windows of Paleozoic rock occur within the Eocene age rocks adjacent to the fault bounded Paleozoic block. Eocene age andesite dykes and sills have intruded the Paleozoic and Eocene rocks.

The western boundary of fault bounded block is marked by the west dipping Copper Mountain Fault and the eastern boundary is marked by an east dipping fault (Figure 3). Therefore, at depth the property may be underlain by a large volume of Late Paleozoic rock. These northeasterly trending faults may be part of the Turoda Graben and the structures can be traced on aeromagnetic maps southwesterly into northern Washington.

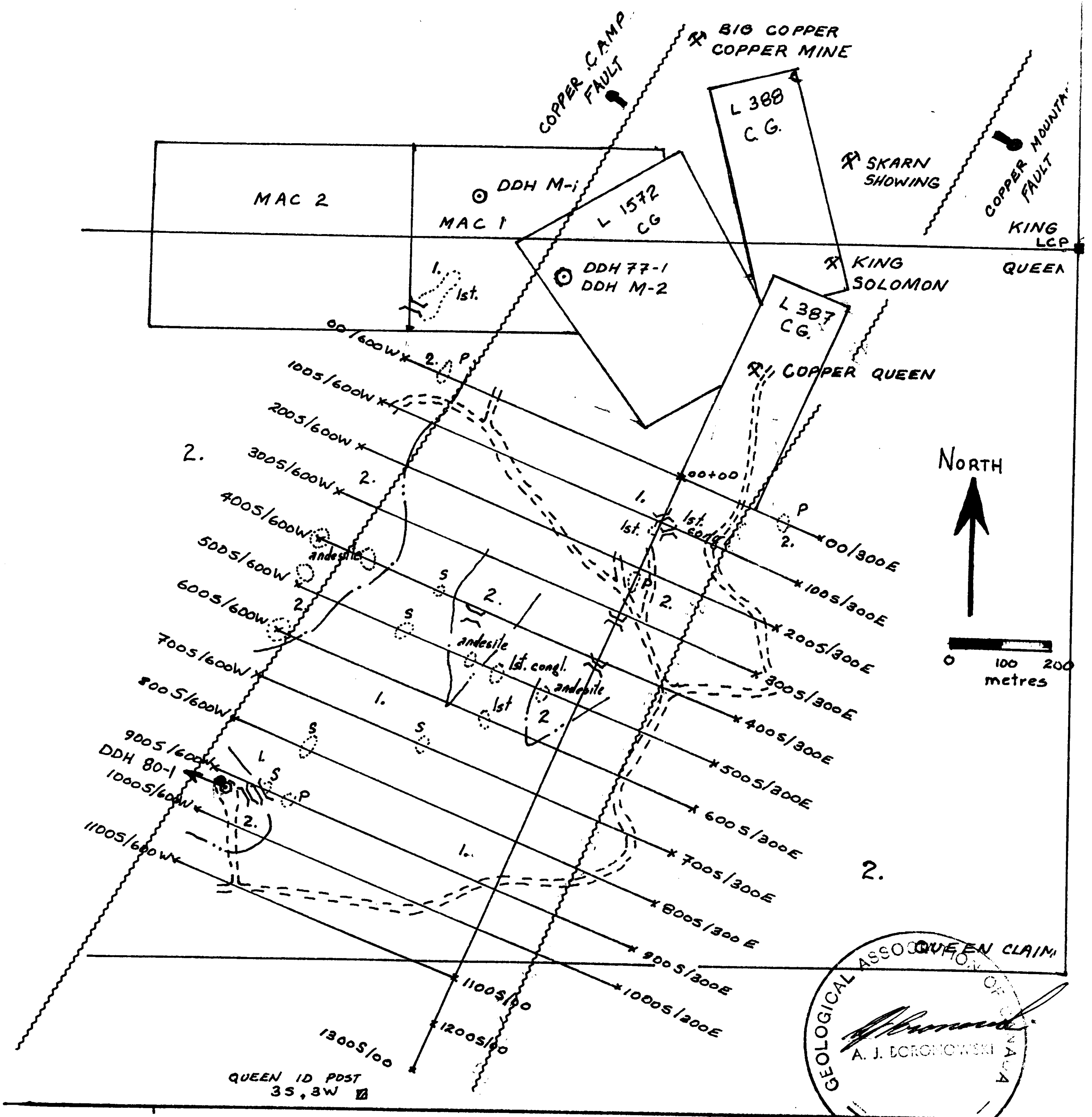
Property mapping during this exploration program was limited to the Queen Grid and an examination of the major showings.

The property geology is presented in Figure 3 and a brief description of lithologies follows:

Triassic

Unit 1: Brooklyn Formation: The chert breccia-conglomerate, calcareous sandstone and limestone, limestone conglomerate which underlie the central part of the Queen Grid are on strike with the Sharpstone and Upper Brooklyn rocks which underlie the Copper Queen and King Solomon Showings.

The calcareous sandstones and crystalline limestones on the



Legend

Unit 1.
Unit 2. } Refer to Table of Formations - Table 1.

lst. = limestone

cong = conglomerate

S = Sharpstone

P = phonolite

trench

diamond drill hole

road

APPROXIMATE FAULT LOCATIONS ACCORDING TO BC.G.S

J.T Fyles - OPEN FILE 1990-25

COPPER MOUNTAIN PROPER[TY]

NTS 82 E/2W

GREENWOOD MINING DISTRI[CT]

Scale 1:10,000

QUEEN GRID GEOLOGY

by Alex Boronowski

Dec 11 1990 Figure 3

Queen claim are light greyish-white, fine grained and contain slight ribbed textures on weathered surfaces. The ribbing is due to either silicification along fractures or detritus silica. The limestone conglomerate comprises light greyish-white, rounded, and fractured limestone clasts within a greenish chloritic-calcareous matrix. Chlorite-epidote hairline filled fractures cut the limestone. The Sharpstone comprises rounded to angular light greyish-white chert fragments in a chloritic matrix.

Eocene

Unit 2: Penticton: This unit underlies the eastern and western part of the Queen Grid. A crumbly, yellowish-white, medium grained arkosic unit was mapped south of the Copper Queen showing along the main road. The remainder of the Penticton Group comprises flows of andesites and phonolite, which have been intruded by andesite dykes.

The dark green weathering, fine grained, chloritized andesite flows are often calcareous and magnetic. The pinkish-grey weathering phonolite comprises whitish feldspar laths (< 5 mm.) in a fine grained, biotite, chlorite matrix. The phonolite can be strongly magnetic. This phonolite which occurs throughout the Queen Grid may be a feldspar porphyry intrusion.

The fine grained, dark green andesite dykes have intruded the Paleozoic and Eocene stratigraphy.

Structure

The property is underlain by a northeast trending fault bounded, block of Late Paleozoic rocks with Eocene age rocks adjacent to the block. The western boundary of fault bounded block is marked by the west dipping Copper Camp Fault and the eastern boundary is marked by the east dipping Copper Mountain Fault (Figure 3). Therefore, at depth the property may be underlain by a large volume of Late Paleozoic rock. These northeasterly trending faults may be part of the Turoda Graben and the structures can be traced on aeromagnetic maps southwesterly into northern Washington.

No evidence of these faults were found on the Queen Grid. However, the predominant fracture directions are approximately 035° and 330°. A brief examination of the King Solomon showing and area indicates that the skarn mineralization and workings trend approximately 035 degrees. The Big Copper (Copper Mine) which is located at the Late Paleozoic-Tertiary contact contains two major faults trending 300°/50°E and 062°/50°N. The northwest trending fault may be cut by the northeast trending fault. The northwest trending fault occurs within shale and arkose of the Penticton Group. A narrow dyke has intruded the fault structure and trends parallel to the structure.

Alteration

The narrow band of Late Paleozoic rocks underlying the Queen Grid do not contain obvious skarn mineralization. However, the Brooklyn Formation has been silicified and skarns may be developed at depth.

Economic Geology

Four rock samples (QR 90-1 to 4) were collected from the vicinity of DDH 80-1 (900S/500W). Two old trenches within the area exposed Sharpstone and andesite and phonolite flows. No significant values were obtained.

Two rock samples (QR 90-5 & 6) were collected from old trenches located to the south of the Copper Queen showing (91S/00, 100S/24E). The strongly jointed or bedded, northeast trending limestone conglomerates contain slightly elevated values for gold (12 & 18 ppb).

A mineralized skarn sample (QR 90-7) from the Copper Queen showing assayed 8,675 **ppm copper (0.87%), 11.7 ppm silver (0.34**

opt.) and 4720 ppb gold (0.138 opt.). The sample is strongly magnetic.

Two samples (QR 90-8 & 9) were collected from the King Solomon showing. One mineralized sample assayed **71,308 ppm copper (7.13%), 21 ppm silver (0.61 opt.), and 2050 ppb gold (0.06 opt).** Another sample of limestone conglomerate assayed 11 ppb gold, which is comparable to the limestone conglomerate collected on the Queen Grid.

Two rock samples (QR 90-10 & 11) were collected from a skarn located between the King Solomon and Big Copper showings. The mineralized samples contain anomalous values for copper and silver but only slightly elevated values for gold (18,327 ppm. copper, 19.7 ppm silver, 48 ppb gold, and 5,744 ppm copper, 27.9 ppm silver, 160 ppb gold).

Six rock samples (QR 90-12 to 17) were collected from different levels of the Big Copper workings. The samples contain ore-grade values for copper and silver, but only slightly elevated values for gold. An elevation difference of 110 feet exists between the 1st level (4600 ft) and the 5th level.

Generally, those samples with elevated values for copper, silver, molybdenum, arsenic, antimony, tungsten and possibly boron and cadmium contain elevated gold values. The limited amount of sampling suggests that the King Solomon and Copper Queen showings and immediate area may contain a slightly elevated concentration of gold.

Geochemistry

The analytical results for the soil and rock sampling survey are contained in Appendix 1. The 121 soil and 17 rock sample locations are presented in Figure 4 and the results for Gold, Silver, Copper, Lead, Zinc, Arsenic, Antimony, Bismuth, Boron, Tungsten, and Cobalt are presented in Figures 5-15.

A statistical analysis of the geochemical soil sample results yielded the following results: Definitely anomalous values exceed the 95 percentile (Mean + 2 Standard deviation (Std).) and slightly anomalous values are those samples between Mean + 1 Std. and the definitely anomalous values.

Element	Mean + 2 Std.	No. of Soils	Mean + 1 Std.	No. of Soils
Gold	>12 ppb.	9	>8 ppb.	16
Silver	>0.4 ppm.	6	>0.3 ppm.	15
Copper	>30 ppm.	5	>24 ppm.	16
Lead	>20 ppm.	4	>16 ppm.	23
Zinc	>176 ppm.	6	>142 ppm.	16
Arsenic	>17 ppm.	2	>12 ppm.	7
Antimony	>3 ppm.	5	>3 ppm.	5
Molybdenum	>1 ppm.	0	>1 ppm.	0
Bismuth	>4 ppm.	10	>3 ppm.	19
Boron	>5 ppm.	15	>4 ppm.	30
Tungsten	>3 ppm	4	>2 ppm.	8
Cobalt	>8 ppm.	12	>7 ppm.	27

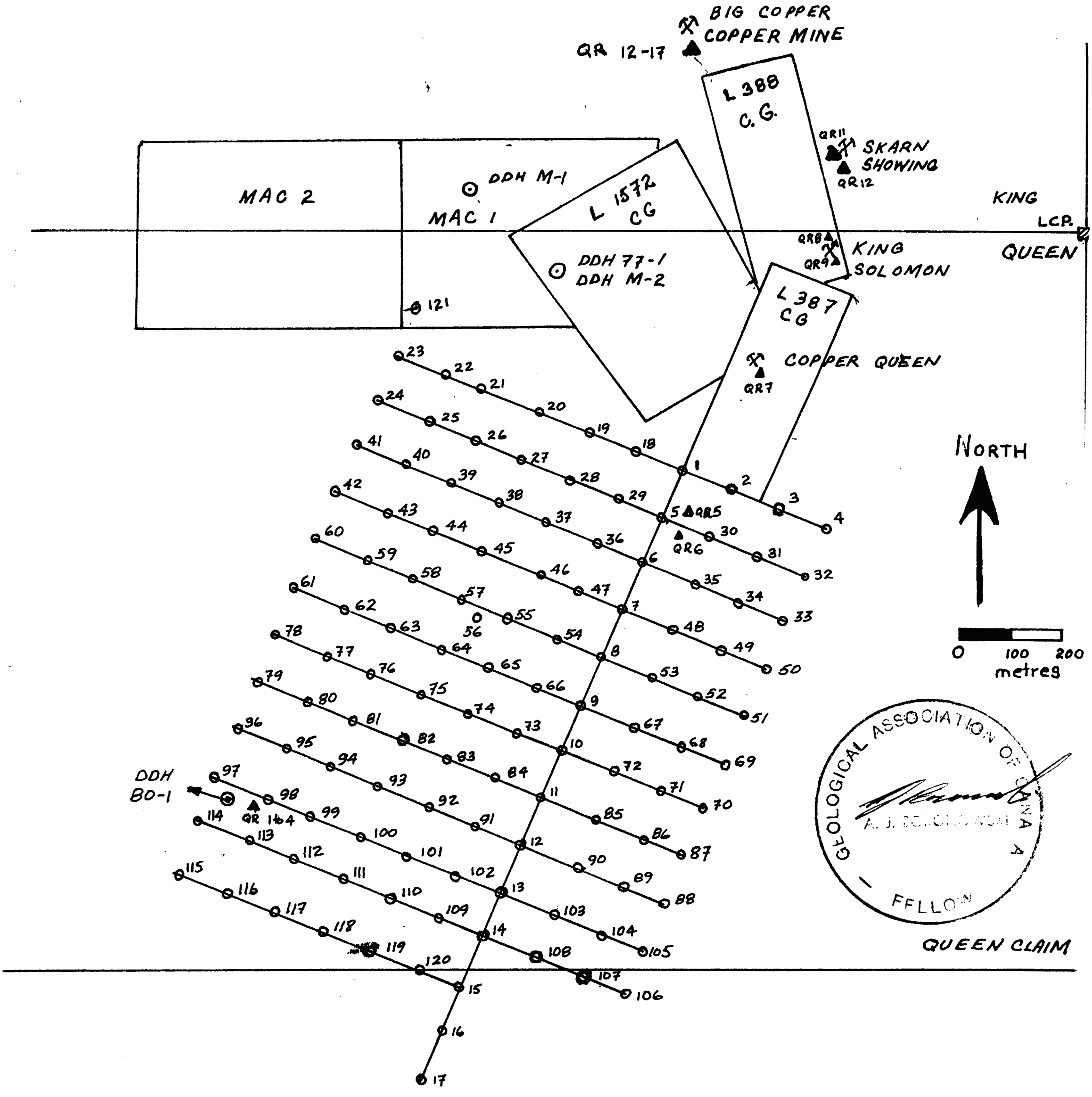
By superimposing the analytical results (Figure 5-15) onto the geological map (Figure 3); one can make the following observations:

1. Anomalous gold and silver values occur along the major east dipping Copper Mountain Fault and along strike of the Copper Queen showing.

2. The area surrounding DDH 80-1 is anomalous in gold, silver, lead, bismuth, boron, tungsten, and cobalt.

3. The andesite and phonolite flows are anomalous for copper.

4. Two coincident zinc and arsenic anomalies occur at 00/300E and 00/300 to 400W. The anomaly at 300E is coincident with an anomalous gold value and lies along the east dipping Copper Mountain Fault. The 200 metre wide anomaly centered at 350W may reflect gold mineralization in the area. DDH 77-1 which lies along strike of this anomaly contained gold intercepts assaying 0.31 opt. gold and 3550 ppb gold.

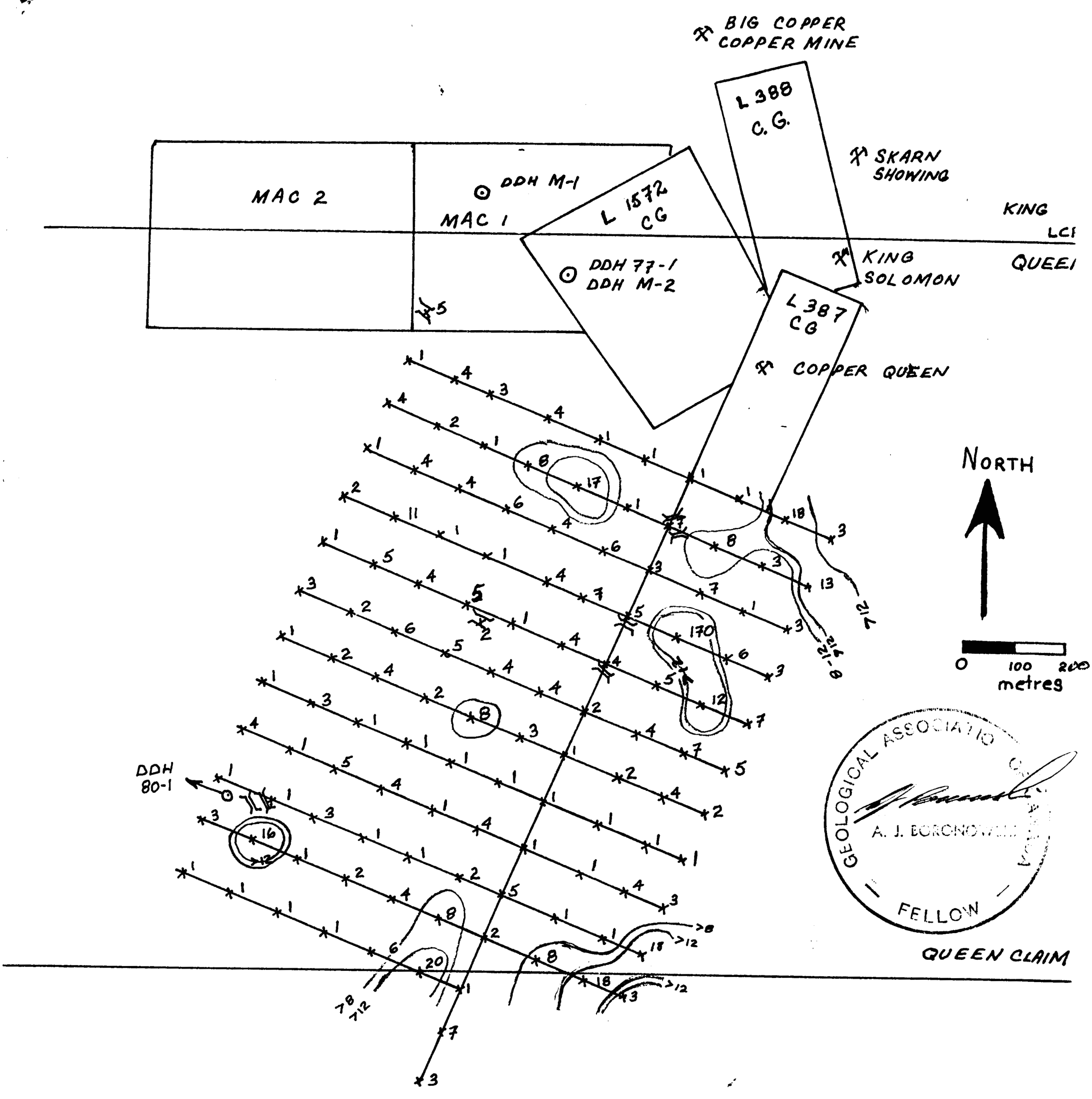


Legend

23 O soil sample
QS 90-23

QR 4 ▲ Rock sample
QR 90-4

COPPER MOUNTAIN PROPER
NTS 82 E/2W
GREENWOOD MINING DISTRI
Scale 1:10,000
QUEEN GRID
Rock & Soil SAMPLE Locatio
Alex Boronowski Figure 4



LEGEND

× 12 ppb Au

Contours

>12 ppb Au

8 ppb - 12 ppb. Au.

⊙ diamond drill hole

trench

COPPER MOUNTAIN PROPER

NTS 82 E/2W

GREENWOOD MINING DISTRIC

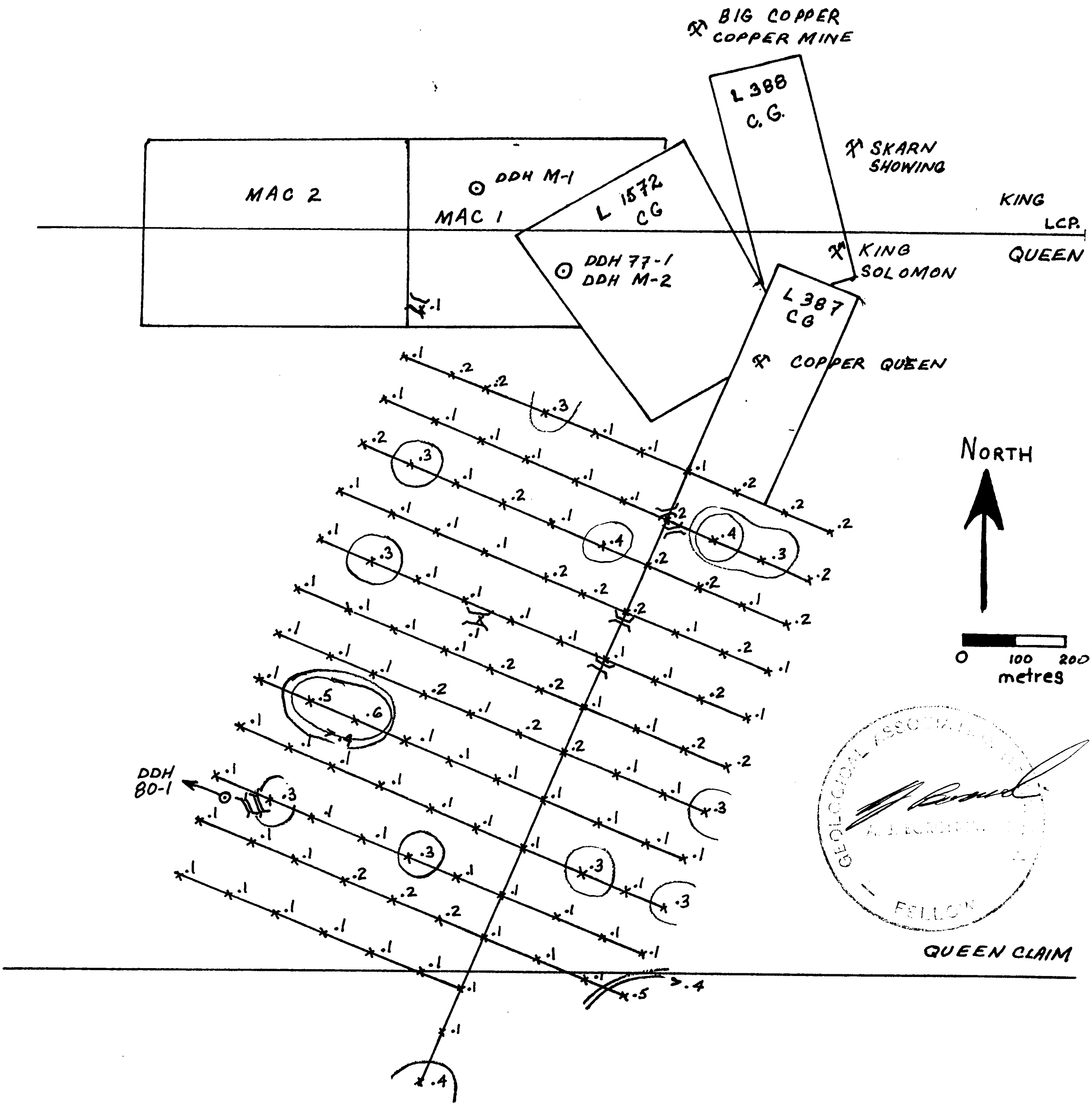
Scale 1:10,000

QUEEN GRID

GOLD PPB

Alex Boronowski

Figure 5



LEGEND

X .1 ppm Ag

⊙ diamond drill hole

trench

Contours

> 0.4 ppm Ag

> 0.3 ppm Ag

Copper Mountain Properi

NTS 82 E/2W

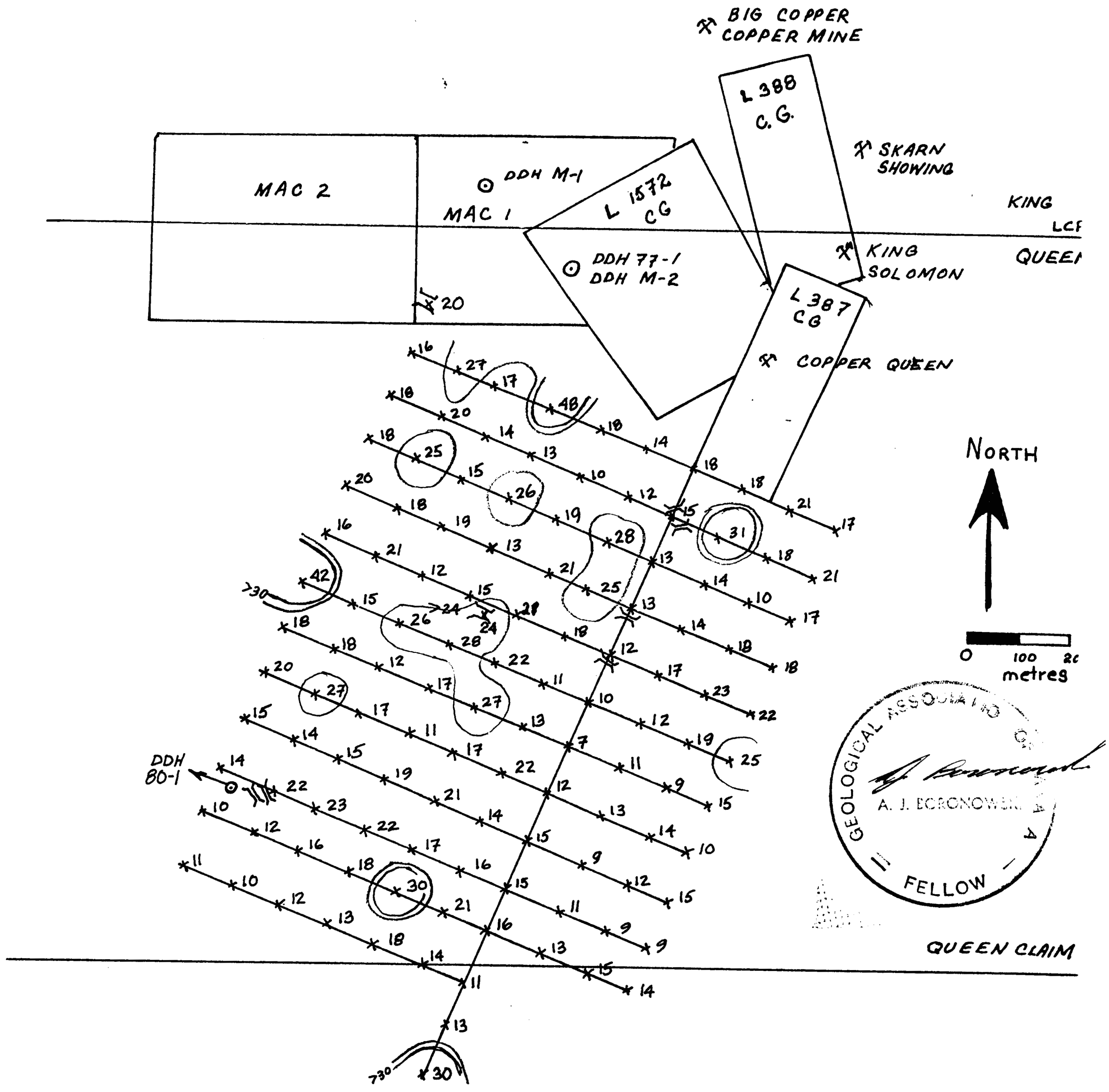
Greenwood Mining Distric

Scale 1:10,000

QUEEN GRID

SILVER PPM

Alex Boronowski Figure 6



LEGEND

× 30 ppm Copper

Contours

> 30 ppm Cu

> 24 ppm Cu

⊙ diamond drill hole

trench

COPPER MOUNTAIN PROPERTY

NTS 82 E/2W

GREENWOOD MINING DISTRICT

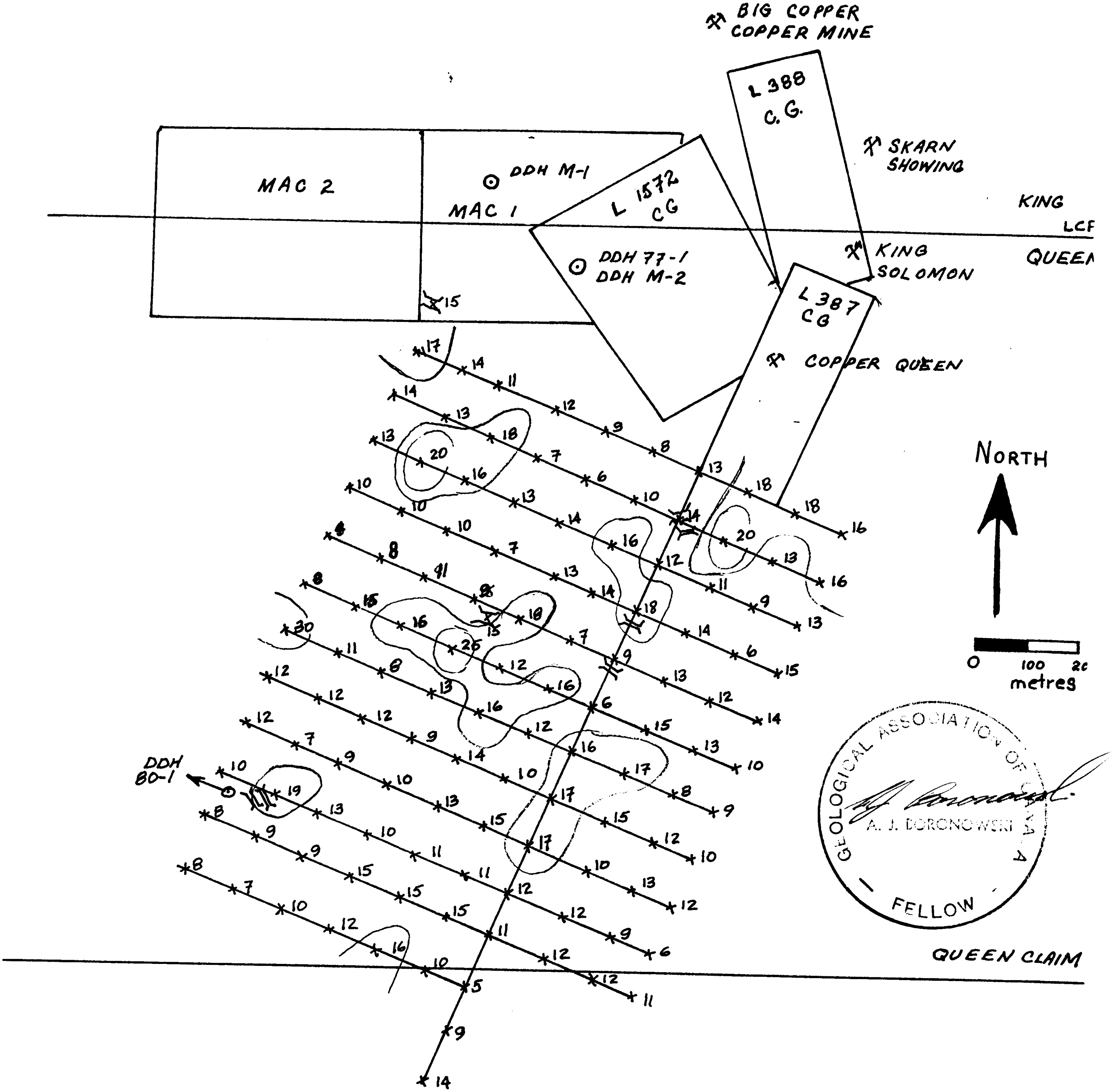
Scale 1:10,000

QUEEN GRID

COPPER PPM

Alex Boronowski

Figure 7



LEGEND

× 20 ppm. Pb

Contour

>20 ppm. Pb.

>16 ppm. Pb.

⊙ diamond drill hole

trench

COPPER MOUNTAIN PROPERT

NTS 82 E/2W

GREENWOOD MINING DISTRIC

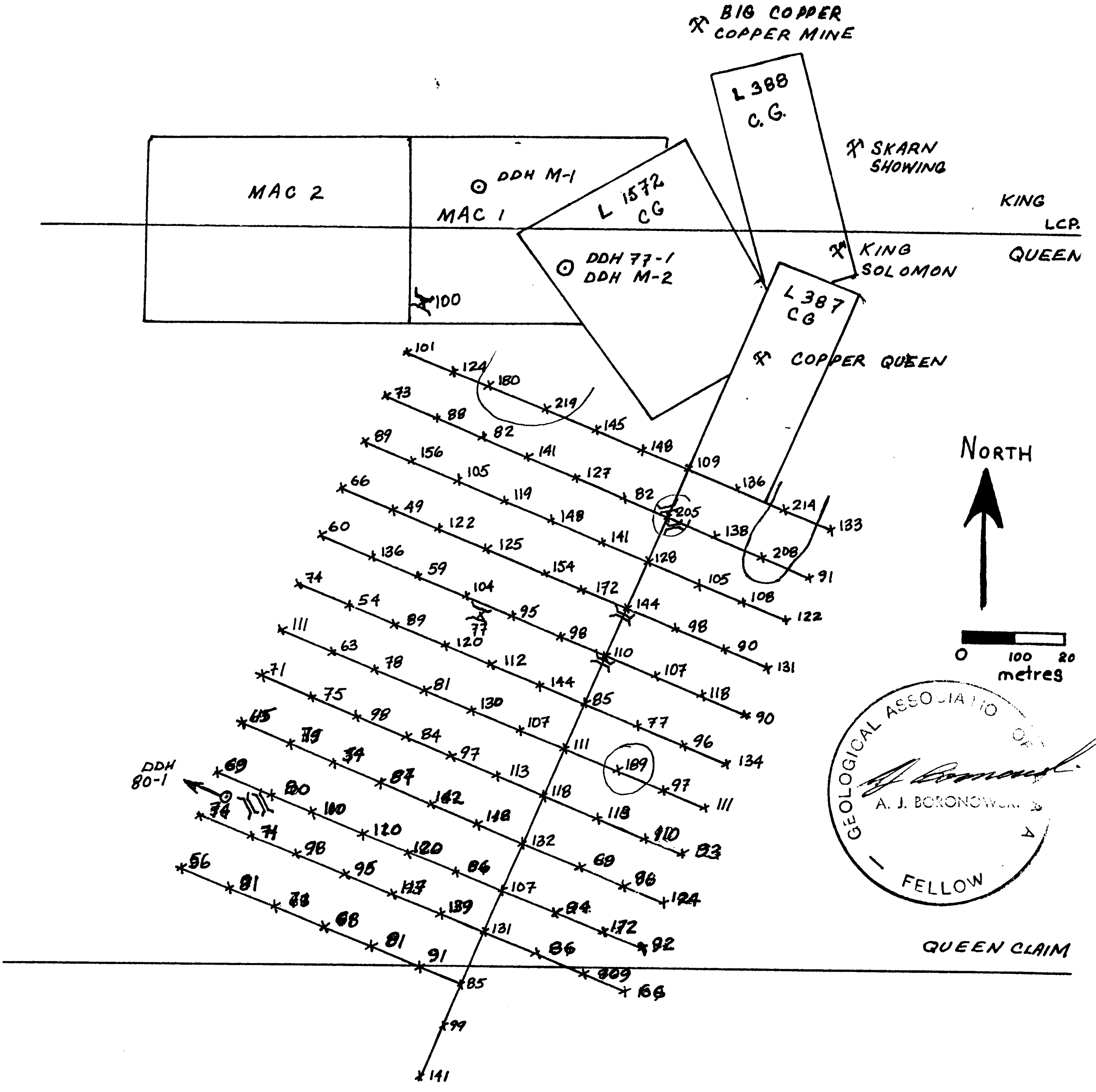
Scale 1:10,000

QUEEN GRID

LEAD PPM

Alex Boronowski

Figure 8



LEGEND

x 176 PPM ZINC

⊙ diamond drill hole

trench

Contours

> 176 ppm Zn.

COPPER MOUNTAIN PROPER

NTS 82 E/2W

GREENWOOD MINING DISTRI

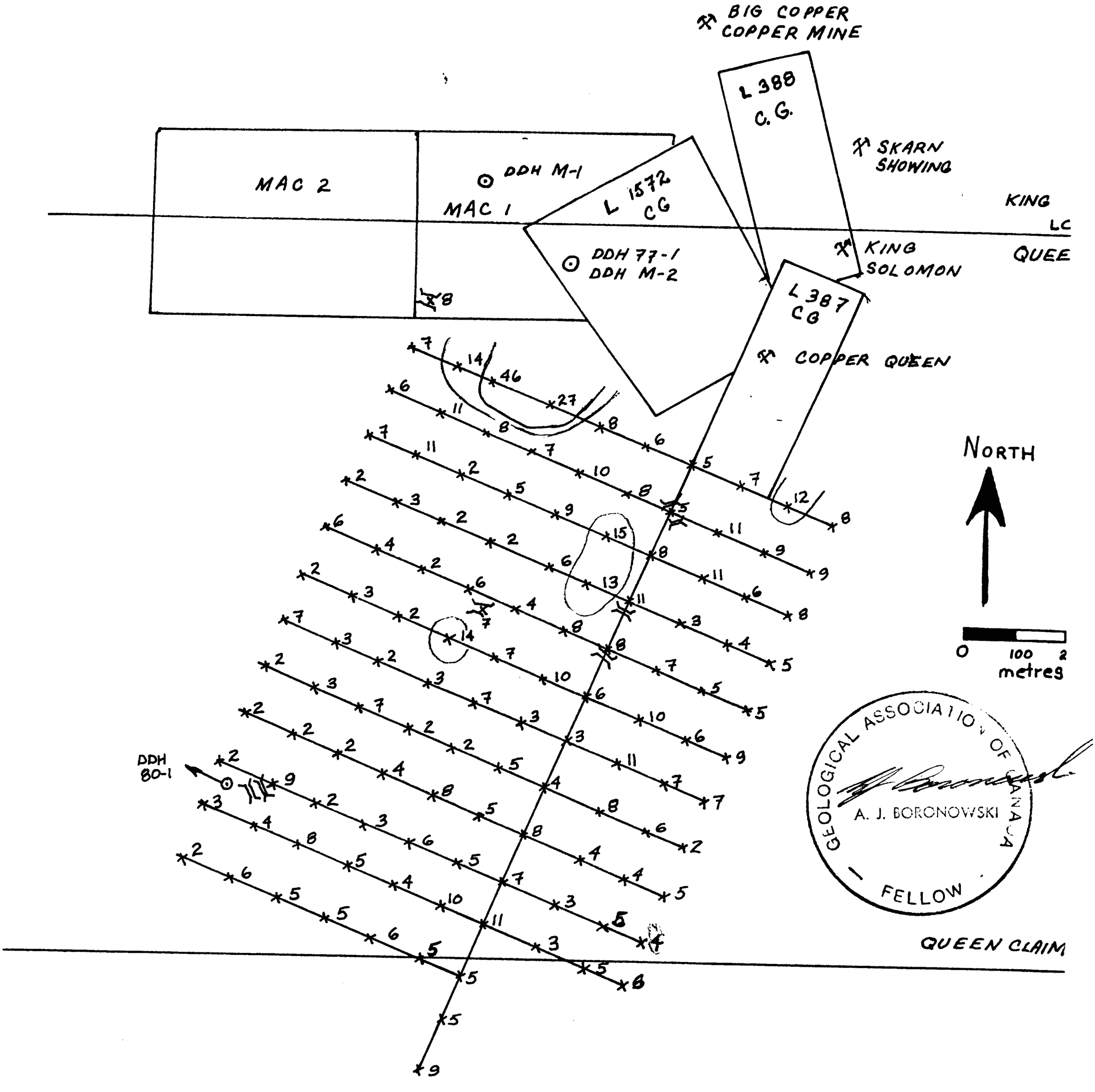
Scale 1:10,000

QUEEN GRID

ZINC PPM

Alex Boronowski

Figure 9



LEGEND

× 17 ppm. Arsenic

⊙ diamond drill hole

trench

Contour

>17 ppm. As.

>12 ppm. As.

COPPER MOUNTAIN PROPER

NTS 82 E/2W

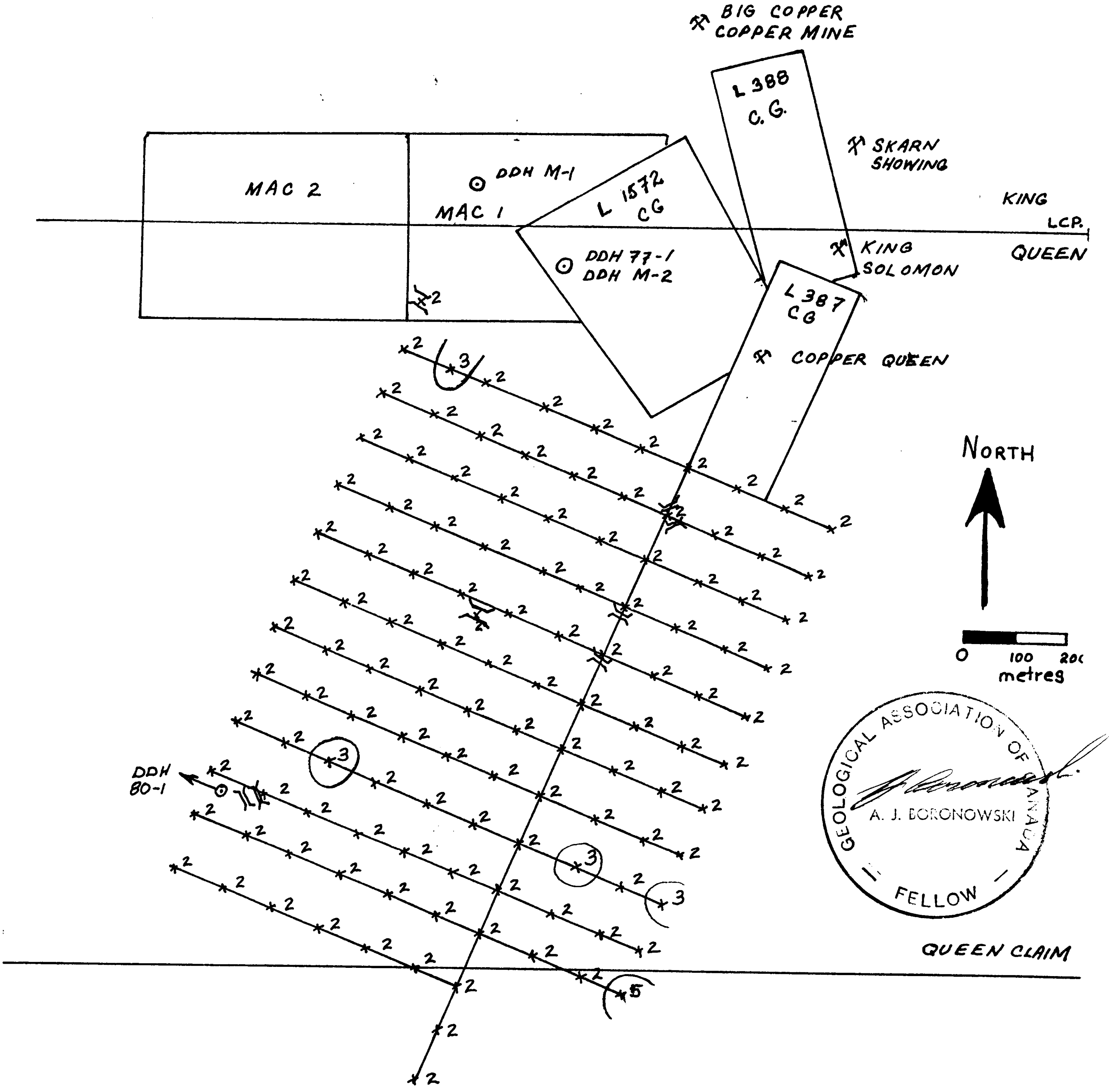
GREENWOOD MINING DISTRI

Scale 1:10,000

QUEEN GRID

ARSENIC PPM

Alex Boronowski Figure 1C



LEGEND

× 3 ppm Sb

Contours
>3 ppm Sb.

⊙ diamond drill hole

trench

COPPER MOUNTAIN PROPERT

NTS 82 E/2W

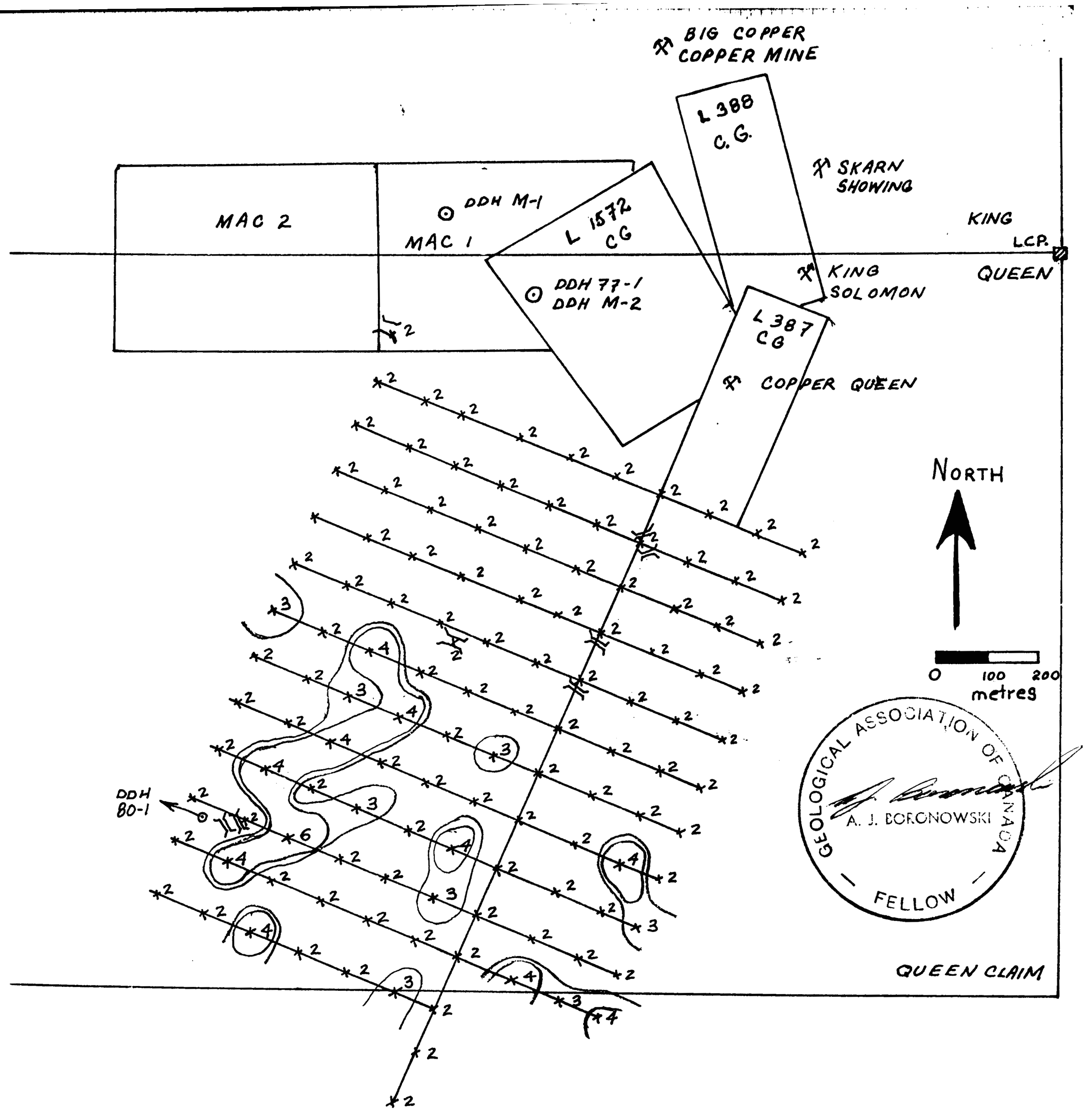
GREENWOOD MINING DISTRICT

Scale 1:10,000

QUEEN GRID

ANTIMONY P.P.M.

Alex Boronowski Figure 11



LEGEND

X 4 ppm. Bi

Contours

> 4 ppm. Bi

> 3 ppm Bi

⊙ diamond drill hole

trench

COPPER MOUNTAIN PROPERTY

NTS 82 E/2W

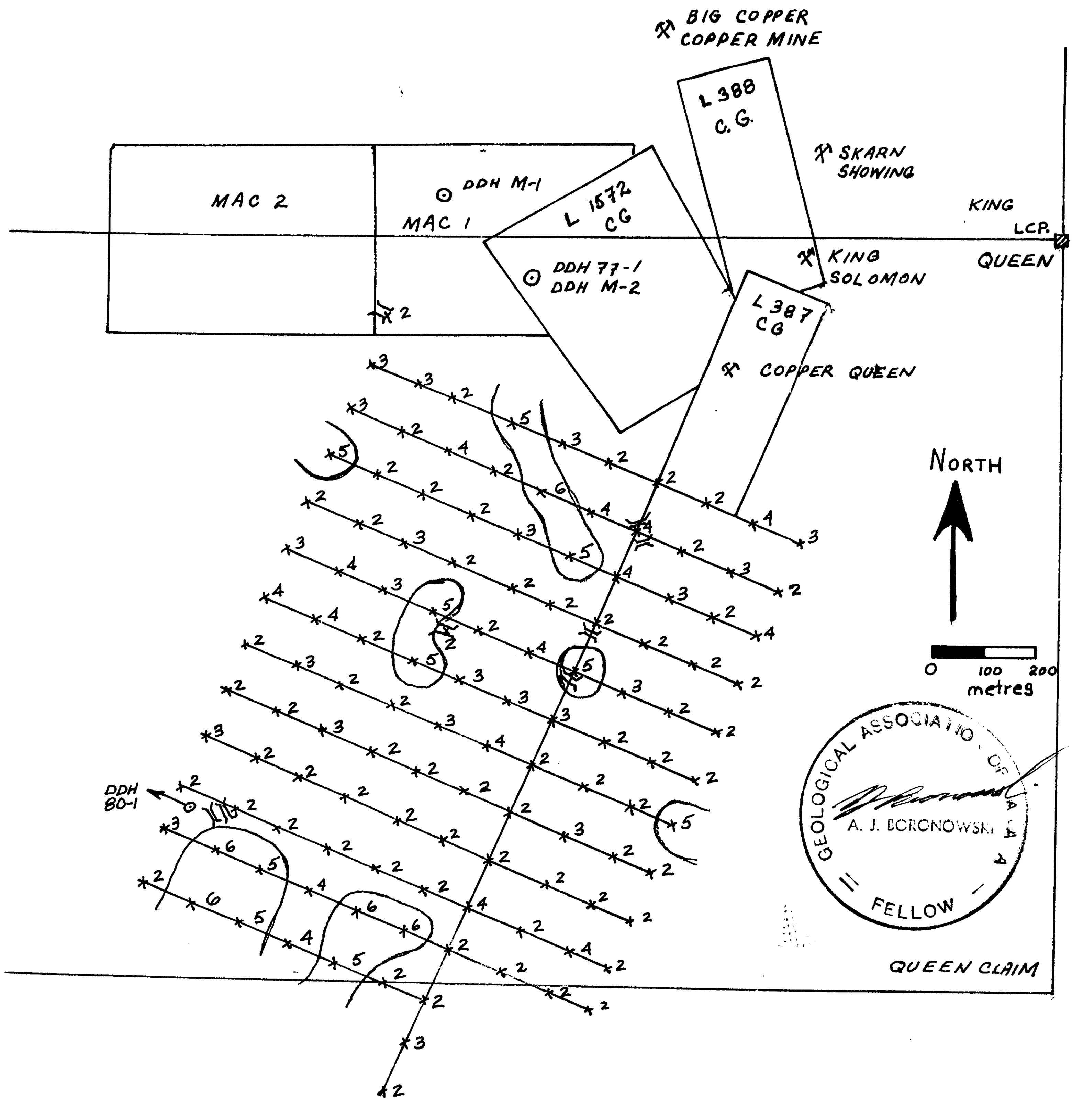
GREENWOOD MINING DISTRICT

Scale 1:10,000

QUEEN GRID

BISMUTH P.P.M.

Alex Boronowski Figure 12



LEGEND

× 5 ppm Boron

⊙ diamond drill hole

trench

Contour
> 5 ppm. B.

COPPER M[illegible] PROPERTY

NTS 82 E [illegible]

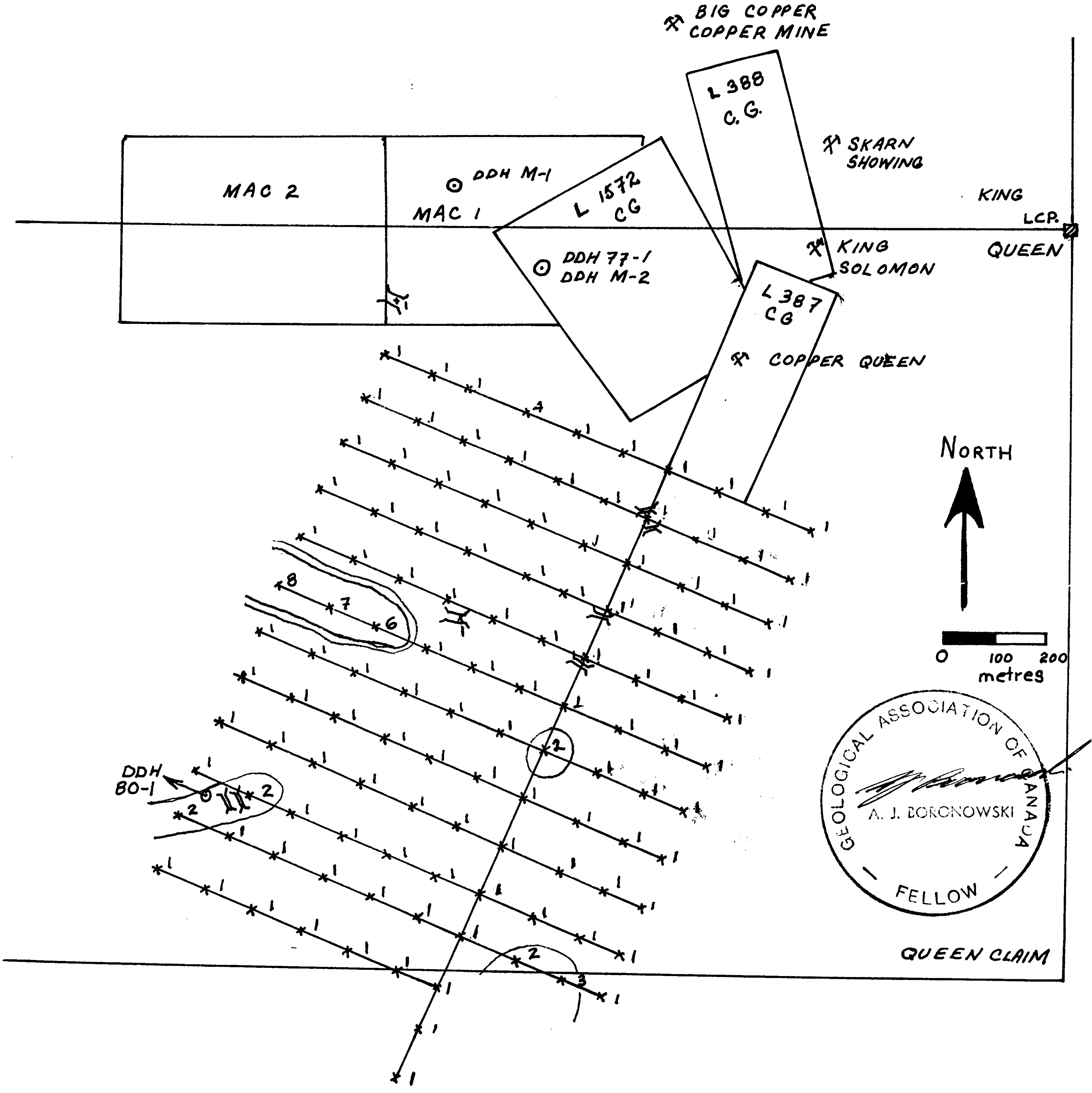
GREENWOOD [illegible] DISTRICT

Scale 1: 10,000

QUEEN GRID

BORON P.P.M.

Alex Boronowski Figure 13.



LEGEND

x 3 ppm. Tungsten

⊙ diamond drill hole

trench

Contour

>3 ppm. W

>2 ppm. W.

COPPER MOUNTAIN PROPERTY

NTS 82 E/2W

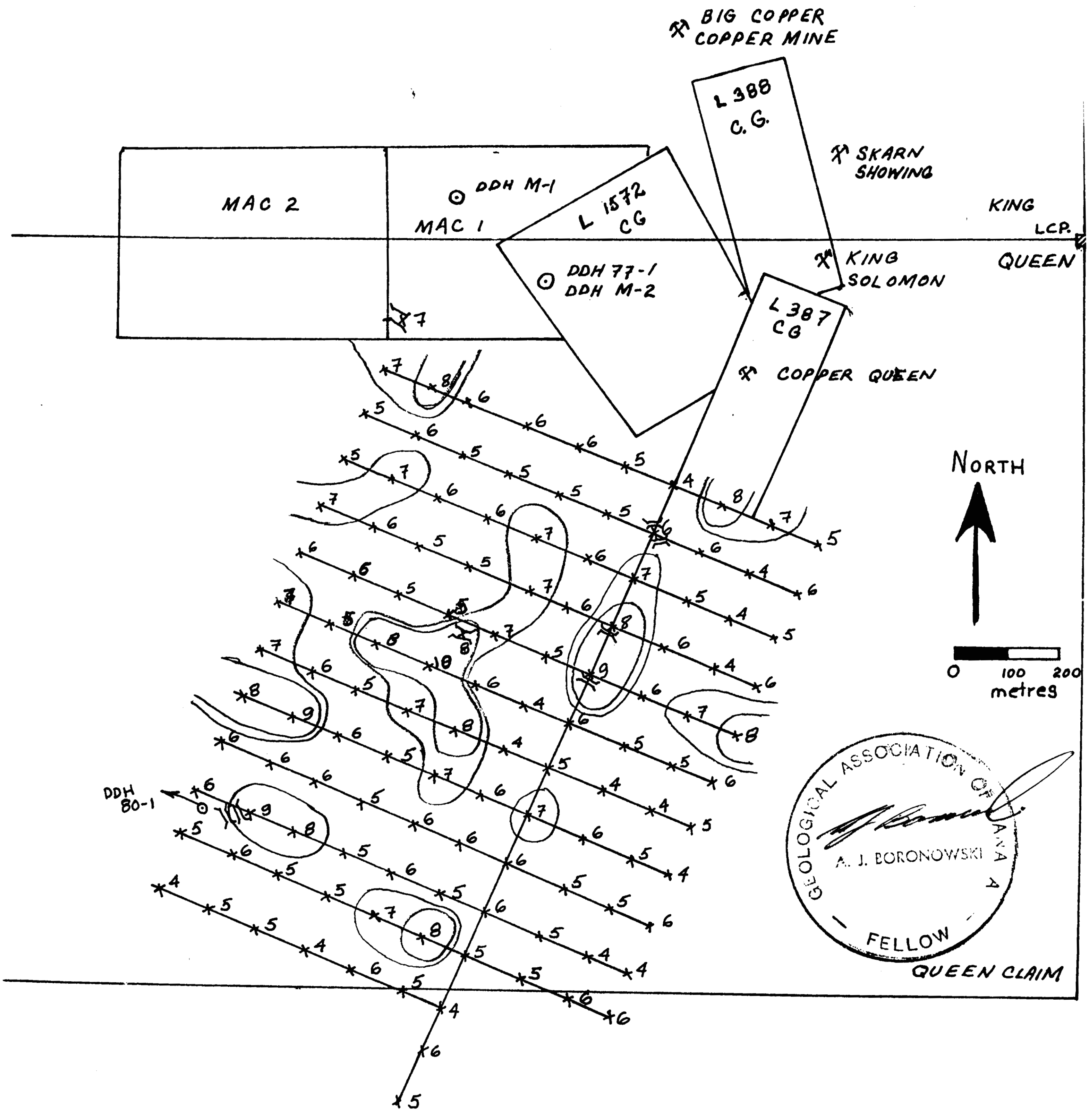
GREENWOOD MINING DISTRICT

Scale 1:10,000

QUEEN GRID

TUNGSTEN P.P.M.

Alex Boronowski Figure 14



LEGEND

X 8 ppm Co.

⊙ diamond drill hole

trench

Contour

> 8 ppm Co.

> 7 ppm Co.

Copper Mountain Property

NTS 82 E/2W

Greenwood Mining District

Scale 1:10,000

QUEEN GRID

COBALT P.P.M.

Alex Boronowski Figure 15

CONCLUSIONS

The Copper Mountain property appears to be spatially associated with a major northeasterly trending graben fault zone (Turoda Graben) and a coincident magnetically anomalous trend. The Crown Jewel, a gold skarn deposit being developed by Battle Mountain Gold at Buckhorn Mt., Washington, is located 12 miles southwestward along this trend. The Midway property which is being explored by Minnova Ltd. for an epithermal-type gold deposit is adjacent to the Copper Mountain property and believed to lie along this same magnetic trend.

Geological mapping of the Queen Grid indicates that the area is underlain by a northeast trending, fault bounded block of Late Paleozoic rocks. Eocene age volcanics occur adjacent to the fault bounded block.

The Copper Mountain property has a past production history from skarn deposits.

Big Copper, Copper Mine

2,431 tons averaging 3.22% Cu, 0.56 opt. Ag, no credit was received for the gold but statistics for the Greenwood Camp (1% copper yields approximately 0.04 opt. gold) suggests that the grade was approximately 0.120 opt. gold.

King Solomon, Copper Queen

1,375 tons averaging 4.74% Cu, 1.24 opt.Ag, 0.183 opt.Au.

The economically favourable sharpstone conglomerate and Brooklyn limestones which host the significant skarn mineralization in the Greenwood Camp are not widely distributed. The Copper Mountain property is underlain by these favourable formations and therefore may represent an area which has depositional, structural, and ore controlling features similar to those at the Greenwood Camp. To date, all of the mineralization discovered on the Copper Mountain property occurs within the Upper Limestone unit. Therefore, the highly prospective Lower Limestone unit has been essentially unexplored.

Recent sampling have obtained appreciable gold values from the Copper Queen (0.87% Cu, 0.34 opt. Ag, and 0.138 opt. Au.) and King Solomon (7.13% Cu, 0.61 opt. Ag, and 0.06 opt. Au.) showings. The high-grade sample from the Copper Queen showing is highly magnetic. No geophysical magnetic survey or deep penetrating I.P. survey has been conducted on the property. Previous exploration has been targeted at the base metal potential of the property. However, the recent sampling and the gold intercepts in DDH 77-1 indicate that the property has the potential of hosting a gold skarn deposit.

The geochemical soil survey was conducted at a 100 metre sampling interval. This sample density does not outline completely the anomalies, but it does indicate those areas warranting follow-up sampling. Results of the geochemical soil survey indicated the following:

1. Anomalous gold and silver values occurring along the east dipping Copper Mountain Fault. This fault marks the boundary between the Paleozoic block and adjacent Eocene age volcanics.
2. The area adjacent to the west dipping Copper Camp Fault, in the vicinity of DDH 80-1, contains anomalous values for gold, silver, arsenic, boron, tungsten, and cobalt.
3. In the northern part of the Queen Grid, two coincident zinc and arsenic anomalies occur along strike of the Copper Queen showing and DDH 77-1. The drill hole intersected a Tertiary dyke swarm, then the pyritiferous zone which yield two significant intersections of which one assayed **0.31 opt. Au. 3.16% Zn, and the other intersection assayed 3550 ppb gold.** These anomalies represent favourable areas for exploring for gold.

RECOMMENDATIONS

Previous exploration programs on the Copper Mountain property have been designed to explore for relatively small high-grade copper skarn deposits. A program designed to continue this search but also view the results for indicating an epithermal or skarn gold deposit is recommended. Briefly, the program would include:

- Extend the Queen Grid northeastward at 100 metre line spacing in order to cover the fault bounded Paleozoic block and part of the Eocene age volcanic cover.

- Geological mapping and sampling of mineralized zones along northeasterly trending (graben) faults and their cross cutting related faults within the Paleozoic block and the Eocene age volcanics.

- Conduct a magnetic, I.P. chargeability and resistivity survey over select portions of the grid. Only a small portion of the property has been tested by a deep looking I.P. survey and no magnetic survey has ever been conducted on the property.

- Geochemical soil sampling on the grid at 50 metre intervals and 100 metre line spacing and infill soil sampling around the gold anomalies obtained on the Queen Grid. No geochemical survey data had been filed for assessment prior to this report.

- Backhoe trenching of delineated targets and follow-up geochemical soil and rock sampling of target areas.

- A 6,000 ft. NQ size diamond drilling program to test anomalous zones and follow up the significant intersection in diamond drill hole 77-1.

ITEMIZED COST STATEMENT

Personnel	
Alex Boronowski - Geologist	
October 23 - 29, 1990	
7 days @ $400/day	$2,800.00
Field Equipment - rental	
7 man days @ $15/man day	$ 105.00
Room and Board	
7 man days @ $60/man day	$ 420.00
Truck - 4WD rental	
October 23 - 29, 1990.	
7 days @ $50/day	$ 350.00
1100 km. @ $0.15/km.	$ 165.00
Analytical Cost	
121 soils @ $8.60/sample	$1,040.60
17 rocks @ $10.75/sample	$ 182.75
analysis for Au + 30 element I.C.P. Mo,Cu,Pb,Zn,Ag,Ni,Co,Mn,Fe,As,U,Au,Th,Sr,Cd,Sb, Bi,V,Ca,P,La,Cr,Mg,Ba,Ti,B,Al,Na,K,W.	
Travel Expenses	
Expenses and Miscellaneous costs	$ 193.14
Report Writing	
Map drafting & prefield preparations	$ 800.00
Report Writing & map drafting (4 days)	$1,600.00
TOTAL:	$7,656.49

GEOLOGICAL ASSOCIATION OF CANADA
A. ... BORONOWSKI
FELLOW

STATEMENT OF QUALIFICATIONS

I, ALEXANDER J. BORONOWSKI, of NORTH VANCOUVER, in the Province of British Columbia, do hereby certify that:

1) I am a graduate of the Faculty of Science, University of British Columbia 1970, with a B.Sc. degree in Geology.

2) I have been a practising geologist in North America, Mexico, and Europe since 1970.

3) I am a Fellow of the Geological Association of Canada and a member of the Canadian Institute of Mining and Metallurgy.

Dated at Vancouver, B.C. this 11th day of December, 1990.

Respectfully submitted,

A.J. Boronowski, B.Sc., F.G.A.C

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APPENDIX 1

Copper Mountain Property - Analytical Results

COPPER MOUNTAIN - QUEEN GRID 1990 - NTS 82E/2W
SOILS - STATISTICAL DATA

ELEMENT	STANDARD DEVIATION	MEAN	2STD+MEAN	
GOLD	4	4	12	* IF THE 170 PPB VALUE (Q5-48) IS REMOVED FROM THE POPULATION
GOLD	15.60656	5.458333	37	
SILVER	0.095564	0.155833	0.4	
COPPER	6.321650	17.30833	30	
LEAD	3.948619	12.34166	20	
ZINC	34.14515	108.3416	176	
ARSENIC	5.094086	6.516666	17	
ANTIMONY	0.323929	2.058333	3	
MOLYBDENU	0	1	1	
COBALT	1.254962	5.741666	8	
BISMUTH	0.682672	2.275	4	
BORON	1.173669	2.85	5	
TUNGSTEN	0.971253	1.2	3	

ACME ANAL :AL LABORATORIES LTD. 852 E. HASTINGS ST. VA JVER B.C. V6A 1R6 PHONE(604)253-3158 FAX(6C 53-1716

GEOCHEMICAL ANALYSIS CERTIFICATE

Imperial Metals Corporation PROJECT 0003 File # 90-5881

800 - 601 W. Hastings St., Vancouver BC V6B 5A6 Submitted by: ALEX BORONOWSKI

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Au* ppb
QR90-1	1	192	6	83	.4	42	28	818	6.51	8	5	ND	1	60	.3	2	2	159	.61	.021	2	48	2.59	27	.16	2	3.17	.07	.02	1	4
QR90-2	1	10	5	65	.3	63	30	827	5.03	13	5	ND	1	72	.3	2	2	105	.74	.011	2	91	3.34	26	.16	2	3.26	.02	.02	1	1
QR90-3	1	37	11	65	.1	40	14	1075	3.27	2	5	ND	2	23	.2	2	2	44	.14	.051	15	37	.62	79	.04	2	1.40	.02	.11	1	1
QR90-4	1	268	7	90	.3	76	38	886	6.32	10	5	ND	1	31	.7	4	2	131	.51	.014	2	148	3.80	30	.21	2	3.46	.02	.02	1	5
QR90-5	1	35	2	49	.3	22	6	868	1.72	2	5	ND	1	319	.6	2	2	38	19.54	.035	6	24	.75	239	.03	2	1.01	.01	.28	1	12
QR90-6	1	10	5	51	.1	22	9	958	2.59	6	5	ND	1	162	.4	2	2	72	10.57	.056	8	28	1.02	188	.04	2	1.38	.04	.34	1	18
QR90-7	4	8675	8	48	11.7	52	13	382	26.31	73	5	4	3	13	1.4	14	2	38	.48	.086	4	11	.06	18	.03	8	.35	.01	.02	92	4720
QR90-8	6	71308 ✓	205	443	21.0	49	16	2154	20.55	298	5	2	2	79	7.5	9	15	71	1.72	.278	12	21	.28	31	.06	8	.73	.01	.06	51	2050
QR90-9	1	164	3	92	1.1	5	3	1020	.75	12	5	ND	1	460	7.5	2	2	7	39.43	.022	2	2	.16	6	.01	6	.10	.01	.01	1	11
QR90-10	1	18327 ✓	1035	939	19.7	17	13	1378	5.50	19	5	ND	2	60	4.6	4	20	19	4.91	.047	2	43	.39	14	.07	2	.99	.01	.02	7	48
QR90-11	9	5744	50	94	27.9	13	11	341	6.62	32	5	ND	1	53	1.8	2	2	19	.88	.104	7	54	.49	17	.12	3	.49	.01	.01	2	160
QR90-12	4	10914 ✓	197	206	6.2	20	20	3230	8.95	60	5	ND	1	94	2.5	5	17	23	5.77	.080	2	17	.12	45	.03	9	.26	.01	.01	29	26
QR90-13	1	36	18	105	.2	11	10	617	2.52	24	5	ND	3	88	.6	2	2	37	2.15	.044	21	8	.64	69	.01	5	1.52	.06	.19	1	6
QR90-14	1	157	11	112	.2	107	31	3382	6.30	15	5	ND	6	298	.9	2	2	123	4.39	.249	50	227	4.22	111	.12	2	3.43	.09	.15	1	6
QR90-15	5	28468 ✓	90	204	14.2	24	19	4619	7.94	123	5	ND	2	109	2.9	3	38	57	2.54	.124	10	24	.26	38	.05	8	.42	.01	.03	42	69
QR90-16	5	2806	98	91	8.8	12	14	2182	5.72	20	5	ND	1	79	1.2	3	9	16	3.78	.084	4	23	.21	39	.06	2	.28	.01	.01	21	45
QR90-17	9	5695	138	141	3.7	18	19	2486	12.11	59	7	ND	2	83	3.3	2	23	13	8.46	.044	2	6	.11	23	.01	3	.18	.01	.03	42	6
IN90-1	3	58	6	39	.2	33	11	170	2.44	7	5	ND	15	80	.2	2	2	29	1.65	.057	25	48	.62	37	.09	2	3.84	.20	.15	1	1
IN90-2	19	43	49	7	1.4	19	7	217	6.77	184	5	ND	6	31	.2	4	2	7	1.07	.472	14	18	.18	20	.01	9	.41	.03	.12	60	48
IN90-3	1	10	3	3	.2	1	1	47	.04	3	7	ND	1	135	.2	2	2	1	33.99	.004	2	1	.89	30	.01	2	.10	.01	.02	1	1
STANDARD C/AU-R	18	58	40	131	6.9	73	31	1055	3.97	41	21	7	39	55	19.9	14	18	57	.45	.096	38	60	.90	182	.07	32	1.90	.06	.14	13	540

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B W AND LIMITED FOR NA K AND AL. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: ROCK AU* ANALYSIS BY ACID LEACH/AA FROM 10 GM SAMPLE.

DATE RECEIVED: NOV 14 1990 DATE REPORT MAILED: Nov 16/90. SIGNED BY [signature] D.TOYE, C.LEONG, J.WANG; CERTIFIED B.C. ASSAYERS

✓ ASSAY RECOMMENDED

ACME ANALY AL LABORATORIES LTD. 852 E. HASTINGS ST. VA UVER B.C. V6A 1R6 PHONE(604)253-3158 FAX(6(.53-1716

GEOCHEMICAL ANALYSIS CERTIFICATE

Echo Bay Mines Ltd. PROJECT 70702 File # 90-5888 Page 1

354 - 200 Granville St., Vancouver BC V6C 1S4 Submitted by: ALEX BORONOWSKI

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Au* ppb
QS90-1	1	18	13	109	.1	14	5	549	1.89	5	5	ND	4	55	.2	2	2	41	.29	.153	30	22	.35	158	.11	2	1.63	.03	.11	1	1
QS90-2	1	18	18	136	.2	18	6	434	1.95	7	5	ND	4	48	.2	2	2	41	.31	.195	27	23	.38	124	.12	2	2.14	.03	.09	1	1
QS90-3	1	21	18	214	.2	23	8	1043	2.44	12	5	ND	1	42	.2	2	2	51	.32	.104	21	29	.52	166	.11	4	2.36	.03	.09	1	18
QS90-4	1	17	16	133	.2	11	4	635	1.64	8	5	ND	2	42	.2	2	2	34	.26	.225	16	16	.23	119	.12	3	2.29	.03	.08	1	3
QS90-5	1	15	14	205	.2	25	7	603	2.43	5	5	ND	4	32	.2	2	2	48	.25	.114	18	31	.56	286	.10	4	2.03	.03	.16	1	7
QS90-6	1	13	12	128	.2	15	5	433	1.85	8	5	ND	3	42	.2	2	2	36	.22	.137	19	21	.37	224	.10	4	1.82	.03	.11	1	3
QS90-7	1	13	18	144	.2	13	6	752	1.66	11	5	ND	2	45	.2	2	2	36	.23	.165	14	19	.34	208	.10	2	1.58	.03	.09	1	5
QS90-8	1	12	9	110	.1	10	5	388	1.51	8	5	ND	3	72	.2	2	2	29	.31	.109	18	14	.30	175	.09	5	2.30	.03	.11	1	4
QS90-9	1	10	6	85	.1	10	4	348	1.34	6	5	ND	4	73	.2	2	2	27	.30	.049	24	14	.26	133	.08	3	1.73	.02	.12	1	2
QS90-10	1	7	16	111	.2	5	3	263	1.42	3	5	ND	3	61	.2	2	2	30	.24	.035	20	13	.23	76	.07	2	1.36	.03	.12	2	1
QS90-11	1	12	17	118	.1	12	5	407	1.73	4	5	ND	5	57	.2	2	2	37	.26	.058	28	19	.32	139	.09	2	1.64	.03	.15	1	1
QS90-12	1	15	17	132	.1	14	5	421	1.70	8	5	ND	5	54	.2	2	2	35	.27	.085	21	20	.31	185	.10	2	1.79	.03	.11	1	1
QS90-13	1	15	12	107	.1	13	5	381	1.75	7	5	ND	4	55	.2	2	2	38	.30	.100	22	21	.33	150	.10	4	1.53	.03	.13	1	5
QS90-14	1	16	11	131	.1	16	5	361	1.88	11	5	ND	5	62	.2	2	2	39	.32	.124	29	22	.34	139	.10	2	1.86	.03	.11	1	2
QS90-15	1	11	5	85	.1	12	4	275	1.71	5	5	ND	5	48	.2	2	2	41	.27	.085	22	17	.25	117	.09	2	1.18	.03	.08	1	1
QS90-16	1	13	9	99	.1	10	4	579	1.32	5	5	ND	2	52	.2	2	2	30	.27	.086	12	15	.26	164	.09	3	1.35	.03	.08	1	7
QS90-17	1	30	14	141	.4	29	7	447	2.58	9	5	ND	8	148	.2	2	2	41	.50	.030	79	26	.62	104	.13	2	2.90	.03	.18	1	3
QS90-18	1	14	8	148	.1	15	6	816	1.93	6	5	ND	4	52	.2	2	2	40	.27	.146	26	19	.33	183	.10	2	1.60	.03	.10	1	1
QS90-19	1	18	9	145	.1	13	6	340	1.58	8	5	ND	2	54	.2	2	2	33	.43	.018	16	19	.30	102	.10	3	1.61	.05	.08	1	1
QS90-20	1	48	12	219	.3	14	6	1177	1.76	27	5	ND	2	103	.6	2	2	34	.78	.182	42	17	.30	121	.10	5	2.66	.05	.07	1	4
QS90-21	1	17	11	180	.2	15	6	478	1.84	46	5	ND	3	35	.2	2	2	37	.26	.144	20	22	.33	175	.11	2	2.06	.03	.11	1	3
QS90-22	1	27	14	124	.2	23	8	378	2.41	14	5	ND	6	65	.2	3	2	47	.33	.090	37	32	.53	144	.14	3	3.23	.04	.14	1	4
QS90-23	1	16	17	101	.1	13	7	558	2.00	7	5	ND	5	78	.2	2	2	44	.30	.132	29	21	.34	99	.11	3	2.04	.02	.09	1	1
QS90-24	1	18	14	73	.1	13	5	450	1.74	6	5	ND	6	103	.2	2	2	36	.31	.085	30	18	.34	107	.11	3	2.13	.03	.13	1	4
QS90-25	1	20	13	88	.1	17	6	240	2.01	11	5	ND	5	61	.2	2	2	42	.27	.063	24	22	.34	125	.13	2	2.48	.04	.12	1	2
QS90-26	1	14	18	82	.1	12	5	492	1.67	8	5	ND	4	41	.2	2	2	34	.23	.147	20	17	.28	153	.11	4	2.39	.03	.09	1	1
QS90-27	1	13	7	141	.1	13	5	396	1.76	7	5	ND	3	44	.2	2	2	35	.25	.139	17	17	.29	173	.10	2	1.84	.03	.12	1	8
QS90-28	1	10	6	127	.1	11	5	373	1.48	10	5	ND	3	40	.2	2	2	30	.19	.104	10	14	.28	169	.10	6	1.48	.03	.12	1	17
QS90-29	1	12	10	82	.1	12	5	576	1.54	8	5	ND	3	43	.2	2	2	34	.28	.110	17	18	.29	156	.10	4	1.45	.04	.10	1	1
QS90-30	1	31	20	138	.4	32	6	535	2.16	11	5	ND	4	54	.2	2	2	33	.35	.078	48	24	.46	248	.10	2	3.35	.04	.13	1	8
QS90-31	1	18	13	208	.3	12	4	561	1.71	9	5	ND	3	79	.2	2	2	31	.26	.405	12	15	.24	216	.11	3	2.66	.03	.06	1	3
QS90-32	1	21	16	91	.2	13	6	332	1.91	9	5	ND	5	47	.2	2	2	38	.27	.118	18	17	.28	148	.13	2	2.37	.03	.09	1	13
QS90-33	1	17	13	122	.2	14	5	469	1.85	8	5	ND	4	58	.2	2	2	34	.22	.161	20	16	.24	149	.12	4	2.64	.03	.09	1	3
QS90-34	1	10	9	108	.1	9	4	345	1.56	6	5	ND	3	52	.2	2	2	32	.21	.120	14	13	.23	136	.10	2	1.58	.03	.08	1	1
QS90-35	1	14	11	105	.2	12	5	385	1.67	11	5	ND	4	43	.2	2	2	36	.21	.184	20	17	.28	152	.10	3	1.57	.03	.10	1	7
QS90-36	1	28	16	141	.4	16	6	421	2.24	15	5	ND	6	55	.2	2	2	45	.30	.103	35	23	.44	183	.13	5	2.68	.04	.12	1	6
STANDARD C/AU-S	17	63	40	133	7.4	72	32	1144	3.97	41	18	8	36	51	18.6	14	20	56	.50	.094	37	58	.90	179	.08	32	1.91	.06	.13	11	48

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B W AND LIMITED FOR NA K AND AL. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: SOIL AU* ANALYSIS BY ACID LEACH/AA FROM 10 GM SAMPLE.

DATE RECEIVED: NOV 14 1990 DATE REPORT MAILED: Nov 21/90. SIGNED BY. ....D.TOYE, C.LEONG, J.WANG; CERTIFIED B.C. ASSAYERS

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Au* ppb
QS90-37	1	19	14	148	.1	19	7	699	1.81	9	5	ND	4	57	.2	2	2	37	.33	.218	22	22	.34	220	.12	3	2.17	.03	.10	1	4
QS90-38	1	26	13	119	.2	19	6	328	1.94	5	5	ND	5	47	.2	2	2	36	.41	.030	33	23	.36	174	.13	2	3.04	.03	.10	1	6
QS90-39	1	15	16	105	.1	16	6	383	1.73	2	5	ND	4	56	.2	2	2	36	.27	.148	23	20	.31	248	.12	2	2.29	.03	.11	1	4
QS90-40	1	25	20	156	.3	19	7	394	2.09	11	5	ND	6	55	.2	2	2	40	.36	.118	43	21	.36	162	.14	2	3.08	.04	.11	1	4
QS90-41	1	18	13	89	.2	11	5	605	1.47	7	5	ND	5	118	.2	2	2	31	.41	.172	26	15	.26	148	.11	5	2.27	.04	.10	1	1
QS90-42	1	20	10	66	.1	14	7	451	2.01	2	5	ND	5	78	.2	2	2	47	.32	.116	29	23	.39	120	.12	2	1.92	.03	.14	1	2
QS90-43	1	18	10	49	.1	16	6	300	2.30	3	5	ND	8	74	.2	2	2	59	.45	.081	49	33	.45	82	.13	2	1.22	.04	.12	1	11
QS90-44	1	19	10	122	.1	17	5	360	1.67	2	5	ND	4	39	.2	2	2	32	.28	.117	19	17	.26	134	.13	3	2.58	.04	.08	1	1
QS90-45	1	13	7	125	.1	13	5	486	1.52	2	5	ND	3	43	.2	2	2	31	.26	.088	16	19	.33	168	.10	2	1.58	.03	.13	1	1
QS90-46	1	21	13	154	.2	18	7	499	2.01	6	5	ND	5	59	.2	2	2	41	.35	.236	25	24	.36	213	.12	2	2.52	.03	.10	1	4
QS90-47	1	25	14	172	.2	17	6	655	1.78	13	5	ND	3	55	.2	2	2	33	.25	.163	32	19	.32	267	.11	2	2.25	.04	.10	1	7
QS90-48	1	17	14	98	.1	17	6	312	2.17	3	5	ND	5	55	.2	2	2	50	.28	.053	22	25	.42	169	.14	2	1.72	.02	.10	1	170
QS90-49	1	18	6	90	.2	13	4	404	1.74	4	5	ND	5	56	.2	2	2	32	.25	.082	31	16	.28	186	.11	2	2.43	.03	.09	1	6
QS90-50	1	18	15	131	.1	14	6	455	1.90	5	5	ND	5	63	.2	2	2	38	.29	.181	21	18	.31	160	.13	2	2.11	.03	.09	1	3
QS90-51	1	22	14	90	.1	19	8	445	2.59	5	5	ND	7	75	.2	2	2	60	.45	.153	37	29	.56	157	.15	2	1.62	.03	.18	1	7
QS90-52	1	23	12	118	.2	23	7	510	2.09	5	5	ND	4	41	.2	2	2	41	.22	.224	22	25	.44	240	.12	2	2.54	.03	.11	1	12
QS90-53	1	17	13	107	.1	20	6	390	1.78	7	5	ND	4	46	.2	2	2	35	.20	.151	17	20	.41	195	.13	3	2.66	.04	.10	1	5
QS90-54	1	15	7	98	.1	11	5	530	1.53	8	5	ND	3	58	.2	2	2	32	.27	.120	20	16	.27	202	.10	4	1.81	.03	.11	1	4
QS90-55	1	21	18	95	.1	20	7	751	2.33	4	5	ND	3	50	.2	2	2	50	.33	.154	28	28	.43	170	.12	2	2.12	.03	.11	1	1
QS90-56	1	24	15	77	.1	20	8	708	2.20	7	5	ND	4	52	.2	2	2	48	.34	.082	32	29	.39	152	.12	2	2.06	.02	.14	1	2
QS90-57	1	15	9	104	.1	13	5	642	1.32	6	5	ND	2	49	.2	2	2	29	.31	.104	18	18	.26	188	.09	5	1.50	.03	.10	1	5
QS90-58	1	12	11	59	.1	14	5	431	1.72	2	5	ND	3	37	.2	2	2	36	.29	.064	17	20	.30	144	.11	3	1.77	.03	.12	1	4
QS90-59	1	21	8	136	.3	13	6	869	1.90	4	5	ND	3	49	.2	2	2	44	.27	.195	18	20	.28	212	.11	4	1.63	.03	.08	1	5
QS90-60	1	16	4	60	.1	12	6	761	1.76	6	5	ND	3	55	.2	2	2	43	.27	.069	18	19	.30	127	.11	3	1.60	.03	.08	1	1
QS90-61	1	42	8	74	.1	19	7	580	1.98	2	5	ND	3	40	.2	2	3	42	.22	.034	20	24	.49	117	.10	4	2.13	.03	.07	8	3
QS90-62	1	15	15	54	.1	13	5	258	1.81	3	5	ND	5	45	.2	2	2	39	.30	.034	25	20	.25	99	.11	4	1.68	.03	.09	7	2
QS90-63	1	26	16	89	.1	27	8	983	2.45	2	5	ND	1	32	.2	2	4	43	.36	.056	16	34	.62	244	.10	2	2.02	.02	.35	6	6
QS90-64	1	28	25	120	.1	21	10	1568	2.44	14	5	ND	1	61	.2	2	2	45	.45	.138	29	27	.44	195	.11	5	2.56	.02	.16	1	5
QS90-65	1	22	12	112	.2	17	6	757	1.85	7	5	ND	4	65	.2	2	2	37	.37	.171	27	23	.38	216	.10	3	1.76	.03	.14	1	4
QS90-66	1	11	16	144	.2	10	4	464	1.64	10	5	ND	3	52	.2	2	2	35	.23	.142	20	15	.26	177	.09	3	1.71	.03	.08	1	4
QS90-67	1	12	15	77	.1	17	5	263	2.09	10	5	ND	5	79	.2	2	2	42	.31	.043	29	26	.48	124	.12	2	2.03	.03	.17	1	4
QS90-68	1	19	13	96	.2	13	5	515	1.82	6	5	ND	4	50	.2	2	2	34	.26	.101	25	19	.32	238	.12	2	2.56	.03	.11	1	7
QS90-69	1	25	10	134	.2	16	6	529	2.02	9	5	ND	4	56	.2	2	2	33	.25	.162	25	18	.32	256	.12	2	3.14	.03	.12	1	5
QS90-70	1	15	9	111	.3	13	5	356	1.78	7	5	ND	5	56	.2	2	2	35	.24	.114	25	18	.32	176	.12	5	2.39	.03	.11	1	2
QS90-71	1	9	8	97	.1	10	4	365	1.51	7	5	ND	3	35	.2	2	2	35	.18	.051	14	17	.26	156	.11	2	1.26	.03	.10	1	4
QS90-72	1	11	17	189	.1	8	4	355	1.92	11	5	ND	7	86	.2	2	2	36	.31	.116	47	14	.30	177	.07	2	2.24	.03	.15	1	2
STANDARD C/AU-S	18	62	41	133	7.5	72	31	1062	3.98	42	16	8	36	52	18.5	15	19	55	.48	.095	36	60	.89	179	.07	35	1.91	.06	.13	13	48

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Au* ppb
QS90-73	1	13	12	107	.2	7	4	615	1.42	3	5	ND	7	81	.6	2	3	25	.30	.064	25	10	.21	181	.07	4	1.35	.03	.13	1	3
QS90-74	1	27	16	130	.1	17	8	905	2.07	7	5	ND	5	59	1.0	2	2	43	.32	.113	28	26	.47	193	.10	3	1.62	.03	.20	1	8
QS90-75	1	17	13	81	.2	17	7	778	1.95	3	5	ND	4	39	.8	2	4	36	.34	.035	23	21	.34	105	.09	2	1.45	.03	.17	1	2
QS90-76	1	12	8	78	.1	9	5	252	1.58	2	5	ND	5	36	.4	2	3	30	.18	.078	18	15	.21	124	.09	2	1.51	.03	.08	1	4
QS90-77	1	18	11	63	.1	12	6	389	1.68	3	5	ND	6	48	.3	2	2	30	.22	.126	14	12	.27	136	.10	3	1.78	.03	.09	1	2
QS90-78	1	18	30	111	.1	10	7	997	1.90	7	5	ND	5	68	.5	2	2	33	.31	.074	49	14	.30	160	.09	2	2.09	.02	.10	1	1
QS90-79	1	20	12	71	.1	18	8	599	2.21	2	5	ND	5	69	.7	2	2	39	.21	.053	30	18	.38	138	.12	2	2.73	.02	.10	1	1
QS90-80	1	27	12	75	.5	17	9	651	2.39	3	5	ND	8	34	.6	2	2	44	.17	.067	28	19	.37	100	.12	2	2.68	.02	.09	1	3
QS90-81	1	17	12	98	.6	12	6	474	1.59	7	5	ND	6	53	.4	2	4	29	.31	.185	19	13	.21	149	.08	3	1.56	.03	.08	1	1
QS90-82	1	11	9	84	.1	11	5	283	1.59	2	5	ND	6	47	.4	2	2	32	.22	.106	21	14	.21	109	.09	2	1.25	.03	.09	1	1
QS90-83	1	17	14	97	.1	15	7	572	1.97	2	5	ND	4	49	.4	2	2	40	.27	.064	30	24	.38	119	.09	2	1.33	.03	.14	1	1
QS90-84	1	22	10	113	.1	15	6	337	1.86	5	5	ND	6	58	.3	2	2	33	.37	.058	35	18	.32	153	.10	2	1.80	.04	.11	1	1
QS90-85	1	13	15	113	.1	12	6	338	1.75	8	5	ND	7	67	.3	2	2	33	.26	.079	32	16	.34	141	.09	3	1.82	.02	.12	1	1
QS90-86	1	14	12	110	.1	11	5	247	1.77	6	5	ND	8	71	.3	2	4	31	.24	.075	47	15	.29	149	.09	2	2.01	.03	.13	1	1
QS90-87	1	10	10	93	.1	10	4	167	1.66	2	5	ND	7	54	.2	2	2	28	.22	.052	21	12	.26	154	.09	2	1.77	.02	.11	1	1
QS90-88	1	15	12	124	.3	11	6	372	1.68	5	5	ND	7	48	.4	3	3	29	.21	.145	21	13	.29	181	.10	2	1.96	.03	.11	1	3
QS90-89	1	12	13	96	.1	11	5	358	1.71	4	5	ND	5	59	.2	2	2	32	.21	.063	27	18	.29	140	.09	2	1.39	.03	.12	1	4
QS90-90	1	9	10	69	.3	10	5	290	1.69	4	5	ND	7	49	.2	3	2	36	.17	.057	22	18	.26	91	.09	2	.87	.03	.12	1	1
QS90-91	1	14	15	118	.1	12	6	404	1.84	5	9	ND	3	37	.2	2	4	34	.19	.125	20	19	.32	134	.09	2	1.41	.03	.12	1	4
QS90-92	1	21	13	142	.1	16	6	456	1.74	8	5	ND	6	56	.7	2	2	32	.24	.166	24	18	.36	150	.11	2	1.90	.03	.10	1	1
QS90-93	1	19	10	87	.1	13	5	245	1.54	4	5	ND	4	51	.2	2	3	28	.38	.072	23	14	.25	69	.09	2	1.75	.04	.07	1	4
QS90-94	1	15	9	54	.1	17	6	482	1.69	2	5	ND	4	40	.3	3	2	31	.24	.028	19	21	.29	67	.09	2	1.37	.03	.13	1	5
QS90-95	1	14	7	79	.1	9	6	624	1.51	2	5	ND	1	45	.4	2	2	26	.22	.078	13	10	.22	102	.08	2	1.55	.03	.05	1	1
QS90-96	1	15	12	115	.1	12	6	508	1.91	2	5	ND	5	70	.2	2	4	34	.23	.069	33	17	.30	138	.10	3	1.54	.02	.14	1	4
QS90-97	1	14	10	69	.1	11	6	304	2.06	2	5	ND	7	74	.2	2	2	39	.25	.041	35	16	.32	97	.11	2	1.43	.02	.17	1	1
QS90-98	1	22	19	80	.3	19	9	672	2.01	9	5	ND	5	79	.8	2	3	36	.38	.053	25	19	.39	124	.10	2	2.04	.02	.13	2	1
QS90-99	1	23	13	100	.1	34	8	792	2.20	2	5	ND	6	85	.2	2	6	36	.47	.056	38	39	.65	164	.11	2	1.80	.02	.22	1	3
QS90-100	1	22	10	110	.1	10	5	585	1.76	3	5	ND	4	106	.2	2	2	29	.40	.279	28	15	.27	204	.09	2	1.61	.02	.13	1	1
QS90-101	1	17	11	120	.3	12	6	379	1.65	6	5	ND	6	42	.2	2	2	30	.17	.116	19	15	.30	156	.10	2	1.80	.03	.08	1	1
QS90-102	1	16	11	86	.1	12	5	276	1.80	5	5	ND	3	51	.2	2	3	35	.24	.121	23	17	.29	123	.10	2	1.39	.02	.10	1	2
QS90-103	1	11	12	94	.1	9	5	328	1.43	3	5	ND	6	63	.2	2	2	27	.22	.100	25	12	.23	132	.08	2	1.63	.02	.10	1	1
QS90-104	1	9	9	172	.1	12	4	558	1.30	5	5	ND	3	26	.4	2	2	22	.13	.153	10	12	.23	184	.07	4	1.28	.03	.06	1	1
QS90-105	1	9	6	92	.1	8	4	309	1.44	4	5	ND	5	61	.2	2	2	24	.23	.048	18	11	.25	132	.08	2	1.52	.02	.12	1	18
QS90-106	1	14	11	66	.5	28	6	237	1.72	6	6	ND	6	108	.2	5	4	33	.29	.025	18	13	.44	64	.10	2	1.44	.03	.10	1	3
QS90-107	1	15	12	109	.1	13	6	336	1.76	5	7	ND	4	85	.2	2	3	31	.27	.224	30	17	.28	138	.09	2	1.50	.03	.10	3	18
QS90-108	1	13	12	86	.1	10	5	313	1.90	3	5	ND	6	55	.2	2	4	40	.28	.093	36	17	.29	95	.08	2	1.06	.02	.10	2	8
STANDARD C/AU-S	19	57	40	132	7.2	72	32	1051	3.95	42	19	7	40	56	19.8	15	21	57	.45	.097	39	56	.91	183	.07	34	1.89	.06	.13	11	55

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Au* ppb
QS90-109	1	21	15	139	.2	20	8	419	2.44	10	5	ND	6	77	.2	2	2	52	.34	.083	34	28	.43	137	.10	6	1.91	.03	.16	1	8
QS90-110	1	30	15	117	.2	13	7	889	2.02	4	5	ND	3	98	.2	2	2	36	.57	.086	27	21	.33	185	.10	6	1.65	.03	.17	1	4
QS90-111	1	18	15	95	.2	12	5	594	1.69	5	5	ND	3	68	.2	2	2	32	.30	.082	22	17	.26	204	.09	4	1.76	.02	.16	1	2
QS90-112	1	16	9	98	.1	10	5	734	1.53	8	5	ND	3	96	.2	2	2	32	.32	.089	24	15	.27	161	.09	5	1.51	.03	.13	1	1
QS90-113	1	12	9	71	.1	9	6	395	2.20	4	5	ND	6	95	.4	2	4	47	.31	.038	31	20	.34	99	.13	6	1.35	.02	.15	1	16
QS90-114	1	10	8	74	.1	8	5	315	1.68	3	5	ND	4	59	.2	2	2	40	.24	.057	20	16	.25	107	.11	3	1.29	.03	.10	2	3
QS90-115	1	11	8	56	.1	8	4	255	1.45	2	5	ND	4	50	.3	2	2	33	.23	.033	20	13	.19	107	.10	2	1.23	.03	.11	1	1
QS90-116	1	10	7	81	.1	10	5	405	1.71	6	5	ND	4	53	.2	2	2	36	.25	.062	17	18	.26	127	.11	6	1.42	.02	.12	1	1
QS90-117	1	12	10	71	.1	10	5	479	1.68	5	5	ND	5	84	.2	2	4	35	.29	.048	26	17	.27	130	.11	5	1.49	.02	.12	1	1
QS90-118	1	13	12	68	.1	7	4	597	1.32	5	5	ND	2	66	.2	2	2	28	.27	.053	18	11	.21	150	.09	4	1.37	.03	.10	1	1
QS90-119	1	18	16	81	.1	14	6	310	2.11	6	5	ND	5	58	.2	2	2	44	.24	.111	26	21	.34	114	.10	5	1.43	.03	.11	1	6
QS90-120	1	14	10	91	.1	11	5	372	1.61	5	5	ND	2	68	.2	2	3	39	.26	.105	24	18	.27	133	.10	2	1.27	.03	.10	1	20
QS90-121	1	20	15	100	.1	24	7	359	2.40	8	5	ND	7	96	.2	2	2	56	.43	.090	52	38	.54	109	.12	2	1.77	.03	.09	1	5
STANDARD C/AU-S	19	61	40	131	7.3	72	31	1060	3.98	44	18	7	36	53	18.7	14	18	56	.47	.094	39	60	.90	179	.07	32	1.91	.06	.13	11	53

APPENDIX 2

Copper Mountain Property - Sample Descriptions

QR 90-1 massive, dark grey weathering andesite, strongly magnetic, slightly calcareous along fractures (900S/500W).

QR 90-2 massive, tan brown weathering, fine grained arkosic? rock with minor rounded clasts - moderate to strongly magnetic (flow?) - 900S/500W.

QR 90-3 chert pebble and volcanic fragment conglomerate - Sharpstone (900S/500W).

QR 90-4 dark weathering, very fine grained, slightly hematitic volcanic flow, weak to non-magnetic (900S/500W).

QR 90-5 trench (91S/00) limestone cobble conglomerate, green chloritic, slightly calcareous matrix.

QR 90-6 trench (100S/24E) limestone cobble conglomerate, same as 5, bedding or jointing 025°/70°W.

QR 90-7 Copper Queen, skarn containing magnetite, hematite, goethite.

QR 90-8 King Solomon, blood red, mineralized float sample from the ore bin?, possibly a skarn.

QR 90-9 King Solomon, brecciated limestone conglomerate, pale green, network of quartz-chlorite filled fractures.

QR 90-10 Skarn Showing between Big Copper and King Solomon, malachite stained on selected skarn samples.

QR 90-11 Skarn Showing between Big Copper and King Solomon, **chip across 1.2 metres** of the most intense skarn mineralization, copper stain.

QR 90-12 Big Copper, 1st level, select blood red, goethite skarn samples

QR 90-13 Big Copper, 1st level, arkosic and argillite rocks from the 300°/50°E trending fault.

QR 90-14 Big Copper, 2nd level, fault gouge from 062°/50°N trending fault.

QR 90-15 Big Copper, 3rd level, goethite skarn

QR 90-16 Big Copper, 4th level, brecciated limestone conglomerate, and goethite material.

QR 90-17 Big Copper, 5th level, goethite skarn.

SOIL SAMPLES

PROJECT Queen PROPERTY Copper Hl GEOLOGIST Alex DATE Oct 23/8? QUAD.

Sample	COORDINATES N·S	E·W	Horizon	Depth	Color	Moisture	Slope	%Org.	~~Trans.~~ Elevation	Residual	NOTES (SOIL DEVELOPMENT, ROCK TYPE, ETC.)
Q590-1	00	00	C	20cm	l br	dry	10°E	0		100	logged area (ledge)
Q590-2	00	100E	C	10	l br	dry	5°E	0		100	~33 metres from road
Q590-3	00	200E	C	10	l br	dry	5°E	0		100	~67m from road
Q590-4	00	300E	C	10	l br	dry	5 W	0		100	2m E of old road
Q590-5	100S	00	C	20	l br	dry	7°E	0	4400	100	1st ?
Q590-6	200S	00	C	30	l br	dry	8°E	0	4480	100	Tr. phonolite float
Q590-7	300S	00	C	35	l br	dry	2 E	0	4560	100	" " "
Q590-8	400S	00	C	30	l br	dry	2°E	0	4620	100	logged - windfall
Q590-9	500S	00	C	40	l br	dry	3°E	0	4640	100	" "
Q590-10	600S	00	C	50	l br	dry	5 W	0	4540	100	float qtz eye f.p. or arkose
Q590-11	700S	00	C	50	l br	dry	5 W	0	4400	100	windfall
Q590-12	800S	00	C	50	l br	dry	3 W	0	4310	100	logged area
Q590-13	900S	00	C	60	l br	"	3 S	0	4230	100	" ; between trees
Q590-14	1000S	00	C	30	l br	"	5 S	0	4160	100	" beside tree
Q590-15	1100S	00	C	20	l br	dry	3 S	0	4100	100	" " "
90-16	1200S	00	C	40	l br	dry	2 S	0	4020	100	" " "
90-17	1300S	00	C	[illegible]	[illegible]	[illegible]	0	0	3960	100	" "
90-18	00	100W	C	30	l br	dry	5 ?	0	4360	100	" "
90-19	00	200W	C	30	"	"	0	0	4380	100	" "

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SOIL SAMPLES

PROJECT Queen PROPERTY GEOLOGIST DATE QUAD.

Sample	COORDINATES N·S	E·W	Horizon	Depth	Color	Moisture	Slope	%Org.	Trans.	Residual	NOTES (SOIL DEVELOPMENT, ROCK TYPE, ETC.)
90-20	00	300W	C	30	l br	dry	3°E	0	4400	100	logged; between trees
90-21	00	421W	C	40	l br	dry	4 E	0	4540	100	" "
90-22	00	500W	C	30	l br	dry	5 E	0	4560	100	" "
90-23	00	600W	C	30	"	"	8E	0	4680	100	in trees
90-24	100S	600W	C	40	l "	"	8E	0	4660	100	" " , pebbles
90-25	100S	500W	C	10	d. br	dry	4 E	0	4500	100	logged, disturbed
90-26	100S	400W	C	20	l br	dry	?E	0	4500	100	" beside tree
90-27	100S	300W	C	30	l br	dry	4 E	0	4460	100	" " "
90-28	100S	200W	C	30	"	"	4 E	0	4470	100	" " "
90-29	100S	100W	C	30	"	"	5 NE	0	4320	100	" " "
90-30	100S	100E	C	40	l br	dry	5 E	0	4150	100	northside of road
90-31	100S	200E	C	30	l br	dry	1 W	0	4080	100	cedar trees
90-32	100S	300E	C	40	"	"	5 W	0	4200	100	treed
90-33	200S	300E	C	30	"	"	5 NE	0	4220	100	"
90-34	200S	200E	C	30	"	"	5 NE	0	4180	100	"
90-35	200S	100E	C	40	"	"	3 E	0	4280	100	"
90-36	200S	100W	C	10	d br	"	2 E	0	4410	100	logged area
90-37	200S	200W	C	30	l br	"	2 E	0	4440	100	" beside tree
90-38	200S	300W	C	10	d br	"	0	0	4480	100	logged area

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SOIL SAMPLES

PROJECT PROPERTY GEOLOGIST DATE QUAD.

Sample	COORDINATES N·S	E·W	Horizon	Depth	Color	Moisture	Slope	%Org.	Trans.	Residual	NOTES (SOIL DEVELOPMENT, ROCK TYPE, ETC.)
90-39	200S	400W	C	30	l br	dry	0	0	4500	100	logged, beside tree
40	200S	500W	C	30	l br	dry	2E	0	4480	100	" "
41	200S	600W	C	40	l br	"	5E	0	4570	100	" "
42	300S	600W	C	30	"	"	5E	0	4520	100	" "
43	300S	500W	C	30	l br	"	4E	0	4450	100	" "
44	300S	400W	C	30	"	"	3W	0	4450	10	" "
45	300S	300W	C	20	"	"	0	0	4600	100	" "
46	300S	175W	C	20	"	"	2E	0	4450	100	" "
47	300S	100W	C	10	d br	"	0E	0	4450	100	" "
48	300S	100E	C	30	l br	"	3E	0	4340	100	" "
49	300S	200E	C	10	l br	"	5NE	0	4300	100	" "
50	300S	300E	C	20	l br	"	5E	0	4200	100	treed
51	400S	300E	C	10	d br	"	0	0	4340	100	logged
52	400S	200E	C	10	"	"	0	0	4340	"	"
53	400S	100E	C	30	l br	"	4E	0	4380	"	"
54	400S	100W	C	30	"	"	2W	0	4440	10	treed
55	400S	200W	C	30	"	"	3E	0	4600	100	"
56	420S	260W	C	10	"	"	0	0	4500	100	trench soil
57	400S	300W	C	20	"	"	1W	0	4490	100	"

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SOIL SAMPLES

PROJECT PROPERTY GEOLOGIST DATE QUAD.

Sample	COORDINATES N·S	E·W	Horizon	Depth	Color	Moisture	Slope	%Org.	Trans.	Residual	NOTES (SOIL DEVELOPMENT, ROCK TYPE, ETC.)
58	400S	400W	C	30	l br	dry	5W	0	4440	100	treed
59	400S	500W	C	30	l br	"	3E	0	4400	"	" o/c and.
60	400S	600W	C	20	d br	"	3W	0	4350	"	o/c and
61	500S	600W	C	30	l br	"	5W	0	4400	"	treed
62	500S	500W	C	20	d br	"	5SE	0	4350	"	treed
63	500S	400W	C	20	"	"	5NW	0	4430	"	"
64	500S	300W	C	30	"	"	2NW	0	4450	"	treed andesite
65	500S	200W	C	40	"	"	3E	0	4450	"	"
66	500S	100W	C	33	l br	"	2W	0	4420	"	"
67	500S	100E	C	50	"	"	3E	0	4320	"	"
68	500S	200E	C	10	d br	"	1W	0	4500	100	logged
69	500S	300E	C	20	l br	"	0	0	4550	"	" ; beside tree
70	600S	300E	C	30	"	"	1W	0	4540	"	treed
71	600S	200E	C	10	l br	"	2W	0	4450	"	logged
72	600S	100E	C	30	d br	"	3E	0	4500	"	treed, and float
73	600S	100W	C	40	l br	"	3SW	0	4540	"	logged, beside tree
74	600S	200W	C	30	l br	"	5SW	0	4580	"	treed
75	600S	300W	C	40	l br	"	6SW	0	4530	"	"
76	600S	400W	C	10	"	"	5W	0	4500	"	"

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Sample	Coordinates N-S	E-W	Horizon	Depth	Color	Moisture	Slope	%Org.	Trans.	Residual	Notes (Soil Development, Rock Type, etc.)
90-77	600S	500W	C	30	l br	dry	3E	0	4510	100	treed
78	600S	600W	C	40	"	"	5E	0	4600	100	"
79	700S	600W	C	40	"	"	0	0	4640	100	"
80	700S	500W	C	40	"	"	4E	0	4560	100	"
81	700S	400W	C	40	"	"	4E	0	4440	100	"
82	700S	300W	C	40	"	"	4W	0	4470	100	logged beside tree
83	700S	200W	C	30	"	"	3SE	0	4560	100	treed
84	700S	100W	C	40	"	"	3W	0	4500	100	logged beside tree
85	700S	100E	C	30	"	"	2W	0	4540	100	treed
86	700S	200E	C	30	"	"	1E	0	4500	100	treed edge of road
87	700S	300E	C	30	"	"	2W	0	4600	100	treed
88	800S	300E	C	30	"	"	3W	0	4440	100	"
89	800S	200E	C	30	"	"	3W	0	4460	100	"
90	800S	100E	C	30	"	"	2S	0	4540	100	"
91	800S	100W	C	35	"	"	2S	0	4450	100	logged beside tree
92	800S	200W	C	40	"	"	3S	0	4450	100	" "
93	800S	300W	C	40	"	"	2S	0	4420	100	" "
94	800S	400W	C	40	"	"	5E	0	4560	100	treed
95	800S	500W	C	30	"	"	0	0	4640	100	" Top of knoll

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Sample	Coordinates N-S	E-W	Horizon	Depth	Color	Moisture	Slope	%Org.	Trans.	Residual	Notes (Soil Development, Rock Type, etc.)
96	800S	600W	C	30	l br	dry	3S	0	4600	100	treed
97	900S	600W	C	50	"	"	5NW	0	4530	100	"
98	900S	500W	C	20	"	"	5NW	0	4640	100	"
99	900S	400W	C	10	"	"	5E	0	4650	100	"
100	900S	300W	C	20	"	"	4E	0	4460	100	"
101	900S	200W	C	30	"	"	0	0	4520	100	"
102	900S	100W	C	30	"	"	3NW	0	4450	100	logged beside tree
103	900S	100E	C	10	d br	"	0	0	4480	100	logged
104	900S	200E	C	20	l br	"	2N	0	4500	100	treed
105	900S	300E	C	30	"	"	5W	0	4540	100	"
106	1000S	300E	C	40	"	"	5W	0	4480	"	"
107	1000S	200E	C	30	"	"	3E	0	4380	"	"
108	1000S	100E	C	10	"	"	1SW	0	4430	"	logged
109	1000S	100W	C	30	"	"	3E	0	4400	"	west side of road
110	1000S	200W	C	10	"	"	1E	0	4470	"	logged
111	1000S	300W	C	30	"	"	2E	0	4540	"	treed
112	1000S	400W	C	30	"	"	3S	0	4600	"	treed
113	1000S	500W	C	20	d br	"	4W	0	4560	"	"
114	1000S	600W	C	10	l br	"	4SW	0	4450	"	burned logging

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Sample	Coordinates N-S	E-W	Horizon	Depth	Color	Moisture	Slope	%Org.	Trans.	Residual	Notes (Soil Development, Rock Type, etc.)
115	1100S	600W	C	10	l br	dry	3S	0		100	logging
116	1100S	500W	C	20	l br	dry	2W	0	4460	100	east of logging in trees
117	1100S	400W	C	30	"	"	1W	0	4520	100	treed
118	1100S	300W	C	30	l br	"	2E	0	4540	100	treed
119	1100S	200W	C	30	l br	"	3E	0	4420	100	treed
120	1100S	100W	C	30	"	"	2S	0	4380	100	logged beside tree
121	Mack	trench	C	Tr	l br	"	3E	0	463	100	trench on lot