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The Chaco-Bear

Epithermal & Mesothermal Gold & Silver Prospects & Porphyry Copper-Gold Prospects

EXECUTIVE OVERVIEW

Revision 2

Confidential

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The Chaco Bear Gold, Silver & Copper Prospects

An Epithermal Transitional Environment within a Shoshonitic Magmatic-Volcanic Complex

Introduction – "the Big Picture"

Among the most impressive gold deposits in the world are those that are formed from **alkalic** magmas in association with **"shoshonitic volcanics"** within an **epithermal transitional environment.**

There are at least 20 **"giant"** alkalic-rock related precious metals camps in the world with production and/or reserves totaling more than 1-million ounces of gold, indicating that alkalic-rock related magmatic hydrothermal systems are capable of mobilizing and transporting large amounts of precious metals (Mutschler and Mooney; 1993). Many of these deposits contain more than 100 tonnes of gold with the very large ones containing up to 600 tonnes of gold.

Substantive geological evidence indicates that the **Chaco-Bear Prospect** fulfills these fundamental criteria and in all probability does contain several gold deposits within a variety of favourable structural zones and host rocks. Pervasive hydrothermal alteration containing significant gold and silver minerals in a variety of deposit styles throughout the claim area shows that precious metals rich magmatic and meteoric fluids circulated throughout a network of structural and lithological conduits depositing gold, silver, copper and other metals where conditions were favourable.

Another significant feature of the Chaco Bear Prospect is that it represents and Eskay Creek subaerial epithermal equivalent. Chaco Bear too is within the Hazelton volcanics, however the upper 50 to 60 % of the Hazelton andesitic succession is missing yet is replaced with a thick sequence of dacites and rhyolites which are shoshonitic. The highly differentiated rhyolites at Eskay Creek were the feeders that carried the mineral fluids to the rich gold-silver epithermal deposits which in the Eskay Creek ease formed subsea.

At Chaco Bear an extensive and thick rhyolite and dacite flow sequence exposed at surface are highly anomalous in As, Ag, and Mo which are pathfinder elements and represent a distal zoning feature to gold mineralization deeper within the epithermal system. The dacitic flow rocks are also extensively silicified which attest to the distal or upper part of fully preserved epithermal system.

A very limited amount of exploratory drilling was completed beneath some interesting shear-hosted gold vein structures within the andesites stratigraphically below the extensive rhyolite flows. The drilling discovered intensely hydrothermally altered

over an intercept distance of about 225 feet. This part of the property is interpreted to be an extrusive centre, which may or may not be distinct from the intrusive centre target area about 6 km to the south. The extrusive centre contains several other precious metals targets of a variety of epithermal mineralizing styles.

The intrusive centre is recognized by a surface alteration zone that is more than 1.5 miles by 1.0 miles in dimension which contains abundant quartz-carbonate and quartz veins containing gold, silver and copper. The whole area is geochemically anomalous in gold. Large areas measuring up to hundreds of metres in length in outcrop are so extensively hydrothermally altered that the protolith is destroyed and replaced by a porous assemblage of finely disseminated pyrite (2 to 10%) and quartz ± sericite.

Geological mapping clearly shows a transitional environment from epithermal to mesothermal to porphyry; therefore the area is highly prospective for finding several classifications of gold deposits. At least five epithermal gold targets, containing anomalous gold deposit pathfinder elements have been found within the intrusive centre aureole. The targets include: a milled matrix fluidized breccia pipe; the root zone of an altered and pyritized flow breccia; a 4,000 foot strike length anomalous sulphide bearing zone that may be structurally related to what has been interpreted as a maar-volcano diatreme; the unconformity between the top of the andesitic succession and the rhyolite flow rocks; and below the altered and silicified andesite which forms the lowest exposed lithological unit within the heavily altered volcanic succession above the intrusive centre.

Gold bearing veins are pervasive throughout the intrusive centre with large areas hydrothermally altered and flooded with silica which attests to several mineralizing episodes with both high temperature and low temperature magmatic fluid flow; including mixing of magmatic fluids with meteoric water. One of the most favourable supporting variables for the discovery of a giant gold deposit in this system is "time". This hydrothermal system would appear to have been episodically aetive over an extended period of geological time including the hiatus between the end of the andesitic phase of volcanism and the beginning of the fractionated felsic phase.

Stream sediment sampling and assaying by the British Columbia Geological Survey of the two major drainage systems on the property; one which drains easterly from the volcanic centre and the other which drains southerly from the intrusive centre revealed the largest and strongest precious metals composite anomaly of classic epithermal geochemical signature in **Au+Ag+As+Sb+Hg** found on the entire 5,000 square mile map sheet. This anomaly is also accompanied by the largest and strongest base metal sulphide composite geochemical anomaly in **Cu+Pb+Zn+Ag+Ba** commensurately. These anomalies which cover the Chaco Bear property are consistent with those epithermal signatures that when diligently explored have resulted in the discovery of giant gold deposits in Nevada and elsewhere throughout the world.

J. M. Ashton
August, 2003

The Chaco-Bear Epithermal & Mesothermal Gold & Silver Prospects & Porphyry Copper-Gold Prospects

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The Chaco-Bear Epithermal & Mesothermal Gold & Silver Prospects & Porphyry Copper-Gold Prospects

EXECUTIVE OVERVIEW

1.0 EXECUTIVE OVERVIEW

1.1 REGIONAL & LOCAL

- Geological mapping in 1996 and 1997 (**Figure 3**) identified two magmatic centres on the property; an extrusive centre (Magmatic Centre 2) and a fully preserved intrusive centre (Magmatic Centre 1). The centres are located about 5.5 km apart along the same major structural break. Alteration, and vein structures containing potentially economic copper, gold, and silver mineralization is pervasive within the aureole of each centre, and between the centres. Geological evidence shows that each centre is transitional from an epithermal character, or environment to a porphyry environment. Evidence also suggests that both low-sulphidation and high-sulphidation mineralizing systems prevail in the epithermal aureoles of both centres.

- Following the completion of the first stage of geological mapping of the property by Peter B. Read, PhD, et al. in 1997, the British Columbia Geological Survey released the results of their regional geochemical survey for NTS 94D, McConnell Creek, where the Chaco-Bear property is located near the south end of the sheet close to 56° 10' North Latitude and 126° 50' West Latitude. (**Figures 5 and 6**). The regional survey showed that the easterly drainage system which drains the area of the volcanic centre and the southerly drainage system which drains the area of intrusive centre each contain the largest and strongest integral stream sediment **Au+Sb+As+Ag+Hg** anomaly found on the map sheet. Superimposed on this signature on the southerly drainage system is also found one of the strongest **Cu+Pb+Zn+Ag+Ba** stream sediment anomalies found on the entire map sheet. **These geochemical signatures are consistent with near surface epithermal precious-metals mineralization.**

- Whole rock analyses of the andesites from the area of the intrusive centre and of the dacites and and rhyolites from the area of the extrusive centre show that the magmas and their extrusive equivalents are the shoshonitic type. **Shoshonites** are potassic igneous rocks characterized by high K_2O/Na_2O ratios (i.e., > 0.5) and high $K_2O + Na_2O$ values (i.e., > 5.0 wt-%). It is now recognized that many world-class epithermal to mesothermal Au deposits and porphyry Au ± Cu deposits occur associated with or are hosted by potassic igneous rocks and

  shoshonites (Mueller & Groves, 1993) and preferentially give rise to those economic gold and copper-gold deposits located in continental-arc subduction zone environments. The Chaco-Bear property fits this criteria.

- C. S. Lord, PhD. (1948) postulated that major north-northwest striking fault zones have tapped the underlying heat and mineral solution sources and channeled these solutions into ideal host horizons, consisting of permeable and porous volcanic tuffs and breccias which are widespread throughout the area.

- The geological report for the property, Read (1997) concluded that shear zones and faults are widespread in the rock units beneath the rhyolite and dacite. The offsets of dyke contacts and closely positioned rock unit boundaries indicate northwesterly and northerly striking faults. Both are subvertical or have a westerly component of dip, are probably pre-vein in age, and provided channelways and open space for vein mineralization on the claims.

- **Geological Model.** The geological model developed by R.V. Kirkham, PhD. (1991) (**Figure 1**) for the Sulphurets Gold Camp which produced the rich Eskay Creek epithermal gold-silver deposit is forecast to also apply to the Chaco-Bear property. Key comparative geological elements include but are not limited to: each mineralizing system is connected with potassic magmas and coeval shoshonitic Hazelton Group volcanics; and in addition to the many mineralized vein structures hosted within the andesitic volcanics the altered rhyolites host vein systems and disseminations that are highly anomalous in gold.

  At **Eskay Creek** the lower part of the stratigraphic sequence is intruded by porphyritic monzodiorite and by younger felsic differentiates which are feeders to the rhyolite and dacite package. Economic mineralization occurs within the marine strata overlying the rhyolite and its footwall dacite. The rhyolite hosts vein systems that are feeders for the mineral deposits. Ore grades of 65.5 grams/tonne Au and 2,930 grams/tonne Ag were reported in the feasibility report. The Eskay Creek intrusive and extrusive systems correspond favourably in composition with what has been mapped at Chaco-Bear. At Chaco-Bear leucogranite clasts have been found in the rhyolites which provide evidence of the plutonic origin of the extrusives and their spatial and temporal relationship.

- Although outcrop is largely covered by overburden, prospecting has shown that wherever pre-mineral breaks such as joints, shears, and faults are exposed on the property, they are filled with quartz, quartz-carbonate, and carbonate veins containing specularite, pyrite, chalcopyrite, tetrahedrite, etc. with copper, gold and silver mineralization of potential economic tenor. Gold values range up to 0.74 ounces per tonne, silver values range up to 307 ounces per tonne and copper values range up to 12.2%. These leakage features are widespread throughout the property and encompass both the extrusive and intrusive centres.

1.1 EXTRUSIVE CENTRE HIGHLIGHTS

- The Geological Survey of Canada, Lord (1948) provided the first public information on the mineral potential of the area by reporting the existence of narrow high-grade gold veins on the ridge west of Bear Lake (now part of the Chaco Bear claim group). Lord stated that "many small veinlets of chalcopyrite, pyrite, galena, sphalerite, specularite, crustified quartz, and calcite were seen in talus fragments of red andesitic tuffs and lavas on the ridge...."**Some of these occurrences are reported to contain appreciable amounts of gold.**" Mapping and prospecting this area in 1996 and 1997 revealed an extensive and altered rhyolite flow in the Saddle Zone on the west side of the ridge. Vuggy quartz veins at the base of the rhyolite assay up to 0.51 ounces gold per tonne, 31.1 ounces silver per tonne and 6.2% copper. A prominent gossan at the base of the rhyolite extends for several km's to the north towards the volcanic centre.

  The rhyolite flow at the Saddle Zone originates from what appears to be an extrusive centre about 5 km to the north-northwest where at that location it is contiguous with and overlies a hydrothermally silicified porphyritic dacite. The rhyolite unit extends a total distance of about 9 km southeasterly from the extrusive centre and this fact alone makes this unit geologically anomalous in the region because of its thickness and extent; which may suggest that rhyolite could emanate from more than one location along its flow path, and/or that it contained significant volatiles at the time of extrusion which reduced its viscosity and extended its flow range. The large volume of combined dacitic and rhyolitic flow rocks suggests a commensurately large mineralizing system.

  Geological mapping and prospecting have yet to be completed within and above the dacitic and rhyolitic sequence; just about where these structures are spatially and temporally likely to produce an economic precious metals resource.

- The central zone of the dacitic unit, near Round Lake, exhibits chaotic flow banding and is intensely silicified over a measured area of about 300 metres (1,000 feet) by 800 metres (2,600 feet) extending in the direction of the ridge west of Bear Lake, to the Southeast and open to the east. It is downslope from this area to the east that one of the strongest integral **Au+Sb+As+Ag+Hg** stream sediment anomalies on the entire NTS 94D – "McConnell Creek" map sheet, is found.

- Midway between the ridge Saddle Zone and the extrusive centre, narrow high-grade veins within the Coccola Zone were drill tested with three holes from the same setup, but only to shallow depths of 100 metres. Intensely altered rhyolite dikes are found in each hole within which several gold bearing zones were found. The better, yet narrow, zones assayed in the range between 1.8 g/t and 5.7 g/t gold. A 0.30 metre vein assayed 18.53 g/t gold. The andesite wall rocks were also heavily altered and in places contained highly anomalous gold. Generally gold in the rhyolite is pervasive, occurring in veins, veinlets and disseminations.

- At about 1 km due south from the extrusive centre angular **massive-sulphide** vein float was found which assayed 307 ounces of silver per tonne and 37% copper; **and is reminiscent of the massive sulphide veins found at surface in the early discovery stage of the Comstock Lode in Nevada (Roberts, 1859).**

- Within the extrusive centre aureole there are at least 5 defined areas hosting a preponderence of quartz, quartz-carbonate, and carbonate veins containing specularite, pyrite, chalcopyrite, tetrahedrite, etc. which assayed upwards to **13.28 grams of Au** per tonne, **397.6 grams of Ag** per tonne, and **12.86% Cu**.

- The extrusive centre target area appears to have seen at least three separate mineralizing periods, an oxidizing and reducing stage of high-temperature vein mineralization; and low-temperature silica flooded zones, and rhyolitic extrusions with gold vein mineralization of which the latter are epithermal mineralizing events. Gold and silver mineralization is associated with all events.

  Leucogranite clasts found in the rhyolite flow rocks northwest of the silicified dacite at Round Lake provide evidence that the heat and mineralizing solution source that created this system is a potassic or shoshonitic magma.

  This area has an excellent plumbing system with pre-vein: shear zones, joints, and major faults found throughout the area. These structural openings provided ideal channelways and open spaces for mineral transport in the fluids circulating from the magmatic centre. The fault structures cut through several favourable host lithologies within the coeval andesites which include but are not limited to porous and permeable tuff and flow breccia horizons throughout the pile.

- Further exploration consisting of the following is warranted:

  - completion of geological mapping with particular attention paid to the unmapped upper section of the Unnamed Formation and: alteration facies zoning, and temperature zoning.
  - a lithogeochemical survey of the area to determine metal zoning.
  - deep probe induced polarization surveys.
  - trenching.
  - diamond drilling.

1.2 INTRUSIVE CENTRE HIGHLIGHTS

- A hydrothermally altered area more than a square mile in extent consists of large integral zones of a porous assemblage of **quartz-sericite-pyrite** that is reminiscent of the top level, or acid leached zone of a potentially productive epithermal or mesothermal precious metals mineralizing event in association with a fully preserved subcropping Cu-Au porphyry system. In a few places the acid leached zone has been eroded sufficiently to reveal intensely silicified andesites.

  Strata-bound zones of silicification are known to underlie acid leached zones found at the top of high-sulphidation and low-sulphidation epithermal gold producing systems; especially where permeable and porous host rocks such as volcaniclastic and tuff horizons are available. These features are clearly evident in the Ferruginate Zone which is another classic Chaco Bear drill target.

  Two additional characteristics of this alteration zone include a superimposed **gossan zone** measuring at least 500 metres by 1,300 metres which occupies the West half of the alteration zone and a larger **ferruginate zone** measuring at least 900 metres by 1,400 metres which occupies the east-half of the alteration zone.

  The altered area has been subject to an intense and prolonged period of hydrothermal activity best described by Read (1997) as "so extensively hydrothermally altered that the protolith is destroyed and replaced by a porous alteration assemblage of **quartz+sericite+finely disseminated pyrite (2-10%).**

  Stream sediments taken below this area of ongoing acid leaching contain the strongest integral **Au+Sb+As+Ag+Hg** and **Cu+Pb+Zn+Ag+Ba** stream sediment anomalies on the NTS 94D Map Sheet.

- At the northwest edge of the **gossan zone** is an un-mineralized yet intensely altered and geochemically anomalous **breccia pipe** exposed over an area of about 250 metres (800 ft) by about 110 metres (360 feet) which has been subject to intense mechanical and chemical effects. The breccia fragments are composed of

a diverse suite of altered and rounded (milled) volcanic clasts. The clasts and dacitic-flour matrix are almost completely replaced with pistachio green epidote, hematite and carbonate. Both clasts and matrix are flooded with silica.

The breccia pipe is interpreted to be the **milled-matrix fluidized-breccia type** and has all of the geological, alteration, and geochemical characteristics classically representative of a strong low sulphidation epithermal gold producing system at depth.

- Leucogranite clasts within the rhyodacite volcanic flow breccias in this target area attest to an underlying potassic or shoshonitic intrusive heat and solution source. Veins within the area assayed up to 0.74 ounces gold per tonne, and veins found beyond this area assayed up to 0.64 ounces gold per tonne; whereas narrow K-feldspar bearing intrusive dikes contained up to 0.08 ounces gold per tonne and 1.54% copper.

- A large heavily altered and intensely pyritized volcanic flow breccia outcrops in the creek bank near the west central side of the intrusive centre about 800 metres southeast of the breccia pipe. It is anomalous in gold (**62 ppb**), arsenic (**56 ppm**) and molybdenum (**15 ppm**). Its extent and root zone cannot be easily traced at this location because of extensive overburden. Soils over a large part of this area are anomalous in gold.

- Along the northeast edge of the nominal one square mile alteration zone there is a geochemically anomalous feature that strikes north-northwest for 1,200 metres with widths up to 300 metres, with possibly a parallel zone up towards the ridge in the direction of the base of the rhyolite flow rocks. This feature is highly anomalous in copper and zinc; up to **2,500 ppm** zinc and **1,500 ppm** copper with a parallel gold anomaly downslope. However the area is extensively overburden covered. This is the only area of the property which saw a two-line reconnaissance induced-polarization (IP) survey completed. Coincident high chargeability results with corresponding low resistivity results are indicative of metallic sulphides as the source of this geochemical anomaly. Quartz, quartz-carbonate, carbonate, pyrite-chalcopyrite-specularite veins found near this area assay up to **15.0 ppm gold** and **12.2% copper**.

- Within the intrusive centre alteration zone, eccentrically located to the east of the central part of the zone is a magnetic anomaly which has a nominal 1,000 gamma amplitude above background. The 500 gamma half-space of the anomaly has a linear edge dimension of about 3,600 metres (11,800 feet). It is suspect of being representative of the potassic core of the intrusive containing secondary biotite, magnetite, and K-feldspar around which the mineralized shell forms in a productive porphyry at depth.

- As for the extrusive centre, the intrusive centre target area would also appear to have seen at least three separate mineralizing episodes; an oxidizing and reducing stage of high temperature vein mineralization and low temperature epithermal manifestations of the high sulphidation type. Gold and silver mineralization is associated with each event.

- This intrusive centre is interpreted to represents the heat and solution source of a significant copper-gold mineralizing system with the probability of finding an epithermal and/or mesothermal gold deposit or deposits within its contact aureole. The **milled-matrix fluidized-breccia pipe** is itself a high priority drill target in its own right because of its bonanza precious metals potential at depth. Other targets believed to also be significant are found in the appendices.

  All of the major epithermal-gold targets, and the porphyry copper-gold target remain to be explored for their economic mineral potential. None of these extraordinary targets has ever been drilled. Further exploration is most definitely warranted and should include but not necessarily be limited to:

  - deep probe induced polarization surveys.
  - completion of geological mapping with attention paid to the top of the Unnamed Formation and: alteration facies, metal zoning, and temperature zoning.
  - diamond drilling.

1.3 PRIMARY TARGET AREA SUMMARY

Several primary exploration targets and/or target concepts have been identified within the aureoles of the **intrusive centre** and the **extrusive centre** within this large mineralized transitional environment. As exploration proceeds undoubtedly several other target concepts will be identified which also includes the massive sulphide veins that occur in the Hi-Grade Zone that are reminiscent of a Comstock lode type concept, i.e., 307 ounces/t Ag and 37% Cu.

Most of the described targets are accompanied by sufficient substantive geological evidence as to provide a fairly high degree of confidence that the interpretations will be convergent with what is found, rather than divergent. However as more data becomes available, the interpretations will no doubt be either supported, modified or possibly be rejected entirely.

What is clear is that a large and complex hydrothermal fluid circulatory system transitional from an epithermal environment to a mesothermal environment to a porphyry environment capable of carrying and depositing gold operated within the subcropping

area of the property. The task now is to map out the fluid flow paths to target the high-grade precious metals ores that were undoubtedly formed within favourable host horizons when the system was active.

The overall model looks right, the geology is right, the alteration is right, the mineralogy is right, major structural breaks are evident which acted as conduits to tap the magmatic fluids, the volcanic pile contains several favourable lithological sequences including tuffs, coarse fragmentals and other favourable permeabilities and porosities, including an immense area of unconformity, all of which are ideal mineral hosting environments for world-class precious metals deposits.

To date, under the auspices of this writer, more than CAN$0.8 million has been spent in bringing the property to the current level of geoscientific understanding which has been perhaps the riskiest stage. The next stage of exploration constitutes the largest reward to risk ratio stage or the stage of greatest potential economic gain should the exploration outcome be successful with the discovery of at least one mineral resource where there are indications of several. There is now an excellent chance for the discovery of one or more economic mineral resources on the property.

However two target concepts at this stage are somewhat **speculative** as there is insufficient exploration data available to completely support the concepts. These speculative concepts include the **manganese carbonate subaerial epithermal gold-silver target** within the aureole of the extrusive centre as set out in Appendix B; and the **diatreme-breccia/maar volcano mesothermal gold-copper target** within the alteration aureole of the intrusive centre as set out in Appendix E. All target concepts are the opinion of this writer.

The copper + gold porphyry targets are targets in their own right.

Specifically the salient targets include but are certainly not limited to the following:

1.3.1 EXTRUSIVE CENTRE TARGETS

Appendix A; An Eskay Creek Subaerial Equivalent; Bonanza Gold-Silver Targets 1, 2, 3 & 4

Appendix B; Manganese-Carbonate Subaerial Epithermal Gold-Silver Target.

1.3.2 INTRUSIVE CENTRE TARGETS

Appendix C; Milled-Matrix Fluidized-Breccia Pipe, Epithermal Gold-Silver Target.

Appendix D; Eruption Breccia-Hotspring L:ow/High Sulphidation Subaerial Gold-Silver Target.

Appendix E; Diatreme-Breccia/Maar-Volcano, Mesothermal Gold-Copper Target.

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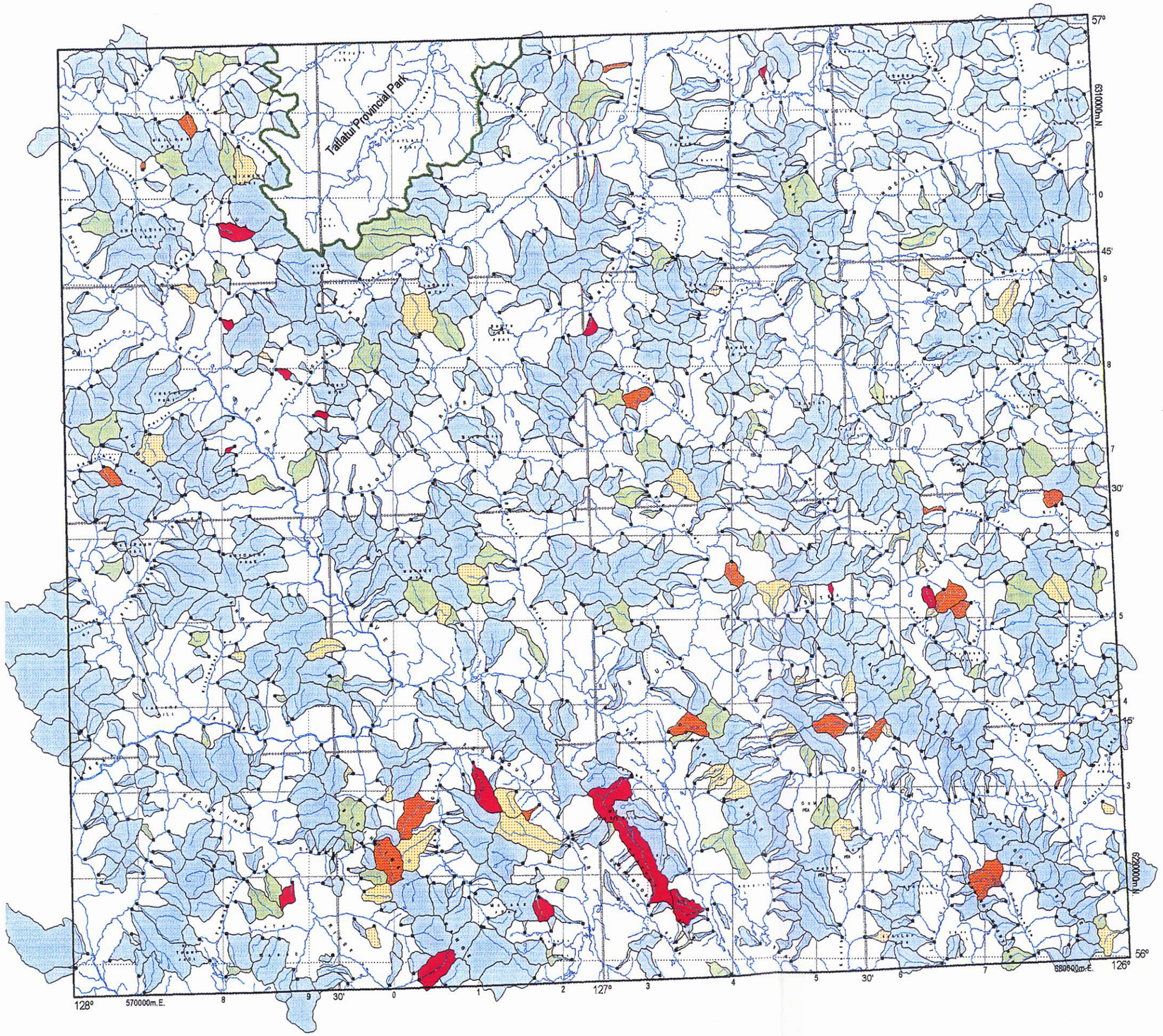
4 September, 2002



B.C. Geological Survey Branch

British Columbia Regional Geochemical Survey

NTS 94D - McConnell Creek

BC RGS 45

0 10 20 30

Kilometres

UTM Zone 9
NAD 83

Refer to Open File text for information on methodology.

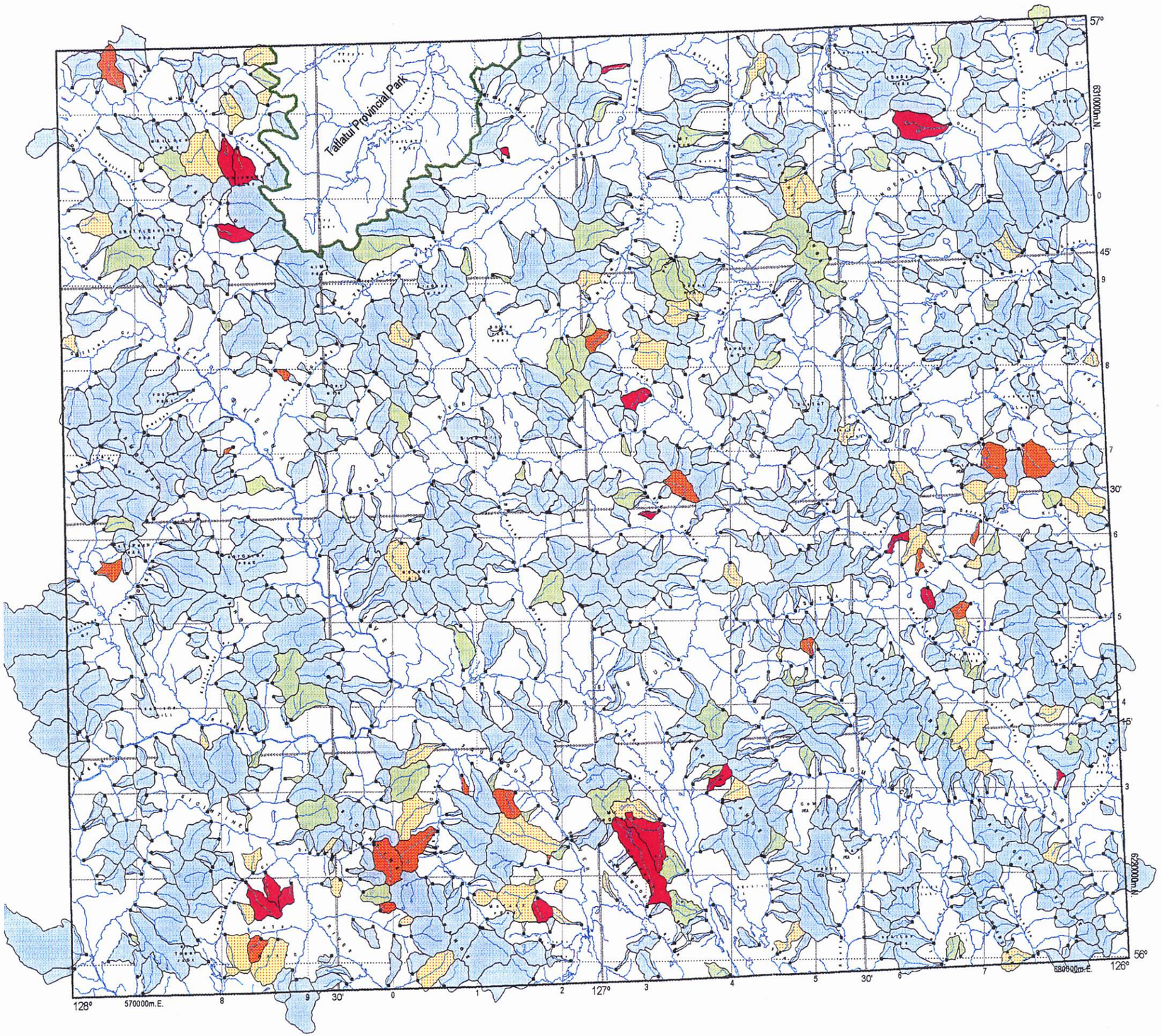
Cu+Pb+Zn+Ag+Ba

Stream Sediments

Total Rating	Frequency
8 to 12	n = 16 [1.6%]
6 to 7	n = 18 [1.8%]
4 to 5	n = 38 [3.9%]
3 to 3	n = 75 [7.8%]
1 to 2	n = 829 [84.9%]

976 Sample Sites

Base Metal Anomaly Map



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BC RGS 45

0 10 20 30

Kilometres

UTM Zone 9
NAD 83

Refer to Open File text for information on methodology.

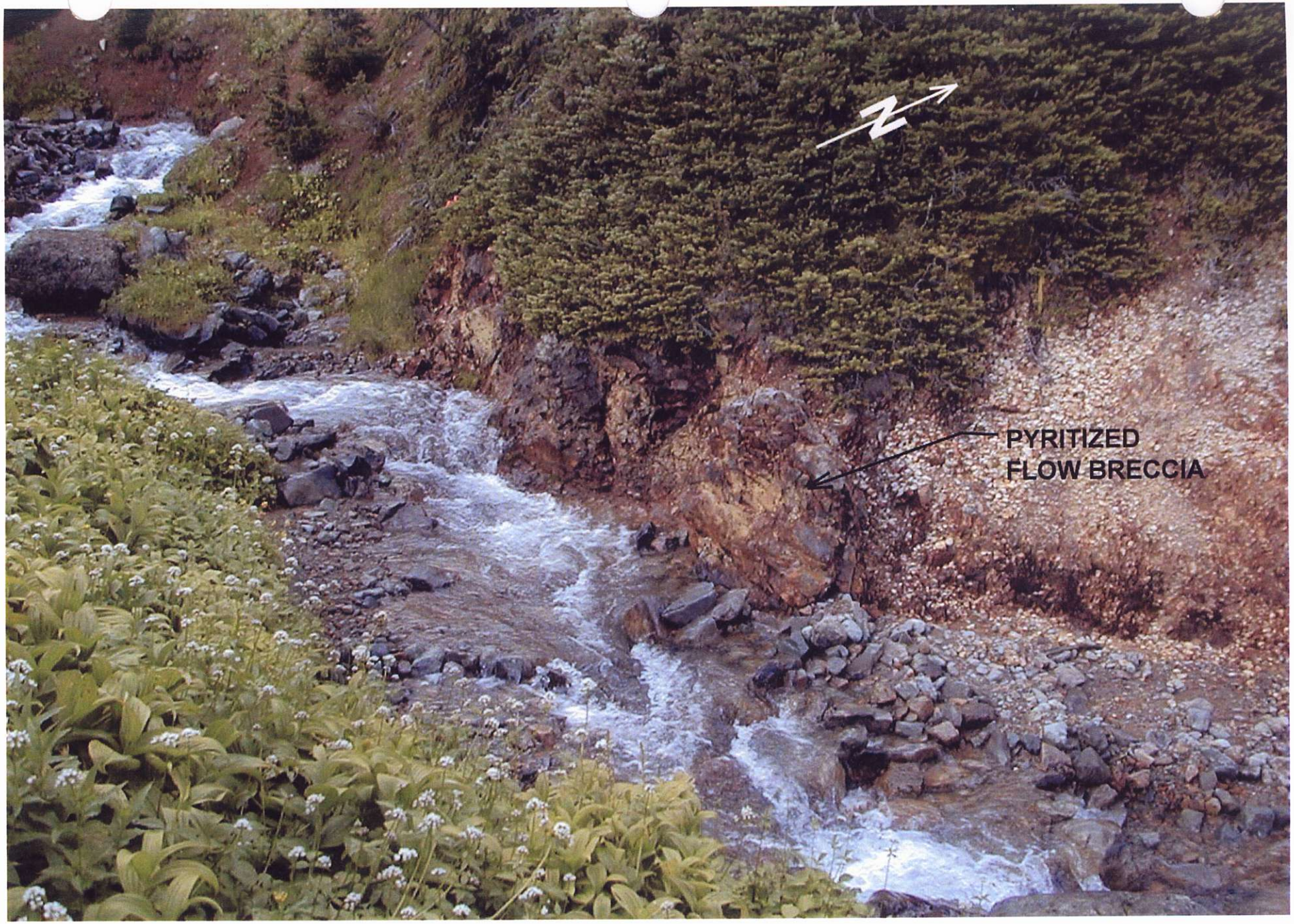
Au+Sb+As+Ag+Hg

Stream Sediments

Total Rating	Frequency
8 to 15	n = 18 [1.8%]
6 to 7	n = 19 [2.0%]
4 to 5	n = 56 [5.7%]
3 to 3	n = 80 [8.2%]
1 to 2	n = 803 [82.3%]

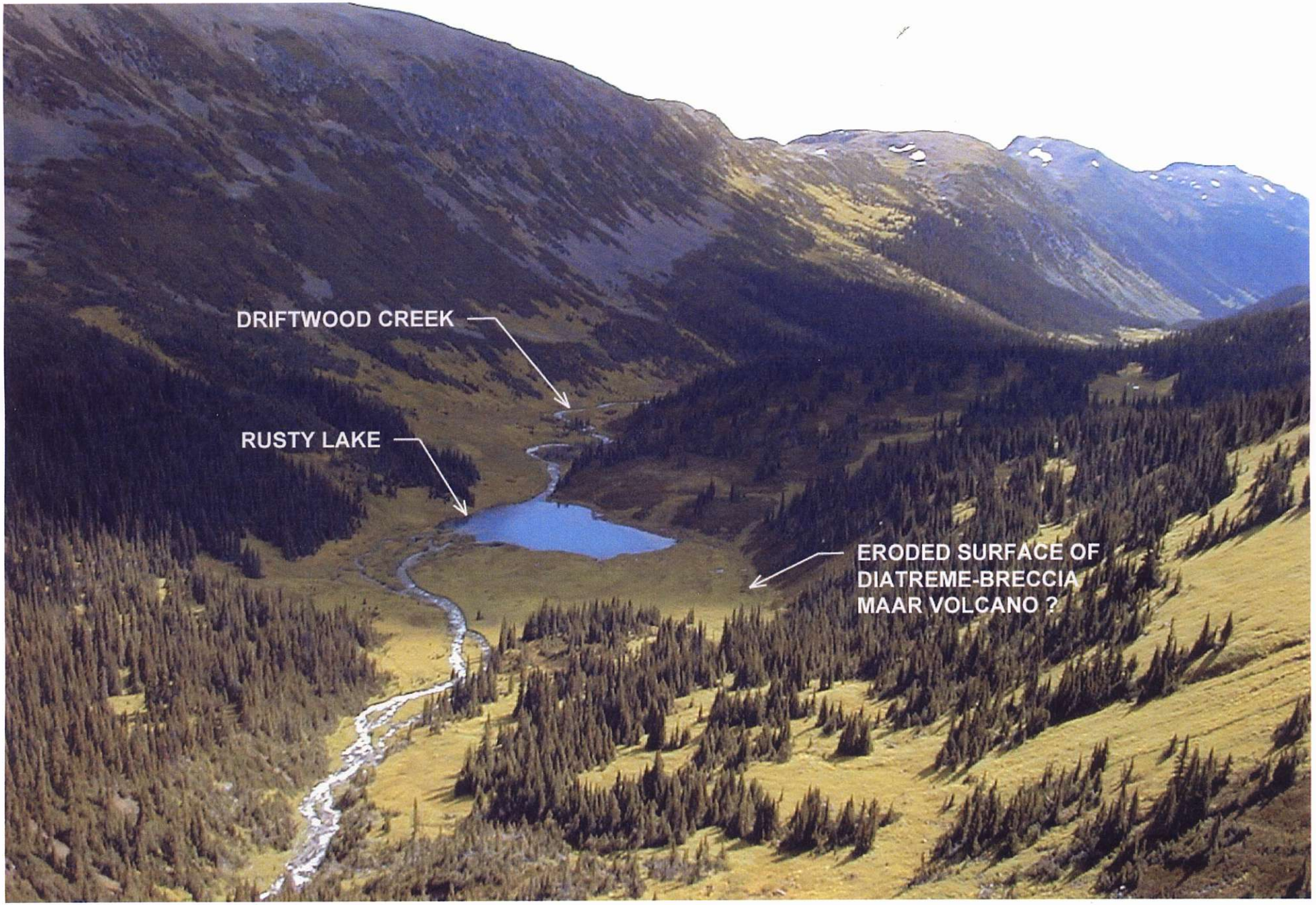
976 Sample Sites

Precious Metal Anomaly Map



PHOTOGRAPH 1

NORTH WALL OF CREEK IS PARTLY EXPOSED HEAVILY PYRITIZED ERUPTION FLOW BRECCIA WITHIN THE HEAVILY ALTERED FELSIC VOLCANIC SECTION OF INTRUSIVE CENTRE (MAGMATIC CENTRE 1) OF THE CHACO BEAR PROPERTY



PHOTOGRAPH 1

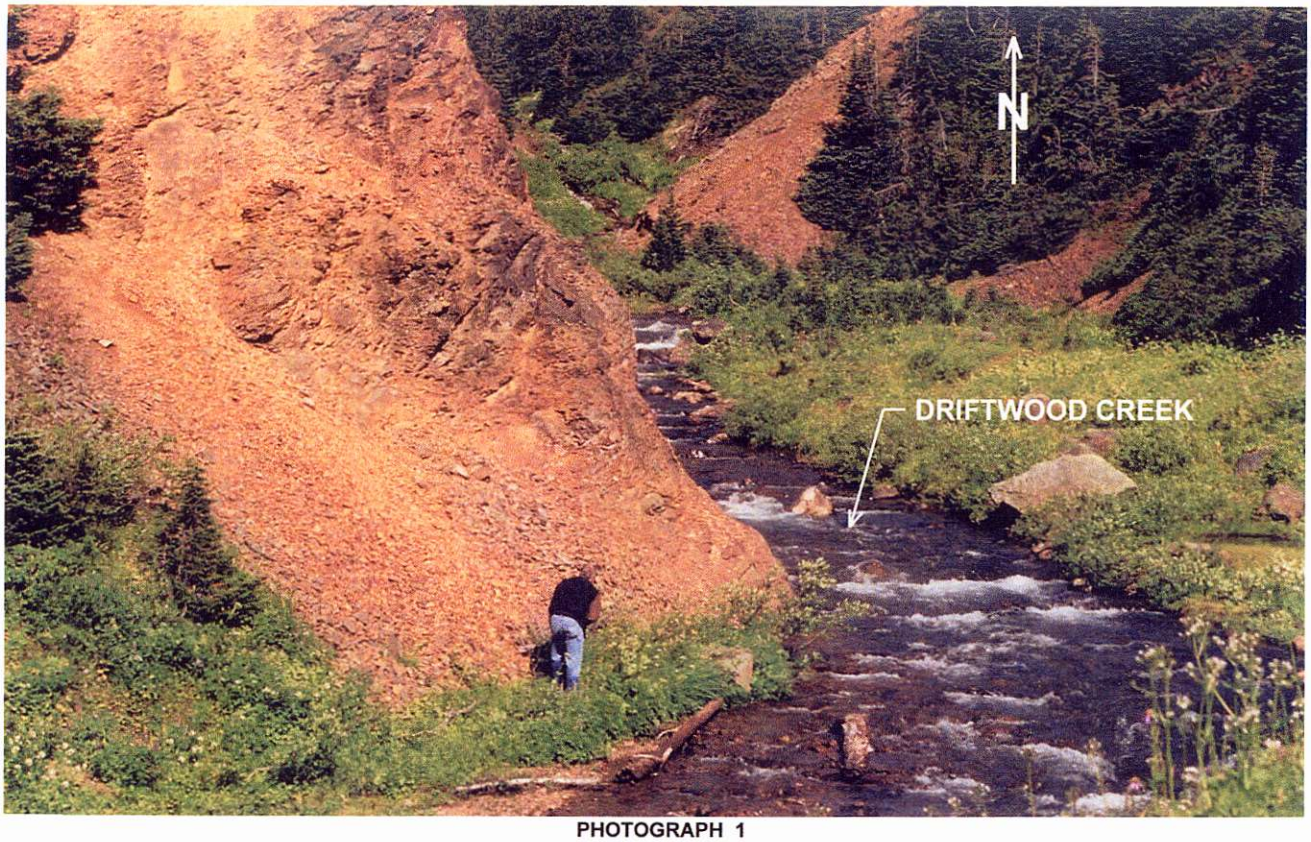
AREA IN FOREGROUND IS
THE ALTERED SURFACE OF THE INTRUSIVE CENTRE
(MAGMATIC CENTRE 1) OF THE CHACO BEAR PROPERTY

Photo 1, Drillcore (Flow Banded Rhyolite) **Au=0.186 oz/t**

Photo 2, Drillcore (Andesite Flow Breccia) **Au=0.077 oz/t**

Photo 3, Drillcore (Flow Banded Rhyolite **Au=0.124 oz/t**)

Photo 4, Drillcore (Flow Banded Rhyolite) **Au=0.018 oz/t**



PHOTOGRAPH 1
INTENSELY ALTERED FELSIC VOLCANICS
SOUTH END OF ALTERATION ZONE
LOOKING NORTH UP

PHOTOGRAPH 2
PARTIAL VIEW OF TRANSPORTED GOSSAN
WITHIN INTENSELY ALTERED FELSIC VOLCANICS
LOOKING EAST

GEOLOGY OF THE CHACO BEAR CLAIMS, OMINECA MINING DISTRICT, NORTH-CENTRAL BRITISH COLUMBIA

Peter B. Read
September 8, 1997

1. INTRODUCTION

This report on the geology of the Chaco Bear Property incorporates the results of 25 days of fieldwork between July 25 and August 19, 1997. The fieldwork was helicopter supported with daily layouts and pickups. The geologically mapped area covers a six kilometre length of the watershed and headwaters of the south-flowing Driftwood River and some of the adjacent country to the northeast which drains eastward through "Coccola Creek" into Bear Lake. All of the approximately 30 km^2 covered lies within the property.

Lord (1948) provided the first regional geology of the claim area in his memoir on McConnell Creek (94D E/2). Richards (1975; 1976) remapped the geology of the area and revised the stratigraphy which including subdividing the Takla (Upper Triassic), Hazelton (Lower and Middle Jurassic) and Bowser Lake (Middle and Upper Jurassic) groups into formations.

Because the area has few named topographic features, the informal topographic names used in this report are enclosed within quote marks and located on Map 1.

2. STRATIGRAPHY

2.1. INTRODUCTION

Richards (1975; 1976) subdivided the Hazelton Group into three formations of which the lowest, or Telkwa Formation, contains calcalkaline basalt, andesite, dacite and up to 50 m of rhyolite flows, breccia and tuff. Lahar, intravolcanic fanglomerate; conglomerate, sandstone and siltstone complete the formation. According to Richards (1975), this formation underlies the entire area of the property. In contrast to Richards, I have subdivided the volcanic rocks of the property into a restricted Telkwa Formation and an overlying unnamed formation. The justification for erecting an unnamed formation is the sudden appearance and significant thickness (450 m) of felsic rocks which overlie, probably unconformably, a thick andesite/basalt succession belonging to the restricted Telkwa Formation. Starting with the restricted Telkwa Formation, the map units are described in ascending stratigraphic order (Map 1).

2.2. TELKWA FORMATION

2.2.1. Red and Green Andesite (**lJrgva**)

Probably very extensive, this unit underlies the ridge on the west side of the property for more than 4 km from near Peteyas Peak southeast along Tsaytut Spur to beyond the southern limit of geological mapping. It contains grey-green and locally maroon aphyric and fine plagioclase-bearing andesite flows and some lapilli tuff probably totalling more than 1000 m in thickness, The base of a distinctive, overlying rhyodacite breccia defines the top of the unit. The base lies to the southwest beyond the limit of mapping.

2.2.2. Red and Green Andesite Tuff (**lJrgvaf**)

Within the red and green andesite flows (**lJrgva**) is a well-bedded sequence of lithic andesite ash-tuff up to 75 m thick. Although only mapped northeast of "Cigar Lake", it extends westerly towards Tsaytut Spur. The upper and lower boundaries of the unit lie at the top and base respectively of the highest and lowest bedded ash-tuff layers. Near "Cigar Lake", andesite flows are absent from the unit. Southeast of "Cigar Lake", the location of its faulted and offset portion is unknown. The uncertainty in correlation of the bedded lithic andesite tuff exposed in the creek east of "Cigar Lake" at Station 27g relegates it to the undivided volcanic rocks of unit **lJvu.**

2.2.3. Rhyodacite Breccia (**lJvdx**)

This unit extends more than 2 km southeasterly from "Goat Knob" on the western boundary of the property to its truncation by "Big Lake" Fault north of "Cigar Lake". The unit ranges from a few metres to about 50 m in thickness. Near "Goat Knob" it displays the differentially weathered, angular clasts of light grey rhyodacite which characterize this unit. About 0.75 km north of "Cigar Lake", near Station 26c, the unit thins to 5 m and has mainly andesite clasts accompanying a few remaining rhyodacite fragments. Immediately north of "Cigar Lake", the unit thickens, re-establishes its rhyodacite composition, and contains rare, pink leucogranite clasts up to 25 cm long. The sharp upper contact of the rhyodacite breccia against the overlying amygdaloidal andesite flows outcrops on the south side of "Goat Knob". The lower contact lies at the top of the highest underlying flow or rhyodacite-free andesite breccia. Its extension east of "Big Lake" Fault is uncertain, but talus blocks with plutonic clasts, which lie above 1600 m elevation south of "Cigar Lake" imply an unexposed continuation in the subcrop beneath the talus. Although thin, this widespread and distinctive breccia is stratigraphically important because it intervenes between a thick overlying maroon and grey basalt/grey-green andesite succession (**lJvb**) and an underlying red and green andesite sequence (**lJrgva**).

2.2.4. Grey and Maroon "Basalt" (**lJvb**)

This unit underlies a 1.2 km length of the ridge on the west side of the property, where it stretches from south of Upper Driftwood Fault to southeast of Peteyas Peak. From the ridge, it extends up to 3.5 km southeasterly across "Big Lake" to its termination against "Big Lake" Fault. On the ridge, maroon "basalt" lapilli tuff is widespread, and dark grey and maroon, amygdaloidal "basalt" flows are uncommon. Here the unit is coarse-bedded and dips moderately to the northeast on cliff-scale, but bedding is rare in outcrop. However, the cliffs west of "Big Lake" expose a southeastward facies change to flow-dominated, grey-green andesite which is lithologically indistinguishable from the overlying andesite. The top of the unit lies at the base of a thin (7 m) well-bedded lithic tuff (**lJvaf**) with grey and maroon beds at Station 14m and the base of the unit lies at the bottom of the lowest amygdaloidal basalt/andesite flow overlying the rhyodacite breccia. Between these contacts, the unit totals several hundred metres in thickness.

2.2.5. Lower Green Andesite (**lJlgva**)

The unit outcrops best along the base of the valley walls near the head of Upper Driftwood Creek. The typical grey-green andesite is aphyric to fine (1 mm) plagioclase-bearing flows with some lapilli tuffs. Some of the flows are amygdaloidal (calcite and chlorite). Although the top or base of the unit is faulted everywhere, the unit is at least 150 m thick. On the north side of Upper Driftwood Creek, the upper contact of the unit lies at the base of the lowest overlying plagiophyric flow or intervening maroon andesite tuff (**lJvaf**). However, on the east side of "Big Lake" both of these overlying units disappear and the position of the top of the unit is lost under the extensive overburden down Driftwood Valley. Only the ridge on the west side of the property exposes the base of the unit placed at the top of the highest underlying grey or maroon "basalt". Elsewhere the base is faulted or drift covered.

2.2.6. Plagiophyric Andesite (**lJvap**)

This important marker unit consists of 10 to 20% plagioclase phenocrysts (2 to 8 mm) set in a light to medium grey aphanitic andesite matrix. The unit extends the 2.5 km length of "Razorback Ridge" to "Big Lake" Fault. On the east side of "Big Lake" it extends about 1 km southeasterly before lensing out. At the southeast corner of the mapped area, a thin plagiophyric andesite reappears from beneath the rhyolite. Here and there the unit contains interflow lenses of bedded maroon andesite tuff and lapilli tuff (**lJvaf**) up to 15 m thick. The top and bottom boundaries are placed at the stratigraphically highest and lowest plagiophyric andesite which results in a maximum thickness of 150 to 200 m.

2.2.7. Andesite Lapilli Tuff (**lJvaf**)

Lenses up to hundreds of metres in length and 50 m in thickness consist of green and maroon, bedded andesite tuff. They are present within and at the margins of especially the green andesite (**lJugva** and **lJlgva**) and plagiophyric andesite (**lJvap**) units in Upper Driftwood Valley. They are important because they give the orientation of otherwise unbedded rocks and locally lie on the boundaries of the units.

2.2.8. Undivided Volcanic Rocks (**vu**)

East of "Big Lake" Fault and down the Driftwood Valley, the combination of a loss of two distinctive marker units (**lJvap** and **lJvdx**) and the grey and maroon "basalt" portion of unit **lJvb**, and the presence of extensive drift results in such significant stratigraphic uncertainties that the volcanic rocks are mapped as undivided. These rocks are all grey-green to green aphyric to fine (1 mm) plagioclase-bearing andesite flows and some lapilli tuff.

2.3. UNNAMED FORMATION

2.3.1. Porphyritic Dacite (lJvdp)

Northwest and southeast of "Round Lake", porphyritic (plagioclase) dacite flows, and welded and unwelded lapilli tuff and ash overlie the upper green andesite (**lJugva**) and underlie rhyolite tuff and flows (**lJvr**). On the south shore of "Round Lake", a 200 to 300 m thickness of heavily silicified, steeply dipping, flow-banded flows compose the unit. Two kilometres to the southeast at "Coccola Lake", the unit consists of 20 m of flows which lens out within a few hundred metres farther southeast. Northwest of "Round Lake" welded and unwelded lapilli tuff and ash form the unit.

2.3.2. Rhyolite Tuff and Flows (lJvr)

For a 3 km stretch along the ridge on the east side of the property, southeast of "Big Lake", rhyolite forms up to a 300 m thick sequence of welded and unwelded lapilli tuff with rare spherulitic flows. The rocks weather a characteristic cream colour, have ubiquitous flow layering and yield platy talus. Along an exposed contact at Station 3i, southeasterly dipping rhyolite lapilli tuff overlies a bumpy surface of the upper green andesite flows (**lJugva**) of uncertain orientation. The upper contact of the unit is placed at the first appearance of dacite flows or aphyric andesite.

Northwest of "Round Lake", in a 150 m thick rhyolite succession, a lapilli tuff bed has pink leucogranite clasts up to 20 cm on edge.

2.3.3. Dacite Flows (lJvd)

Along the ridge on the east side of the property southeast of "Big Lake" is a light to medium grey and locally maroon sequence of flows with 5% fine (1 mm) plagioclase laths set in an aphanitic matrix. In contrast to the underlying rhyolite, the dacite weathers grey, lacks flow layering and yields blocky talus.

2.3.4. Aphyric Andesite (lJva)

Along the ridge on the east side of the property southeast of "Big Lake", grey-green aphyric andesite flows up to 50 m thick lie within the rhyolite and an undetermined thickness overlies the rhyolite. Where the andesite overlies the dacite, the basal andesite breccia contains angular clasts of light-weathering dacite.

3. INTRUSIONS

3.1. INTRODUCTION

Within the map area, mainly thin (up to 5 m) and rarely thick (up to 30 m) dikes intrude all the stratified units. Most dips range from subvertical to moderate southwest to west, but some, especially those east of "Big Lake", dip southeast to south. The dikes are either aphyric, porphyritic with an aphanitic matrix, or fine-grained (1 mm or less) with plutonic rocks absent. However, geological mapping by W. Raven and D. Cole along (Station 11) and on the west side of Tsaytut Spur outlines a medium-grained (1-3 mm) leucogranite or leucosyenite body that extends northerly for a few kilometres and downslope into the drift beyond the limits of mapping. The only other evidence of nearby plutonic rocks is the presence of rare leucogranite clasts in the rhyodacite breccia (**lJvdx**) and rhyolite lapilli tuff (**lJvr**) units. The density of dikes increases southward along Tsaytut Spur.

3.2. DIKES

3.2.1 Mafic (**m**)

Aphanitic andesite dikes, which are regionally altered by subgreenschist metamorphism, are common particularly in the volcanic rocks of the restricted Telkwa Formation. Because they are distinguished with difficulty from the andesite flows characteristic of the Telkwa, they may be much more common than mapped.

3.2.2. Plagiophyric Meta-andesite (**ma**)

Plagioclase phenocryst-bearing (5-10%, 2-6 mm) andesite dikes cut all the rock units stratigraphically beneath the plagiophyric andesite (**lJvap**). The southwest flank of "Razorback Ridge" exposes a few plagiophyric meta-andesite dikes cutting the lower green andesite (**lJlgva**), but none cutting the upper green andesite (**lJugva**). These are the feeder dikes for the flows of the plagiophyric andesite unit (**lJvap**).

3.2.3. Metadiorite (**di**)

These are chloritized, fine-grained (less than 1 mm) diorite or gabbro dikes. They occur exclusively in the restricted Telkwa Formation.

3.2.4. Felsite (**f**)

White aphanitic to sparse fine feldspar-bearing (less than 5%, 0.4 mm) dikes which are marginally flow-layered. They cut all the volcanic rock units.

3.2.5. Pink Leucogranite (**g**)

On the top of Tsaytut Spur at Station 11, is a white to pink leucogranite. Geological mapping indicates that it intrudes across a metadiorite dike and thus should be younger. However, it age relationships to the felsite and other dikes are unknown.

4. STRUCTURE

4.1. INTRODUCTION

The units of the Telkwa Formation, that is, those units underlying the rhyolite and dacite, form a moderate northeasterly dipping sequence which is upright, faces northeastward and is convex to the northeast. On the ridge on the east side of the property south of "Big Lake", the rhyolite, dacite and younger rocks of the unnamed formation outline an arcuate pattern concave to the east. Later faulting is superimposed on these warps.

4.2. FOLDING

On the property, the Lower Jurassic stratified rocks all dip at 30 to 50°NE in contrast to the nearby gentle dips of the Upper Cretaceous Sustut Group. This contrast between the attitudes of the Hazelton and Sustut group implies that the rocks of the Hazelton Group were deformed mainly before the Upper Cretaceous. Superimposed on these tilted rocks are local broad warps such as on the northeast side of Upper Driftwood Fault where the rocks at the west edge of the property strike westerly, and the rocks the east edge of the property strike southeasterly.

4.3. FAULTING

Shear zones and faults are widespread in the rock units beneath the rhyolite and dacite offset all intrusions except possibly the leucogranite (**g**).The offsets of dike contacts and closely positioned rock unit boundaries indicate northwesterly and northerly striking faults. Both are subvertical or have a westerly component of dip, are probably pre-vein in age, and provided channelways and open space for the vein mineralization on the claims.

4.3.1. Bearnx Fault

This fault follows the creek bed of the Upper Driftwood Creek above "Big Lake" in the area of the 1996 drilling program. The offset base of a 30°N dipping pplagioclase-bearing basalt flow and a right laterally offset felsite dike yields a fault displacement of 82 m of right lateral normal fault with a movement direction (trend/plunge) of 288/30NW with the southwest side down. This calculated movement direction compared favourably with a single set of slickensides of 302/20NW measured on a subsidiary fault of 318/39SW which dips more gently than the 318/50SW fault attitude derived from the 1996 drill sections (Drill sections, W. Raven).

4.3.2. Upper Driftwood Fault

Upper Driftwood Fault has been traced for 6 km southeasterly across the width of the property from the head of Upper Driftwood Creek, across the north end of "Big Lake" to the ridge on the east side of the property. Offsets of three stratigraphic units, the plagiophyric andesite (**lJvap**), andesite tuff (**lJvaf**), and the base of the rhyolite (**lJvr**) imply a dip-slip movement of hundreds of metres with the southwest side down. Drill hole CB97-6 intersected this fault zone from 81 m to the end of the hole at 117 m.

4.3.3. "Big Lake" Fault

A strong north-striking lineament trends north from "Big Lake" for 2.5 km through "Coccola Lake". The gully immediately north of "Big Lake" exposes northerly striking, subvertical faults filled with carbonate. One fault shows dip-slip slickensides. The upper contact of the plagiophyric andesite (**lJvap**) shows a right-lateral offset of 325 m but by "Coccola Lake", the base of the rhyolite unit (**lJvr**) shows only 75 m of right-lateral offset. These offsets and slickenside attitude indicate that the fault is

east side down. At the intersection of "Big Lake" and Upper Driftwood faults, "Big Lake" is probably little offset because both faults have steep dips and large components of dip-slip motion. Farther south, the airphoto linear curves to the southwest through "Cigar Lake" and geological mapping shows that rock units do not extend southeasterly along strike and across the lake.

5. MINERALIZATION

The following observations are a by-product of the geological mapping. The subject will be treated in much greater detail in a report by W. Raven and D. Cole.

5.1. DISSEMINATED MINERALIZATION

Large areas, measuring up to hundreds of metres are so extensively hydrothermally altered that the protolith is destroyed and replaced by a porous assemblage of finely disseminated pyrite (2 to 10%) and quartz±sericite. Four such areas, in order of increasing intensity of alteration are:

5.1.1. Base of the Rhyolite Unit (lJvr)

At the base of the rhyolite unit (**lJvr**) on the ridge on the east side of the property weakly disseminated pyrite lies within a few metres of the base yielding a gossanous zone which extends into the upper green andesite (**lJugva**) along the trace of the Upper Driftwood Fault.

5.1.2. Driftwood River

A 600 m long canyon between the 1380 and 1400 m levels in Driftwood River exposes zones of strongly disseminated pyrite-quartz±sericite alteration in the undivided volcanics (**lJvu**).

5.1.3. East Side of Tsaytut Spur South of "Cigar Lake" (Gossan Zone)

See W. Raven's and D. Cole's report for this area.

5.1.4. Meadows Southeast of "Cigar Lake"

Streams cutting the meadowed bench southeast of "Cigar Lake" expose very strongly altered, plagiophyric meta-andesite dikes and rocks of unknown protolith. The intense pyrite-quartz±sericite alteration accompanies these closely fractured rocks.

5.2 VEIN MINERALIZATION

Vein mineralization consisting of some of specularite, chalcopyrite, pyrite, bornite, chalcocite, argentite?, galena, sphalerite, quartz, calcite and ferroan dolomite form veins ranging from a few centimetres to 0.5 m in width. An exposure in a creek cutting the meadows southeast of "Cigar Lake" at Station 27g clearly shows vuggy quartz-specularite veins cutting bedded tuffs hydrothermally altered with disseminated pyrite-quartz±sericite.

5.3. TIMING OF MINERALIZATION

Exposures show that the disseminated mineralization is clearly older than the vein mineralization. However, the absolute timing of these two periods of mineralization is unknown. If the mineralization is genetically and thus spatially associated with the leucogranite (**g**), the presence of leucogranite clasts in the rhyodacite breccia (**lJvdx**) and rhyolite (**lJvr**) units restricts the age of mineralization to Early and Middle Jurassic. Because this age is before the pre-Sustut regional folding, the original attitude of the disseminated mineralization could be approximated by rotating the northeast dip of the Jurassic rocks into the horizontal around the regional northwesterly strike of bedding. This rotation will make many of the northwesterly striking dikes subvertical.

6. REFERENCES

Lord, C.S. (1948):
McConnell Creek Map-Area, Cassiar District, British Columbia; Geological Survey of Canada, Memoir 251.

Richards, T.A. (1975):
Geology, McConnell Creek Map-Area (94D/E); Geological Survey of Canada, Open File 342.

Richards, T.A. (1976):
Takla Project (Reports 10-16): McConnell Creek Map-Area (94D, East Half) British Columbia; in Report of Activities, Part A, Geological Survey of Canada, Paper 76-1A, p. 43-50.

LEGEND

QUATERNARY
RECENT

Rfe	915	Ferricrete

JURASSIC TO EOCENE

Veins: quartz-carbonate-specularite-pyrite-chalcopyrite-(bornite, chalcocite)

Hydrothermal alteration: quartz-pyrite-(sericite)

JURASSIC
LOWER AND MIDDLE JURASSIC

HAZELTON GROUP

Unnamed Formation

lJvd	941	Light grey fine (1 mm) plagioclase-bearing dacite flows; locally maroon
lJva	948	Grey-green aphyric andesite flows; where overlying lJvr a basal volcanic breccia with dacite clasts
lJvr	956	Rhyolite tuff, ash and lapilli tuff; rare spherulitic flows; andesite lapilli tuff where speckled
lJvdp	944	Plagiophyric dacite flows; bedded lapilli tuff and ash

Telkwa Formation

lJugva	920	Grey and grey-green aphyric to fine (1 mm) plagioclase-bearing andesite flows; minor lapilli tuff
lJvap	911	Grey plagiophyric (1-4mm, 5-20%) andesite flows
lJvaf	912	Maroon and grey lithic andesite tuff and lapilli tuff
lJlgva	908	Grey-green, aphyric to fine (1 mm) plagioclase-bearing andesite flows; minor lapilli tuff
lJvb	905	Interbedded grey and maroon "basalt" flows and lapilli tuff
lJvdx	910	Rhyodacite lapilli breccia; locally andesite clasts; rare plutonic fragments
lJrgva	907	Green and red andesite flows; minor intercalated lapilli tuff
lJrgvaf	913	Green and red, bedded, lithic andesite tuff
lJvu	909	Undivided green, grey-green meta-andesite flows and tephra; minor maroon

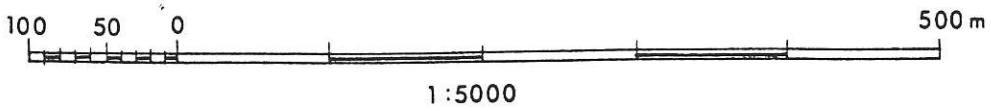
INTRUSIONS

g	921	Pink leucogranite
f	929	Felsite dike
di	937	Fine grain metadiorite
ma	911	Plagiophyric meta-andesite dike
m	931	Mafic dike

STRUCTURAL SYMBOLS

Contacts	exposed	
	approximate	
	inferred	
Faults	exposed (peg side down)	
	approximate (peg side down)	
	assumed (peg side down)	
Bedding	inclined	
	vertical	
	tops upright	
Flow Layering	horizontal	
	inclined	
	vertical	
Platy Jointing	inclined	
	vertical	
Dike		
Vein		
Outcrop area		
Station number		
Limit of mapping		

Geology: Geotex Consultants Limited, P. B. Read , 1997



The Chaco Bear Epithermal & Mesothermal Gold-Silver Prospects & Porphyry Copper-Gold Prospects

Location, Access, History

1.0 Location & Access

The centre of the claim block which comprises the Chaco Bear property is located about 4 kilometres West of Bear Lake, British Columbia at Longitude 126°50'00" West and Latitude 56°10'00 North.

Bear Lake is located about 100 miles due north of Smithers and about 220 miles north-northwest from Prince George. The Kemess Mine is located about 60 miles north-northeast from Chaco Bear, and Stewart is located about 140 miles west of Chaco Bear.

The British Columbia Railway (BCR) has operating track up to the east side of Bear Lake. Similarly logging road along the east side of Bear Lake provides access from Fort St. James to the south east. From "Big Lake" at the centre of the Chaco Bear property, to the road and railroad as the crow flies is about 3 miles. Construction of a road from Bear Lake to the property should not be difficult. A bridge across the Bear River is required.

The British Columbia government has plans for the construction of the Stewart-Omineca Road that will connect the deep sea port of Stewart with the Kemess Mine and other promising mineral prospects throughout the region. This road will pass by the Chaco Bear property about 11 miles to the north and will connect to existing logging road that extends northward from the east side of Bear Lake.

Access to the property is presently by any of the following alternatives to Bear Lake, thence by helicopter to the property.

- road or railroad to Bear Lake
- fixed wing float aircraft to Bear Lake.
- fixed wing wheeled aircraft to the Bear Lake dirt strip

Alternatively direct helicopter access can be provided from Smithers, Prince George, Fraser Lake, or Takla Lake, to name a few.

Various alternatives are recommended to gain access to the property in a most cost effective manner depending upon the amount of freight and equipment that is required for advanced exploration work.

2.0 Property History

There is very little recorded work on the Chaco Bear property but from personal communication with others it is known that Noranda Mines and Canadian Superior Exploration were interested in the area.

There are numerous showings that show signs of early trenches and test pits dug by the old-timers of which are unknown: Subsequently the known work and the operators include but may not be limited to the following:

Year 1948 — The area was mapped as part of a regional geological survey by C.S. Lord, McConnell Creek Area; Geological Survey of Canada Memoir 251.

Year 1968 — Cominco staked the Dave Claims at the south end of "Big Lake" and completed 7.8 line-miles of horizontal loop electromagnetic survey. The survey was unsuccessful in locating any conductors. It was concluded that the highly oxidized nature of the sulphides in the limited area of the survey insulated the sulphide grains from their contiguous neighbours and accordingly would not respond well to EM induction effects. Cominco abandoned the claims thereafter.

Year 1984 — Suncor Inc. of Calgary, Alberta staked the Peteka 1-4 claims and completed stream sediment sampling, some prospecting and lithogeochemical sampling. Their survey results identified highly anomalous gold and copper values in the stream sediments and from intensely altered rock samples.

Year 1985 — Suncor Inc. completed follow up prospecting, some local geological mapping, geochemical soils sampling, and lithogeochemical sampling, a VLF-EM survey and a total field magnetic survey over the large > 1 square mile intensely altered area bisected by the Driftwood Valley. The results showed several anomalous features from all the survey programs in this central area of interest and in particular they mapped and sampled many quartz veins, quartz carbonate veins and carbonate veins many which contained high values in copper, gold and silver. They identified a breccia pipe within the intensely altered area.

Suncor Inc. abandoned the property after ceasing to operate their mineral exploration department.

Year 1992 — J. M. Ashton acquired the property by staking and completed a shallow probe reconnaissance induced polarization survey over the northeastern part of the alteration zone. A very high chargeability-low resistivity anomaly striking north-northwest was found which coincided with a strong linear VLF-EM anomaly and the strongest copper-zinc geochemical

anomaly since found on the property. The target structure has a strike length of about 4,000 feet. Geological examinations of the property by specialists working with Ashton confirmed the extensive zone of alteration and identified classic alteration facies and zonation symmetry of a transitional environment from epithermal to mesothermal to a high level porphyry system.

Year 1996 Imperials Metals Corporation optioned the property and completed prospecting and limited reconnaissance geological mapping. Their results confirmed the anomalous character of the property identified by previous operators and outlined several additional areas of interest. In the fall of 1996 Imperial completed a weather limited diamond drilling program on the Bearnx shear zone which had interesting mineral exposures on the surface. Results from this small zone returned assays of 0.45 g/t Au, 5.61 g/t Ag, and 0.6% Cu of a width of 6.8metres.

Year 1997 Imperials Metals completed extensive geological mapping of the property and confirmed the large zone of alteration in the central southern section of the property. Late in the exploration program following drilling nearby they identified what is interpreted to be a highly altered volcanic centre consisting of dacitic and rhyolitic flows. The earlier drilling on the edge of this centre within a mineralized shear structure with good surface showings encountered heavily altered rhyolite dykes with similarly altered andesitic wall rocks containing geochemically anomalous gold values. The geological mapping by Imperial confirmed that the property appears to be underlain by the Hazelton Series of shoshonitic volcanics and coeval intrusives that produced the gold and silver rich Eskay Creek epithermal precious metals deposits.

What is interesting about the geology is the lower section of volcanics is made up of an incomplete sequence of the Hazelton Series consisting of a **restricted** Telkwa Formation which is unconformably overlain by a sequence of felsic extrusives consisting of dacites, rhyolites and andesites up to 600 metres thick called the Unnamed Formation.

Imperial Metals relinquished their option on the property to preserve working capital. They had just put the Mount Polley copper and gold porphyry deposit into production and falling gold and copper prices reduced their cash flow substantially.

All of the major target areas on the Chaco Bear property have yet to be tested. The major targets include but are not limited to the following:

- Porphyry copper-gold deposits subcropping the intrusive and extrusive centre.

- Several low sulphidation epithermal gold-silver targets including a milled-matrix fluidized breccia pipe related to the intrusive centre.

- A possible diatreme breccia/maar volcano mesothermal gold-copper target within the altered zone of the intrusive centre.

- An Eskay Creek epithermal subaerial analogue associated with the extrusive centre and stratabound structurally controlled precious metals deposits hosted by the unconformity between the Unnamed Formation felsics and the restricted Telkwa Formation andesites.

Prepared By: J. M. Ashton

Vancouver, British Columbia

August, 2002

GEOLOGY OF THE CHACO BEAR CLAIMS,
OMINECA MINING DISTRICT,
NORTH-CENTRAL BRITISH COLUMBIA

Latitude:	56°09'
Longitude:	126°56'
Owner:	Imperial Metals Corporation
Operator:	Imperial Metals Corporation
Consultant:	Geotex Consultants Limited
Author:	Peter B. Read
Date:	September 8, 1997

GEOTEX CONSULTANTS LIMITED CONSULTING GEOLOGISTS

SALIENT DRILL CORE PHOTOGRAPHS

With TYPICAL GOLD & SILVER ASSAYS

Table 1; Gold & Silver Assays

Core Photo	Drill Hole	Hole Interval	Gold Assay		Silver Assay	
			grams/t	oz/t	grams/t	oz/t
1	97-11	50.8m	5.77	0.186	9.9	0.32
2	97-12	23.3m	2.38	0.077	81.1	2.61
3	97-12	43.2m	3.84	0.124	5.9	0.19
4	97-12	66.5m	0.58	0.018	5.5	0.18

Table 2; Basic Geological Description of Drill Core

Drill Hole	Core Interval	Basic Geological Description
97-11	50.8m	Flow Banded Rhyolite, Quartz-Carbonate Veining
97-12	23.3m	Andesite Flow Breccia, Quartz Veining
97-12	43.2m	Flow Banded Rhyolite, Brecciated
97-12	66.5m	Flow Banded Rhyolite Brecciated, with Chalcopyrite

Note: See Accompanying Photographs 1, 2, 3, & 4

Chaco Bear Epithermal Gold & Silver Prospects

An Eskay Creek Subaerial Equivalent;
Bonanza Gold-Silver Targets 1, 2, 3, & 4

Confidential Disclosure

1.0 SUMMARY

The felsic extrusives of the **Unnamed Formation** discovered while mapping the property in 1997 are shoshonitic. **Shoshonites** are in that special class of high-K rocks that produce many of the world's richest and largest epithermal and mesothermal gold deposits of a variety of styles; and includes the gold rich porphyry copper-gold class of deposits as well, in which grades range from about 0.4 grams/t to as high as 2.0 grams/t Au.

World-class epithermal gold deposits which fall into this category, to name a few of the outstanding ones, include: Ladolam (42.6 M-oz contained Au); Porgera (> 14 M-oz contained Au); Emperor Gold (7.5 M-oz recovered + reserves); and Cripple Creek (19.4 M-oz recovered)

At Chaco Bear the extrusive system and the intrusive system have all the top level geological, pervasive alteration, precious metals indicator geochemistry, precious metals veins, and bulk gold content rhyolites characteristically representative of very large and strong gold mineralizing system which are more likely to produce world-class gold deposits than not.

Regionally, a geochemical silt-sampling program conducted by the British Columbia Geological Survey identified the Chaco Bear Property as having the largest and strongest **Au+Ag+Sb+As+Hg** epithermal style geochemical signature found on the 5,000 square mile map sheet. Such signatures when found in the major gold producing districts in Nevada and other parts of the world usually lead to the discovery of significant gold deposits.

Substantive data obtained in early stage exploration indicates a very high probability for finding several styles of epithermal and mesothermal precious metals deposits within or related to the Unnamed Formation package of felsic volcanics and in the restricted Telkwa Formation; which include but are certainly not limited to:

Subaerial Epithermal, Bonanza Gold and Silver Deposits associated with the following geological features found on the property:

- within the system that produced the large silicified and geochemically anomalous, dacitic extrusive zone at Round Lake.

- within the system that produced the **gold-rich** rhyolitic feeder zone subcropping the Coccola Zone; serendipitously discovered by drilling.

- within the system and its structural conduits that produced the rhyolitic feeder zones beneath the Unnamed Formation-restricted Telkwa Formation 9.5 km long unconformity which also incorporates the Round Lake Zone and the Coccola Zone.

Stratabound, Bulk Mineable, Low to Medium Grade Gold and Silver Deposits associated with the following geological features found on the property:

- within and contiguous with the unconformity between the Unnamed Formation felsics and the restricted Telkwa Formation andesites.

- within favourable host lithology in the Unnamed Formation and the restricted Telkwa Formation integral with fracture/shear zones and fault zones that permeate the area; i.e., where the Big Lake Fault and the Upper Driftwood Fault and their subsidiary structures cut the Unnamed Formation and the Telkwa Formation.

Mesothermal Precious Metals Veins and Stockworks at depth, below the zones of epithermal boiling.

2.0 INTRODUCTION

At **Eskay Creek** the Mine's 21B Zone precious metals deposit, prior to production, had a mineral inventory of 1.19 million tons grading 1.91 ounces Au per ton and 85.5 ounces Ag per ton for a total of 2.27 million ounces of gold and approximately 102 million ounces of silver. It is one of the world's richest gold and silver deposits ever discovered that is presently being mined.

The deposit is hosted by Middle Jurassic volcanic and sedimentary rocks in the upper part of the Hazleton Group where the lower part of the sequence is intruded by porphyritic monzodiorite to diorite and by younger felsic dykes and sills which are feeders to a dacite-rhyolite package of extrusives analogous to the extrusive system at Chaco Bear.

The main ore sequence is marked by silicified and intensely auto-brecciated, locally massive flow banded, and spherulitic low-Ti rhyolite flows. The rhyolites are intercalated with basaltic flows and sills, and sediments.

Stockwork vein and disseminated precious metals mineralization are present in the rhyolite. **The rhyolites are the feeders to the gold and silver rich orebodies.**

There are several styles of ore, to name a few, from stratiform lenses of massive to semi-massive sulphides overlying disseminated mineralization within the rhyolites to

stockwork quartz-sulphide veins with visible gold associated with silica flooding within rhyolite, to very fine sulphide disseminations and veinlets within the rhyolite.

The geology and the mineral delivery mechanism at Eskay Creek appears to be remarkably analogous to the Chaco Bear discovery.

At **Chaco Bear,** an extensive and detailed geological mapping program, superbly done, carried out in 1997 identified a thick succession of coeval volcanics above what are interpreted as two magmatic centres estimated to be about 5.5 km (3.4 miles) apart. A third magmatic centre represented by an outcropping Tertiary quartz-monzonite porphyry apophyses containing significant Cu and Mo is on the same lineament about 5.5 km south of the Chaco Bear buried intrusive centre.

The volcanic sequence at Chaco Bear includes a lower section of shoshonitic andesites, rhyodacite breccias, basalts, andesite lapilli tuffs, and an upper section of shoshonitic felsics. Excluding the upper felsic units, the base of the volcanic sequence is interpreted to represent the lowest, or Telkwa Formation, of the three formations which make up the Hazelton Group.

Peter Read, Ph.D. in his geological mapping report in 1997 described the "**sudden appearance**" of a thick sequence of felsic volcanics which **unconformably** overlies the '**restricted**' Telkwa Formation so named because the upper two Formations are absent.

The '**Unnamed Formation**' consists of a substantial succession of felsic lithologies that appear to be more than 600 metres thick in places, which include the following lithologies sequenced in order from the bottom (oldest) to the top (youngest):

- **Porphyritic Dacite**; up to 300 metres thick.
- **Rhyolite Tuffs and Flows**; up to 300 metres thick [possibly much thicker]
- **Dacite Flows**.
- **Aphyric Andesite Flows**; up to 50 metres thick within the rhyolite and an undetermined thickness overlying the rhyolite.

Within the rhyolites, pink leucogranite clasts are found northwest of the Round Lake extrusive centre which attests to an intrusive at depth. Similarly, leucogranite clasts are found in the rhyodacite lapilli breccia proximal to the intrusive centre which also attests to an intrusive at depth.

What is most significant about the "Unnamed Formation" is that these dacitic and rhyolitic differentiates are synonomous with the major feeder zones and host horizons of some of the world's most productive epithermal gold and silver deposits; many of them containing world-class bonanza gold and silver deposits where the rhyolite dyke and flow complexes are emplaced along synvolcanic faults that not only act as magma conduits but also as channelways for focused hydrothermal fluid discharge. At Eskay Creek rhyolite

dykes and sills are the main feeders to the bonanza gold and silver deposits, which in this case formed sub-sea.

3.0 EPITHERMAL GOLD DEPOSITS & RELATED GOLD DEPOSIT TARGETS

3.1 Round Lake Dacitic Unit; Target 1

At Round Lake there is a large zone of heavy silicification characteristic of the top of a low sulphidation epithermal system within the lower dacitic unit of the "Unnamed Formation" felsics. The zone of silicification extends for a strike length of 800 metres (2,600 feet) within the dacite and is up to 300 metres (1,000 feet) in width. It may extend into the rhyolite sequence above the dacite. Silicification is in the form of steeply dipping ribbon-banded quartz veins which although not mineralized, are anomalous in Ag and As. The dacitic unit itself is anomalous in places; containing up to 13.9 ppm silver. The lack of gold mineralization is consistent with the cooler part of the epithermal system.

The flow banded dacitic unit at the south end of Round Lake has variable and **chaotic flow banding orientations** over short distances which is characteristio of an extrusive centre. The silicified dacite is further cut by abundant narrow quartz veinlets containing zeolite minerals. Some of these veinlets are mineralized. The one veinlet sampled by this writer assayed: 5.9 ppb Au; 4.2 ppm Ag; 28 ppm Mo; 26 ppm As; 12 ppm Sb; and 416 ppb Hg, which attests to its highly anomalous epithermal gold signature indicative of a gold deposit at depth and its magmatic mineral-fluid source.

Six reconnaissance soil and the silt samples (3 each) were taken in the area. **Each sample is very anomalous in arsenic** and averages 48 ppm As with the highest value at 150 ppm As. Lithogeochemical samples from the rhyolites and dacites in this area are also very anomalous in arsenic.

3.2 Coccola Zone Rhyolite and Andesites; Target 2

Approximately 2.5 km southeast of the Round Lake volcanic centre, within the andesite flow rocks of the restricted Telkwa Formation, limited test drilling beneath a mineralized quartz-carbonate, chalcopyrite, vein structure, within a 10 metre wide felsic dyke discovered a series of altered and mineralized rhyolite dykes, intercalated with the host andesites, each containing significant gold mineralization. The rhyolite dykes are further intruded by a younger, narrow, andesite dyke believed to be part of the "Unnamed Formation". The dyke also contains significant gold mineralization.

The best mineralized section of the surface vein structure which has a strike length of 40 metres, and is open a both ends, assayed 3.7 grams/t Au over 1.9 metres; and 2.4 grams/t Au over 3.0 metres.

Other vein structures found in the area assayed up to 13.28 grams/t Au; 276.6 grams/t Ag; and 3.72% Cu. Mineralization consists of pyrite, chalcopyrite, bornite, tetrahedrite, and galena; and specular hematite with malachite staining in quartz-carbonate shear-breccia veins.

The gold content within the rhyolites and in the porous and permeable andesite wall rocks, particularly the andesite breccias, is significant. The gold occurs in anomalous quantities throughout each hole but only those values in the rhyolites and into part of the andesite wall rocks, accounted for in the following tables, shows that the rhyolite feeders are integral with a gold rich mineralizing system. **The bulk gold content over the total interval noted, 72.8 metres (239 feet) , is 0.724 grams/t Au and is expected to increase substantially in the hotter part of the epithermal system.**

Table 1: Drill Hole 97-11

Drill Hole 97-11 contains an average content of **0.80 grams of gold per tonne over 22.4 metres** (74 feet) in the following lithological units:

Interval	Gold Content	Lithology
9.5 m (25-34.5m)	0.86 grams/t	Silica flooded partial andesite breccia Avg: As = 19 ppm; and Mo = 15 ppm
4.0 m (48-52m) [0.90 m]	1.49 grams/t [2.58 grams/t]	Flow banded rhyolite; sericitized, silicified, and carbonatized Includes: **[cross cutting andesite dyke] Avg: As = 456 ppm; Mo = 57 ppm
9.0 m (52-61m)	0.43 grams/t	Flow banded rhyolite; sericitized, silicified and carbonatized Avg: As = 599 ppm; Mo = 82 ppm

** An andesite dyke located in the gossan zone of the intrusive centre assayed 0.33 grams/t Au; 5.4 grams/t Ag; 50 ppm As; and 17 ppm Mo.

Table 2: Drill Hole 97-12

Drill Hole 97-12 contains an average content of **0.60 grams of gold per tonne over 36.4 metres** (120 feet) in the following lithological units:

Interval	Gold Content	Lithology
3.0 m (11.2-14.2m)	2.16 grams/t	Andesite Avg: As = 20 ppm; Mo = 35 ppm
4.7 m 18.7-23.4m)	0.56 grams/t	Andesite flow breccia Avg: As = 10 ppm; Mo = 11 ppm
3.6 m (37.7-41.3m)	0.42 grams/t	Andesite Avg: As = 16 ppm; Mo = 2 ppm
10.60 m (42.8-53.4m)	0.51 grams/t	Flow banded rhyolite, sericitized, silicified and carbonatized Avg: As = 71 ppm; Mo = 60 ppm
14.40 m (60.0-74.4m)	0.40 grams/t	Flow banded rhyolite, sericitized, silicified and carbonatized Avg: As = 340 ppm; Mo = 69 ppm

Table 3: Drill Hole 97-13

Drill Hole 97-13 contains an average content of **0.54 grams of gold per tonne over 24.0 metres** (79 feet) in the following lithological units:

Interval	Gold Content	Lithology
12.90 m (44.8-57.7m)	0.62 grams/t	Flow banded rhyolite, sericitized, silicified and carbonatized Avg: As = 24 ppm; Mo = 43 ppm
11.10 m (64.5-75.6m)	0.45 grams/t	Andesite flow breccia Avg: As = 21 ppm; Mo = 0 ppm

About 500 metres west-northwest of the Coccola Creek drilling, two quartz veins amongst several containing massive chalcopyrite, assayed an average of 3.95 grams/t Au, 386.5 grams/t Ag, 13.2% Cu, 28 ppm As and 9 ppm Mo. These veins are located in the andesites near the top of the restricted Telkwa Formation about 300 metres below the Unnamed Formation rhyolite. Gold containing rhyolite dykes are believed to be feeders to these veins.

Approximately 500 metres east-southeast of the Coccola drilling in the direction of the East Ridge a vein contains 13.8 grams/t Au, 59.9 grams/t Ag, 0.24% Cu, 50 ppm As, and 10 ppm Mo. This vein is also located about 300 metres below the rhyolite of the Unnamed Formation. Again, gold containing rhyolte dykes are believed to be feeders to these veins.

3.3 Unconformity Between Restricted Telkwa Formation & Unnamed Formation Target 3

Unconformities are very favourable sites for mineral deposits. For example, the weathered surface zone beneath an unconformity is generally more porous and permeable than would be contiguous sections of flow rocks and will serve as channelways for pregnant fluids and open spaces for mineral precipitation in the form of mantos, and disseminations and replacements within the wall rocks.

At Chaco Bear there is an enormous area of unconformity which lies between the top of the restricted Telkwa Formation andesites and the Unnamed Formation felsic volcanics. Where exposed the zone of unconformity is both altered and pyritized and contains vein structures with economically significant gold and silver mineralization. This zone which could potentially host large tonnages of precious metals mineralization is virtually unexplored.

The unconformity starts at the south end of the East Ridge Zone and continues through the mineralized Saddle Zone and extends to the Upper Driftwood Fault Zone at its north end. This section of the unconformity contact zone is 3.5 km (11,500 feet) in length.

For the 3.5 km section the base of the rhyolite contains weakly disseminated pyrite alteration which forms a prominent gossanous zone which extends into the top of the andesite along its length. This section of rhyolite lies to the east of the large intrusive centre.

About 200 to 300 metres downslope from the East Ridge contact zone, about half way along the 3.5 km strike of the rhyolite, a transported gossan, of not insignificant size, was discovered shortly after the property was acquired. It was forecast that a significant sulphide body might be undergoing active oxidation-reduction somewhere upslope from

the gossan. It would appear that at this time the source of the transported iron may be from a sulphide body associated with the unconformity. The only metal so far found associated with the gossan is anomalous arsenic which averaged 45 ppm As from two samples taken at the time. This section of the unconformity is virtually unexplored.

From the Upper Driftwood Fault Zone to the limit of mapping northwest of Round Lake, the unconformity contaet zone is more than 6.0 km (20,000 feet) in length. However in the Round Lake area a wedge of dacite about 3.0 km in length appears between the rhyolite of the Unnamed Formation and the andesite of the restricted Telkwa Formation. Within this section the dacite-andesite contact represents the zone of unconformity. Similarly this section of the unconformity is virtually unexplored.

This extensive unconformity could host several precious metals deposits along its length. Most importantly; shear zones and faults are widespread in the rock units beneath the rhyolites and dacites of the Unnamed Formation and will have served as channelways for the gold and silver rich magmatic/meteoric fluids to access the permeable and porous lithologies prevalent in the area.

3.4 East Ridge Rhyolite; Target 4

The rhyolite at the base of the Unnamed Formation extends more than 9.5 km from northwest of the Round Lake extrusive centre to the East Ridge. For approximately 3 km along strike from the East Ridge back in the direction of Round Lake the base of the rhyolite contains weakly disseminated pyrite alteration which forms a prominent gossanous zone which extends into the top of the andesite of the restricted Telkwa Formation along its length.

The East Ridge also contains a few zones of chaotic flow layering in the rhyolite which is indicative of extrusive vent areas; but these zones require examination in detail.

The Geological Survey of Canada; Lord (1948) reported the existence of narrow high grade gold veins on the east side of the East Ridge. He stated that many small veinlets of chalcopyrite, pyrite, galena, sphalerite, specularite, crustified quartz and calcite were seen in talus fragments of red andesite tuffs and lavas on the ridge. **"Some of these occurrences are reported to contain appreciable amounts of Gold"**.

The Saddle Zone rhyolite located on the East Ridge contains float boulders with vuggy quartz veins containing chalcopyrite and bornite and upon assay returned values up to 17.63 grams/t Au; 1,066 grams/t Ag; 2.4% As; and 6.2 % Cu. This mineralization is found at the unconformity contact between the Unnamed Formation rhyolite and the underlying restricted Telkwa Formation andesite. Grab and chip samples taken from other veins along this contact zone assayed up to 1 gram/t Au; 1,307 grams/t Ag; 10.6% Cu; > 10,000 ppm (1.0%) As; and 9 ppm Mo.

Two samples from rhyolite rock in the Saddle Zone were averaged and found to be slightly anomalous in gold (20 ppb) and silver (2.5 ppm) and highly anomalous in As (50 ppm) and Mo (16 ppm); whereas flow banded rhyolite dykes found west of the Bearnx Zone were highly anomalous in silver, averaging 23 grams/t Ag from three samples.

The gold mineralized rhyolites from the extrusive centre at Chaco Bear appear to be of the same age and metalogenesis that acted as feeders to produce the gold and silver rich Eskay Creek bonanza deposit. Whereas Eskay Creek was submarine-epithermal, Chaco Bear is subaerial-epithermal. The rhyolites at Chaco Bear overlie the dacites as is also the case at Eskay Creek; but the rhyolites at Chaco Bear and are much more extensive and voluminous than found at Eskay Creek. Almost everywhere on the property the rhyolites contain epithermal precious metals geochemical signatures.

4.0 DISCUSSION

There is substantive evidence that several styles of subaerial epithermal gold and silver deposits will be found within the influence of the two magmatic centres. Both centres are characterized as transitional from epithermal to mesothermal to porphyry.

Without diminishing the significance of the intrusive centre, particularly its milled-matrix fluidized-breccia pipe with its bonanza deposit epithermal gold-silver potential; in all likelihood, the volcanic centre, with its shoshonitic felsic volcanics and excellent plumbing sytem, could play host to several bonanza type epithermal gold-silver deposits that should grade into base metal sulphide deposits at depth.

The volcanic centre has produced an unusually thick sequence of felsic-volcanics (the "Unnamed Formation") with rhyolites up to 300 metres thick along a strike distance of 9.5 km (6 miles) from the East Ridge to beyond Round Lake. The extent and size of these rhyolites is geologically anomalous in this region. These rhyolites (and dacites near Round Lake) lie unconformably on top of the restricted Telkwa Formation andesites. The zone of unconformity is therefore very large and exploration portends the probability of finding several associated gold bearing zones along its length. **Unconformities are ideal host repositories for ore deposits.**

Gold, silver and copper bearing vein structures, veinlets, and disseminations within silicified zones, found pervasively throughout the Unnamed Formation felsics and in the underlying andesites of the restricted Telkwa Formation attest to a magma that was rich in precious metals and copper. But perhaps the best clue as to the gold potential of the area is the discovery of intensely altered rhyolite dykes and their andesite wall rocks, found within the uppermost andesite sequence of the restricted Telkwa Formation.

Albeit, the 0.72 grams/t bulk gold content of the rhyolite dykes and their andesite wall rocks, found serendipitously near surface, are not economic; the gold content is expected

to increase with increasing temperature of formation both at depth and close to the major conduits that introduced the gold rich fluids.

This discovery shows that the root zone, or zones, of the rhyolite dykes are definitely gold rich with the implication that the magma was a strong gold producer.

The rhyolite dykes will behave like highly permeable zones, like major faults, when rapid ascent of fluids will result in sudden exsolution and vigorous boiling. Bonanza gold-silver deposits are therefore most likely to be found within this system; possibly at several locations. The task now is to identify the mineral fluid upwelling zones and favourable volcanic host lithology intercepts. These are ideal sites for ore deposits.

The **extensive low temperature silica cap in the flow banded dacite** at Round Lake is characteristic of a low sulphidation epithermal centre. It should be connected to the main mineralized fluid upflow zone, i.e., the zone of magmatic-meteoric fluid mixing and boiling zone. Characteristically this silica cap has sealed the mineral fluid upflow here resulting in the spreading out of fluid flow into favourable host lithology beneath the cap. Here there is the probability of finding bulk-tonnage precious metals near surface and bonanza deposits at depth. The extensive system of ribbon-banded quartz veins here is reminiscent of the Grass Valley gold deposits in eastern California, which was one of the greatest lode gold centres known. Grass Valley gold was found in ribbon-banded quartz veins associated with various sulphide minerals. Gold grade averaged about 0.5 oz/ton.

The upper shallow zone of residual silicification introduced by boiling at depth is generally barren of precious metals, and if anomalous, is usually only weakly so in silver and epithermal indicator minerals; which is the case near the Round Lake target.

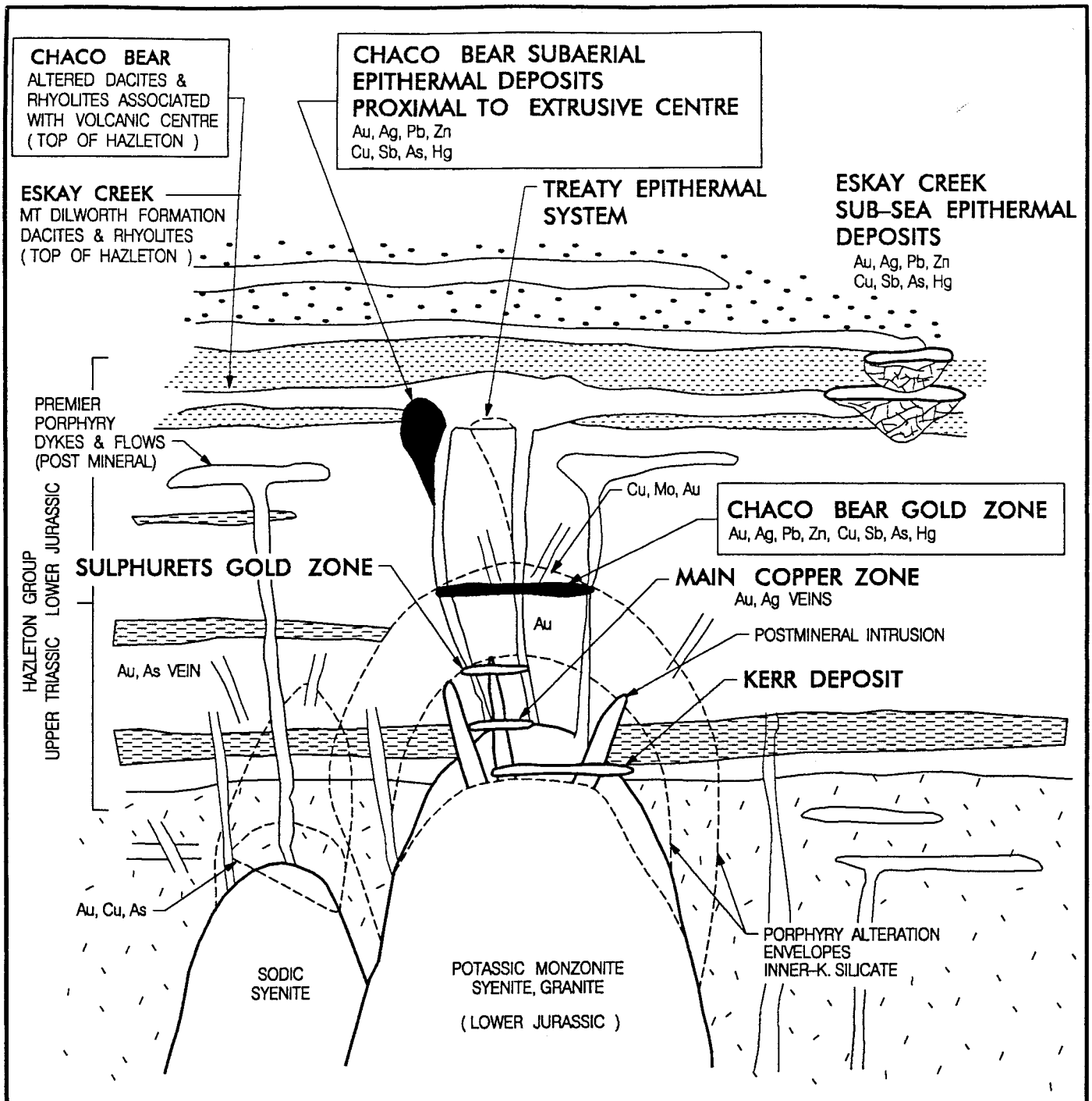
The **enormous unconformity** between the contiguous Unnamed Formation felsics and the top of the restricted Telkwa Formation andesites contains gold, silver, and copper mineralization of potentially economic tenor in the form of veins and disseminations that have no doubt formed from mineral bearing fluids channeled into the unconformity.

These precious metals targets are all significant as any one of them could represent a world-class deposit because this is such a large gold–silver producing system. The rocks are right, the alteration is right, and the size and strength of epithermal indicator minerals pervasive throughout the property have the correct signature. **The model is indeed right.**

With the present definition of the several targets at this stage of exploration the financial reward to risk ratio is considered to be at its maximum potential.

Prepared by: J. M. Ashton

Vancouver, British Columbia
September, 2002



SCHEMATIC STRATIGRAPHY AND SYN-INTRUSIVE, SYN-VOLCANIC MINERAL DEPOSITS

FIGURE 1

MODIFIED AFTER: KIRKHAM et al., 1991

808 EXPLORATION SERVICES LTD.

CHACO BEAR PROJECT

BRITISH COLUMBIA

GEOLOGICAL MODEL
CHACO BEAR GOLD ZONES IN COMPARISON WITH THE SULPHURETS GOLD CAMP

BY	J.M. Ashton	SCALE	AS SHOWN
DRAWN	E.B. Catapia	DATE	MARCH 2002
CHECKED	J.M. Ashton	REVISED	

PLOTTED: 07 JUL 2002

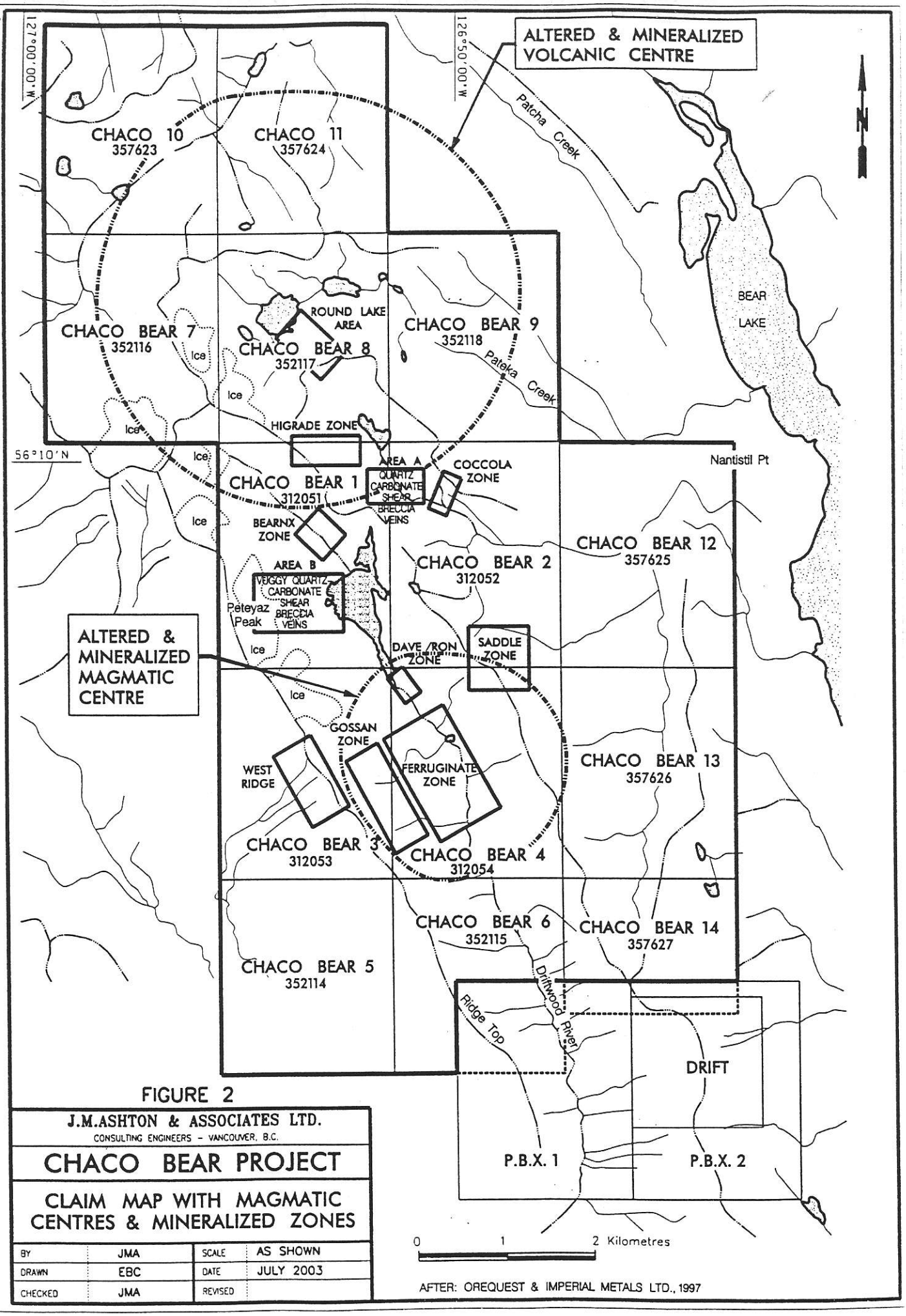


FIGURE 2

J.M.ASHTON & ASSOCIATES LTD.
CONSULTING ENGINEERS - VANCOUVER, B.C.

CHACO BEAR PROJECT

CLAIM MAP WITH MAGMATIC CENTRES & MINERALIZED ZONES

BY	JMA	SCALE	AS SHOWN
DRAWN	EBC	DATE	JULY 2003
CHECKED	JMA	REVISED	

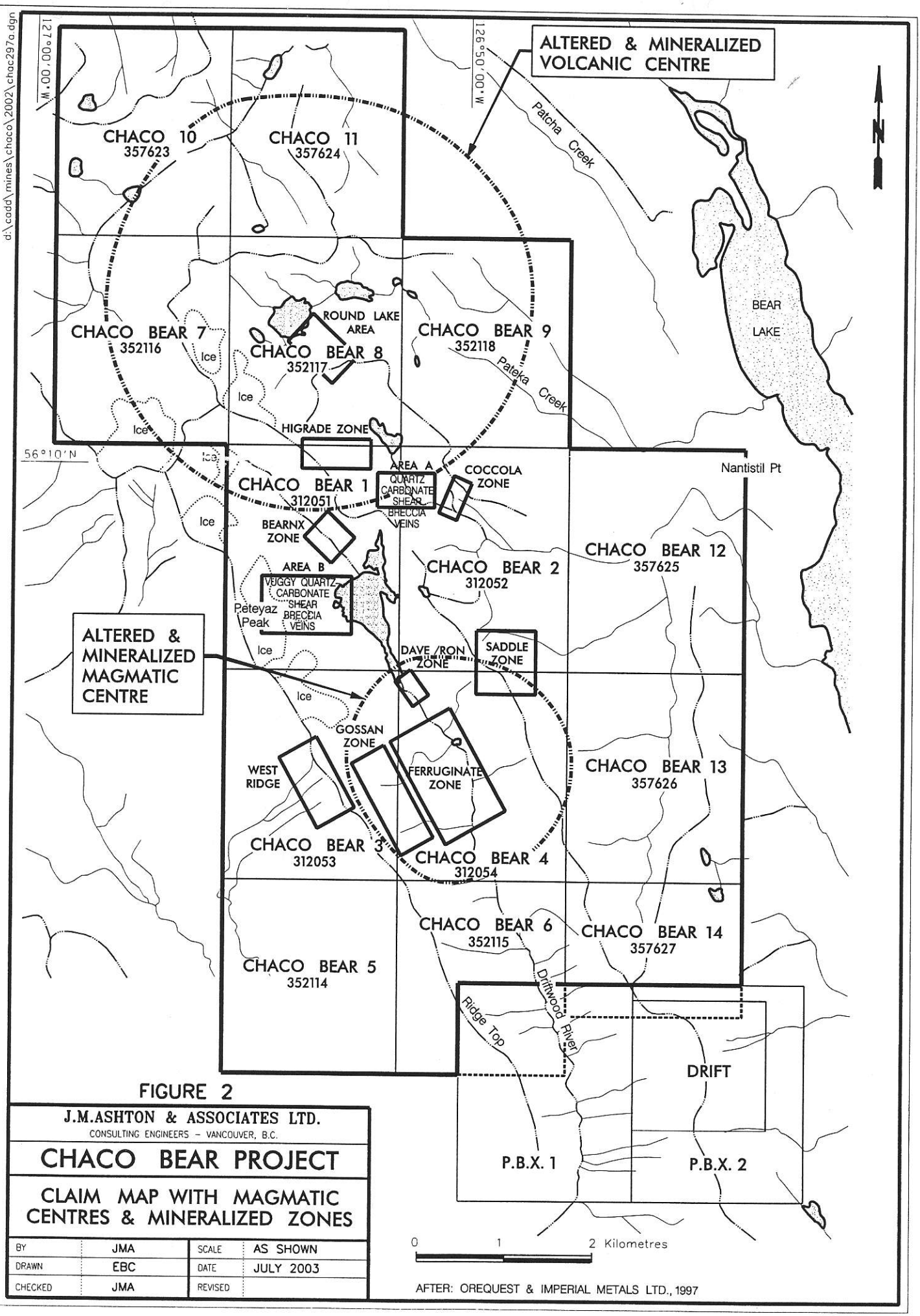


FIGURE 2

J.M.ASHTON & ASSOCIATES LTD.			
CONSULTING ENGINEERS – VANCOUVER, B.C.			
CHACO BEAR PROJECT			
CLAIM MAP WITH MAGMATIC CENTRES & MINERALIZED ZONES			
BY	JMA	SCALE	AS SHOWN
DRAWN	EBC	DATE	JULY 2003
CHECKED	JMA	REVISED	

AFTER: OREQUEST & IMPERIAL METALS LTD., 1997

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LEGEND–GEOLOGY

HAZELTON GROUP

UNNAMED FORMATION

- **Ljvd** LIGHT GREY FINE (1mm) PLAGIOCLASE–BEARING FLOWS; LOCALLY MAROON
- **Ljva** GREY–GREEN APHYRIC ANDESITE FLOWS; WHERE OVERLYING Ljvr A BASAL VOLCANIC BRECCIA WITH DACITE CLASTS
- **Ljvr** RHYOLITE TUFF, ASH AND LAPILLI TUFF; RARE SPHERULITIC FLOWS; ANDESITE LAPILLI TUFF WHERE SPECKLED
- **Ljvdp** PLAGIOPHYRITIC DACITE FLOWS; BEDDED LAPILLI TUFF AND ASH

RESTRICTED – TELKWA FORMATION

- **Ljugva** GREY AND GREY–GREEN APHYRIC TO FINE (1mm) PLAGIOCLASE–BEARING ANDESITE FLOWS; MINOR LAPILLI TUFF
- **Ljvap** GREY PLAGIOPHYRIC (1–4mm, 5–20%) ANDESITE FLOWS
- **Ljvaf** MAROON AND GREY LITHIC ANDESITE TUFF AND LAPILLI TUFF
- **Ljlgva** GREY–GREEN APHYRIC TO FINE (1mm) PLAGIOCLASE–BEARING ANDESITE FLOWS; MINOR LAPILLI TUFF
- **Ljvb** INTERBEDDED GREY AND MAROON 'BASALT' FLOWS AND LAPILLI TUFF
- **Ljvdx** RHYODACITE LAPILLI BRECCIA; ANDESITE CLASTS; RARE PLUTONIC FRAGMENTS
- **Ljrgva** GREEN AND RED ANDESITE FLOWS; MINOR INTERCALATED LAPILLI TUFF
- **Ljrgvaf** GREEN AND RED, BEDDED LITHIC ANDESITE TUFF
- **Ljvu** UNSUBDIVIDED GREEN, GREY–GREEN META–ANDESITE FLOWS AND TEPHRA; MINOR MAROON

FAULT, PEG SIDE DOWN

INTRUSIVE DIKES

MAGNETIC ANOMALY
500 GAMMAS
1000 GAMMAS

630,000 E

629,000 E

625,000 E

627,000 E

26,000 E

6,228,000 N

6,227,000 N

6,226,000 N

6,225,000 N

6,224,000 N

6,223,000 N

6,222,000 N

6,221,000 N

UPPER DRIFTWOOD FAULT

BIG LAKE FAULT

MAAR–DIATREME ? INSTRUSIVE BRECCIA COMPLEX

RUSTY LAKE

TRANSPORTED GOSSAN

BEARNX ZONE

BIG LAKE

ROUND LAKE

INTENSE SILICIFICATION WITH RIBBON BANDED QUARTZ VEINS

LEUCOGRANITE CLASTS

INTENSELY ALTERED BRECCIA PIPE

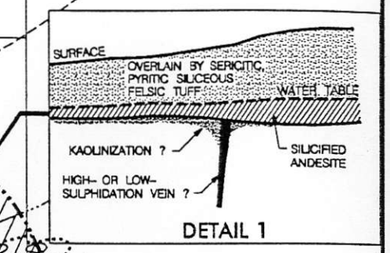
FERRUGINATE ZONE

GOSSAN ZONE

UNALTERED LEUCOGRANITE TO LEUCOSYENITE INTRUSIVE (EXTENDS TO WEST)

AREA OF INTENSELY ALTERED FELSIC VOLCANICS, PORPHYRY BRECCIA PYRITIZED, SERICITIZED & SILICIFIED

SILICEOUS, 5–10% PYRITE, KAOLINIZED, FELSIC VOLCANICS



DETAIL 1

SCALE 1:200,000 — 200 0 200 400 600 800 metres

GEOLOGY & ALTERATION AFTER:
B. MACKIE (1992), P.B. READ, 1997
W. RAVEN & V.P. VAN DAMME, 1997

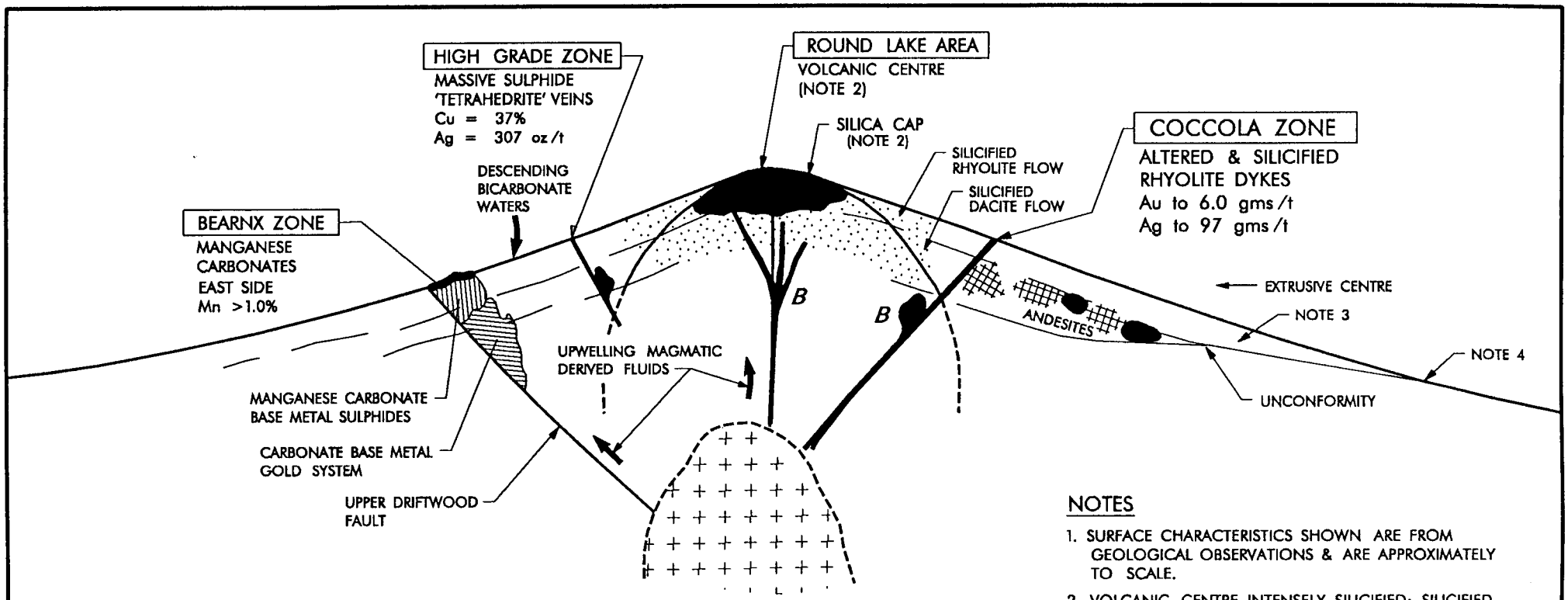
FIGURE 3

J.M.ASHTON & ASSOCIATES LTD.
CONSULTING ENGINEERS – VANCOUVER, B.C.

CHACO BEAR PROJECT

GEOLOGY & ALTERATION

GEOLOGISTS	AS NOTED	SCALE	AS SHOWN
DRAWN	EBC	DATE	JANUARY 2002
CHECKED	JMA	REVISED	



NOTES

1. SURFACE CHARACTERISTICS SHOWN ARE FROM GEOLOGICAL OBSERVATIONS & ARE APPROXIMATELY TO SCALE.
2. VOLCANIC CENTRE, INTENSELY SILICIFIED; SILICIFIED RIBBON BANDED QUARTZ VEINS IN DACITE FLOW, CHAOTIC FLOW BANDING, AREA 1000FT x 2,600FT ANOMALOUS IN SILVER.
3. EXTENSIVE SILICIFIED ALTERED RHYOLITE FLOWS CONTAINING LEUCOGRANITE CLASTS.
4. STREAM SEDIMENT GEOCHEMISTRY HIGHLY ANOMALOUS IN Au+Ag+Sb+As+Hg & Cu, Pb, Zn, Ag, Ba.

LEGEND

- ADVANCED SILICIFICATION & ALTERATION.
- PRECIOUS AND BASE METAL VEINS, PIPES & LODES.
- B — BONANZA DEPOSITS
- STRATA BOUND DEPOSITS

REFERENCES:
FIGURE 2, MINERAL DEPOSIT AREAS
FIGURE 3, GEOLOGY

500 0 500 1000 1500m
HORIZONTAL BAR SCALE

FIGURE 4

J.M.ASHTON & ASSOCIATES LTD.
CONSULTING ENGINEERS - VANCOUVER, B.C.

CHACO BEAR PROJECT

EXTRUSIVE CENTRE MODEL
WITH PORTENDED
EPITHERMAL Au & Ag DEPOSITS

By:	JMA	SCALE	AS SHOWN
DRAWN	EBC	DATE	SEPTEMBER 2002
CHECKED	JMA	REVISED	

Chaco Bear Epithermal Gold & Silver Prospects

Manganese-Carbonate Subaerial Epithermal Gold-Silver Target

Confidential Disclosure

1.0 SUMMARY

The manganese-carbonate base-metal subaerial epithermal gold-silver target is entirely speculation but this model also fits as a potential mineral resource style at the Chaco Bear property. It is contiguous with the mineralized Bearnx breccia zone but is a separate distinct feature.

Where magmatic fluids exsolve from intrusive source rocks into environments containing meteoric waters of differing eompositions, quartz-sulphide gold ± copper systems fonn proximal to the magmatic source rocks through fluid mixing. As part of this circulatory system Carbonate-base metal gold systems form at higher levels by reaction of magmatic fluids with low pH bicarbonate gas condensate waters. Epithermal quartz gold-silver systems represent the most distal portions of this system with bonanza gold grades occurring by reaction of the more dilute magmatic fluids with oxygenated meteroric waters.

The Bearnx Zone is a **carbonate-quartz breccia zone** located at the north end of Big Lake. It strikes about 330° azimuth over a distanee of at least 1,100 metres and dips westerly at about 45°. Eight holes were drilled to test this zone.

The best grade over an interval of 6.8 metres averaged 0.45 grams/t Au, 5.6 grams/t Ag, and 0.60% copper; which indieates that the mineral solutions at this level were relatively depleted. The zone width is fairly consistent over the entire length averaging about 6.5 metres.

The Upper Driftwood Fault, a major fault structure which strikes 305° azimuth, intersects the Bearnx breccia zone in Drill Hole 97-6 at Line 5N. About 500 metres east of this location is the north striking Big Lake Fault; another major fault structure.

A large, and strong, manganese in soils anomaly lies within a wedge shape section between the Big Lake Fault and Upper Driftwood Fault at the north end of Big Lake. This intersection of through going major fault structures is considered an ideal setting for carbonate-base metal gold deposition.

Regionally, a geochemical silt-sampling program conducted by the British Columbia Geological Survey identified the Chaco Bear Property as having the largest and strongest **Au+Ag+Sb+As+Hg** epithermal style geochemical signature found on the 5,000 square mile map sheet. This signature pertains to both the Driftwood Creek drainage system, or the intrusive centre, **and** the drainage system associated with the extrusive centre unconformity. The area involved is therefore very large. Such signatures when found in

the major gold producing districts in Nevada and other parts of the world usually lead to the discovery of significant gold deposits. The manganese-carbonate zone is within the extremely anomalous epithermal gold-silver signature.

All of the epithermal characteristics thus far observed indicate that the present erosion surface is high in the system hence the precious metals potential remains fully preserved below the present surface.

2.0 INTRODUCTION

2.1 Geology

At **Chaco Bear,** an extensive and detailed geological mapping program, superbly done, carried out in 1997, identified a thick succession of coeval volcanics above what are interpreted as two magmatic centres, an intrusive centre, and an extrusive centre; estimated to be about 5.5 km (3.4 miles) apart.

Additionally a well exposed third magmatic centre represented by an outcropping Tertiary quartz-monzonite porphyry apophyses containing significant Cu and Mo is on the same lineament about 5.5 km south of the Chaco Bear buried intrusive centre just beyond the south boundary of the Chaco Bear property.

The manganese-carbonate epithermal gold and silver target described in this overview is related to alteration and mineralization within the overlapping aureoles of both the intrusive centre and the extrusive centre. In fact this target area is midway between the two interpreted centres.

The volcanic sequence within the influence of the intrusive centre and extrusive eentre includes members of the restricted Telkwa Formation of the Hazelton Group consisting of shoshonitic andesites, rhyodacite breccias, basalts, andesite lapilli tuffs, and an upper section of shoshonitic felsics unconformably overlying the restricted Telkwa Formation located on the ridge to the east known as the East Ridge. The upper section of felsic volcanics is called the Unnamed Formation.

Within the influence of the intrusive oentre the volcanic sequence is intruded by:

- andesite dykes
- plagiophyric meta-andesite dykes
- metadiorite dykes
- mineralized felsic dykes

Leucogranite clasts found in the rhyodacite lapilli breccia proximal to the intrusive centre attests to an intrusive at depth and in a similar manner leucogranite clasts found in the rhyolites proximal to the extrusive centre attests to an intrusive below the extrusive centre.

The volcanics associated with the Bearnx Zone are members of the restricted Telkwa Formation.

The west-northwest striking Upper Driftwood Fault and the northerly striking Big Lake Fault structures which intersect near the manganese anomaly each cut the restricted Telkwa Formation volcanics, the base unit, and the Unnamed Formation felsic volcanics which lies unconformably on the Telkwa Formation.

2.3 Manganese-Silver Soils Geochemical Anomaly

2.3.1 General

The large anomalous zone of manganese in soils is centered about 150 metres (500 feet) east of the mineralized Bearnx Fault/Shear Zone. It strikes at 330° azimuth or parallel with the Bearnx Zone.

The strongest part of the manganese anomaly has an areal dimension of about 600 metres (2,000 feet) north-south by 200 metres (660 feet) east-west with manganese values exceeding 10,000 ppm which was the upper limit of the assay technique employed. Coincident with the manganese anomaly are barium (up to 765 ppm) and silver anomalies (up to 2.4 ppm).

A single point gold anomaly, greater than 1 gram/t Au, is located on the north-east flank of the manganese anomaly.

The Bearnx breccia zone appears to be a subsidiary fault zone to either the Upper Driftwood Fault and/or the Big Lake Fault. The breccia zone and the Upper Driftwood Fault structures intersect in Drill Hole 97-6 at Line 7 North.

The Upper Driftwood Fault and the Big Lake Fault are major fault structures and therefore in all probability have tapped the magmatic fluids related to either one or both subcropping magmatic centres.

The Bearnx zone, projected northward would appear to pass in the neighborhood of the discovery of massive sulphide vein float which assayed 307 oz/t Ag and 37% Cu.

Approximately 150 metres west of the axis of the manganese anomaly Drill Hole 96-3 encountered an intensely altered Latite Flow dipping 45 degrees to the east. The manganese anomaly may therefore be expressing itself in the host latite at this level. The upper sections of Latite, in holes 96-3 and 96-4 have limonite stained sections and manganese staining on fractures.

A petrographical study of the latite at 72.2 metres in Hole 96-4 showed it to be a **strongly altered Latite Tuff**. This section of the hole is described as a quartz-carbonate breccia zone. Therefore the mineralization within the Bearnx Zone is structurally controlled.

The original host rock was a cryptocrystalline latite tuff dominated by sericite, minor quartz and titanium-oxide. The second stage of alteration was carbonatization and hematization; and a final stage of alteration included the introduction of patches and veinlets of fine grained calcite-quartz with moderately abundant patches of chalcopyrite, lesser bornite, and minor tetrahedrite and galena. Average mineral content over 2.0 metres here averaged 0.61 grams/t Au; and 2.0 grams/t Ag.

The Upper Driftwood Fault zone passes through the Latite about 150 metres east of herc through the west edge of the manganese-silver-barium anomaly. Therefore the manganese anomaly appears to be controlled by the Upper Driftwood Fault and is a separate anomalous feature from the Bearnx Zone.

2.3.2 Gold Migration in the Presence of Manganese

One question is why is there no gold anomaly associated with the manganese-silver-barium geochemical anomaly.

Generally manganese is very soluble at a pH < 5, and leaches easily. It is also known (Boyle) that the presence of Mn in natural waters is responsible for the high migration capacity of gold.

Silver complexes are much more soluble than gold under low pH conditions.

Also according to Boyle manganese dioxide and some other oxides aid in the formation of chlorine which complexes with gold and renders it mobile whereas in the absence of chlorides gold tends to be enriched in oxidized zones containing supergene manganses minerals. Consequently, where chlorides and an ample supply of H2 SO4 are available gold may be mobilized and migrate downward to the zone of reduction where some of the element may be precipitated in the native state or incorporated in the secondary sulphides. If such was the mechanism in the anomalous manganese zone this could explain the absence of a gold in the coincident soils anomaly.

2.4 Vein Mineralization

Vein mineralization, is pervasive in the area of the manganese anomaly where outcrop is exposed; yet most of the area is overburden covered.

Wherever there are shears, joints, or faults they are mineralized with quartz, quartz-carbonate, and carbonate veins which carry significant quantities of gold, silver and copper.

Vein mineralization consists of specularite, chalcopyrite, pyrite, bornite, chalcocite, argentite?, tetrahedrite, galena, sphalerite, quartz, calcite, and ferroan dolomite up to 0.5 metres wide.

Some of the vein structures contain vuggy quartz-specularite veins cutting bedded tuffs hydrothermal altered with disseminated pyrite-quartz± sericite.

2.5 Carbonate-Base Metal Gold Systems

Carbonate-base metal gold systems are found at elevated crustal levels above and distal to porphyry copper-gold deposits. They develop from the mixing of a magmatic derived fluid with surficial bicarbonate gas condensate waters. Mineralization varies from higher grade vein/breccia lode mineralization to bulk low grade fracture or breccia infill styles. This style of base-metal gold system can range in size from a nominal 1.0 million ounces up to 22.5 million ounces of mineable gold.

Base metal contents typically occur as Zn, Pb, and Cu, while carbonates exhibit a wide range in chemistry and spatial zonations progressing from Fe-carbonates near surface to Mn-carbonates, and to Ca-carbonates with increasing depth. Gold mineralization preferentially occurs in association with the Mn and Mg carbonates. Mineralizing fluids are transitional between dilute circulating meteoric waters typical of epithermal environments and high temperature saline porphyry systems.

Many carbonate-base metal gold systems are associated with milled-matrix fluidized-breccias.

Both bulk mineable low grade fracture/breccia ore deposits and high grade lode style ores are common features of carbonate-base metal systems.

Major structures localize hydrothermal systems and by movement create dilational ore-hosting environments in subsidiary structures. The dilational ore zones form at differing orientations to the controlling structures which themselves may be only weakly mineralized.

3.0 MANGANESE-CARBONATE SUBAERIAL EPITHERMAL Au-Ag TARGET

At Kerimenge (51 Mt of 1.0 grams/t Au) Stage 1 veining and alteration are zoned from quartz-sulphides at depth up to manganese-carbonate lodes close to surface. These deposits are fault controlled; with the major Kerimenge Fault acting as the conduit to tap the magmatic derived fluids at depth. The gold deposits were formed in the hanging wall.

At Chaco Bear it appears that the manganese anomaly is fault controlled as the Upper Driftwood Fault, a major structure, is proximal to it.

According to Boyle areas stained or bleached black due to manganese oxides should be analyzed for Au and Ag and their indicator elements such as As; even where surface zones are low in these elements they could be the upward manifestations of deeper bonanza's.

At Kerimenge high grade mineralization co-exists with manganese-carbonate veining. The mineralization occurred in response to mixing of cool bicarbonate waters related to manganese-carbonate deposition and hot but dilute upwelling saline (NaCl) fluids.

Under similar conditions bonanza gold deposits developed as carbonate-quartz breccias within feeder structures as a result of quenching of upwelling mineralized fluids by descending meteoric waters.

The task now is to identify the conduit system or systems, or upwelling zones, which have tapped the mixing zone of magmatic source fluids with bicarbonate meteoric source fluids. The conduit system includes permeable zones related to major fault structures and/or feeder dykes. Permeable and porous structures include flow breccias, fragmentals, volcanic tuffs, and rhyolite and dacite dykes and sills. Several styles stratabound precious metals deposits are possible, including bonanza deposits in zones of retrograde boiling.

The intersection of two major structural conduits (the Upper Driftwood Fault and the Big Lake Fault) provides an ideal channelway to tap the upwelling magmatic fluids and mix them with the descending bicarbonate gas condensate waters to produce several styles of precious metals mineralization of the carbonate-base metal gold system type. A single major fault zone is generally all that it takes to enable this mineralizing mechanism to create a world class gold deposit.

Identification of carbonate species will provide information on zonation and vectors to the suspected carbonate-base metal gold deposits.

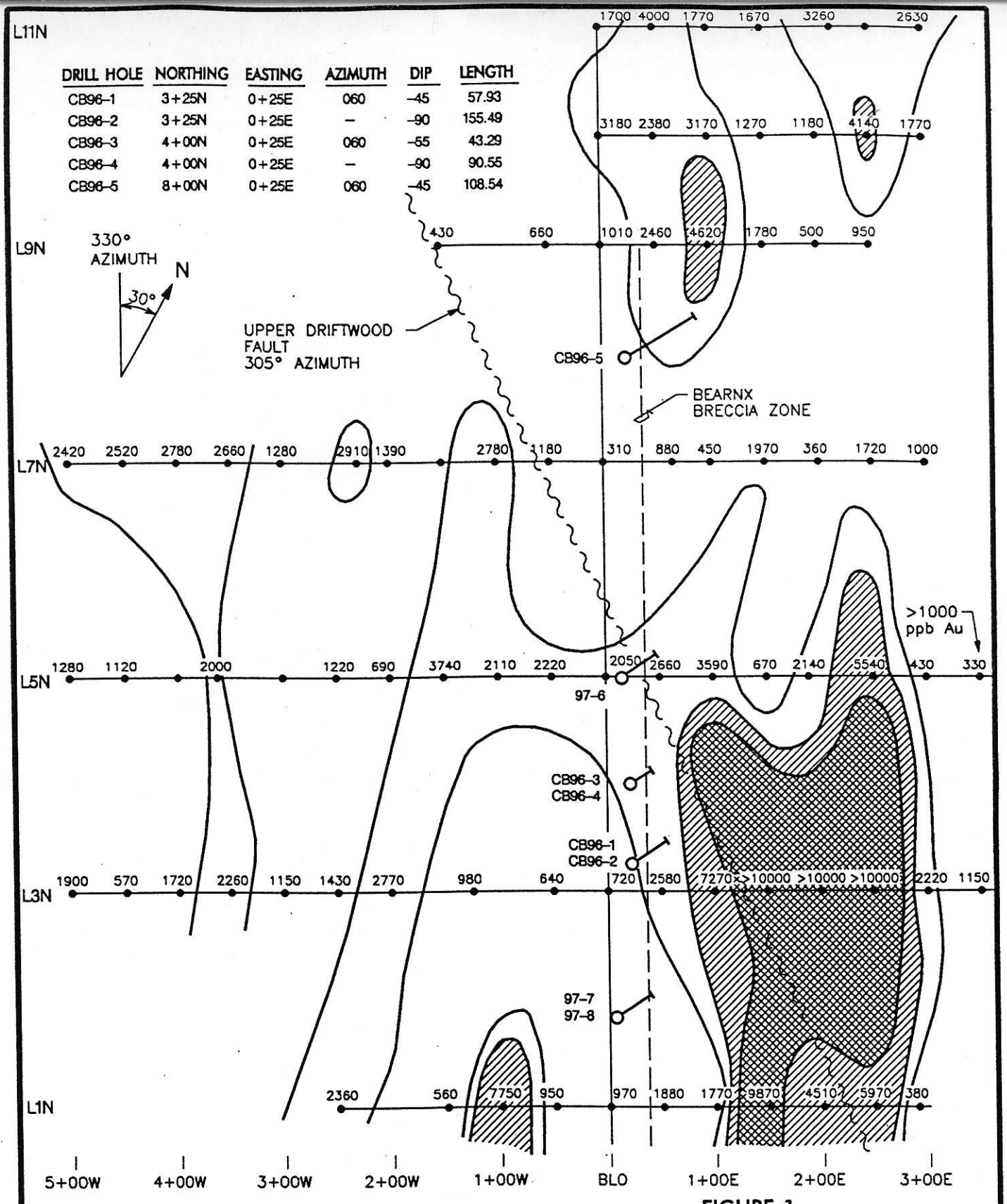
Deep probe induced polarization surveys will identify and possibly discriminate between the gold-rich quartz-sulphide zones and deeper gold-rich base metal sulphide (chalcopyrite) zones.

END

Prepared by: J. M. Ashton

Vancouver
British Columbia

August, 2002



DRILL HOLE	NORTHING	EASTING	AZIMUTH	DIP	LENGTH
CB96-1	3+25N	0+25E	060	-45	57.93
CB96-2	3+25N	0+25E	–	-90	155.49
CB96-3	4+00N	0+25E	060	-55	43.29
CB96-4	4+00N	0+25E	–	-90	90.55
CB96-5	8+00N	0+25E	060	-45	108.54

FIGURE 1

LEGEND

Mn ppm
<2000
2001–4000 ANOMALOUS
4001–8000 VERY ANOMALOUS
>8000 EXTREMELY ANOMALOUS

NOTES

1. AVERAGE ABUNDANCE OF Mn IN EARTHS CRUST IS 1000ppm ±

0 50 100 150 200 m

BAR SCALE 1:5000

CHACO BEAR PROJECT

BEARNX ZONE MANGANESE SOIL GEOCHEMISTRY

BY	J.M. Ashton	SCALE	AS SHOWN
DRAWN	E.B. Catapia	DATE	JULY 2002
CHECKED	J.M. Ashton	REVISED	

PLOTTED: 12 AUG 2002

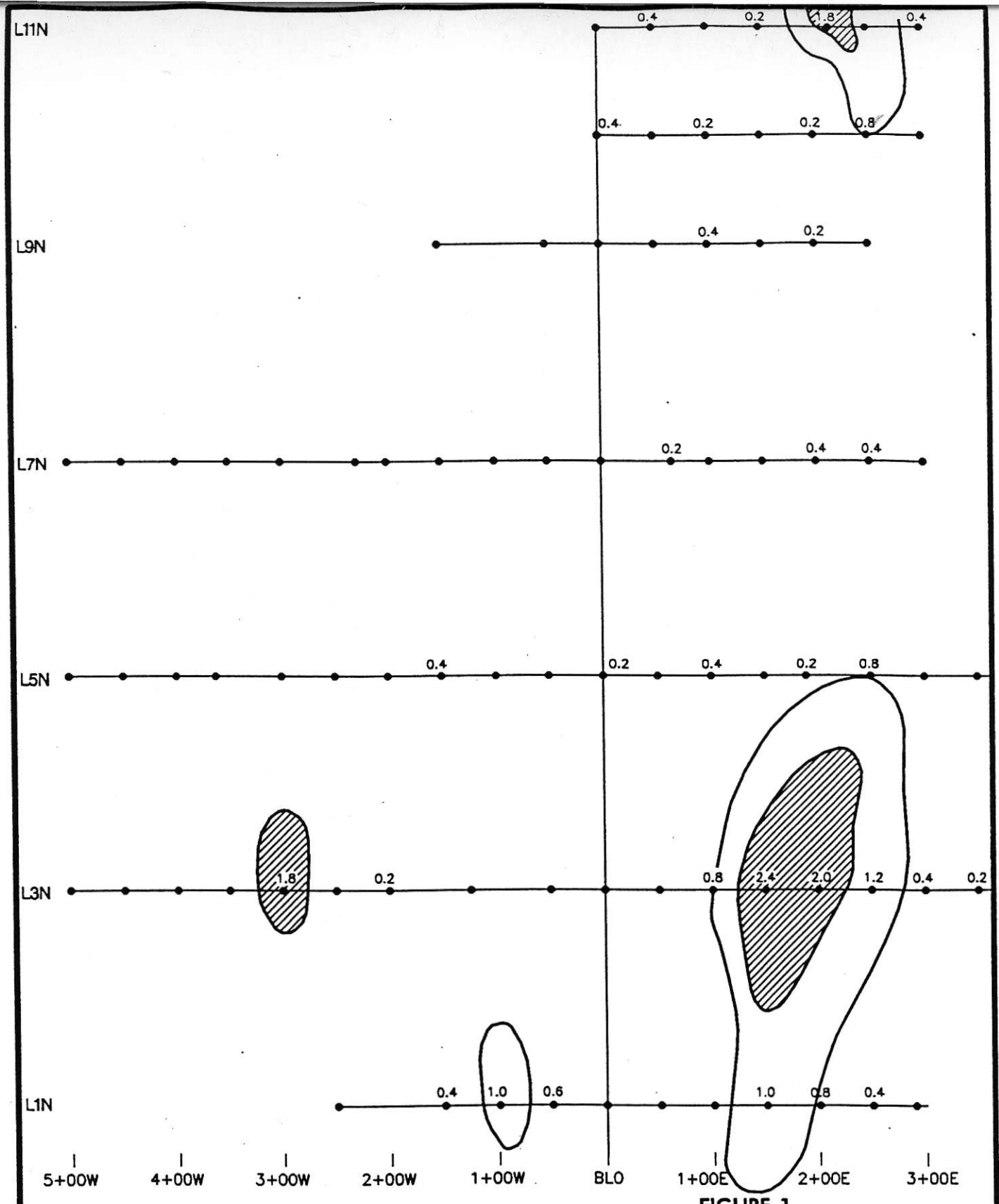


FIGURE 1

LEGEND

Ag ppm
<0.80

0.81–1.60

>1.60

0 50 100 150 200 m

BAR SCALE 1:5000

ANOMALOUS THRESHOLD – 0.7 ppm Ag

PLOTTED: 13 JUL 2002

CHACO BEAR PROJECT

BEARNX ZONE
SILVER SOIL GEOCHEMISTRY

BY	J.M. Ashton	SCALE	AS SHOWN
DRAWN	E.B. Catapia	DATE	JULY 2002
CHECKED	J.M. Ashton	REVISED	

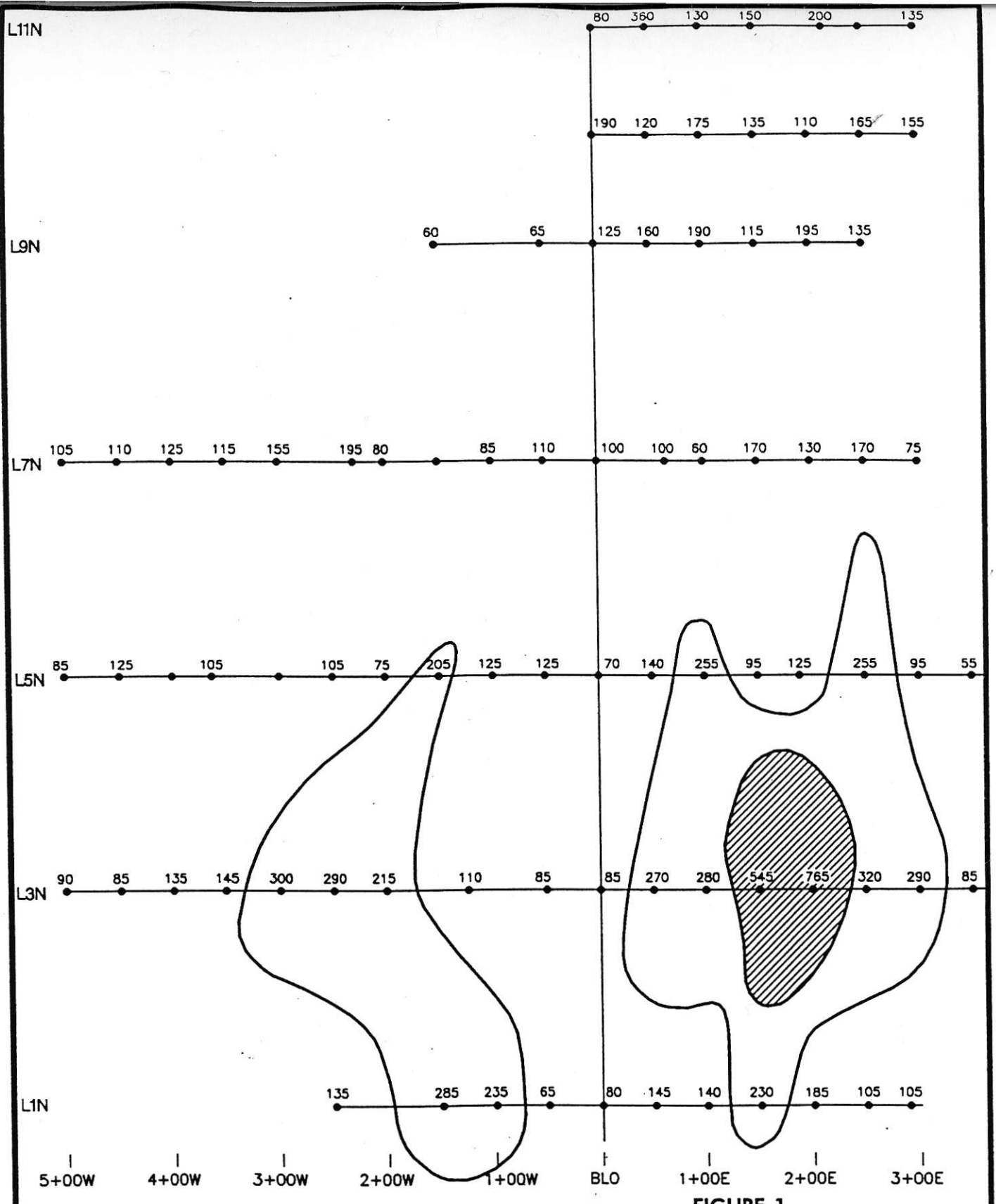


FIGURE 1

LEGEND

Ba ppm
<200
201–400
>401

ANOMALOUS THRESHOLD – 400 ppm Ba

0 50 100 150 200 m
BAR SCALE 1:5000

CHACO BEAR PROJECT

BEARNX ZONE
BARIUM SOIL GEOCHEMISTRY

BY	J.M. Ashton	SCALE	AS SHOWN
DRAWN	E.B. Catapia	DATE	JULY 2002
CHECKED	J.M. Ashton	REVISED	

PLOTTED: 13 JUL 2002

The Chaco Bear Shoshonitic Igneous Complex

HIGH GRADE ZONE

A Comstock Lode Bonanza Style Gold-Silver Target

Confidential

The High-Grade Zone is located near the northern boundary of the Chaco Bear 1 and 2 mineral claims contiguous with the Chaco Bear 7 and 8 claims. The zone is within the aureole of the magmatic extrusive centre where pre-vein shear zones and faults are widespread and acted as channelways for mineral rich magmatic fluids.

Spectacular massive-sulphide float 2 inches to 4 inches thick indicative of a high sulphidation epithermal gold-silver mineralizing system occurs in float that trends northerly up a slope to a ridge top. This is the same direction that the large vein structures are found on the claims. **The massive sulphide consists of *bluish-grey argentiferous tetrahedrite* which assayed 307 ounces (10,530 grams) silver per tonne and 36.9% copper.** At today's prices for silver (US$5.00/oz) and copper (US$0.80/lb) the sulphides have an in-the-ground value of US$2,184 per tonne.

In the nearby area, found widespread in-place, narrow vein structures, assay up to 2.31 grams/t gold, 397.6 grams/t silver and 8.62% copper.

What is significant about these massive sulphides is they represent the effect of intensely-focused mineral fluid flow occurring over an extended period of time. The strength of the mineralization indicates that it tapped one of the **master fluid flow channelways connected with its magmatic source.**

Potassic and Shoshonitic Environment

Potassic igneous rocks are of considerable economic importance as many of the world's most productive epithermal and mesothermal gold deposits; and porphyry copper-gold deposits, are accompanied or hosted by potassic igneous rocks with the **world-class** and **giant gold deposits** most likely accompanied or hosted by the higher potassic content shoshonitic igneous rocks.

Whole rock analyses of the andesitic succession which forms the country rock at this location shows that the andesites are shoshonitic. **Shoshonites** are potassic igneous rocks characterized by: $K_2O > 1.0$ Wt-% [CB Average = 4.54%] at 50 Wt-% SiO_2 [CB Average SiO_2 = 58.2 Wt-%]. K_2O/Na_2O ratios > 0.50 [CB Average = 2.32]; and $K_2O + Na_2O > 5.0$ Wt-% [CB Average = 6.50 Wt-%].

What is even more significant are the nearby shoshonitic dacite and rhyolite flows extruded from the volcanic centre and forming what appears to be a dome complex at the top of the volcanic succession. These flows are heavily silicified (Average = 77.32% SiO_2); and enriched with hydrothermal potassium (Average = 7.62% K_2O) with accompanying sodium depletion.

The permeable dacites & rhyolites are the **ore-bringers** to most major gold deposits and are directly connected to the gold-rich magmatic fluids, forming important parts of the master fluid flow channels.

Substantive proof that these felsic volcanic units are the ore bringers was found in the nearby Coccola Zone where diamond drilling discovered heavily altered rhyolite dykes containing significant gold mineralization. A total of 239 feet of intercepted rhyolite dyke within the andesitic succession contained an average gold content of 0.724 grams/tonne.

World-Class (≥ 100 tonnes of gold) epithermal to mesothermal **gold deposits** and **Giant Gold Deposits** (≥ 500 tonnes of gold), occur in direct association with or are hosted by potassic igneous rocks with the latter most likely accompanied or hosted by shoshonitic igneous rocks. Similarly, the higher grade gold porphyry Au ± Cu deposits are hosted by potassic and shoshonitic igneous rocks.

Massive Sulphide Veins

The silver-rich massive tetrahedrite vein encountered in the High-Grade Zone **is a very good and positive indication** that this part of the hydrothermal system could in the classic sense host a Comstock Lode style of lode gold-silver deposit.

The Comstock Lode, in Nevada, produced more than 8.25 million ounces of gold and 192 million ounces of silver worth US$4.0 billion at todays prices.

Two leading features about the Comstock Lode that an explorationist should be aware of was the intense potassic (Adularia) alteration (the ore bringer phase) and the **very narrow massive sulphide veins** (2 inches to 4 inches wide) found on the surface which followed to depth led directly to the great bonanza gold and silver deposits.

The writer is very familiar with the strong potassic alteration which even today traces out the location of the Comstock Lode on surface and is most intense above the areas of the great bonanza's. As the potassium isotopic species contains a radioactive member designated ^{40}K, anomalous potassium rich zones related to gold mineralization can be detected by gamma ray spectrometry using a scintillometer.

In the mid 1980's the writer, as part of a research effort, performed a radioactive ^{40}K survey over most of the Comstock Lode using a highly sensitive scintillometer with a large NaI crystal detector. High magnitude radioactive ^{40}K responses were recorded above that section of the lode which contained the bonanza orebodies. Response amplitudes diminished in a north and south strike direction along the great fault zone from the mined area. The great fault zone which was the **master channelway** for the K-rich mineral bearing fluids which produced the great orebodies was clearly traceable and the ^{40}K correlation was impressive.

The importance of narrow massive sulphide veins found on surface in this unique potassium rich geological environment of the Comstock Lode cannot be emphasized more than by the example provided during the beginning of exploration at the Comstock Lode. At the top of the great bonanza deposits the miners first encountered **thin-streaks of silver rich ore** at the surface of the Ophir bonanza discovered in 1859.

In The History of the Comstock Lode, 1850-1920, by Grant H. Smith, published jointly by the MacKay School of Mines, and the University of Nevada, in July 1943, p15-16, the observations made at the original discovery of massive sulphide veins in which lead directly to the great bonanzas was described as reported by the *Sacramento Union* newspaper on October 5, 1859:

"The orebody had been exposed by wide trenches for a length of three hundred feet through the Mexican, Ophir and Central claims. Apparently all that the owners thought of was to disclose as much of the Lode as possible in the shortest space of time, and, what was most important, to extract the streaks of rich, bluish gray silver sulphide ore for shipment to San Francisco. The ore body at that time was far from being the bonanza that was developed during the succeeding year. George D. Roberts, one of the early arrivals, reported that the rich ore worth from $3,000 to $4,000 per ton ***is found in irregular veins from 1 to 4 inches in thickness*** *enclosed in a large vein from 10 to 15 feet wide".*

Deidesheimer, a notable mining engineer, stated that on November 1, 1859, *"at a depth of 30 feet the vein of silver sulphurets was from 4 to 15 inches thick".*

The Gould & Curry found a ***small vein of good ore*** *near the surface which followed to depth* ***later proved to be the top of <u>The</u> Great Bonanza*** *found 1,200 feet below surface.*

Many veins were found on the surface near the influence of the Comstock Fault, the master channelway, These veins were not mineable because of their comparatively low grade but the gold released from the veins due to weathering resulted in concentrations that could be recovered by panning. Similar veining is widespread at Chaco Bear.

As no two mineral deposits are the same; because they all have their unique host geology and plumbing systems which affect how, and where deposits are formed, and govern their ultimate size relative to the location of their magmatic heat and mineral solution source.

Geological structure, i.e., faults and fracture patterns provides the most important clue to the flow regime in a fossil or paleo system. Application of fluid chemistry to the structural network, particularly focused fluid flow rather than dispersed fluid flow is the prequisite for the formation of high grade economic mineral deposits. Accordingly isotopic geochronology and geothermometry, assisted by fluid inclusion studies, can be very useful tools in locating these deposits through accurate interpretation of the plumbing system which led to their formation.

By: J. M. Ashton, P.Eng.

October, 2003
Vancouver, British Columbia

The Chaco Bear Epithermal & Mesothermal Gold-Silver Prospects & Porphyry Copper-Gold Prospects

Confidential

Significance of the Unconformity

1.0 UNCONFORMITY

P.B. Read, Ph.D., in his 1997 geological report, described the contact zone between the Unnamed felsic volcanics and the Restricted Telkwa andesites as an **Unconformity.**

In the introductory statement in Section 2 on **Stratigraphy**, Section 2, he states:

" Richards (1975, 1976) subdivided the Hazelton Group into three formations of which the lowest , or Telkwa Formation , contains calc-alkaline basalt, andesite, dacite, and up to 50 m of rhyolite flows, breccia, and tuff. Lahar, intravolcanic fanglomerate, conglomerate, sandstone and siltstone complete the formation. According to Richards (1975) this formation underlies the entire area of the property. In contrast to Richards, I have subdivided the volcanic rocks of the property into a **restricted Telkwa Formation** and an overlying unnamed formation . The justification for erecting an unnamed formation is *the sudden appearance and significant thickness (450 m) of felsic rocks which overlie, probably unconformably, a thick andesite/basalt succession belonging to the restricted Telkwa Formation..."*

Under **Rhyolite Tuff and Flows** **(IJvr)** [part of **Unnamed** Formation], he states: "Along an exposed contact at Station 3i, southeasterly dipping rhyolite lapilli tuff **(IJvr)** overlies a **bumpy surface** of the upper green andesite flows (IJugva) of uncertain orientation. The upper contact of the unit is placed at the first appearance of dacite flows or aphyric andesite.

Under the Section 5 on **Mineralization** in Paragraph 5.1.1, Base of the Rhyolite Unit **(IJvr)**, it is stated:
" At the base of the rhyolite unit **(IJvr)** on the ridge, on the east side of the property, **(East Ridge)** weakly disseminated pyrite lies within a few metres of the base yielding a gossanous zone which extends into the upper green andesite **(IJugva)** along the trace of the Upper Driftwood Fault".

Under Section 4., **Structure,** Subsection 4.3, Faulting, the geological report states:
" Shear zones and faults are widespread in the rock units beneath the rhyolite and dacite offset all intrusions except possibly the leucogranite (g). The offsets of dike contacts and closely positioned rock unit boundaries indicate northwesterly and northerly striking faults. Both are subvertical or have a westerly component of dip, are probably pre-vein in age and provided channelways and open space for the vein mineralization on the claims."

The northwesterly striking Upper Driftwood Fault is located about 800 metres (0.5 mile) north of the mineralized Saddle Zone where it intersects the rhyolite (and the unconformity) of the Unnamed Formation.

Approximately 2 km northwest of the northerly striking Unnamed Formation rhyolite-Upper Driftwood Fault intersection, the 36 metre (118 feet) wide fault zone, which passes through the northerly striking mineralized Bearnx Zone, contains several narrow yet moderately altered rhyolite dikes. Assays across one dike, 4.3 metres wide, averaged about 0.2 grams/t Au, 10 ppm As, 5 ppm Mo and 2,000 ppm Mn.

It is noteworthy that in all drill holes within the Bearnx Zone restricted Telkwa Formation, only one hole encountered rhyolite dikes, and that was within the Upper Driftwood Fault zone. The rhyolite dikes here were therefore emplaced post faulting.

Generally throughout the property wherever fault, shear, and joint structures are exposed in outcrop, or by drilling, they are mineralized with copper, gold and silver minerals of potential economic tenor, in proportion to the size of their precursor openings.

The main concepts to entertain here, based on this indirect evidence, are:

- Gold is late stage succeeding the majority of lithological, structural and magmatic development

- The leuco-granites may represent a highly differentiated, late stage magmatic derivative. They may be temporally associated with 'syn' to 'post'mineral magmatism.

- The upper zone or "Unnamed Formation" felsics are a series of brittle, porous and permeable felsic units, stratigraphically surrounded by more competent constraining units.

2.0 DISCUSSION

Unconformities are known to host major mineral deposits. They often include thick, permeable regoliths which form a significant part of the hydraulic conduit system for hydrothermal fluid transport and mineral deposition.

For the reasons cited above under Section 1.0, "Unconformity", gold is a late stage event. Previously existing and often deep long-life structures are reactivated. Fluid emplacement is a dynamic activity and so less competent and more porous/permeable zones act as sites of rheological contrast and as physico-chemical traps allowing sudden drops in system pressure over large volumes whereby hydrostatic pressure of the hydrothermal system exceeds the confining lithostatic pressure.

What may appear to be extensive weathering may be retrograde argillic alteration.

There are several subvertical faults and subsidiary shear zones which intersect the unconformity providing the major conduits to tap and focus mantle-derived (oxidized) gold-rich hydrothermal fluids. Hence there is strong support for the thesis that the unconformity and the surrounding felsic units provide primary targets for gold mineralization.

Primary exploration targets related to structural and magmatic development are:

- intersections of major fault and shear zones with the unconformity,
- intersections of felsic magmatic centres with major structural elements including the unconformity zone,
- intersections of other permeable and porous lithologies in direct contact with the major faults and shears which direct and focus the gold rich hydrothermal fluids.

Based upon similar settings observed elsewhere in the Pacific Rim gold belt, the significance of the unconformity and the tectonic setting (arc proximal) suggests the main zones of mineralization will be flat lying, and joined by narrow high angle structures. The higher grade ore shoot targets will be at the intersection of these flat lying beds with the strike trace of the subvertical structures.

The Unnamed Formation rhyolite which sits on the unconformity is known for its intrinsic permeability and porosity, and rhyolite permeability can also be enhanced due to its brittle nature which crackles readily under slight stress as normally occurs under thermal and hydrothermal conditions. And, as this rhyolite is interpreted to be a feeder zone in direct communication with the gold rich magmatic fluids of the Chaco Bear hydrothermal system, the analogous mechanism of mineralized fluid transport through the rhyolites, which also produced the gold and silver rich Eskay Creek subsea-epithermal deposits, has also most likely occurred here as well.

At several locations along the unconformity, notably the Saddle Zone, vuggy quartz-carbonate veins contain significant gold and silver mineralization. With a thick regolith expected at the top of the andesites before the extrusive rhyolite event, this augers well for extensive mineralized zones to be found within and contiguous with this structure. The source of the precious metals mineralization could either be from fluid flow from the regolith channelway, or the rhyolite, or from both.

A prominent transported gossan zone, anomalous in arsenic, of not insignificant size, has formed on the east bank of Driftwood Creek about 200 to 300 metres downslope to the west from the East Ridge zone of unconformity. This location is about 1 km south from the Saddle Zone, or 1.8 km south of where the unconformity intersects the Upper Driftwood Fault. It is probable that the transported gossan is the oxidation product of a

buried sulphide body undergoing oxidation-reduction somewhere upslope with the most likely location being at the zone of unconformity.

Small veins and veinlets in volcanic rock talus, containing significant gold mineralization were also found by the Geological Survey of Canada on reconnaissance traverses on the east slope of the northerly striking East Ridge in the 1940's.

The unconformity occupies an immense area. It begins at the south end of the East Ridge and extends northerly to the Upper Driftwood Fault, a major basement structure, a distance of 3.6 km (2.2 miles). From the north side of the Upper Driftwood Fault the unconformity extends a further 6.0 km (3.7 miles) to beyond Round Lake.

With a total linear distance of 9.6 km (about 6 miles), and open to the north and down dip this unconformity represents a major structural feature which appears to have been involved with the large scale hydrothermal activity, providing the scope to host a major economic gold camp.

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Constructive review: T.H.

References: P.B. Read

Vancouver, British Columbia
October, 2002

The Chaco Bear Epithermal Gold-Silver Prospects
&
Porphyry Copper-Gold

Milled-Matrix Fluidized-Breccia Pipe; Epithermal Gold Target

1.0 Summary

A milled-matrix fluidized-type breccia pipe is located within the large alteration zone of Magmatic Centre 1 on the Chaco Bear Prospect. It has all the classic upper-most level geological, geochemical, and alteration characteristics of a strong low sulphidation epithermal gold producing system at depth. Such systems are known to produce world-class gold deposits with the larger ones containing several hundred tonnes of gold.

2.0 Introduction

Two large fully preserved magmatic centres are interpreted to subcrop the property; an **intrusive centre** (Magmatic Centre 1) and an **extrusive centre** (Magmatic Centre 2) with their centres separated by an estimated distance of 5½ km. Gold, silver, and copper minerals are associated with both centres. Geological evidence shows that each centre is transitional from an epithermal environment to mesothermal and porphyry environments. Evidence also suggests that both high-sulphidation and low-sulphidation mineralizing systems may prevail in the epithermal aureoles of both centres.

Proximal to Magmatic Centre 2 altered shoshonitic dacite and rhyolite extrusives appear to be the same type, composition, and age that acted as feeders to produce the gold and silver rich Eskay Creek deposit. The Eskay Creek deposits are found in an Upper Triasssic to Middle Jurassic volcano-sedimentary arc complex (the Hazelton Group) which are similar lithologies to those as found at Chaco Bear. Whereas Eskay Creek was submarine-epithermal, Chaco Bear is subaerial-epithermal. The rhyolites appear to overlie the dacites and are more extensive. Limited drilling of mineralized outcrops nearby encountered rhyolite dykes, hydrothermally altered, with anomalous gold contents of upwards to 5.7 ppm. The altered dacites are anomalous in silver, up to 15 ppm, and consist of silica flooded ribbon-banded quartz veins.

In addition to the Eskay Creek type target several other target areas of economic interest have been identified within the influence of both magmatic centres. One of the highest priority targets is an intensely altered breccia pipe located within the alteration aureole of the intrusive centre (Magmatic Centre 2). The significance of the breccia is that magmatic-arc copper-gold systems contain breccias and the process of breccia formation and ore formation are intimately related.

The breccia pipe with comminuted (milled) clasts, somewhat elliptical in plan, has exposed dimensions of 250 metres (820 feet) by 110 metres (360 feet) and is located near the north extremity of a large Gossan Zone which is part of the intrusive centre alteration zone.

The breccia pipe penetrates a shoshonitic volcanic pile composed of andesites, andesitic tuffs and breccias, felsic volcanics, and porphyry flow breccias, which are found in surface outcrop. The geological character of the subcropping lithology is presently unknown.

Alteration of the volcanics above the intrusive centre consists of, intense pyritization, sericitization, silicification, chloritization and epidotization ; and in several locations kaolinization. There are also large areas measuring up to hundreds of metres that are so extensively hydrothermally altered that the protolith is destroyed and replaced by a porous assemblage of finely disseminated pyrite (2 to 10%) and quartz ± sericite.

Surrounding the breccia pipe, and widespread throughout the area are mineralized quartz-veins, quartz-carbonate veins and carbonate veins which occupy shear, joint, and fault structures. Mineralization metals include copper, gold and silver with metal values ranging up to **16.8% copper, 0.74 ounces gold** per tonne, and **4.67 ounces silver** per tonne. Generally silver values within the extrusive centre aureole are much higher grade than silver values found within the influence of the intrusive centre

The existence of these mineralized structures is significant as the mineralization represents leakage of precious and base metal rich solutions produced from either one or both magmatic centres underlying the area; and more significantly the magmatic system was gold producing.

Geological evidence from mapping the area shows that in all probability the epithermal component of the mineralizing system is fully preserved and with it the potential for discovery of near surface bonanza type gold-silver deposits and a copper-gold bearing parent porphyry deposit or deposits at depth.

3.0 The Breccia Pipe

The breccia pipe was identified by Suncor geologists while mapping and prospecting the area in 1985; however no details of its geological or petrological character were reported. It is not known if samples from the breccia pipe were ever taken or assayed at the time.

The first geological character report was provided by geologist Bruce Mackie in 1992. Mackie described an intensely altered breccia pipe consisting of intensely milled polymictic clasts in a daeitic matrix.

Intense hydrothermal alteration in the form of epidote, hematite and carbonate pervades the milled-clasts and flour-like dacitic matrix followed by silica flooding of the clasts and matrix. When close to the breccia it stands out clearly with its brilliant pistachio-green epidote colour.

Four **lithogeochemical** samples were taken from the outcropping breccia body. Three of the four samples showed anomalous precious metal content and epithermal signatures which averaged ( ): gold (23 ppb)[4 ppb]; silver (0.93 ppm)[0.10 ppm]; and arsenic (22 ppm)[1.8 ppm]. Values in [ ] brackets are the average abundances in the earth's crust.

The values are considered lithogeochemically significant. Most often the top level a low temperature silica flooded zone of a productive epithermal system is barren of precious metals. The fact that anomalous gold is found in this uppermost silicified section of the breccia pipe indicates that the epithermal system which produced the silicification was gold producing and thereby substantially reinforces the probability of finding an economic gold resource or resources at depth either within the pipe boundaries or proximal to the pipe, or both.

4.0 Discussion

There is substantive evidence that a large gold mineralizing event pervades the area. The silica flooded, intensely altered and comminuted breccia pipe is geochemically anomalous in gold. It has low sulphidation epithermal character and is located above a large, intensely altered gold producing magmatic centre as evidenced by the gold and silver bearing quartz-carbonate veins, quartz veins, and carbonate veins widespread throughout the area.

Pervasive silicification generally indicates lower temperatures and therefore shallow depths and; hydrothermal brecciation and associated silicification indicates proximity to the main zone of hydrothermal fluid upflow and boiling which are the areas of greatest potential for discovering epithermal gold deposits.

The breccia characteristics are of the ore-related magmatic hydrothermal injection type or milled-matrix fluidized-breccia type caused by phreatomagmatic processes where "phreato" means water converted to steam and magma. These breccias are associated with high-level porphyry intrusions and normally extend to considerable depths. They host some of the world's richest and largest epithermal gold deposits.

One mechanism which leads to formation of precious metals deposits is that the magmatic dominated fluids are channeled into these permeable hydrothermal breccia structures where they mix with meteoric waters. Fluid over-pressurizing and release of hydrostatic pressure can result in repeated brecciation and the boiling induced by the brecciation precipates the gold. This milled-matrix fluidized breccia pipe has undergone several episodes of brecciation and boiling and therefore could produce several telescoped gold deposits or several overprints of gold deposits within the same zone.

The upper shallow zone of residual silicification introduced by the boiling is generally barren of precious metals and only weakly if at all anomalous; and if anomalous is generally so only in the lower part of the zone of silicification; but when anomalous precious metals signatures are present, and given that this is a large precious metals mineralizing system there is very high probability of finding a significant gold resource at depth in the zone of boiling or in this case within several zones of boiling which may be overlapped and/or telescoped.

There is no doubt that this magmatic centre was not a significant gold producer as evidenced by the myriads of gold bearing veins at the surface, the epithermal gold character of the breccia pipe and the gold and copper bearing argillically altered leucocratic intrusive dykes found sporadically throughout the alteration zone.

Porphyry related low sulphidation epithermal gold systems and more particularly those formed within milled-matrix fluidized-breccias can range in size from less than 100 tonnes (3.2 million ounces) of mineable gold, to more than 500 tonnes (16 million ounces) of mineable gold, and they generally represent the higher grade gold deposits ranging between 2 to 70 grams per tonne.

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Vancouver, British Columbia
July, 2002

Chaco Bear Epithermal Gold & Silver Prospects

Eruption Breccia-Hotspring Low/High-Sulphidation Subaerial Gold-Silver Target

Confidential Disclosure

1.0 SUMMARY

On both sides of Driftwood Creek above the intrusive centre a very large area covering hundreds of metres along the creek and extending east an indeterminate distance and several hundreds of metres to the west up towards the West Ridge has been so extensively hydrothermally altered that the protolith volcanics have been destroyed and replaced by a porous assemblage of quartz-pyrite (2-10%) ± sericite. Within this altered area erosion has provided a few windows into the subcropping silicified and pyritic (2-3%) andesite.

Clay alteration is pervasive, and altered and pyritized feldspar porphyry dykes heaviliy altered with clay minerals are ubiquitious throughout the area.

These features are interpreted to represent the acid leached zone or zones of the shallow parts of a fully preserved epithermal system transitional to a mesothermal vein system and to a gold-rich porphyry copper deposit at depth. Low or high sulphidation precious metals vein structures are forecast below the silicified andesite within structural conduits or permeable upwelling zones connected to the parent magma.

On the west side of Driftwood Creek about 300 metres up a small creek west of "Rusty" Lake" through which Driftwood Creek flows is a fairly thick flow-breccia full of pyrite integral with an intensely altered crystal tuff unit. The pyritized breccia is anomalous in gold and epithermal deposit indicator minerals As, and Mo; hence epithermal style gold-rich mineral resources are forecast to be associated with the altered and pyritized flow breccia within its root zone.

Regionally, a geochemical silt-sampling program conducted by the British Columbia Geological Survey identified the Chaco Bear Property as having the largest and strongest **Au+Ag+Sb+As+Hg** epithermal style geochemical signature found on the 5,000 square mile map sheet. This signature pertains to both the Driftwood Creek drainage system, or the intrusive centre, **and** the drainage system associated with the extrusive centre unconformity. The area involved is therefore very large. Such signatures when found in the major gold producing districts in Nevada and other parts of the world usually lead to the discovery of significant gold deposits.

All of the epithermal characteristics thus far observed indicate that the present erosion surface is high in the system hence the precious metals potential remains fully preserved below the present surface.

2.0 INTRODUCTION

2.1 Geology

At **Chaco Bear,** an extensive and detailed geological mapping program, superbly done, carried out in 1997, identified a thick succession of coeval volcanics above what are interpreted as two magmatic centres, an intrusive centre and an extrusive centre; estimated to be about 5.5 km (3.4 miles) apart.

Additionally a well exposed third magmatic centre represented by an outcropping Tertiary quartz-monzonite porphyry apophyses containing significant Cu and Mo is on the same lineament about 5.5 km south of the Chaco Bear buried intrusive centre.

The eruption breccia-hotspring low/high sulphidation subaerial gold and silver targets described in this overview are all related to alteration and mineralization within the aureole of the intrusive centre. Subaerial epithermal gold and silver targets are also found within the extrusive centre aureole.

The volcanic sequence within the influence of the intrusive centre includes members of the restricted Telkwa Formation of the Hazelton Group consisting of shoshenitic andesites, rhyodacite breccias, basalts, andesite lapilli tuffs, and an upper section of shoshonitic felsics unconformably overlying the restricted Telkwa Formation located on the ridge to the east known as the East Ridge.

Within the influence of the intrusive centre the volcanic sequence is intruded by:

- andesite dykes
- plagiophyric meta-andesite dykes
- metadiorite dykes
- mineralized felsic dykes

Leucogranite clasts found in the rhyodacite lapilli breccia proximal to the intrusive centre attests to an intrusive at depth.

2.2 Rusty Lake

In the north half of the intensely altered felsic volcanics which occupy the whole of the central part of Driftwood Valley a small lake has formed on the west side of Driftwood Creek. The lake is now known as Rusty Lake.

Driftwood Creek appears to skirt the east side of Rusty Lake as it flows downstream because it enters the lake and egresses the lake on the east side. The lake only occupies about 30 percent of what appears to be a large almost circular area covered with meadow and swamp vegetation. The circular area appears as if it was sculpted out of the centre of the valley almost unnaturally. This makes the lake an interesting feature; as if it was a

zone of much greater weakness than the surrounding lithology. It is a structural anomaly. It has the appearance of a large subcropping circular diatreme-breccia or a maar volcano.

The total field magnetic map shows a broad magnetic low, nominally less than 200 gammas in the area of the possible diatreme, compared with the anomalous field around it which attains field strengths of up to 2,000 gammas. Prominent magnetic anomalies greater than 1,000 gammas with half spaces of 500 gammas occupy the south half of the altered area.

Another feature of interest in this area were the results of a VLF-EM survey conducted by Suncor Inc. The In-Phase and Quadrature waveforms from Big Lake to 200 metres north of Rusty Lake are indicative of another major fault structure which passes down the west side of the valley (i.e., The quadrature follows the in-phase polarity).

However at about the centre of the possible diatreme, north of Rusty Lake and from there to about 1 km south, the quadrature is negative to the in-phase response which indicates that fault is conductive and contains sulphides. In addition the strongest VLF-EM conductor of the survey which is about 400+ metres in length projects directly into the centre of the possible diatreme structure from the south. Another VLF-EM conductor parallels the strong one about 100 metres easterly passing through the east half of 300 metre diameter diatreme.

Although speculation at this time, due to lack of data, mineralization associated with diatreme-breccia structures typically occurs within competent fractured country rocks about the diatreme margins and commonly at the intersection of the diatreme with through-going structures.

A gold in soils anomaly, averaging about 180 ppb Au with a maximum gold value of 1.45 grams/t gold, appears to pass through Rusty Lake for a strike distance of about 800 metres. Whether this anomaly is transported or represents a subcropping gold bearing structure is not known.

Quart-carbonate veins north, east and south of Rusty Lake contain significant values in gold and copper; up to 14.9 grams/t Au and up to 12.2% Cu.

The rust in the lake indicates that sulphide oxidation-reduction reactions are occurring in the local area and are indicative of significant buried sulphide occurrences either within the diatreme or adjacent to it.

2.3 Heavily Pyritized Volcanic-Flow Breccia

Within the central section of the pyritized, silicified, and kaolinized felsic volcanics of the intrusive centre a heavily pyritized volcanic flow-breccia outcrops on the north side of a small creek located about 300 metres west-southwest of **Rusty Lake**. See **Photograph 1**. For reference, the **milled-matrix fluidized-breccia pipe** is located about 1 km due west of Rusty Lake.

The pyritized flow breccia which is geochemically anomalous in gold and arsenic is exposed for an estimated 150 metres from west to east. The form and dimensions of this body and location of its root zone are unknown because this area is mostly overburden covered. A silicified and crystal tuff unit is contiguous with it upslope to the west and a bleached and gossanous feldspar porphyry unit is in contact with it downslope to the east towards Driftwood Creek.

Pyritiferous iron formations are well known for their precipitating effect on gold solutions; and as pyrite often precedes the gold phase of mineralization the root zone could be the locus for bonanza type gold deposition.

It is in the creek bed near here, which is heavily obscured with boulders, cobbles and other detritus, and high water, that Cominco, in 1968, reported finding numerous mineralized veins.

2.4 Disseminated Mineralization

In this area disseminated mineralization consists of large areas measuring up to hundreds of metres of so extensively hydrothermally altered that the protolith is destroyed and replaced by a porous assemblage of finely disseminated pyrite (2-10%) and quartz± sericite. This intense alteration is found in all directions from the Rusty Lake.

On the west side of Driftwood Creek a huge gossan zone extends up to the West Ridge.and straddling the Creek up to and beyond the pyritized flow-breccia the streams cutting this area expose heavily altered plagiophyric meta-andesite dykes and rocks of an unknown protolith. The intense pyrite-quartz± sericite alteration accompanies these closely fractured rocks

2.5 Local Vein Mineralization

Vein mineralization is pervasive throughout the area where outcrop is exposed; yet most of the area is overburden covered.

Wherever there are shears, joints, or faults they are mineralized with quartz, quartz-carbonate, and carbonate veins which carry significant quantities of gold, silver and copper.

Vein mineralization consists of specularite, chalcopyrite, pyrite, bornite, chalcocite, argentite?, tetrahedrite, galena, sphalerite, quartz, calcite, and ferroan dolomite up to 0.5 metres wide.

Some of the vein structures contain vuggy quartz-specularite veins cutting bedded tuffs hydrothermal altered with disseminated pyrite-quartz± sericite.

3.0 PYRITIZED VOLCANIC FLOW-BRECCIA TARGET

The entire area is anomalous in gold geochemistry. In the area of the pyritized flow breccia, sampled by Suncor in 1984, gold values range up to 1,080 ppb Au, and the average gold content from 48 samples taken in this area was 59 ppb Au. At the time assays were not made for other indicator metals other than silver for which the maximum value obtained in the area was 4.2 ppm Ag.

The area is intensely altered and a large part of the surface contains thick sections of ferricrete which is transported from sulphide bearing structures within the Gossan Zone upslope. Therefore it is possible that the gold in soils anomaly may be largely a transported feature; even though the underlying overburden covered area is believed to contain many unexposed vein structures.

A quartz-carbonate vein found in outcrop up the slope to the west of this location contained 8.9 grams/t Au and the average of three veins found in outcrop beside the creek proximally to the west of this location, assayed an average of 2.08 grams/t Au.

A lithogeochemical sample taken by this writer of the exposed pyritized flow breccia assayed 62 ppb Au, 56 ppm As and 15 ppm Mo.

Three samples of the pyritized flow breccia taken by others, gave the following geochemical results in Table 1:

Table 1

Sample	**Au** (ppb)	**As** (ppm)	**Mo** (ppm)	**Ba** (ppm)
1	5	6	1	872
2	40	2	13	298
3	5	9	2	654

So far there are two substantive extrusive features that have been identified in the large altered area, interpreted as the intrusive centre, that characterize an epithermal mineralizing environment transitional to a mineralized porphyry environment. These two features are the **milled-matrix fluidized breccia pipe** and the **pyritized volcanic flow breccia**. Generally they are referred to as **eruption-breccias**. Speculation now brings the possibility that Rusty Lake is a Maar-Diatreme eruption breccia complex.

The task now is to identify the mineral fluid upwelling zones which now includes in addition to the breccia pipe the root zone of the pyritized volcanic flow breccia.

Investigation of Rusty Lake as a potential diatreme-breccia maar volcano complex is also in order as conceptually there is a high probability that all three of these potential ore bearing features are genetically related and connected to the subcropping magmatic centre. Elsewhere in the world the integral presence of these features within a large and strong gold producing system have led to the discovery of world-class gold deposits.

The model is right, the favourable host rocks are well altered, and the magmatic system is gold producing; and considering the present definition of the several targets the financial reward to risk ratio in exploring these targets is believed to be considerable.

Prepared by: J. M. Ashton

Vancouver
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August, 2002

Chaco Bear Epithermal Gold & Silver Prospects

Diatreme-Breccia/Maar Volcano ?
Mesothermal Gold-Copper Target

Confidential Disclosure

1.0 SUMMARY

On both sides of Driftwood Creek above the intrusive centre a very large area covering hundreds of metres along the creek and extending east an indeterminate distance and several hundreds of metres to the west up towards the West Ridge has been so extensively hydrothermally altered that the protolith volcanics have been destroyed and replaced by a porous assemblage of quartz-pyrite (2-10%) ± sericite. Within this altered area erosion has provided a few windows into the subcropping silieified and pyritic (2-3%) andesite.

Clay alteration is pervasive, and altered and pyritized feldspar porphyry dykes heaviliy altered with clay minerals are ubiquitious throughout the area.

These features are interpreted to represent the acid leached zone or zones of the shallow parts of a fully preserved epithermal system transitional to a mesothermal vein system and to a gold-rich porphyry copper deposit at depth. Low or high sulphidation precious metals vein structures are forecast below the silicified andesite within structural conduits or permeable upwelling zones connected to the parent magma.

On the west side of Driftwood Creek about 300 metres up a small creek west of "Rusty" Lake" through which Driftwood Creek flows is a fairly thick flow-breccia full of pyrite integral with an intensely altered crystal tuff unit. The pyritized breccia is anomalous in gold and epithermal deposit indicator minerals As, and Mo; hence epithermal style gold-rich mineral resources are forecast to be associated with the altered and pyritized flow breccia within its root zone.

Regionally, a geochemical silt-sampling program conducted by the British Columbia Geological Survey identified the Chaco Bear Property as having the largest and strongest **Au+Ag+Sb+As+Hg** epithermal style geochemical signature found on the 5,000 square mile map sheet. This signature pertains to both the Driftwood Creek drainage system, or the intrusive centre, **and** the drainage system associated with the extrusive centre unconformity. The area involved is therefore very large measuring about 5 km (3 miles) east-west by 10 km (6 miles) north-south. Such signatures when found in the major gold producing districts in Nevada and other parts of the world usually lead to the discovery of significant gold **deposits.**

All of the epithermal characteristics thus far observed indicate that the present erosion surface is high in the system hence the transitional environment from epithermal to mesothermal to porphyry remains fully preserved below the present surface.

A very strong Cu-Pb-Zn geochemical soils anomaly extends for a linear distance of 1,200 metres (4,000 feet) east of Driftwood Creek between the south end of Big Lake to about 300 metres southeast of Rusty Lake. See **Figures 1, 2, & 3**. The results of a reconnaissance induced polarization survey covering about 400 metres (1,300 feet) of the northernmost section of this multi-element geochemical anomaly showed a classic chargeability-low resistivity response dipping about 40° westerly and open to depth with chargeability increasing markedly along strike and to depth towards the south. The high chargeability indicates the presence of substantial sulphide content.

Lord (1948) postulated a major fault zone through the Driftwood Creek valley and the VLF EM survey conducted by Suncor Inc. shows a major in-phase/quadrature crossover feature which does indicate a major fault structure passing through this location. In addition the VLF-EM anomalies (conductors) identified by Suncor show parallel mineralized structures co-incident with the very strong IP anomaly and co-incident multi-element geochemical anomaly. Therefore in all likelihood this linear zone of extremely anomalous geochemistry also represents a major structural feature which has tapped the magmatic fluids of this intrusive centre within this transitional environment in which case this system could be a paragenetic mineral-deposit sequence of substantial size and vertical extent, from epithermal to mesothermal to porphyry style in which case consecutive zonation to depth would be characterized from **Cu-Pb-Zn** near surface to **Au-Cu** (mesothermal) to **Cu±Au** at depth. The principal target in this case is the mesothermal Au-Cu deposit.

Although speculative, and enhancing the economic probabilities of this specific target, there is the likelihood that the magmatic source mineralizing fluids may have been tapped through a diatreme-breccia maar volcano complex. This complex is interpreted at this location with justification at this time. Rusty Lake occupies a small part of a nearly circular 300 metre diameter structural anomaly located in the centre of the Driftwood Creek Valley. It is positioned well within the 2½ by 3 km zone of most intense felsic volcanic alteration just about where a diatreme breccia is most likely to form as they do in similar geological environments throughout the world. See **Photograph 1**. They also sometime occur in clusters; and a milled-matrix fluidized breccia pipe is also located 1 km due west of this feature.

Present data suggests that the main zone of mineralization **dilates** (fluid upwelling zone) within the east half of the suggested diatreme-breccia maar volcano complex appearing to originate at that location with fluid flow continuing to pass out of that location to the north and south through the major structural break thereby creating this 1,200 metre multi-element anomaly with the diatreme breccia in the middle.

The rusty appearance of the lake indicates that there are significant sulphides in the immediate neighborhood undergoing oxidation-reduction. The sulphides are most likely part of the same targetted Au-Cu sulphide system as is the focus of this disclosure. The alternative would be leachate from a buried sulphide deposit up-slope to the east.

2.0 INTRODUCTION

2.1 Geology

At **Chaco Bear,** an extensive and detailed geological mapping program, superbly done, carried out in 1997, identified a thick succession of coeval volcanics above what are interpreted as two magmatic centres, an intrusive centre and an extrusive centre; estimated to be about 5.5 km (3.4 miles) apart.

Additionally a well exposed third magmatic centre represented by an outcropping Tertiary quartz-monzonite porphyry apophyses containing significant Cu and Mo is on the same lineament about 5.5 km south of the Chaco Bear buried intrusive centre.

The copper-zinc sulphide lode with offsetting gold target described in this overview is related to alteration and mineralization within the aureole of the intrusive centre.

The geological environment is a volcanic sequence within the influence of the intrusive centre and includes members of the restricted Telkwa Formation of the Hazelton Group consisting of shoshonitic andesites, rhyodacite breccias, basalts, andesite lapilli tuffs, and an upper section of shoshonitic felsics unconformably overlying the restricted Telkwa Formation located on the ridge to the east known as the East Ridge.

This target is a mineralized structure within the meta andesites of the restricted Telkwa Formation.

Within the influence of the intrusive centre the volcanic sequence is intruded by:

- mineralized andesite dykes
- plagiophyric meta-andesite dykes
- metadiorite dykes
- mineralized felsic dykes

Leucogranite clasts found in the rhyodacite lapilli breccia proximal to the intrusive centre attests to an intrusive at depth.

2.2 Rusty Lake

A small lake named Rusty Lake for its sometimes rusty-like colour under low flow conditions is located in the north half of the intensely altered felsic volcanics. The felsic volcanics occupy the whole of the central part of the valley in this area.

Driftwood Creek appears to skirt the east side of Rusty Lake as it flows downstream because it enters the lake and egresses the lake on the east side. The lake only occupies about 30 percent of what appears to be a large almost circular area covered with meadow and swamp vegetation. The circular area appears as if it was sculpted out of the centre of the valley almost unnaturally. It can be desdcribed as a structural anomaly in this mountain setting. This makes the lake an interesting feature; as if it was a zone of much greater weakness than the surrounding lithology. It has the appearance of a large subcropping circular diatreme-breccia/maar volcano complex.

The total field magnetic map shows a broad magnetic low, nominally less than 200 gammas in the area of the possible diatreme, compared with the anomalous field around it which attains field strengths of up to 2,000 gammas. Prominent magnetic anomalies greater than 1,000 gammas with half spaces of 500 gammas oecupy the south half of the altered area. The main anoinaly is suspected as being the magnetic signature of the potassic zone of the buried gold rich copper porphyry at depth.

Another feature of interest in this area were the results of the VLF-EM survey conducted by Suncor Inc. The In-Phase and Quadrature waveforms from Big Lake to 200 metres north of Rusty Lake are indicative of another major fault structure which passes down the west side of the valley (i.e., The quadrature follows the in-phase polarity).

However at about the centre of the possible diatreme-breccia, north of Rusty Lake, and from there to about 1 km south, the quadrature is negative to the in-phase response which indicates that fault is conductive and contains sulphides. In addition the strongest VLF-EM conductor of the survey which is about 400+ metres in length projects directly into the centre of the possible diatreme structure from the south. Another VLF-EM conductor parallels the strong one about 100 metres easterly at about the possible diatreme edge and is coincident with an extremely anomalous copper-lead-zinc anomaly.

Although speculation in this case, mineralization associated with diatremes typically occurs within competent fractured country rocks about the diatreme margins as major sheeted zones commonly at the intersection of the diatreme with through-going structures. Often this mineralization is in the form of carbonate base-metal sulphides in the upper section and grades into more gold rich mineralization with increasing depth.

Quartz-carbonate veins north, east and south of Rusty Lake contain significant values in gold and copper; up to 14.9 grams/t Au and up to 12.2% Cu.

The slightly rust colour in the lake indicates that sulphide oxidation-reduction reactions are occurring in the local area. It is speculated that the products of oxidation are from the mineralizing system that is the focus of this disclosure.

2.3 Mesothermal Gold-Copper Target

In 1985 Suncor Inc.identified a moderately strong VLF-EM anomaly coincident with a very strong copper-lead-zinc soils geochemical anomaly southeast of Big Lake about 250 metres east of Driftwood Creek. The anomaly extends south-easterly for about 1,200 metres (4,000 feet), passing just east of **Rusty Lake**.

It therefore cuts tangentially across the east side of the **speculated** Maar Diatreme intrusive breccia complex; which at that location is at least 150 metres (500 feet) in width with most of it beyond the Diatreme east side wall.

The **maximum (average)** metal values in soil include:

- copper @ **2,870 (1,224)** ppm;
- lead @ **303 (186)** ppm,; and
- zinc @ **2,400 (640)** ppm

There appears to be a parallel geochemical anomaly, 100 metres in width, defined by one only extended survey line further up the slope from this anomaly. The maximum (average) metal values in soil for this anomaly include:

- copper @ **1,590 (911)** ppm;
- lead @ **942 (531)** ppm; and
- zinc @ **1,300 (828)** ppm)

The copper and lead anomalies are extremely anomalous and the the zinc anomaly is very anomalous.

A very strong gold-in-soils anomaly, averaging about 180 ppb Au with a maximum gold value of 1.45 grams/t gold, parallels the copper-lead-zinc downslope and passes directly through Rusty Lake within the Diatreme complex and appears to pass through the lake for a strike distance of about 800 metres (2,600 feet).

2.4 Induced Polarization Anomaly

Immediately after acquiring the property in 1992 a two-line reconnaissance dipole-dipole induced polarization (IP) survey was completed over the northeast quadrant of the large multi-element geochemical soils anomaly. It was designed to include the strongest

copper-lead-zinc anomaly with a coincident VLF-EM anomaly found on the property by Suncor Inc. which is the target structure of this disclosure.

The dipole spread was 25 metres with 7 levels surveyed, which gives a nominal penetration or survey depth of about 100 metres (300 feet).

The results of the IP survey identified a very strong induced polarization response with associated low resistivity response which was co-incident with the extremely anomalous geochemistry and VLF-EM anomaly found by Suncor Inc. Chargeability responses up to a maximum of 81.0 milliseconds were recorded with corresponding low resistivities with a maximum low of 488 ohm-metres. The identified sulphide bearing structure strikes north-northwest and dips about minus 40° westerly, and is open to depth and to the south. The attitude of the structure conforms with the major fault and shear directions in this area of the property.

Subcropping sulphide content increases markedly from north to south as the intense zone of hydrothermal alteration is progressively penetrated and as the intensity of the copper,lead and zinc geochemistry increases to the south.

At the northern extremity of the coincident induced polarization anomaly and Cu-Pb-Zn anomaly very little outcrop is exposed yet one sample taken from the small outcrop exposed near there revealed heavily chloritized andesite with quartz filled fractures with a trace of pyrite. A boulder (float) of hematitic andesite containing 3-5% pyrite was anomalous in gold (40ppb) and silver (2 ppm).

2.5 Disseminated Mineralization

In this area disseminated mineralization consists of large areas measuring up to hundreds of metres of so extensively hydrothermally altered that the protolith is destroyed and replaced by a porous assemblage of finely disseminated pyrite (2-10%) and quartz± sericite. This intense alteration is found in all directions from the rusty lake.

On the west side of Driftwood Creek a huge gossan zone extends up to the West Ridge.and straddling the Creek up to and beyond the Flow-Breccia the streams cutting this area expose heavily altered plagiophyric meta-andesite dykes and rocks of an unknown protolith. The intense pyrite-quartz± sericite alteration accompanies these closely fractured rocks

2.5 Local Vein Mineralization

The entire area is anomalous in gold-in-soils geochemistry; and silt samples taken from the drainages from both east and west slopes entering Driftwood Creek are anomalous in gold. Hence gold bearing structures exist on both sides of the creek.

Vein mineralization is pervasive throughout the area where outcrop is exposed; yet most of the area is overburden covered. Wherever there are shears, joints, or faults they are mineralized with quartz, quartz-carbonate, and carbonate veins which carry significant quantities of gold, silver and copper.

Vein mineralization consists of specularite, chalcopyrite, pyrite, bornite, chalcocite, argentite?, tetrahedrite, galena, sphalerite, quartz, calcite, and ferroan dolomite up to 0.5 metres wide. Some of the vein structures contain vuggy quartz-specularite veins cutting bedded tuffs hydrothermally altered with disseminated pyrite-quartz± sericite.

The area is intensely altered and a large part of the surfaee contains thick sections of ferricrete which is transported from subcropping sulphide bearing structures upslope. The underlying overburden covered area is believed to contain many unexposed vein structures. About 200 metres downstream from Rusty Lake above the east bank of Driftwood Creek there is a large transported gossan which attests to the probability of a buried sulphide body upslope. This gossan is very high in arsenic (32 & 58 ppm As).

The Suncor Inc. geochemical survey showed several extremely anomalous arsenic highs exceeding 300 ppm As throughout this specific target area.

Quartz-carbonate veins found on the slope above the east side of Driftwood Creek within the area of the coincident Cu-Pb-Zn geochemical anomaly and induced polarization anomaly, assayed as follows:

Vein Structure	Copper (%)	Gold (ppm)	Silver (ppm)
1	12.2	6.2	8.4
2	1.9	7.9	3.8
3	5.2	14.9	11.0

Within this local area there are at least two substantive extrusive features that have been identified in the large altered area, that characterize an epithermal mineralizing environment transitional to a mineralized porphyry environment. These two features are a geochemically anomalous and intensely altered a **milled-matrix fluidized-breccia pipe** and a **pyritized volcanic flow-breccia**. Generally they are referred to as **eruption-breccias**. Speculation now brings the possibility that Rusty Lake is a **Maar-Diatreme eruption breccia complex.**

3.0 DISCUSSION

In epithermal-mesothermal-porphyry transitional environments, as is the case here, styles of alteration, veins, and mineralization provide vectors which point towards the source of magmatic mineralizing fluids. These fluids migrate along existing major structural breaks, shears, and lithological porosities, usually vertically, to form epithermal and mesothermal-style ore deposits in consecutive zones of **Cu±Au; Au-Cu and Cu-Pb-Zn** at increasing distances from the magmatic heat and solution source.

As a precursor to a mesothermal gold-copper mineralizing stage at depth below the paleo surface often pyrite with base metal sulphides including copper, galena, and sphalerite and sometimes magnetite will form deposits distally. Marr-diatreme intrusive breccia complexes are ideal structural conduits to allow the upwelling of mineralized magmatic fluids to mix with meteoric waters which provides the mechanism for epithermal and mesothermal mineral deposition. Major structural breaks perform the same function.

At the Chaco Bear property this specific target area, an interpreted semi-massive sulphide (high-chargeability response) zone defined by the co-incident Cu-Pb-Zn geochemistry, VLF-EM anomaly, and induced polarization (IP) chargeability anomaly, is not without precedent as a potential mesothermal copper-gold deposit in this type of geological environment. The geological and geophysical data is of sufficient weight as to include it on the list of priority targets as a potentially economic mesothermal Au-Cu target.

Four substantive, independent, and convergent anomalies: two geophysical, one multi-element geochemical, and large alteration zone appear to emanate from the diatreme or other source in its immediate vicinity. The geochemistry is supported by coincident geophysical anomalies which indicate subcropping sulphides. The gap in the geochemistry immediately east of Rusty Lake is explained by a rock slide at that location. Support for the anomaly's continuity is given by the un-interrupted VLF-EM anomaly underlying the gap.

However what is not explained is the discontinuity in the VLF-EM anomaly for about 100 metres in the strong part of the geochemical anomaly at Line 4+50S. Cominco whom conducted a horizontal loop EM survey over this area in 1969, and failed to find any anomalies, were disappointed in the results and concluded that because of the highly oxidized nature of the mineralization, near surface conductive mineral grains of semi-massive to massive vein sulphide samples were insulated from their neighbors by limonite coatings and silica flooding thereby significantly attenuating the EM effect because of lack of electronic continuity. This is indeed a legitimate explanation because several mineralized vein matter samples recovered by this writer failed to show electrical continuity for the same reasons.

It is clear that the VLF-EM survey conducted by Suncor Inc. was much more successful than the Cominco survey however IP surveying has proved to be much more successful as it provides definition of sulphide strength, and polarizable body size and attitude.

Chaco Bear Epithermal Gold & Silver Prospects
Diatreme-Breccia/Maar Volcano ?
Mesothermal Gold-Copper Target

The extremely anomalous multi-element geochemical anomaly with co-incident VLF-EM anomaly at the east end of Line 6+00S in all probability represents a larger structure than shown as the north and south strike directions have yet to be surveyed and are presently open. This surveyed section also represents subcropping sulphides without question.

The very strong IP chargeability anomaly, coincident with the geochemistry between IP Survey lines 1 & 2 within the extremely anomalous multi-element geochemical anomaly shown, is open to depth and along strike. Sulphide intensity and size increases significantly as it enters the extremely anomalous portion of the geochemical anomaly. In this environment chargeability correlates directly with sulphide content.

The 300 metre circular feature partly occupied by Rusty Lake at its south end is strongly suspect as being the near surface remnant of an eroded **Maar-Diatreme intrusive breccia complex**. It has a near circular shape and is located well within the intensely altered volcanic pile where it would be expected to be found.

The rusty colour of the lake indicates that the lake is connected to a source of actively oxidizing sulphides; either within the lake itself or from a buried sulphide body upslope from it, most likely to the east, similar to the origin of the transported gossan, located about 200 metres downstream from Rusty Lake on the east bank of Driftwood Creek.

The model is right, the favourable host rocks are intensely altered, and the magmatic system is gold producing. The integral presence of these features within a large and strong gold producing system have produced world-class gold deposits in similar environments.

In addition to the fully preserved copper-gold porphyry system at depth there are now at least three well defined epithermal to mesothermal targets of significance defined within the influence of this magmatic centre which now include:

a) this **diatreme intrusive-breccia complex,** mesothermal Au-Cu target in the vicinity of Rusty Lake, or equivalent mineralizing mechanism;

b) the **milled-matrix fluidized-breccia pipe,** epithermal Au-Ag target, located 1 km to the west;

c) the **eruption-breccia hotspring low/high sulphidation subaerial** epithermal Au-Ag target, located about 300 metres to the southwest and undefined targets within the surrounding area of intensely altered and silicified felsic volcanics.

Prepared by: J. M. Ashton

Vancouver
British Columbia
August, 2002

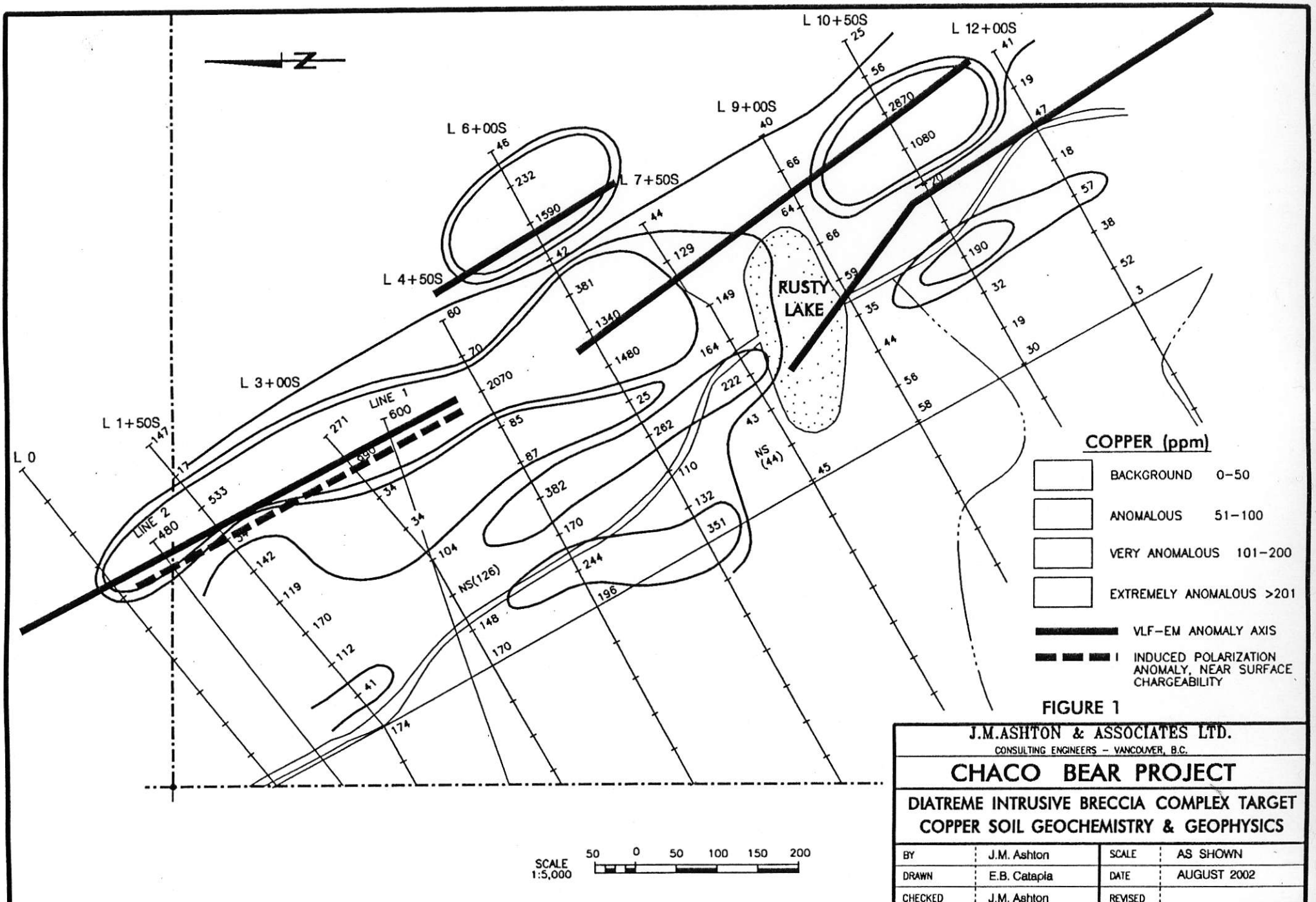

FIGURE 1

J.M.ASHTON & ASSOCIATES LTD.
CONSULTING ENGINEERS - VANCOUVER, B.C.

CHACO BEAR PROJECT

DIATREME INTRUSIVE BRECCIA COMPLEX TARGET COPPER SOIL GEOCHEMISTRY & GEOPHYSICS

BY	J.M. Ashton	SCALE	AS SHOWN
DRAWN	E.B. Catapia	DATE	AUGUST 2002
CHECKED	J.M. Ashton	REVISED	

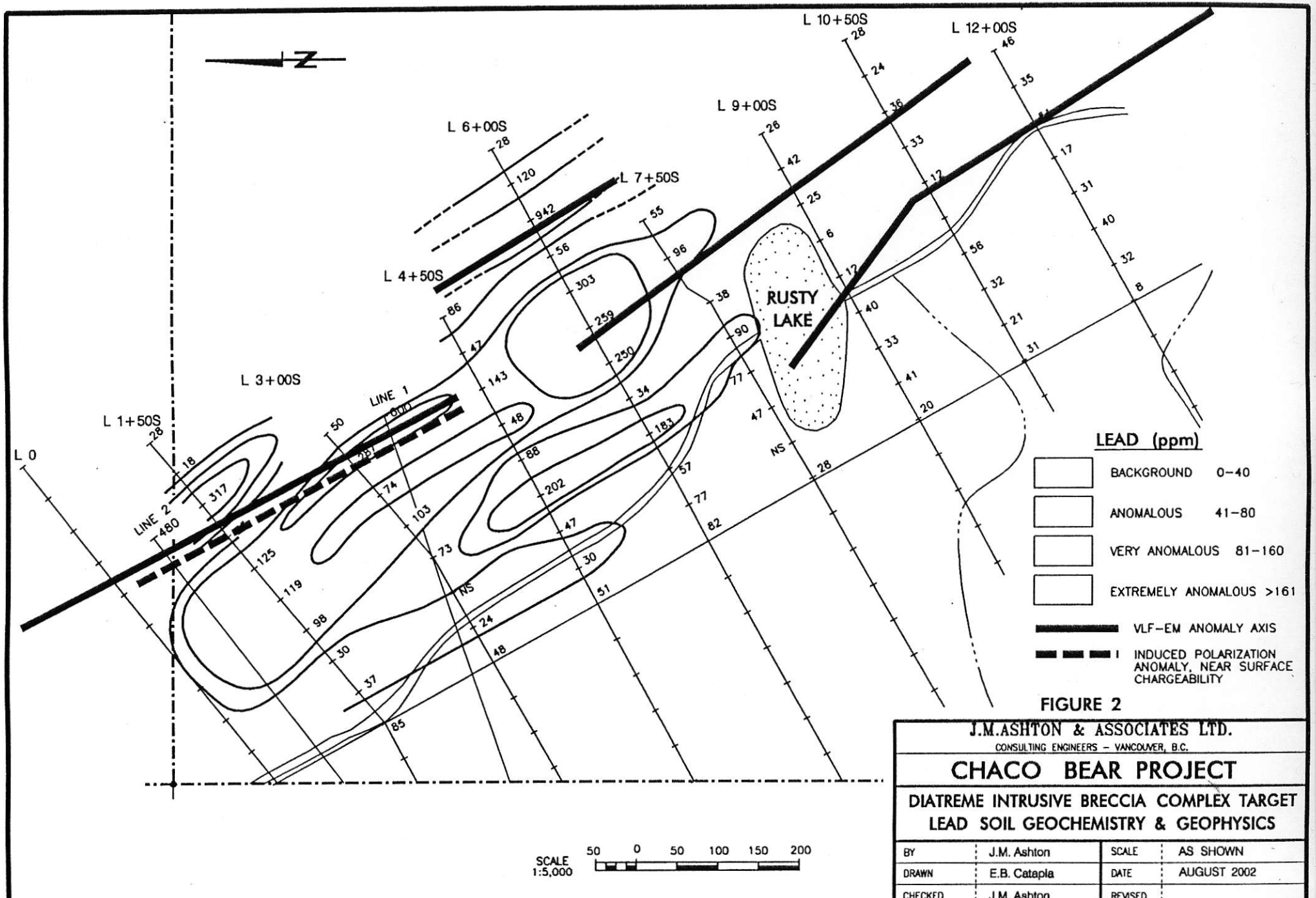

FIGURE 2

J.M.ASHTON & ASSOCIATES LTD.
CONSULTING ENGINEERS – VANCOUVER, B.C.

CHACO BEAR PROJECT

DIATREME INTRUSIVE BRECCIA COMPLEX TARGET
LEAD SOIL GEOCHEMISTRY & GEOPHYSICS

BY	J.M. Ashton	SCALE	AS SHOWN
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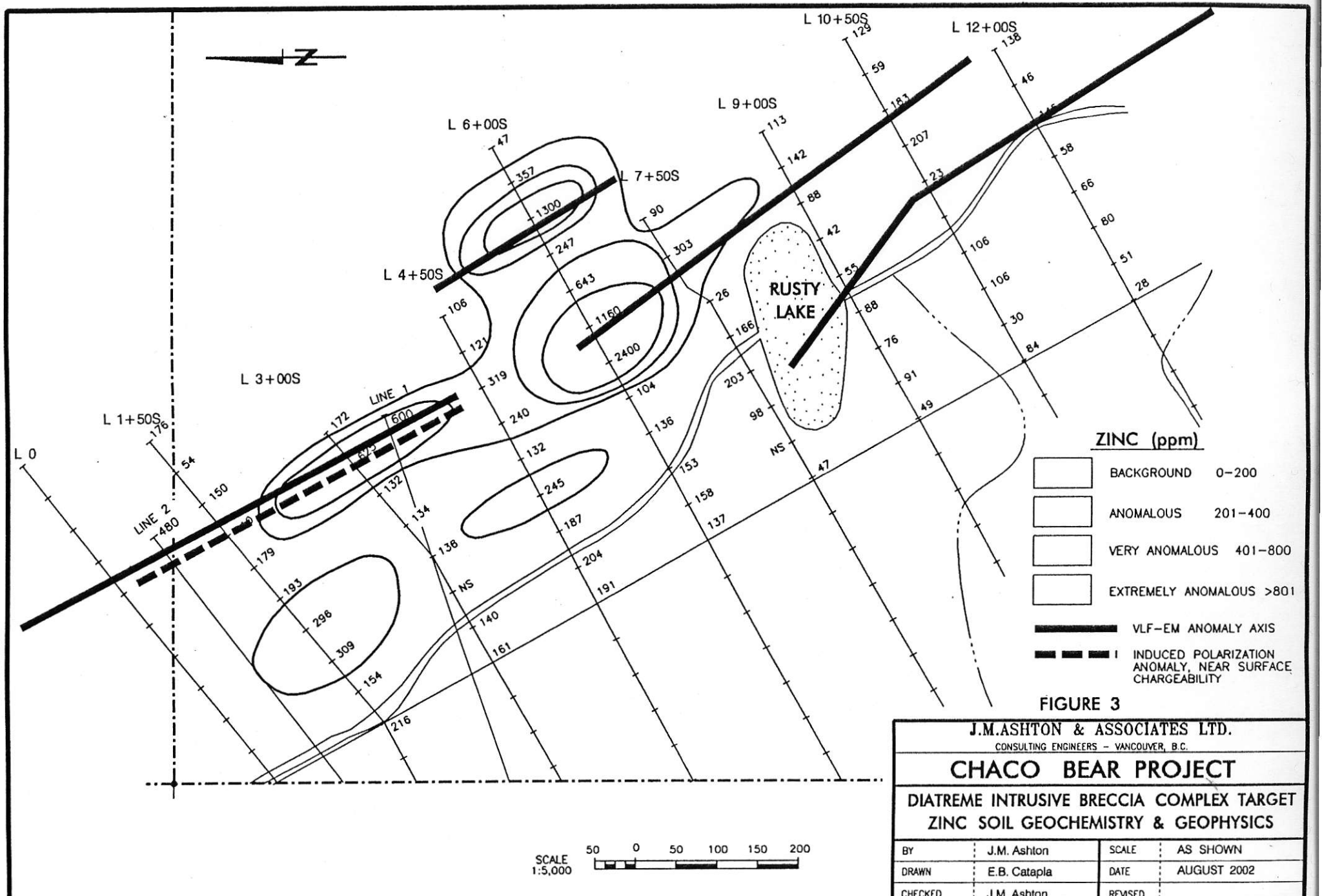

FIGURE 3

J.M.ASHTON & ASSOCIATES LTD.
CONSULTING ENGINEERS - VANCOUVER, B.C.

CHACO BEAR PROJECT

DIATREME INTRUSIVE BRECCIA COMPLEX TARGET
ZINC SOIL GEOCHEMISTRY & GEOPHYSICS

BY	J.M. Ashton	SCALE	AS SHOWN
DRAWN	E.B. Catapla	DATE	AUGUST 2002
CHECKED	J.M. Ashton	REVISED	

The Chaco Bear Epithermal & Mesothermal Gold-Silver Prospects & Porphyry Copper-Gold Prospects

Significance of the Unconformity

1.0 UNCONFORMITY

P.B. Read, Ph.D., in his 1997 geological report, described the contact zone between the Unnamed felsic volcanics and the Restricted Telkwa andesites as an **Unconformity.**

In the introductory statement in Section 2 on **Stratigraphy**, Section 2, he states:

" Richards (1975, 1976) subdivided the Hazelton Group into three formations of which the lowest , or Telkwa Formation , contains calc-alkaline basalt, andesite, dacite, and up to 50 m of rhyolite flows, breccia, and tuff. Lahar, intravolcanic fanglomerate, conglomerate, sandstone and siltstone complete the formation. According to Richards (1975) this formation underlies the entire area of the property. In contrast to Richards, I have subdivided the volcanic rocks of the property into a **restricted Telkwa Formation** and an overlying unnamed formation . The justification for erecting an unnamed formation is the sudden appearance and significant thickness (450 m) of felsic rocks which overlie, probably unconformably, a thick andesite/basalt succession belonging to the restricted Telkwa Formation..."

Under **Rhyolite Tuff and Flows** (**IJvr**) [part of **Unnamed** Formation], he states:
"Along an exposed contact at Station 3i, southeasterly dipping rhyolite lapilli tuff (**IJvr**) overlies a **bumpy surface** of the upper green andesite flows (IJugva) of uncertain orientation. The upper contact of the unit is placed at the first appearance of dacite flows or aphyric andesite.

Under the Section 5 on **Mineralization** in Paragraph 5.1.1, Base of the Rhyolite Unit (**IJvr**), it is stated:
" At the base of the rhyolite unit (**IJvr**) on the ridge, on the east side of the property, (**East Ridge**) weakly disseminated pyrite lies within a few metres of the base yielding a gossanous zone which extends into the upper green andesite (**IJugva**) along the trace of the Upper Driftwood Fault".

Under Section 4., **Structure,** Subsection 4.3, Faulting, the geological report states:
" Shear zones and faults are widespread in the rock units beneath the rhyolite and dacite offset all intrusions except possibly the leucogranite (**g**). The offsets of dike contacts and closely positioned rock unit boundaries indicate northwesterly and northerly striking faults. Both are subvertical or have a westerly component of dip, are probably pre-vein in age and provided channelways and open space for the vein mineralization on the claims."

The northwesterly striking Upper Driftwood Fault is located about 800 metres (0.5 mile) north of the mineralized Saddle Zone where it intersects the rhyolite (and the unconformity) of the Unnamed Formation.

Approximately 2 km northwest of the northerly striking Unnamed Formation rhyolite-Upper Driftwood Fault intersection, the 36 metre (118 feet) wide fault zone, which passes through the northerly striking mineralized Bearnx Zone, contains several narrow yet moderately altered rhyolite dikes. Assays across one dike, 4.3 metres wide, averaged about 0.2 grams/t Au, 10 ppm As, 5 ppm Mo and 2,000 ppm Mn.

It is noteworthy that in all drill holes within the Bearnx Zone restricted Telkwa Formation, only one hole encountered rhyolite dikes, and that was within the Upper Driftwood Fault zone. The rhyolite dikes here were therefore emplaced post faulting.

Generally throughout the property wherever fault, shear, and joint structures are exposed in outcrop, or by drilling, they are mineralized with copper, gold and silver minerals of potential economic tenor, in proportion to the size of their precursor openings.

2.0 DISCUSSION

Unconformities are known to host major mineral deposits.

This unconformity as is charaeteristic of unconformities in similar environments, was probably developed under strong weathering and chemical conditions which produced deep weathered zones along its surface; **accompanied by thick permeable regoliths.**

If the regolith is preserved along the unconformity, and there is no reason to suspect it is not preserved, then it offers itself as a **master channelway** for the passage of mineral rich fluids both into it and into contiguous permeable host lithologies.

There are several faults and subsidiary shear zones which intersect the unconformity which are no doubt major conduits to the underlying gold-rich magmatic-source fluids. Hence there is strong support for the thesis that the unconformity is mineralized, as well as its contiguous permeable host lithologies.

Primary exploration targets specifically related to the zone of unconformity include, but are not limited to:

1. intersections of major fault and shear zones with the unconformity,
2. intersections of extrusive dacite and rhyolite centres with the unconformity,
3. the entire zone of unconformity,
4. permeable and porous lithologies in direct contact with the unconformity.

The Unnamed Formation rhyolite which sits on the unconformity is known for its intrinsic permeability and porosity, and rhyolite permeability can also be enhanced due to its brittle nature which crackles readlly under slight stress as normally occurs under thermal and hydrothermal conditions. And, as this rhyolite is interpreted to be a feeder zone in direct communication with the gold rich magmatic fluids of the Chaco Bear hydrothermal system, the analogous mechanism of mineralized fluid transport through the rhyolites, which also produced the gold and silver rich Eskay Creek subsea-epithermal deposits, has also most likely occurred here as well.

At several locations along the unconformity, notably the Saddle Zone, vuggy quartz-carbonate veins contain significant gold and silver mineralization. With a thick regolith expected at the top of the andesites before the extrusive rhyolite event, this augers well for extensive mineralized zones to be found within and contiguous with this structure. The source of the precious metals mineralization could either be from fluid flow from the regolith channelway, or the rhyolite, or from both.

A prominent transported gossan zone, anomalous in arsenic, of not insignificant size, has formed on the east bank of Driftwood Creek about 200 to 300 metres downslope to the west from the East Ridge zone of unconformity. This location is about 1 km south from the Saddle Zone, or 1.8 km south of where the unconformity intersects the Upper Driftwood Fault. It is probable that the transported gossan is the oxidation product of a buried sulphide body undergoing oxidation-reduction somewhere upslope with the most likely location being at the zone of unconformity.

Small veins and veinlets in volcanic rock talus, containing significant gold mineralization were also found by the Geological Survey of Canada on reconnaissance traverses on the east slope of the northerly striking East Ridge in the 1940's.

The unconformity occupies an immense area. It begins at the south end of the East Ridge and extends northerly to the Upper Driftwood Fault, a major basement structure, a distance of 3.6 km (2.2 miles). From the north side of the Upper Driftwood Fault the unconformity extends a further 6.0 km (3.7 miles) to beyond Round Lake.

With a total linear distance of 9.6 km (about 6 miles), and open to the north and down dip this unconformity represents a **stupendous structure;** and if the regolith is preserved, and was part of the hydrothermal mineral fluid circulatory system it could host a commensurately sized precious metals deposit; or integrally, several deposits.

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Approximately 2 km northwest of the northerly striking Unnamed Formation rhyolite-Upper Driftwood Fault intersection, the 36 metre (118 feet) wide fault zone, which passes through the northerly striking mineralized Bearnx Zone, contains several narrow yet moderately altered rhyolite dikes. Assays across one dike, 4.3 metres wide, averaged about 0.2 grams/t Au, 10 ppm As, 5 ppm Mo and 2,000 ppm Mn.

It is noteworthy that in all drill holes within the Bearnx Zone restricted Telkwa Formation, only one hole encountered rhyolite dikes, and that was within the Upper Driftwood Fault zone. The rhyolite dikes here were therefore emplaced post faulting.

Generally throughout the property wherever fault, shear, and joint structures are exposed in outcrop, or by drilling, they are mineralized with copper, gold and silver minerals of potential economic tenor, in proportion to the size of their precursor openings.

The main concepts to entertain here, based on this indirect evidence, are:

- Gold is late-stage suceeding the majority of lithological, structural and magmatic development.
- The Leuco-granites may represent a highly differentiated, late-stage magmatic derivative. It may be temporally associated with syn to post mineral magamtism.
- The upper zone of the ?Telkwa Formation is a series of brittle and porous felsic units, stratigraphically surrounded by more competent "constraining" units.

2.0 DISCUSSION

Unconformities are known to host major mineral deposits.

For the above reasons. Gold is a late stage event. Previously existing and often deep long life structures are reactivated. Fluid emplacement is a dynamic activity and so les competent and more porous/ permeable zones act as sites of rheological contrast and as physio-chemical traps allowing sudden drops in pressure and the hydrostatic pressure to exceed the constraining lithostatic pressure.

~~This unconformity as is characteristic of unconformities in similar environments, was probably developed under strong weathering and chemical conditions which produced deep weathered zones along its surface;~~ **~~accompanied by thick permeable regoliths.~~**

~~If the regolith is preserved along the unconformity, and there is no reason to suspect it is not preserved, then it offers itself as a **master channelway** for the passage of mineral rich fluids both into it and into contiguous permeable host lithologies.~~

What may appear to be extensive weathering may be retrograde argillic alteration.

There are several (?subvertical) faults and subsidiary shear zones which intersect the unconformity providing the ~~which are no doubt~~ major conduits required to tap and focus mantle-derived (oxidised) ~~to the underlying~~ gold-rich hydrothermal fluids.~~magmatic source fluids.~~ Hence there is strong support for the thesis that the unconformityand the surrounding felsic units -provide a primary target for gold mineralisation. ~~is mineralized, as well as its contiguous permeable host lithologies.~~

Primary exploration targets ~~specifically~~ related to the structural and magmatic development are: ~~related to the zone of unconformity include, but are not limited to~~:

- ~~1.~~ intersections of major fault and shear zones with the unconformity,
- ~~2.~~ intersections of felsic magmatic centres with ~~extrusive dacite and rhyolite centres with~~ major structural elements including the unconformity zone.

~~the unconformity.~~

~~3. the entire zone of unconformity,~~

- ~~4.~~ Intersections of other permeable and porous lithologies in direct contact the major shears and faults, which direct the gold hydrothermal fluids. ~~with the unconformity.~~

Based on similar settings observed elsewhere in the Pacific Rim, the significance of the unconformity and the tectonic setting (arc proximal) suggests the main zones of mineralisation will be flatlying, joined by narrow high angle structures. The higher grade ore shoot targets will be at the intersection of these flat-lying beds with the strike trace of the subvertical structures.

The Unnamed Formation rhyolite which sits on the unconformity is known for its intrinsic permeability and porosity, and rhyolite permeability can also be enhanced due to its brittle nature which crackles readily under slight stress as normally occurs under thermal and hydrothermal conditions. And, as this rhyolite is interpreted to be a feeder zone in direct communication with the gold rich magmatic fluids of the Chaco Bear hydrothermal system, the analogous mechanism of mineralized fluid transport through the rhyolites, which also produced the gold and silver rich Eskay Creek subsea-epithermal deposits, has also most likely occurred here as well.

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With a total linear distance of 9.6 km (about 6 miles), and open to the north and down dip this unconformity represents a major structural feature ~~**stupendous structure; and if the regolith is preserved, and**~~ which appears to have been involved with the widescale hydrothermal activity, providing the scope to host a major economic gold camp. ~~was part of the hydrothermal mineral fluid circulatory system it could host a commensurately sized precious metals deposit; or integrally, several deposits.~~

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The northwesterly striking Upper Driftwood Fault is located about 800 metres (0.5 mile) north of the mineralized Saddle Zone where it intersects the rhyolite (and the unconformity) of the Unnamed Formation.

Approximately 2 km northwest of the northerly striking Unnamed Formation rhyolite-Upper Driftwood Fault intersection, the 36 metre (118 feet) wide fault zone, which passes through the northerly striking mineralized Bearnx Zone, contains several narrow yet moderately altered rhyolite dikes. Assays across one dike, 4.3 metres wide, averaged about 0.2 grams/t Au, 10 ppm As, 5 ppm Mo and 2,000 ppm Mn.

It is noteworthy that in all drill holes within the Bearnx Zone restricted Telkwa Formation, only one hole encountered rhyolite dikes, and that was within the Upper Driftwood Fault zone. The rhyolite dikes here were therefore emplaced post faulting.

Generally throughout the property wherever fault, shear, and joint structures are exposed in outcrop, or by drilling, they are mineralized with copper, gold and silver minerals of potential economic tenor, in proportion to the size of their precursor openings.

The main concepts to entertain here, based on this indirect evidence, are:

- Gold is late stage succeeding the majority of lithological, structural and magmatic development

- The leuco-granites may represent a highly differentiated, late stage magmatic derivative. They may be temporally associated with 'syn' to 'post' mineral magmatism.

- The upper zone or "Unnamed Formation" felsics are a series of brittle, porous and permeable felsic units, stratigraphically surrounded by more competent constraining units.

2.0 DISCUSSION

Unconformities are known to host major mineral deposits. They often include thick, permeable regoliths which form a significant part of the hydraulic conduit system for hydrothermal fluid transport and mineral deposition.

For the reasons cited above under Section 1.0, "Unconformity", gold is a late stage event. Previously existing and often deep long-life structures are reactivated. Fluid emplacement is a dynamic activity and so less competent and more porous/permeable zones act as sites of rheological contrast and as physico-chemical traps allowing sudden drops in system pressure over large volumes whereby hydrostatic pressure of the hydrothermal system exceeds the confining lithostatic pressure.

What may appear to be extensive weathering may be retrograde argillic alteration.

There are several subvertical faults and subsidiary shear zones which intersect the unconformity providing the major conduits to tap and focus mantle-derived (oxidized) gold-rich hydrothermal fluids. Hence there is strong support for the thesis that the unconformity and the surrounding felsic units provide primary targets for gold mineralization.

Primary exploration targets related to structural and magmatic development are:

- intersections of major fault and shear zones with the unconformity,
- intersections of felsic magmatic centres with major structural elements including the unconformity zone,
- intersections of other permeable and porous lithologies in direct contact with the major faults and shears which direct and focus the gold rich hydrothermal fluids.

Based upon similar settings observed elsewhere in the Pacific Rim gold belt, the significance of the unconformity and the tectonic setting (arc proximal) suggests the main zones of mineralization will be flat lying, and joined by narrow high angle structures. The higher grade ore shoot targets will be at the intersection of these flat lying beds with the strike trace of the subvertical structures.

The Unnamed Formation rhyolite which sits on the unconformity is known for its intrinsic permeability and porosity, and rhyolite permeability can also be enhanced due to its brittle nature which crackles readily under slight stress as normally occurs under thermal and hydrothermal conditions. And, as this rhyolite is interpreted to be a feeder zone in direct communication with the gold rich magmatic fluids of the Chaco Bear hydrothermal system, the analogous mechanism of mineralized fluid transport through the rhyolites, which also produced the gold and silver rich Eskay Creek subsea-epithermal deposits, has also most likely occurred here as well.

At several locations along the unconformity, notably the Saddle Zone, vuggy quartz-carbonate veins contain significant gold and silver mineralization. With a thick regolith expected at the top of the andesites before the extrusive rhyolite event, this augers well for extensive mineralized zones to be found within and contiguous with this structure. The source of the precious metals mineralization could either be from fluid flow from the regolith channelway, or the rhyolite, or from both.

A prominent transported gossan zone, anomalous in arsenic, of not insignificant size, has formed on the east bank of Driftwood Creek about 200 to 300 metres downslope to the west from the East Ridge zone of unconformity. This location is about 1 km south from the Saddle Zone, or 1.8 km south of where the unconformity intersects the Upper Driftwood Fault. It is probable that the transported gossan is the oxidation product of a

buried sulphide body undergoing oxidation-reduction somewhere upslope with the most likely location being at the zone of unconformity.

Small veins and veinlets in volcanic rock talus, containing significant gold mineralization were also found by the Geological Survey of Canada on reconnaissance traverses on the east slope of the northerly striking East Ridge in the 1940's.

The unconformity occupies an immense area. It begins at the south end of the East Ridge and extends northerly to the Upper Driftwood Fault, a major basement structure, a distance of 3.6 km (2.2 miles). From the north side of the Upper Driftwood Fault the unconformity extends a further 6.0 km (3.7 miles) to beyond Round Lake.

With a total linear distance of 9.6 km (about 6 miles), and open to the north and down dip this unconformity represents a major structural feature which appears to have been involved with the large scale hydrothermal activity, providing the scope to host a major economic gold camp.

Prepared by: J. M. Ashton
Constructive additions: T.Hronsky

References: P.B. Read

Vancouver, British Columbia
October, 2002

The Chaco Bear Epithermal & Mesothermal Gold-Silver Prospects & Porphyry Copper-Gold Prospects

Significance of the Unconformity

1.0 UNCONFORMITY

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Unconformities are known to host major mineral deposits.

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~~This unconformity as is characteristic of unconformities in similar environments, was probably developed under strong weathering and chemical conditions which produced deep weathered zones along its surface;~~ **~~accompanied by thick permeable regoliths.~~**

~~If the regolith is preserved along the unconformity, and there is no reason to suspect it is not preserved, then it offers itself as a **master channelway** for the passage of mineral rich fluids both into it and into contiguous permeable host lithologies.~~

What may appear to be extensive weathering may be retrograde argillic alteration.

There are several (?subvertical) faults and subsidiary shear zones which intersect the unconformity providing the ~~which are no doubt~~ major conduits required to tap and focus mantle-derived (oxidised) ~~to the underlying~~ gold-rich hydrothermal fluids.~~magmatic-source fluids.~~ Hence there is strong support for the thesis that the unconformityand the surrounding felsic units -provide a primary target for gold mineralisation. ~~is mineralized, as well as its contiguous permeable host lithologies.~~

Primary exploration targets ~~specifically~~ related to the structural and magmatic development are: ~~related to the zone of unconformity include, but are not limited to~~:

- ~~1.~~ intersections of major fault and shear zones with the unconformity,
- ~~2.~~ intersections of felsic magmatic centres with ~~extrusive dacite and rhyolite centres with~~ major structural elements including the unconformity zone.

~~the unconformity.~~

~~3. the entire zone of unconformity,~~

- ~~4.~~ Intersections of other permeable and porous lithologies in direct contact the major shears and faults, which direct the gold hydrothermal fluids. ~~with the unconformity.~~

Based on similar settings observed elsewhere in the Pacific Rim, the significance of the unconformity and the tectonic setting (arc proximal) suggests the main zones of mineralisation will be flatlying, joined by narrow high angle structures. The higher grade ore shoot targets will be at the intersection of these flat-lying beds with the strike trace of the subvertical structures.

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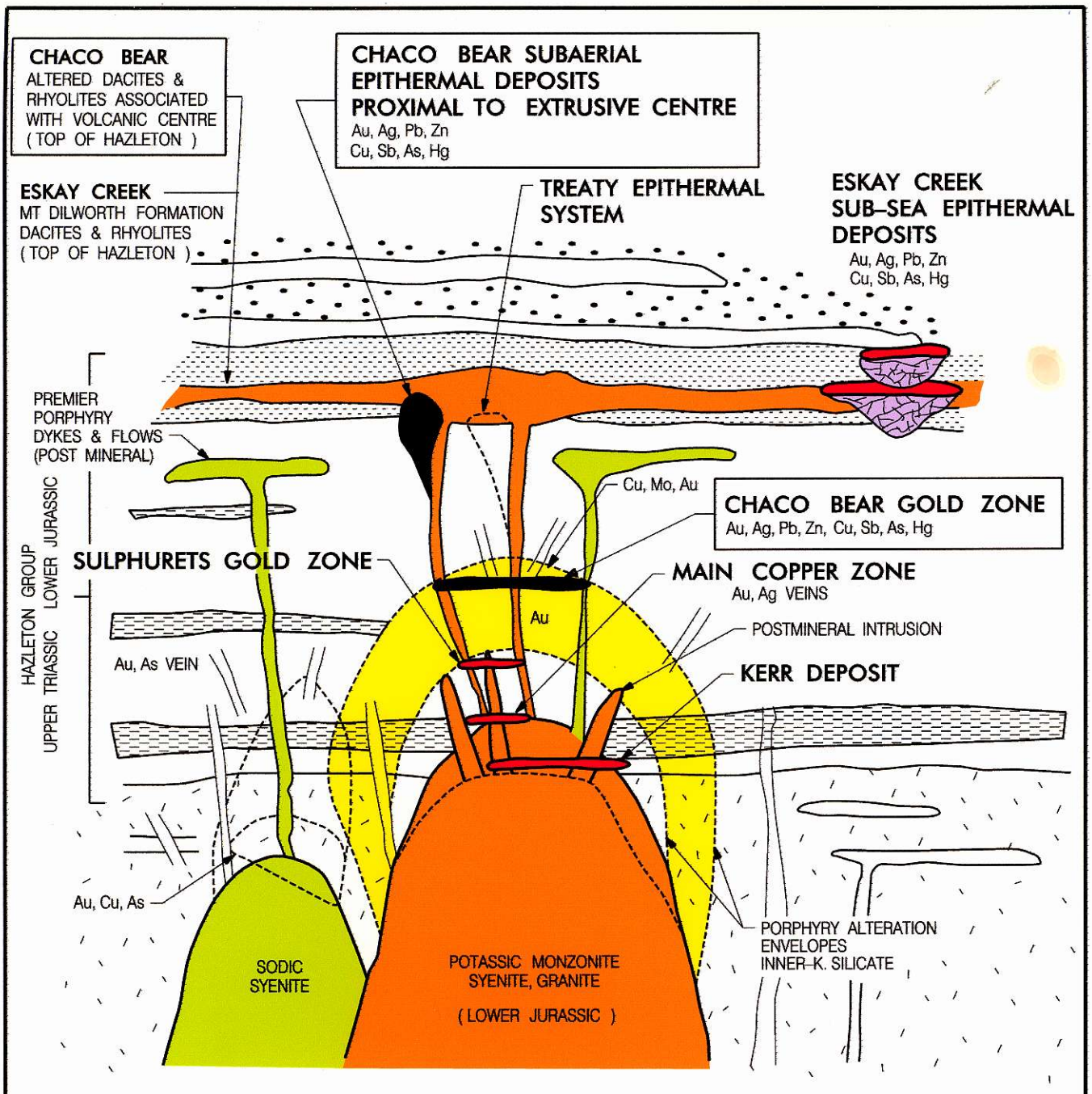
J. M. Ashton

Vancouver, British Columbia
October, 2002



SCHEMATIC STRATIGRAPHY AND SYN–INTRUSIVE, SYN–VOLCANIC MINERAL DEPOSITS

MODIFIED AFTER: KIRKHAM et al., 1991

FIGURE 1

808 EXPLORATION SERVICES LTD.

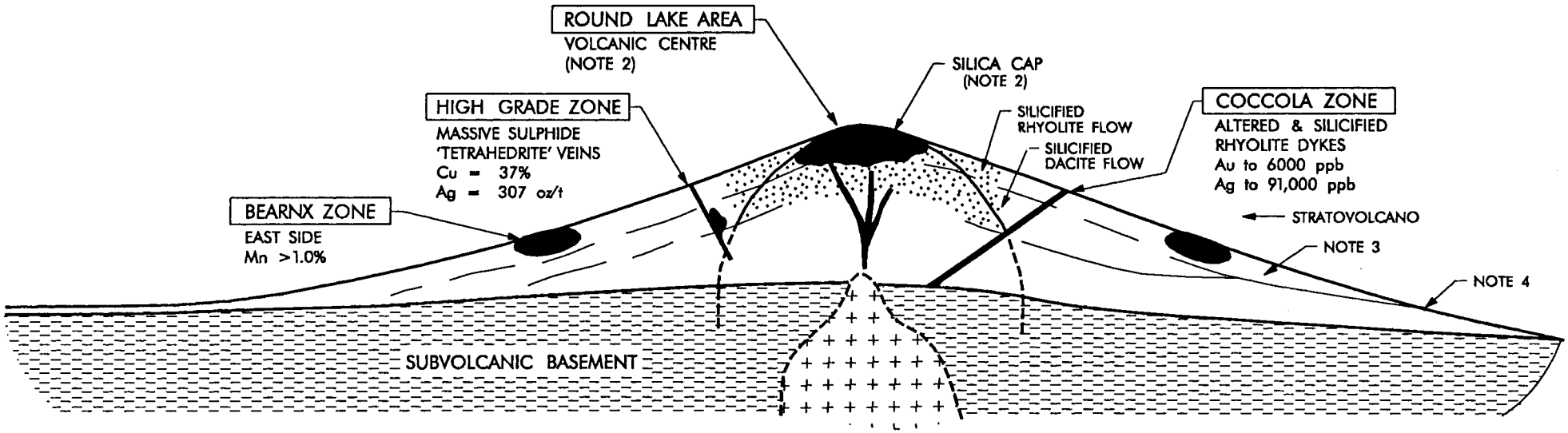
CHACO BEAR PROJECT

BRITISH COLUMBIA

GEOLOGICAL MODEL
CHACO BEAR GOLD ZONES IN COMPARISON WITH THE SULPHURETS GOLD CAMP

BY	J.M. Ashton	SCALE	AS SHOWN
DRAWN	E.B. Catapia	DATE	MARCH 2002
CHECKED	J.M. Ashton	REVISED	

PLOTTED: $DATE$



LEGEND

ADVANCED SILICIFICATION & ALTERATION.

PRECIOUS AND BASE METAL VEINS, PIPES & LODES.

THERMAL SPRINGS AND MANGANESE DEPOSITS.

NOTES

1. SURFACE CHARACTERISTICS SHOWN ARE FROM GEOLOGICAL OBSERVATIONS & ARE APPROXIMATELY TO SCALE.
2. VOLCANIC CENTRE, INTENSELY SILICIFIED; SILICIFIED RIBBON BANDED QUARTZ VEINS IN DACITE FLOW, CHAOTIC FLOW BANDING, AREA 1000FT x 2,600FT ANOMALOUS IN SILVER.
3. EXTENSIVE SILICIFIED ALTERED RHYOLITE FLOWS CONTAINING LEUCOGRANITE CLASTS.
4. STREAM SEDIMENT GEOCHEMISTRY HIGHLY ANOMALOUS IN Au+Ag+Sb+As+Hg & Cu, Pb, Zn, Ag, Ba.

REFERENCES:

FIGURE 2, MINERAL DEPOSIT AREAS
FIGURE 3, GEOLOGY

500 0 500 1000 1500m

HORIZONTAL BAR SCALE

AFTER: SILLITOE, R.H., ECONOMIC GEOLOGY VOL. 70, 1975, pp 1190-1201

FIGURE 4

808 EXPLORATION SERVICES LTD.

CHACO BEAR PROJECT

VOLCANIC CENTRE SCALE MODEL
WITH PORTENDED
EPITHERMAL Au & Ag DEPOSITS

By:	JMA	SCALE	AS SHOWN
DRAWN	EBC	DATE	MARCH 2002
CHECKED	JMA	REVISED	

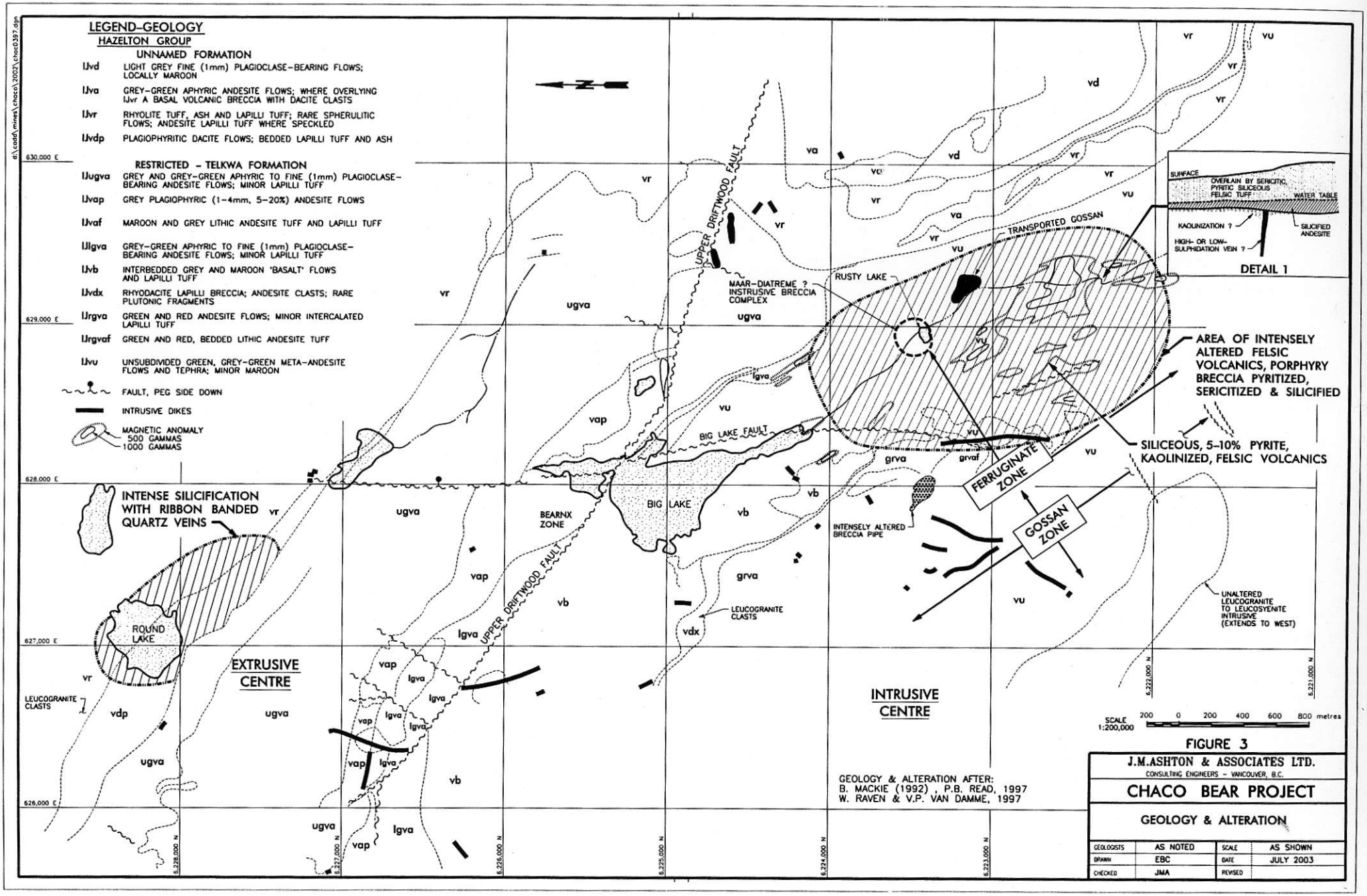


FIGURE 3

J.M.ASHTON & ASSOCIATES LTD.
CONSULTING ENGINEERS - VANCOUVER, B.C.

CHACO BEAR PROJECT

GEOLOGY & ALTERATION

GEOLOGISTS	AS NOTED	SCALE	AS SHOWN
DRAWN	EBC	DATE	JULY 2003
CHECKED	JMA	REVISED	