# Report for Assessment Work Credit

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**Drilling Programs** 

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MORRISON PROPERTY Roli 1 Claim

Gold Commissioner's Office VANCOUVER, B.C. (March 1, 2002 – August 15, 2002)

# **OMINECA MINING DIVISION** BABINE LAKE AREA, BC

**VOLUME 1 of 4** 

Latitude 55°11'N

NTS 93-M-01W

Longitude 126°18'W

### PACIFIC BOOKER MINERALS INC.

#1702 - 1166 Alberni Street Vancouver, BC, V6E 3Z3

Date Submitted: 14 November, 2002 GEOLOGICAL SURVAMORDANCE ASSESS David Hladky, Geol.



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Appendix A Drilling: Logs

Appendix B Assay Certificates

# **FIGURES**

Location Map
 Claim Map: Morrison Claims
 Regional Geology Map
 Drill Hole Location Map
 Cross Sections 9180N and 9300N
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 In Pocket

### Volume 2

Drill Logs Holes M0-01-63 to M0-02-72

### Volume 3

Drill Logs Holes M0-02-73 to M0-02-82

### Volume 4

**ACME Assay Certificates** 

Recommendations:

Recommendations for future exploration on the Morrison property are as follows:

1. Complete pre-feasibility drilling and an in-house scope study including an ore resource estimate using computer generated ore polygons. Proceed with feasibility study with Snowden Mining Industry Consultants.

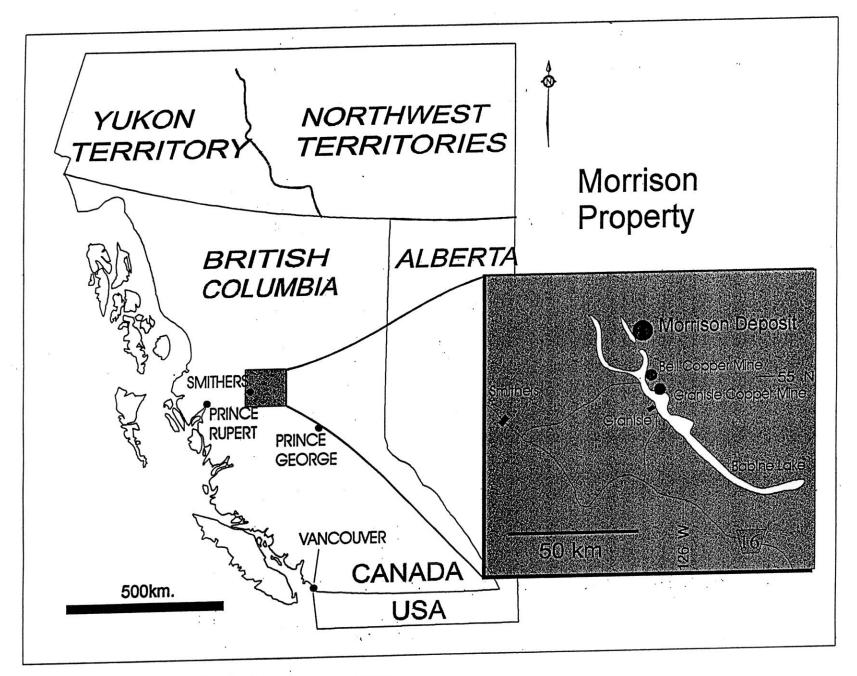
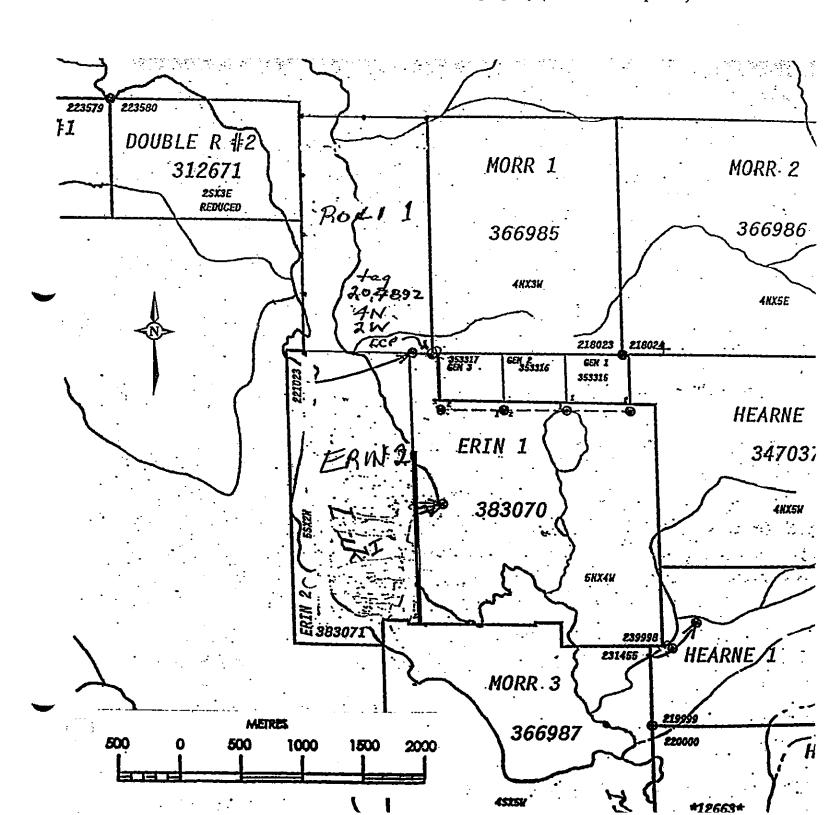


Figure 1: Location map for the Morrison property.



Figure 2: Claims map of the Morrison property (93 M/01 W mapsheet).



### 1. Introduction

The purpose of this report is to describe results of drilling programs completed by Pacific Booker Minerals Inc. (formerly Booker Gold Explorations) at the Morrison Property from March 1, 2002 – August 15, 2002. The basic physiographic details of the claim are:

### 1.1 Location and Access

The Morrison deposit is situated in the Babine Lake region of the Intermontane Belt of central British Columbia (Fig. 1), at latitude 55E11'N and longitude 126E18'W. The Morrison/Hearne Hill Property is 30 km due north of the Village of Granisle which was originally built to service the Granisle and Bell Mines.

The Granisle Mine ceased production in 1982 and all surface facilities have been removed. Production ceased at the Bell Mine in 1992 and the minesite has been decommissioned.

Access to the property is by means of paved provincial Highway 321 (Topley - Granisle) to Michelle Bay. Then by barge (no charge) across Babine Lake to Nosebay (approximately 20 minutes). A network of main haulage logging roads (principally the Hagen along the east side of Babine Lake) provides access to the Morrison Property (approximately 38 km from the barge).

# 1.2 Topography

The Babine Lake region forms part of the rolling uplands of the Nechako Plateau within the Intermontane Belt of central British Columbia (Fig. 1). Oligocene to Recent block faulting dissected the region into a basin and range morphology consisting of northwesterly-trending ridges and valleys. The major depressions are filled with long, narrow and deep lakes, the largest of which is Babine Lake. Morrison Lake lies to the northwest of Hatchery Arm of Babine Lake and occupies the same valley. Elevations range from 733m on the shore of Morrison Lake, (i.e. in the basin) to 1380m on Hearne Hill (i.e. the Range). The eroded scarp of the Morrison Fault forms the western flank of the Morrison graben.

#### 1.3 Claim Details

The claim of the Morrison Property on which the work was conducted:

Claim Name	Tenure Number	Expiry Date
Roli 1	390461	October 11, 2007

# 2. History of Exploration at Morrison

The Morrison Lake area was first explored in the early 1960s during the initial rush of exploration to the Babine region. Regional stream sediment sampling in 1962 by the Norpex Group of Noranda Exploration Company, Limited led to the discovery of the Morrison deposit in 1963 with critical early work by L. Saunders, R. Woolverton and D.A. Lowrie (Woolverton, 1964).

During the follow-up in 1963 of copper-anomalous stream sediments that were collected in 1962, copper-bearing BFP float and exposures were found by employees of Noranda Exploration Company, Limited in the stream that flows over the copper zone (Figs. 2, 3). Trenching of the thin overburden uncovered relatively unweathered chalcopyrite-bearing bedrock in large areas on both sides of the stream, where soil samples were anomalous.

Ninety-five diamond holes, most oriented east or west with dip 45E, were drilled from 1963 to 1973. The first 65 holes were AEX diameter. The remaining 30 were BQ diameter. Induced polarization surveys were not definitive, because of widespread pyrite. However, the BFP intrusions, including portions of the BFP plug, were known to contain abundant magnetite; therefore, magnetic surveys were used as a guide in the early drilling. By 1968, a sub-economic deposit had been outlined that consisted of two zones totaling about 55 million tonnes averaging 0.42% copper. The zones are immediately northwest and southeast of the small central pond (Fig. 3), and their positions correspond closely to strong geochemical and magnetic anomalies.

Geological mapping done in 1963 and 1967 had indicated the possibility that the two zones might be parts of a single faulted deposit. Hydrothermal alteration studies initiated in 1967 showed that the deposit had well-defined biotite-chlorite zoning and that biotitization was very closely related to copper grades. Although data were sparse, biotitization in the large poorly tested area between the two known zones appeared to be widespread and strong, indicating that this area was probably underlain by additional +0.4% copper mineralization. Drilling in 1970 to test the central area, succeeded in joining the portions of the faulted copper zone and increased the known tonnage of the deposit from about 55 to 86 million tonnes.

The Morrison copper zone and peripheral hydrothermally altered rocks have resisted erosion by glaciation more than the surrounding unaltered rocks. The altered rocks occur in an elevated, thinly mantled, roughly elliptical plateau 60-90 metres above the level of Morrison Lake. This plateau is bisected by a north-south gully carved along the East Fault, and is surrounded by areas of shallow to very deep glacial overburden (Fig. 3).

It is significant to note that following the 1973 drill program, Noranda did no further field work at Morrison. Pit design studies were carried out in 1988 and 1990 to establish whether Morrison could supply feed to the Bell Mine, but no further drilling was done on the property until Booker Gold Exploration (now Pacific Booker Minerals Inc.) initiated a

2 Phase exploration program in 1998. The main features of each phase were as follows (as per Assessment Report # 26410):

### Phase I

This phase consisted of 11 strategically located diamond drill holes (MO-01 – MO-11), drilled during the period January 1998 to July 2000. Large size NQ thin-wall core provided optimum core recoveries and representative sample material to confirm and validate the copper grades from the Noranda drilling, and also to determine the potential gold, silver and molybdenum distributions for the deposit. A number of the holes were designed to test and define the potential depth and possible extensions of the mineralization.

A till geochemical survey was completed over the Morrison claim block to evaluate the geochemical signature over the Morrison deposit, and to determine if extensions to the known deposit and other nearby targets could be defined.

Trenching along old trenches and access roads with a backhoe was completed with the objective of exposing continuous bedrock to facilitate geological mapping and sampling.

Geological interpretation and deposit modeling based on the Noranda data were completed to evaluate an approximate resource estimate and to identify potential extensions to the known deposit.

### Phase II

Based on results of Phase I drilling and additional trenching information, 12 diamond drill holes (MO-12 – MO-23) were drilled during the period from August to November 2000. Drilling defined the western and northern limits of the copper zone for the central sector of the deposit. Diamond drill holes at the northwest sector of the deposit have defined the major northerly-trending West Fault that offsets the deposit with a relative right-hand movement. Very well-mineralized breccia zones alongside of this fault were encountered with the best intersection grading 0.75% Cu and 3.74 g/t Au over 8.8 m.

An IP survey was completed over the northwest sector of the deposit area where favorable potential for extensions to the deposit was indicated. The survey was also conducted to possibly define the boundary between the copper zone and the pyrite halo. The survey was contracted to Peter E. Walcott & Associates Ltd.; the survey and results are covered in a report entitled AA Geophysical Report on Magnetic and IP Surveys, Feb. 2001.

Trenching along the old Noranda Road that peripherally skirts the west and southwest side of the Morrison deposit exposed a series of weakly mineralized, northerly-trending BFP dyke-like bodies. Drilling across this assemblage with holes MO-00-21 and MO-00-22 confirmed that the mineralized zone is within the pyrite halo with associated weak copper mineralization.

### Phase III

The re-drilling of the deposit, Phase III, commenced in July, 2001 and was completed in July, 2002. A total of 58 holes (MO-01-24 to MO-02-82) totaling 15,825 metres was drilled on an approximate 60-metre pattern in this phase. As a result of this program the Morrison deposit has been systematically defined to its lateral and vertical extents, and a reliable geological and assay database has been assembled and compiled.

### 3. Regional Geology

The Morrison deposit is situated on the northern edge of the Skeena Arch in a region underlain by volcanic, clastic and epiclastic rocks ranging in age from Lower Jurassic Telkwa Formation to Lower Cretaceous Skeena Group. This sequence of rocks has been cut by a northwest trending series of faults that have created a long linear sequence of horsts and grabens. The rocks have been intruded by a variety of intermediate to felsic stocks, plugs and dykes of Eocene age (Richards, 1990).

During the Tertiary-Eocene period, BFP plugs and stocks of the Babine Igneous Suite were emplaced along major faults in a continental magmatic arc. Two orebodies (Bell and Granisle) and numerous sub-economic deposits occur as porphyry copper deposits that are temporally and spatially associated with the Babine Igneous Suite intrusions (Carson and Jambor, 1974).

# 4. Property Geology

### 4.1 Lithology

The following description of the geology of the Morrison Property is largely based on the detailed petrographic studies by Carson and Jambor (1974), for the most part, the geological descriptions are taken directly from their document. Geological information from regional mapping by MacIntyre et.a. (1997-1) and field investigations by Pacific Booker Minerals Inc. complement the studies by Carson and Jambor.

### 4.1.1 Jurassic Sedimentary Rocks

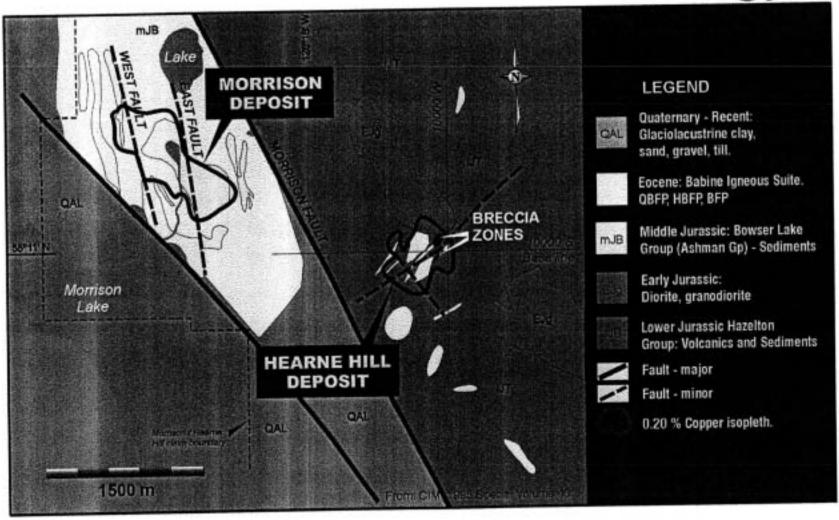
Host rocks for the BFP intrusions at Morrison are siltstone, silty argillites and minor conglomerates of the Upper Jurassic Ashman Formation.

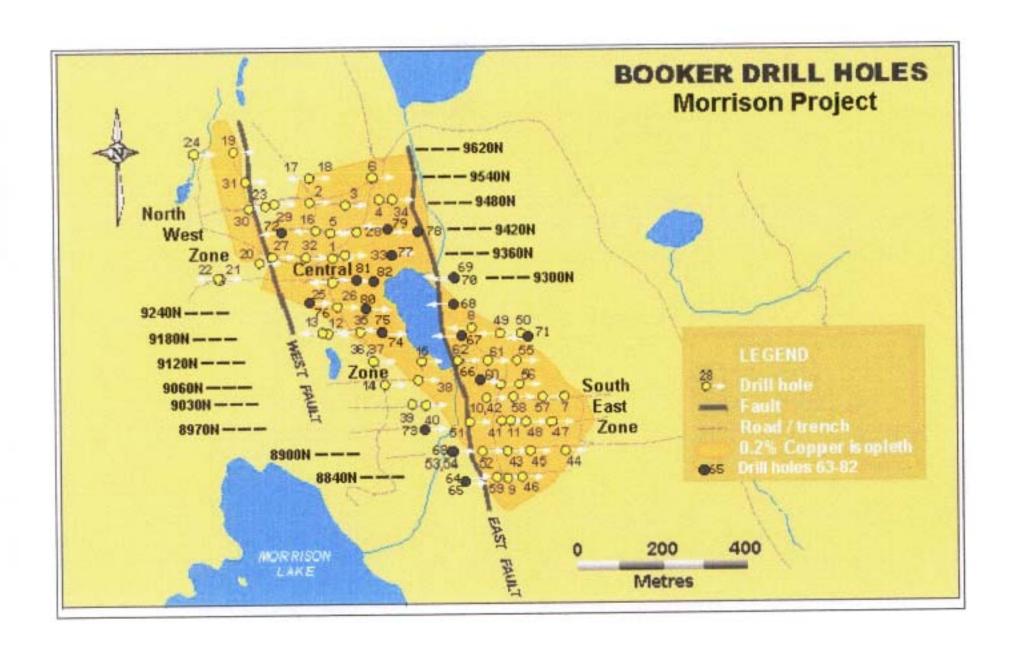
In most localities on the Morrison Property, the Ashman rocks are massive and strongly altered, and bedding is usually not visible. Where observable, bedding generally strikes northerly to northwesterly and dips steeply.

The siltstones and silty argillites are fine to medium grained and consist largely of a hetero-geneous mixture of detrital quartz, feldspars, and volcanic and sedimentary rock

# Morrison Project

# Project Geology





fragments. The overall appearance and mineralogy of these rocks depend largely on their location in the Morrison alteration zones. Fawn or medium grey colours and observable clastic textures are characteristic of rocks with considerable introduced carbonate in the outer portions of the property. Some siltstones are poorly indurated; some are shaly. The rocks become darker greyish-green and fawn, indurated, chlorite-carbonate-rich greywackes and argillites as the copper zone is approached, and are dark grey and jet-black biotitized varieties in the copper zone.

Conglomerates have been observed at a few localities such as in the creek near the old Noranda campsite. These conglomerates are light grey to fawn-coloured rocks that contain rounded pebbles of cherty, dacitic and andesitic rocks.

Throughout the entire property, the Hazelton sedimentary rocks are cut by abundant BFP dykes and sills.

### 4.1.2 Eocene Rhyodacite

Widespread rhyodacite dykes in the Babine area are believed to be co-magmatic with the BFP intrusions. At Morrison, light tan-coloured, medium- to fine-grained rhyodacite dykes with aplitic textures occur at a few localities. They are leucocratic rocks composed almost entirely of quartz, albite and K-feldspar. At some localities, the dykes have a fine to coarse breccia texture in which aplitic fragments are contained in a very fine grained siliceous matrix.

### 4.1.3 Eocene Biotite (Hornblende) Plagioclase Porphyry (BFP)

The BFP at Morrison is similar to BFP at other Babine porphyry copper deposits. A complete description of this rock, including chemical and microprobe analyses, is given by Carson and Jambor (1974).

The main BFP pluton at Morrison is a faulted plug, with nearly vertical contacts, which occupies a northwesterly oriented elliptical area of 900 by 150-300 metres. Before faulting, the plug was roughly circular in plan, with a diameter of about 500 metres. Numerous offshoots of the plug, many of which are northerly trending dykes or sills, occur everywhere in the Hazelton sedimentary rocks. The offshoots vary in width from less than 1 metre to greater than 500 metres. Most BFP contacts are sharp. Angular inclusions of siltstone have been observed in only a few localities.

Unaltered BFP is speckled with abundant 1/4 to 5-mm phenocrysts of plagioclase (zoned oligoclase-andesine), biotite and hornblende in a fine-grained matrix of the same materials as well as quartz and K-feldspar. Apatite and magnetite are common accessory minerals. At Morrison, all rock exposures are altered, and hornblende phenocrysts in particular have been largely replaced by hydrothermal chlorite or biotite. Compositionally, Morrison BFP is equivalent to quartz diorite porphyry (dacite porphyry).

At Granisle, many phases of BFP intrusions are evident from cross-cutting relationships among slightly different-appearing types of BFP and from the occurrence of fragments of one type or another in breccia pipes (?) and intrusive breccias. Such features are seen most clearly during close examination of rock faces in the pit. At Morrison, the plug is known to contain a large number of phases of BFP. Their presence is indicated by the occurrence of varieties of BFP that have contrasting abundances of phenocrysts and of groundmass grain sizes. Some of these BFP variations occur over distances of only a few metres, and in a few cases intrusive contacts have been observed in drill cores.

Part of the variation in appearance of BFP is due to superimposed hydrothermal alteration. BFP in the chlorite-carbonate zone is typically a greenish grey speckled rock with phenocrysts of pale grey plagioclase, pale green chloritized hornblende and books of unaltered brown biotite. In the weak, outer part of the biotite zone, the rock is darker greyish green. In the inner, stronger biotitized part of the copper zone, BFP is dark grey to black, and speckled with distinct unaltered white plagioclase phenocrysts and books of black biotite.

### 4.1.4 Post-Mineral Andesite Dykes

Light green, very fine grained to aphanitic, weakly altered dykes ranging in width from 1/3 to 2 metres have been encountered in a few drill holes. The dykes are andesitic and contain widely scattered 1/2 to 1-mm phenocrysts of plagioclase, hornblende and biotite. These intrusions, possibly a late-stage, relatively mafic type of BFP, are barren of copper. Hole Mo-00-8 ended in an andesite dyke at a depth of 311.45-326.44 m i.e. at least a 14.99 m intersection. Since the hole has a steep dip of approximately 72E, the intersection does not represent the true width of the dyke.

#### 4.2 Structure

The Morrison deposit occupies the central part of a major graben that is a component of the regional northwesterly-trending block-fault system of the Babine area (Carter, 1973; Richards, 1974). The western bounding fault is believed to be along Morrison Lake, and the eastern fault is about 0.8 km east of the property. Within this graben, Upper Jurassic Ashman Formation, and the Cretaceous Sustut Group which crops out 3 km to the northwest of the Morrison deposit have been down-faulted and preserved from erosion.

The most prominent structure at Morrison is the north-northwest-trending East Fault, which bisects the BFP plug and copper zone (Fig. 3). The fault is apparently vertical and has a relative right-hand movement of approximately 300 metres. The vertical displacement, although unknown, is believed to be considerable. Rather than a single break, the East Fault is a linear zone of parallel shears and fractures. The zone averages about 25 metres in width, but ranges from 50 metres in its central portion to only a few metres at its extremities. The West Fault also shows right hand horizontal movement of approximately 100m. It is also considered to be either vertical or steeply dipping.

Along their entire lengths, the Morrison faults are marked by intense clay-carbonate alteration and well-defined zones of carbonate-cemented gouge and breccia. Northwesterly-trending streaks and patches of clay-carbonate alteration found elsewhere in the BFP plug and surrounding rocks are believed to have developed along minor shears and fractures that formed along contacts and bedding planes during movements along the Morrison faults.

Mineralized fractures, 2 to 10 cm apart, are exposed in trenches and outcrops. The fractures have a great variety of orientations, but tend to dip steeply and trend northerly, parallel with the strike of the Ashman sedimentary rocks, and the Morrison faults.

Major fold structures have not been observed at Morrison. Although the strike of the sedimentary rocks appears to be mainly north-northwesterly, some argillaceous siltstones and conglomerates at the southern end of the property strike east-northeast to east-southeast and dip steeply. This suggests that the BFP plug may be localized in the north-northwesterly trending isoclinal fold, the nose of which is at the southern end of the property.

### 4.3 Mineralization and Hydrothermal Alteration

### 4.3.1 Copper Zone

The Morrison copper zone is a vertical annular cylinder that conforms to the shape of the BFP plug and is disrupted by the East and West Faults. The copper zone is defined by external and internal boundaries that mark the limits of lithologic units with copper content consistently greater than 0.2% copper. In most places, the external boundary is relatively sharp and copper content declines outward to less than 0.1% within about 40 metres. The low-grade core averages between 0.15 and 0.2% copper. Between the internal and external 0.2% isopleths, copper increases fairly regularly to form a higher-grade annulus. In the annulus, which is 15 to 150 metres wide, copper exceeds 0.5%. Molybdenum averages approximately 0.01% and gold and silver averages 0.3 gram per tonne and 3 grams per tonne, respectively. Spotty occurrences of galena and sphalerite, in carbonate-cemented brecciated veins within and near the faults and in smaller parallel shears, contribute to relatively high, but uncommercial, values of lead and zinc.

At Morrison, all copper sulphides are primary. Chalcopyrite is the main copper-bearing mineral. It is distributed partly as fine grained disseminations in the BFP and peripheral sedimentary rocks and partly as fracture-filling stockworks, with or without quartz, in which the chalcopyrite occurs as coarse grains (1 - 3 mm). Bornite occurs within the higher grade copper zones, as disseminations and associated with quartz-sulphide stockwork style of mineralization.

### 4.3.2 Pyrite Halo

A pyrite halo is developed in the chlorite-carbonate altered wallrock that spatially bounds the copper zone. The pyrite mineralization characteristically occurs as thin (0.1 to 5.0 cm) fracture-fillings and quartz-pyrite-minor chalcopyrite stringers in the form of stockwork within the halo. There is a crude zonation to the pyrite development with coarse (0.5 to 5.0 mm) disseminated crystals commonly occurring and complementing the stockwork style of mineralization within the inner parts of the halo immediately peripheral to the copper zone where pyrite content ranges from 5 to 15% by volume. Pyrite in the outer zone is predominantly developed as a stockwork and averages 1 to 2% by volume. Copper mineralization is weakly developed in the pyrite halo, and in the outer zone, it averages about 0.05% copper.

The pyrite halo is developed as a more extensive zone around the eastern and southeastern segment of the Morrison deposit. Drilling and geophysical surveys indicate that the halo at this position attains widths up to 500m with up to 15% pyrite for the inner margin and decreasing abruptly to 1 to 2% in the outer two thirds of the halo. The pyrite halo is more restricted at the western and northwestern segments of the deposit where pyrite abundances decrease more gradually to the 3 to 5% range. The siltstone host rock at this location is intruded by large northerly-trending BFP and rhyodacite dykes.

### 4.3.3 Sulphide Mineralogy and Zoning

Chalcopyrite and pyrite are the main sulphides at Morrison. Minor to moderate amounts of bornite at a few places in the copper zone contribute significantly to copper grades. However, most of the high-grade sections owe their copper content solely to chalcopyrite. Most of the chalcopyrite occurs along thin seams and veinlets with or without quartz and biotite, but notable amounts of the sulphide are also finely disseminated in the BFP and sedimentary rock units.

Very minor molybdenite occurs in some chalcopyrite-pyrite seams and as minute disseminated flakes in the copper zone, which averages about 0.01% molybdenum.

Though pyrrhotite and marcasite occur in only minor quantities at Morrison, these minerals are more abundant than at the Bell and Granisle deposits. Pyrrhotite occurs almost exclusively in the pyrite halo, but the quantity present is unrelated to the percentage of pyrite present. Marcasite is most commonly associated with pyrite, arsenopyrite, galena, sphalerite, geocronite and boulangerite. These minerals occur with quartz and carbonate in small vuggy veinlets and pockets in minor faults and in the clay-carbonate-altered rocks of the fault zones.

Detailed polished-sections indicate that pyrite and chalcopyrite have a well-defined zonal relationship. Although pyrite predominates in the pyrite halo, the 0.2% copper isopleth precisely marks a change in pyrite-to-chalcopyrite ratios; chalcopyrite consistently exceeds

pyrite in samples only from the inside of this boundary. Although the absolute abundance of pyrite decreases toward the centre of the Morrison deposit, disseminated grains of pyrite persist throughout the copper zone and in the low-grade core.

Polished-section studies have also shown that, in addition to chalcopyrite and pyrite, magnetite and minor bornite are present in the low-grade core of the deposit. Magnetite is confined to the low-grade core and the copper zone; that is, the area enclosed by the outer 0.2% copper isopleth. The mineral is a finely disseminated original constituent of the BFP and siltstones, and is most abundant in the western segment of the copper zone. Many magnetite grains are partly altered to hematite, which seems to be most abundant at the outer 0.2% boundary. No iron oxides have been observed in the pyrite halo.

### 4.3.4 Hydrothermal Alteration

Hydrothermal alteration at Morrison is similar to that at Granisle and other Babine porphyry copper deposits (Carson and Jambor, 1974). The copper deposit is within a centrally located biotite zone, the quality of which decreases outward. Surrounding the biotite zone is a chlorite-carbonate zone. Intense clay-carbonate alteration is associated predominantly with the faults and related shears. Minor amounts of well-crystallized chlorite occur in the biotite zone, mainly as veinlets and crystal clusters. Finer, less strongly crystallized chlorite is common in the weak outer part of the biotite zone, and abundant chlorite that occurs mainly as pseudomorphs after hornblende characterizes the chlorite-carbonate zone.

As is evident from the above, the biotite-to-chlorite ratio increases as the copper zone is approached from the outer margins. The crystallinity of both minerals also increases inwards to the core of the copper zone

The three types of phenocrysts in BFP, namely biotite, hornblende and plagioclase, possess distinctly different susceptibilities to alteration. Biotite phenocrysts were relatively stable and remained largely unaltered both in the chlorite-carbonate and biotite zones. Only in the most intensely biotitized rocks are phenocrysts partly replaced on their rims by finer hydrothermal biotite. In contrast to biotite, hornblende phenocrysts were very sensitive to hydrothermal alteration. Their replacement in the central copper-bearing area by hydrothermal biotite and in the peripheral areas by chlorite and carbonates, is the most diagnostic and useful feature of hydrothermal alteration at Morrison and all Babine deposits. Within the biotite zone of the Morrison deposit, residual primary hornblende as well as hydrothermal amphibole of the tremolite-actinolite series is common.

Plagioclase phenocrysts are weakly flecked with kaolinite, sericite and carbonate in the outermost part of the chlorite-carbonate zone. However, this feldspar destructive alteration increases in intensity inward to the inner chlorite-carbonate zone, where some crystals are completely replaced; others are partly replaced in irregular patches or along cleavages and compositional zones. In the carbonate-deficient parts of the inner biotite zone, most

plagioclase is clear and unaltered. However, in some cases, unaltered phenocrysts occur adjacent to totally altered (sericite-kaolinite-carbonate) phenocrysts.

K-feldspar has been observed in very minor amounts in quartz-chalcopyrite-biotite veinlets in the inner + 0.3% copper portion of the copper zone. Its distribution coincides with the inner, stronger part of the biotite zone, which therefore corresponds to the classical potassic zones of other porphyry copper deposits.

Along faults and shears, clay-carbonate alteration is superimposed on the earlier biotitic and chloritic alteration phases. In the fault zones and at other localities of intense clay-carbonate alteration, biotite, hornblende and plagioclase phenocrysts and BFP matrix have been almost totally altered to kaolinite  $\pm$  montmorillonite, chlorite and mixtures of calcite, dolomite and, rarely, siderite. Pyrite is an additional alteration product of the mafic phenocrysts. At several localities where the streaks and patches of moderately intense clay-carbonate alteration are exposed in trenches, many can be seen to be parallel to the Morrison Fault, to most BFP dyke contacts and to the over-all strike of the Hazelton sedimentary rocks.

Disseminated fine-grained apatite is anomalously abundant in the BFP plug and in some large dykes. Veinlets and pockets of coarse apatite-biotite-bornite-chalcopyrite, such as those that occur at Granisle, have not been found at Morrison. Gypsum has been observed at places in the copper zone. Very minor amounts of tourmaline were observed in thin sections of BFP and siltstone at four localities near the western edge the copper zone. Minor epidote is found in all parts of the property, but is most common in the outer chlorite-carbonate zone. Minor amounts of sericite are also present in most localities. Moderate amounts of sericite, accompanied by carbonates, occur in the southern third of the large rhyodacite dyke and in some siliceous sedimentary rocks in the southeastern part of the pyrite halo.

As is evident from the above, hydrothermal zoning at Morrison, like copper zoning, is relatively uniform. Except for superimposed, structurally controlled clay-carbonate alteration, there are no significant reversals in the mineralogy.

### 4.4 Geological Evolution

Evolution of the Morrison porphyry copper deposit seems to have occurred in the following stages.

- 1. **Emplacement of BFP** During Eocene block-faulting, the multi-phase BFP plug and peripheral dykes and sills were intruded into steeply dipping Jurassic sedimentary rocks. The emplacement occurred in a graben.
- 2. Magmatic Crystallization and Hydrothermal Effects Sharp contacts between different varieties of BFP within the plug indicate partial or complete solidification of one

phase prior to injection of another. The survival of the distinctly annular shape and regular grade-zoning show that the copper deposit did not undergo repeated disruptive pulses of intrusion, and must therefore, have formed after most BFP had been emplaced. In rare cases, adjacent phases of BFP exhibit different intensities of biotitization and chloritization, so that hydrothermal alteration began, at least locally, before intrusion of all BFP ceased. Nevertheless, the zonally arranged, pervasive replacement of magmatic minerals, and the equally widespread occurrences of sulphide and alteration minerals in fractures, show that solidification of nearly all BFP had occurred before crystallization of the hydrothermal minerals, and before the development of sulphide-silicate zonal patterns. Within the alteration halo, specific sulphide mineral assemblages are inextricably allied with specific silicate alteration assemblages; thus, the sulphide zones and the silicate zones are most likely related genetically and temporally. Development of the entire porphyry system is considered to have taken place as a single episode, during which the sulphide and silicate zones formed contemporaneously. The biotite-copper zone was the focal part of the system. This concept of a static development of the major zones does not exclude the incursion of retrograde effects on the already established gross zonal pattern. Examples of such retrograde effects are the very minor chloritization of hydrothermal biotite and the occurrence of minor quartz sericite veinlets in the biotite zone. These incursion phenomena can be attributed to residual fluids reacting on the previously altered, but otherwise dormant, host rocks.

- 3. Initial Offset of the Copper Zone and Late Hydrothermal Activity Repeated movements along the East and West Faults, possibly as a consequence of continued regional faulting, caused noticeable separation of parts of the copper zone and pyrite halo. The absence of significant distortion in the zonal patterns of the sulphides and principal hydrothermal alteration assemblages indicates that these formed prior to major displacement along the faults. However, clay-carbonate alteration and associated pyrite-arsenopyrite-marcasite-galena-sphalerite + chalcopyrite veinlets and masses were superimposed on the earlier assemblages along the Morrison Fault Zone and in numerous small subsidiary shears throughout the copper zone and pyrite halo. The widespread distribution of this distinct sulphide-silicate assemblage suggests strongly that it is a late-stage derivative of the porphyry copper system. If so, an undetermined increment of movement along the East and West Faults occurred prior to the complete cessation of hydrothermal activity.
- **4. Post-Mineral Faulting** It is probable that movement on the East and West Faults continued after late-sulphide deposition, and that some of the carbonate-cemented breccias represent fragments healed by carbonate-laden ground waters. The cumulative effect of the Fault movements is a relative right-lateral displacement of approximately 300 m on the East Fault, approximately 100 m on the West fault and a substantial vertical offset of unknown magnitude.
- **5. Erosion and Weathering** If post-Eocene supergene enrichment occurred at Morrison, its effects have been removed by later erosion and glaciation. Tertiary erosion and

Pleistocene glacial scouring exposed the copper zone and surrounding hydrothermally altered rocks. Post-glacial weathering was very minor. In a few places, exposed copper minerals were altered to malachite, brochantite and small amounts of an unidentified pale blue copper silicate. Some iron-bearing sulphides were altered to iron oxides and minor jarosite.

### 5. Exploration Program

### 5.1 Diamond Drilling

During the period from November 10, 2001 – November 10, 2002, 30 diamond drill holes were drilled with the primary objective of defining the configuration and potential economic limits for the deposit. Details of holes drilled by Pacific Booker Minerals Inc. during this period are shown in the following table.

Table 1
2002 MORRISON PROJECT DIAMOND DRILL SUMMARY

HOLE-ID	LOCATION	LOCATION	LOCATION	LENGTH	AZIMUTH	DIP	DATE	DATE
	[EAST]	[NORTH]	[ELEV.]				STARTED	FINISHED
MO-02-63	670775.63	6118905.36	801.92	345.95	90	-60	22-Mar-02	01-Apr-02
MO-02-64	670783.80	6118832.95	794.98	195.07	90	-60	01-Apr-02	08-Apr-02
MO-02-65	670784.06	6118833.00	795.18	291.08	90	-45	09-Apr-02	13-Арг-02
MO-02-66	670809.13	6119073.48	808.16	326.14	90	-55	13-Apr-02	16-Apr-02
MO-02-67	670772.74	6119180,86	806,66	281.94	270	-45	17-Apr-02	21-Apr-02
MO-02-68	670755.72	6119250,89	805.12	135.34	270	-60	21-Apr-02	22-Apr-02
MO-02-69	670761,06	6119313,84	808.91	301.75	270	-60	22-Apr-02	11-May-02
MO-02-70	670760.69	6119313.81	809,20	375.21	270	-45	11-May-02	17-May-02
MO-02-71	670931.86	6119183.43	849.99	349.00	270	-65	17-May-02	20-May-02
MO-02-72	670351.39	6119425.40	829.84	150.88	270	-45	20-May-02	22-May-02
MO-02-73	670676.56	6118962.11	798.50	372.19	90	-45	15-Jun-02	19-Jun-02
MO-02-74	670586.30	6119190.17	818.54	131.06	90	-45	20-Jun-02	21-Jun-02
MO-02-75	670582,95	6119188.51	818.85	160.02	270	-45	21-Jun-02	22-Jun-02
MO-02-76	670410.05	6119256,36	821.90	414.84	90	-45	22-Jun-02	27-Jun-02
MO-02-77	670604.16	6119368.57	805.63	180.75	90	-45	27-Jun-02	28-Jun-02
MO-02-78	670676.53	6119425.12	806.11	376.74	270	-45	28-Jun-02	03-Jul-02
MO-02-79	670601.79	6119429.15	810.89	329.18	270	-45	03-Jul-02	07-Jul-02
MO-02-80	670549.15	6119244.27	812.38	300.23	90	-45	07-Jul-02	11-Jul-02
MO-02-81	670523.77	6119309.96	808.29	280.42	270	-50	11-Jul-02	13-Jul-02
MO-02-82	670568.25	6119307.16	800.88	280.42	270	-60	14-Jul-02	16-Jul-02

Diamond drill logs and assay certificates are included in Appendix 1 and 2, respectively.

Drill core was logged in detail utilizing a Graphic Log format. Normally the core was logged in 3.05 m (10 ft) intervals to correspond with sample lengths. In addition to the geological core log, recoveries, RQD and fracture densities were recorded. Following the core logging, effectively the entire length of recovered core was split into two halves. One-half was bagged and tagged in plastic bags as a sample for shipment to the laboratory. The other half was replaced in the core box for reference and storage at the campsite.

Core samples were delivered to ACME Analytical Laboratories in Vancouver for preparation and analysis for Copper – Gold values.

The control program implemented for the drill program included a standard and duplicate procedure to ensure the accuracy of assaying procedures.

# 5.1.1. Results of Drill Program

The objectives of the 2002 drilling program at the Morrison Property were adequately achieved. In order of priority, the principal results are as follows:

The diamond drill programs confirmed the occurrences of broad zones of higher grade copper-gold mineralization within the system.

The mineralization has been confirmed to extend at depth below surface, and the limits of this mineralization have been defined by drilling for the south-east sector of the deposit.

The mineralized intersections from holes comprising the drill program are summarized in Table 2. Locations are shown on Figure 3.

TABLE 2

The 20 holes comprising the 2002 drill program are summarized in the following table. Locations are shown on Figure 3.

# MORRISON DEPOSIT SUMMARY OF DIAMOND DRILLING

Drill Hole	From	То	Intersection	Zone	Cu grade	Au Grade	Comments
	(m)	(m)	Length (m)		(%)	(g/t)	
MO-02-63	138.68	345.95	207,27	Cu zone	0.47	0.16	Southeast Zone
inc.	169,16	202.69	33.53		0.58	0.22	
inc.	263.65	318.52	54.87		0.67	0.21	
MO-02-64	2.50	77,72	75.22	Py halo	0.07	0.02	very weakly mineralized
	77.72	195.07	117.35	Cu zone	0.41	0.14	Southeast Zone
MO-02-65	7.25	56.39	49.14	Py halo	0.03	0.01	very weakly mineralized
	56.39	233.17	176.78	Cu zone	0.30	0.11	Southeast Zone
	233.17	291.08	57,91	Py halo	0.14	0.09	weakly mineralized
MO-02-66	5.20	24.00	18.80	E fault zone	0.30	0.27	
	24.00	26.45	2,45	E fault zone	1.15	10.55	massive sulfides vein
	26.45	91.44	64.99	Cu zone	0.36	0.36	Southeast Zone
	91.44	131.06	39.62	low grade core	0.15	0.08	weakly mineralized
	131.06	326.14	195.08	Cu zone	0.51	0.20	Southeast Zone
inc.	176.78	240.79	64.01		0.62	0.25	
							Central Zone from 126 to
MO-02-67	26.52	233.17	206.65	E fault zone + Cu zone	0,39		234m
inc.	111.25	126.49	15.24	E fault zone	1.17	0.73	
	233,17	281.94	48.77	Py halo	0.16	0.04	weakly mineralized
MO-02-68	16.45	60.96	44.51	E fault zone	0.30	0.09	
	60.96	76.20	15.24	E fault zone	0.34	1.25	• • • • • • • • • • • • • • • • • • •
	76.20	135.34	59.14	E fault zone	0.32	0.13	
MO-02-69	24.30	73.15	48.85	Py halo	0.07	0.05	very weakly mineralized
	73.15	301.75	228.60	E fault zone + Cu zone	0.36	0.22	Central zone from 105m
inc.	249.94	292.61	42.67	Cu zone	0,50	0.29	Central Zone
MO-02-70	30.48	54.86	24.38	Py halo	0.06	0.04	very weakly mineralized
	54.86	169.16	114.30	E fault zone + Cu zone	0.29	0.20	Central Zone from 75 to 169m
	169.16	187.45	18.29	low grade core	0.11	0.06	weakly mineralized
	187.45	375,21	187.76	Cu zone	0.40	0.29	Central Zone
inc.	254,51	294,13	39.62		0.62	0.33	
MO-02-71	2.00	65.53	63.53	Cu zone	0.35	0.11	Southeast Zone
	65.53	120.40	54.87	Py halo	0.13	0.04	weakly mineralized
	120.40	349.00	228.60	Cu zone	0.41	0.15	Southeast Zone
inc.	288.04	339.85	51.81		0.66	0,23	
MO-02-72	4.57	150.88	146.31	Py halo	0.17	0.14	weakly mineralized
inc.	92,96	102,70	9.74	W fault zone	0.44	1.36	massive sulfides vein
					· · · · · · · · · · · · · · · · · · ·		

Drill Hole	From	To	Intersect	Zone	Cu grade	Au Grade	Comments
	(m)	(m)	length (m)		(%)	(g/t)	
MO-02-73	15.90	129.54	113.64	Py halo	0.07	0.07	very weakly mineralized
	129.54	275.84	146.30	E fault zone + Cu zone	0.32	0.19	SE zone from 180m
inc.	220.98	275.84	54.86	Cu zone	0.38	0.21	
	275,84	372,19	96.35	Cu zone	0.53	0.21	Southeast Zone
inc.	318.52	372.19	53.67		0.60	0.21	
MO-02-74	3.05	21.34	18.29	Py halo	0.09	0.02	very weakly mineralized
	21.34	131.06	109.72	Cu zone	0.32	0.10	Central Zone
inc.	121.92	131.06	9.14		0.51	0.22	
MO-02-75	1.35	160.02	158.67	Cu zone	0.23	0.06	Central Zone, mineralized seds
MO-02-76	3.00	80.77	77.77	Py halo	0.20	0.12	weakly mineralized
	80.77	397.76	316.99	Cu zone + E fault zone	0.35	0.18	Central Zone, E fault from 376m
inc.	324.61	376.43	51.82		0.52	0.26	
	397.76	414.84	17.08	E fault zone	0.11	0.15	weakly mineralized
MO-02-77	23.90	153.92	130.02	Cu zone + E fault zone	0.24	0.19	Central Zone, E fault from 73m
inc.	117.35	153.92	36.57		0.35	0.28	
	153,92	180.75	26.83	Py halo	0.05	0.02	very weakly mineralized
MO-02-78	37.15	135.64	98.49	low grade core	0.19	0.11	weakly mineralized
	135.64	376.74	241.10	Cu zone	0.46	0.28	Central Zone
inc.	169.16	370.33	201.17		0.50	0.30	
MO-02-79	19.81	50.29	30.48	low grade core	0.11	0.07	weakly mineralized
	50,29	312,42	262,13	Cu zone	0.50	0.29	Central Zone
inc.	86.87	172.21	85.34		0.58	0.45	
	312.42	329.18	16.76	Cu zone	0.20	0.07	Central Zone, mineralized seds
AO-02-80	6.50	99.06	92.56	Cu zone	0.37	0.15	Central Zone
	99.06	211.84	112.78	Cu zone + E fault zone	0.46	0.24	E fault zone from 190m
inc.	99.09	147.83	48.74	•	0.55	0.25	
	211.84	227.08	15.24	E fault zone	0.10	0.06	weakly mineralized
	227.08	300.23	73.15	E fault zone + Cu zone	0.41	0.21	SW zone from 281.60m
MO-02-81	4.25	77.72	73.47	Cu zone	0.23	0.15	Central Zone
inc.	35.05	50.29	15.24		0.43	0.29	
	77.72	211.84	134.12	Cu zone	0.35	0.11	Central Zone
	211.84	280.42	68.58	Py halo	0.13	0.04	weakly mineralized
MO-02-82	7.00	82.30	75.30	low grade core	0.18	0.14	weakly mineralized
	82.30	280.42	198.12	Cu zone	0.45	0.25	Central Zone
inc.	82.30	128.02	45.72		0.56	0.44	
inc.	82.30	100.58	18.28		0.66	0.56	
	152,40	240,79	88.39		0,51	0.24	
inc.	187.45	224.03	36.58		0.57	0.19	
	263.65	296.58	32.93	py halo	0.12	0.05	weakly mineralized

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9. Statement of Expenditures: Morrison Property 1 March, 2002 to 15 August, 2002.

Drilling Diamond Drilling 1,000,000.00

TOTAL COSTS \$1,000,000.00

# 10.2 Certificate.

- I, David Hladky of Vancouver, British Columbia, do hereby certify that:
- 1. I graduated with an Honors B. Sc. in Geology from The University of Alberta, in 1997.
- 2. I have been active in the exploration industry continuously since graduation.
- 3. This report is based on field work and observations completed by myself over the past 13 months with Pacific Booker Minerals Inc..
- 4. I am a registered Member-In-Training with the Association of Professional Engineers and Geologists and Geophysicists of Alberta.

Dated at Vancouver, British Columbia this 14th day of November, 2002.

David Hladky, B.Sc. Geo. I. T.

Geologist

