

**MICROSCOPIC STUDY
OF
FOUR GRAIN MOUNTS**

FOR

Chris Graf, B.A.Sc, P.Eng.

**Bonanza Mining Corporation
P.O. Box 20
6242 Cartwright Street
Wardner, B.C. V0B 2J0**

Authored By:

McLeod Geological

J.A. McLeod, M.A.Sc.
1314 Phillips Avenue
Burnaby, B.C.
V5A 2Z3

Cell: 604-505-0311

Email: jmcleod1314@gmail.com

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MICROSCOPIC DESCRIPTIONS:

SAMPLE 1 (A0004532):

The sulphide content of this -10 mesh grain mount is visually estimated to be between 5 – 7% by area. The sulphides (opaques) are identified as follows:

Pyrite:	65%
Sphalerite:	25%
Galena:	10%
Chalcopyrite:	<1%
Bornite:	1 grain
Tennantite:	2-3 grains
Electrum:	2 grains
Graphite:	<1%

Pyrite occurs as grains of cubic to irregular form in aggregates up to 1.5 mm and grains all the way down to 0.1 mm. Sphalerite may also occur in aggregates or intergrown with pyrite and galena. The sphalerite grains are in the 0.05 – 0.7 mm size range.

Chalcopyrite is present as minute measles-like inclusions in sphalerite. This is also known as chalcopyrite disease. These grains are also in contact with sphalerite. Galena is included in pyrite and sphalerite. A grain of bornite is noted contacting sphalerite. Two grains of electrum are noted between 0.07 x 0.04 mm's in size. One is equant and one is a shear or vein like material.

The host is dominated by quartz in angular fragments up to 2 mm. Most is vein type quartz and show some shearing. Minor amounts of sericite, chert and sericite-chert are either as free grains or in contact with quartz.

SAMPLE 2 (A0004533):

The sulphide consists of approximately 5% by area of the -10 mesh grain mount.

The mineralogy is as follows:

Pyrite:	90%
Sphalerite:	8%
Chalcopyrite:	2%
Electrum (?):	1 grain (possible)

Pyrite grains range from 0.01 – 0.4 mm in size. The larger grains are more equant, unlike small grains which are seen to be irregular in shape and fragmental. Sphalerite grains are up to 0.1 mm when seen to be liberated but much of the sphalerite is included within pyrite. Chalcopyrite is as minute drop-like inclusions in pyrite and sphalerite. A possible grain of electrum, 0.014 mm in size is seen in pyrite. A few minute blebs of galena are noted in sphalerite in this section.

The host gangue is dominated by quartz grains and quartz fragments. A few grains of argillite are noted. As well, augened grains of quartz are seen elongated in sheared argillite.

SAMPLE 3 (A0004539):

The total opaque content (sulfides) in this section is approximately 4 – 5% by area. The sulfides are composed of:

Sphalerite:	50%
Galena:	35%
Pyrite:	10%
Chalcopyrite:	5%

Most sulfides are composite grains. However, pyrite tends to be more as broken and isolated grains. The combination of galena-sphalerite and chalcopyrite are often all seen as mutual intergrowths with one another. Although some Fe-oxides are noted, no other mineral species are seen. All opaque grains range from a top size of about 1 mm down to 0.01 mm in size. These sulfides are usually in a separated crushed quartz and sericite component of the rock which includes quartz grains of significant size that are well developed.

SAMPLE 4 (A0004549):

In thin section, less than 5% by area is seen to be sulfides. The sulfides consist of (by visual estimation):

Pyrite:	45%
Sphalerite:	35-40%
Galena:	15%
Chalcopyrite:	1-2%

One grain 0.015 x 0.020 mm is believed to be gold based on its optical properties.

Most sulfides are in a very fine grained quartz and quartzitic mixture. Often sulfides are in contact with coarser quartz grains and fragments consisting of coarse grains.

The sulfides are relatively well segregated with some inclusions of one in the other. The sulfide grains range from 1 mm in size down to a few tenths of a mm.

Pyrite is primarily as inclusions and exsolutions in sphalerite. Pyrite appears to be more liberated than the other sulfides and galena and sphalerite are often as intergrowths.

The gangue is dominated by coarse quartz grains and calcite. They may be in aggregates but all tend to be liberated. Lesser amounts of sericite are noted.

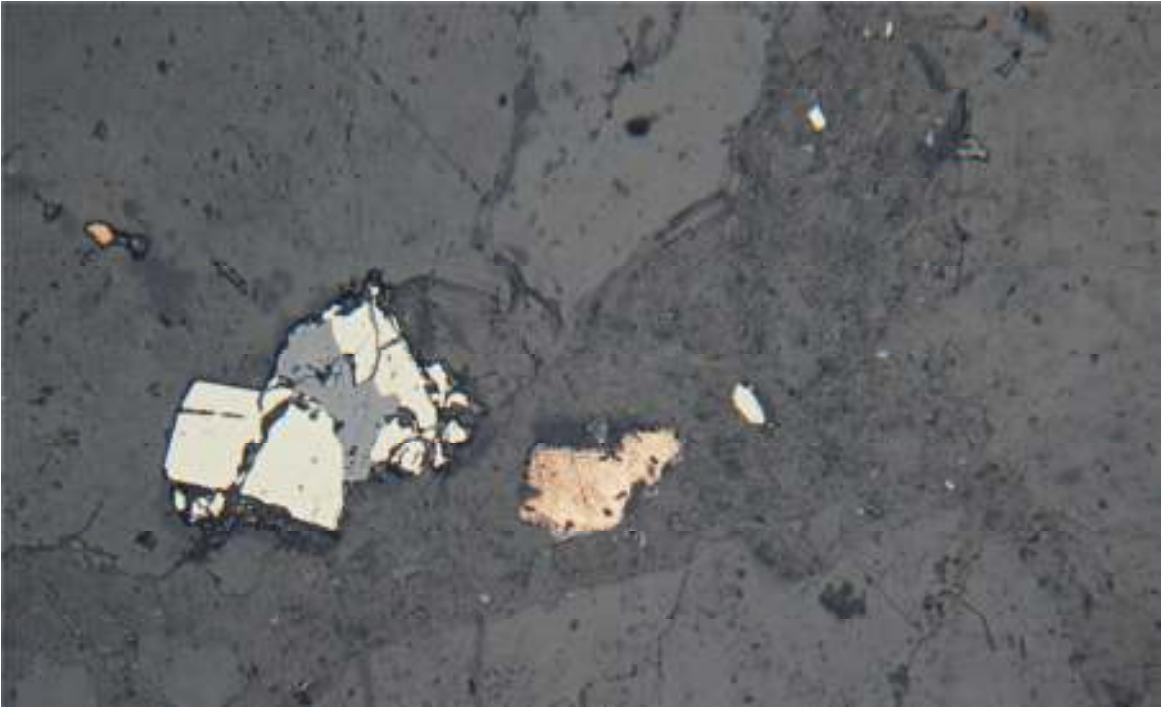
Sincerely,



J.A. McLeod, M.A.Sc.

JAM/skw
App. (photomicrographs)

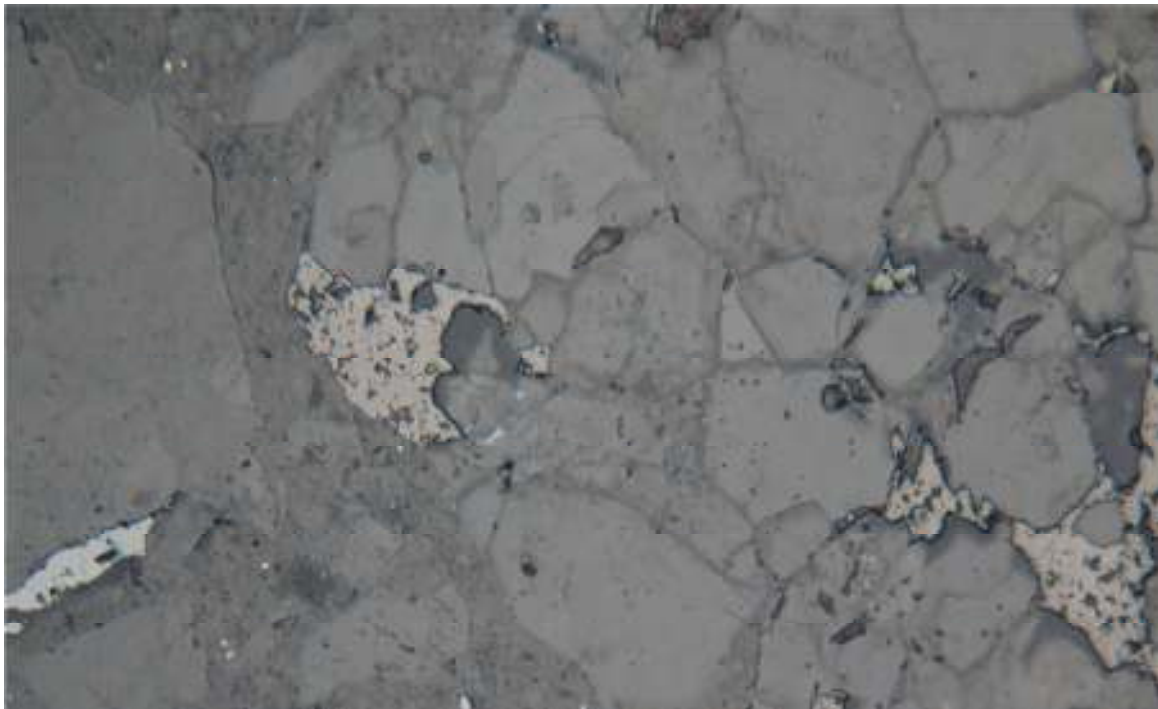
PHOTOMICROGRAPHS: BONANZA MINING CORPORATION



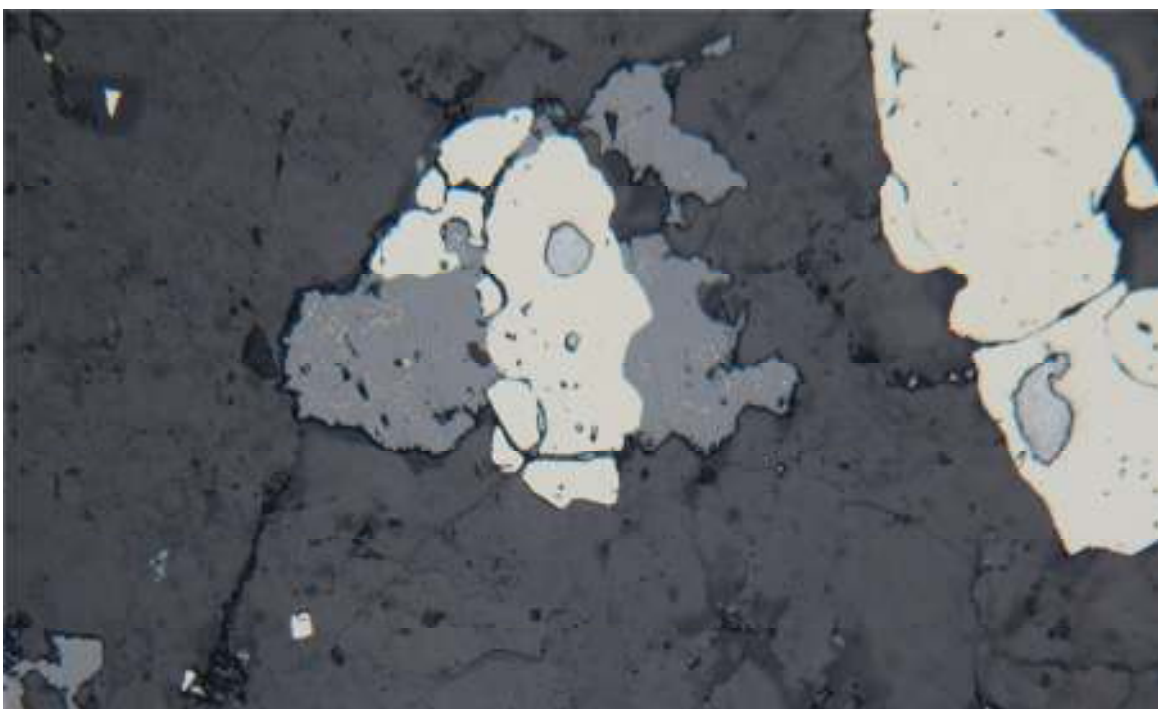
Sample 1. Gold-electrum, pyrite with sphalerite and tiny chalcopyrite. Field of view =1.35 mm.



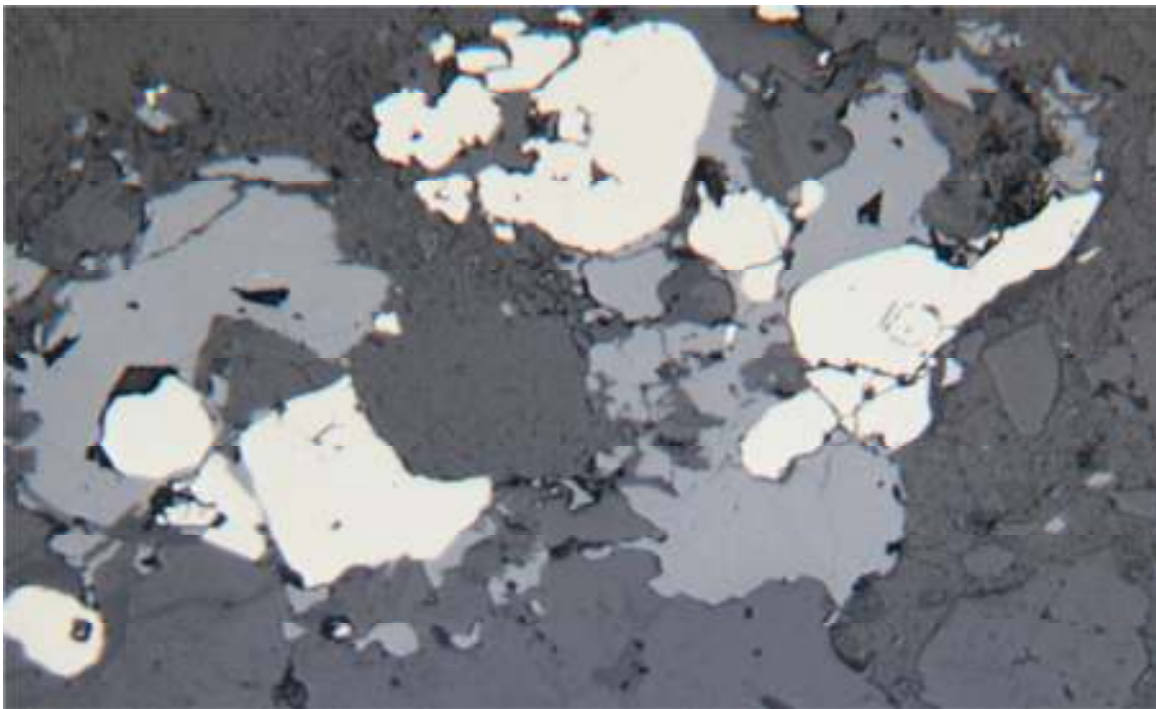
Sample 1-1. Seam of gold-electrum in quartz. Pyrite grains and sphalerite in bottom center. Field of view = 1.35 mm.



Sample 1-2. Top left is sphalerite. Bottom center is tennantite. Field of view = 1.35 mm.



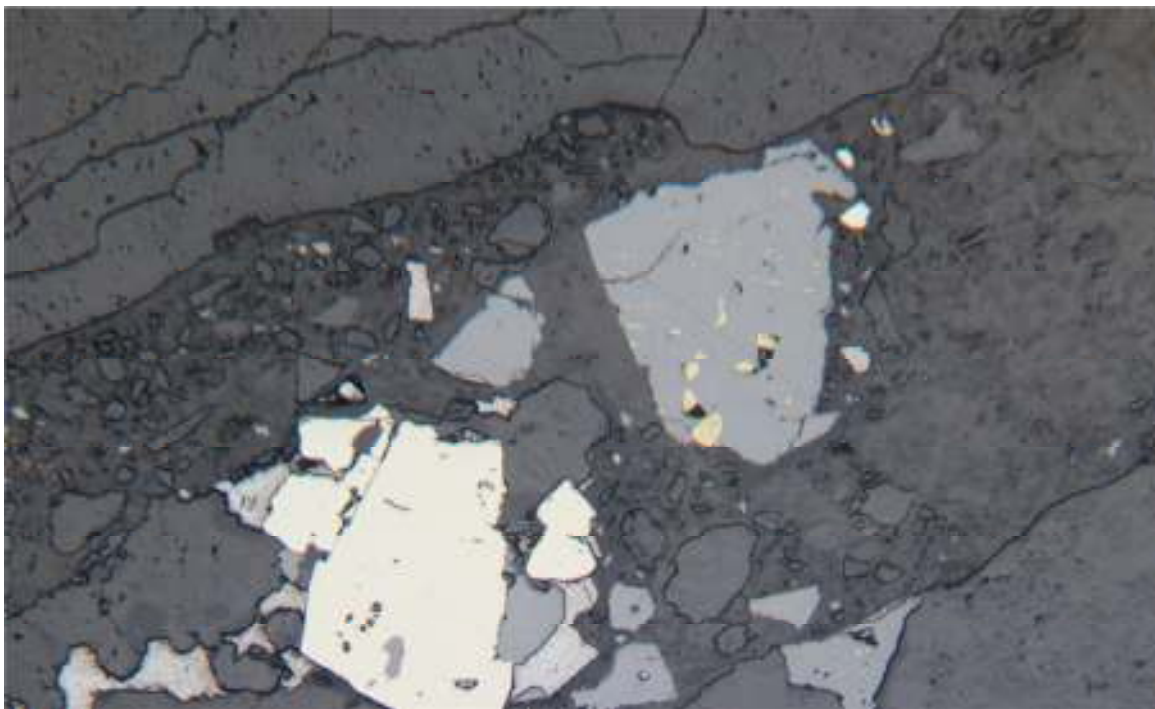
Sample 1-3. Sphalerite with minute chalcopyrite inclusions intergrown with pyrite. Galena included in pyrite. Field of view = 1.35 mm.



Sample 1-4. Typical pyrite intergrowth with sphalerite. Minute inclusions of chalcopyrite (too small to see in this photo) in sphalerite. Field of view = 1.35 mm.



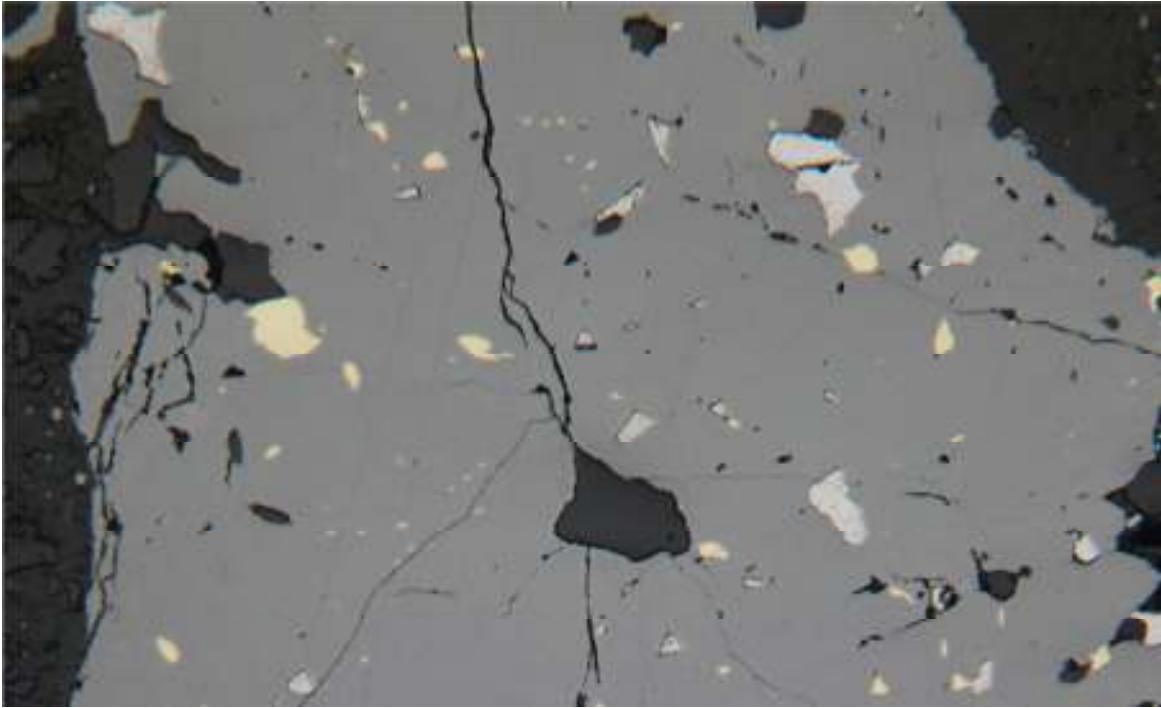
Sample 2.. Small gold(?) and pyrite grains. Field of view = 1.35 mm.



Sample 3. Sphalerite with chalcopyrite inclusions. Pyrite with small rimmings of galena. Field of view = 1.35 mm.



Sample 3-1. Pyrite with chalcopyrite inclusions. Field of view = 1.35 mm.



Sample 4. Sphalerite with galena and chalcopyrite inclusions. Field of view = 1.35 mm.