

W.S. copy E+L

Page rpt #2 - Summary - "Microscopic Exam of Esh. ore"
 by Sheffield Research per rpt from A. Ritchie
 Sheffield; by R.W. Deane, mineralogist.
 Sample submitted consisted of broken rock c. 4" size
 many indiv. pos. badly surf. weathered and also
 penetrative weathering affecting whole lumps. E+L

Prep. & Procedures

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- (a) Chip samples in bottles for micro exam.
- (b) -10 mesh hand sample immersed in tetrabrommethane (2.96)
 and scrub portion (sulphides) washed & mounted in
 bottle for micro exam.
- (c) X-ray diffraction patterns made of powdered sulphides for
 conclusive identification of species.

Mineralogy

actinolite

Host rock has quartz, talc, chlorite, kaolinite, &
 limonite (goethite). (see also a pyrox diabase)
Sulphide Minerals - pyrrh, chry, pentl., violarite (?)
 (after Pentlandite), pyrite and some marcasite.
 A 3rd Ni mineral is believed to be present
 oxides: Mt, Sphene, ilmenite, goethite, avatane &
 perovskite (both Ti oxides) tentatively identified.
 Grain size surf. oxide min'l's from < 5 to > 100
 microns in diameter.

Nickel Minerals

Pentlandite & violarite only two noted.

Presence of 3rd Ni mineral possible.

mean ratio of Ni min'l
 Cu mineral 1.4 (Data p. 424 gives this
 as 22% Cu)

Nickel content of pentlandite (Fe Ni) 458 @ 34-35%.

" " " pure violarite Ni 2 Fe 54 @ 39% ±.

Copper " " chry. - Cu Fe 52 @ 34.5%.

" " " covellite - Cu S @ 66%

with hand assays of 0.81% Ni & 0.94% Cu by direct assay,
 the calc. Ni:Cu mineral ratio would be 1:1.18
 ∴ the following conclusions are possible:

E & L Ore per Lakefield Research.

2.

(1) There is an additional mineral other than Pentlandite & Violante - which would have a content $> 45\%$ Ni. - - (???)

(2) The chalcopyrite may be copper deficient to such a degree that the Cu mineral could be Antonite (Cu Per 53). But indented pos. as chalcopyrite.

(3) The Pentlandite & Violante may contain abnormally high amounts of nickel.

Item 1. is the most probable possibility and that mineral could be one of the Ni series, i.e. close to polydymite (Ni 354) - (Ill. # 3) Pentlandite $> 90\%$ as normal bluish grains, and occurred within pyrrhotite.

* Plug gaps may weather weathered.

Size range $< 5 \mu$ to > 200 microns in $\frac{2}{3}$ in - 50-100 range

* Much of the Pentlandite shattered and fractured (complete age rel.?), and alteration of Pentlandite common along these faults.

* This alteration was to Violante (hydrous re-constitution) and possibly further (to Ni 354).

Copper Minerals

cpy most common; malinite and traces of chalcocite (after cpy) seen in all sects.

* Some areas showed replacement of cpy by a silicate (note W.S. rept.) as well as albite & malinite. 65% of cpy @ 45-75 microns. The 1-yr. cpy was observed dispersed in the silicate gangue (Ill. # 7)

Pyrrhotite : most abundant sulfide

grains ≈ 45 microns.

Incapable supergene act. & massive metal locally along cleavages or pyrrh.

* Note Mart. & shows fractured pyrrhotite with cpy in fractures,

Pyrite

Sparse - mostly occur in cpy.

grains extremely fine-grained