

G05 - Cyprus Massive Sulphide Cu (Zn)

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Høy, T., 1995. Cyprus massive sulphide Cu (Zn): In: Selected mineral deposit profiles, volume 1 - metallics and coal, British Columbia Ministry of Employment and Investment, British Columbia Geological Survey Open File 1995-20, pp. 51–52.

IDENTIFICATION

SYNONYMS: Cyprus massive sulphide, cuprous pyrite.

COMMODITY (BYPRODUCTS): Cu, (Au, Ag, Zn, Co, Cd).

EXAMPLES (British Columbia - *Canada/International*): Chu Chua (092F 140), Lang Creek (104P 008), Hidden Creek (103P 021), Bonanza (103P 023), Double Ed (103P 025) ; *Cyprus; York Harbour and Betts Cove (Newfoundland, Canada); Turner-Albright (USA); Lokken (Norway)*.

GEOLOGICAL CHARACTERISTICS

CAPSULE DESCRIPTION: Deposits typically comprise one or more lenses of massive pyrite and chalcopyrite hosted by mafic volcanic rocks and underlain by a well developed pipe-shaped stockwork zone.

TECTONIC SETTINGS: Within ophiolitic complexes formed at oceanic or back-arc spreading ridges; possibly within marginal basins above subduction zones or near volcanic islands within an intraplate environment.

DEPOSITIONAL ENVIRONMENT / GEOLOGICAL SETTING: Lenses commonly are in tholeiitic or calcalkaline marine basalts, commonly pillowed, near a transition with overlying argillaceous sediments. Many lenses appear to be structurally controlled, aligned near steep normal faults.

AGE OF MINERALIZATION: Any age. Deposits in British Columbia are primarily Mississippian-Permian or Late Triassic.

HOST/ASSOCIATED ROCK TYPES: Tholeiitic or calcalkaline pillow and flow basalts, basaltic tuff, chert, argillite. Overlying “umbers” consist of ochre [Mn-poor, Fe-rich bedded mudstone containing goethite, maghemite (Fe₃O₄-Fe₂O₃ mixture) and quartz] or chert.

DEPOSIT FORM: Concordant massive sulphide lens overlying cross-cutting zone of intense alteration and stockwork mineralization and hydrothermally altered wallrock, and overlain by chert.

TEXTURE/STRUCTURE: Massive, fine-grained pyrite and chalcopyrite, sometimes brecciated or banded?; massive magnetite, magnetite-talc and talc with variable sulphide content; associated chert layers, locally brecciated, contain disseminated sulphides; disseminated, vein and stockwork mineralization beneath lenses.

ORE MINERALOGY (Principal and *subordinate*): Pyrite, chalcopyrite, magnetite, sphalerite, *marcasite, galena, pyrrhotite, cubanite, stannite-besterite, hematite*. Sometimes goethite alteration of top of sulphide layer.

GANGUE MINERALOGY: Talc, chert, magnetite, chlorite.

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ALTERATION MINERALOGY: Chlorite, talc, carbonate, sericite and quartz veins in the core of the stringer zone, sometimes with an envelope of weak albite with illite alteration.

ORE CONTROLS: Prominent structural control with clustering or alignment of sulphide lenses along early normal faults, near transition from mafic pillow basalts; less commonly mafic tuff; to overlying fine pelagic material.

GENETIC MODEL: Seafloor deposition of sulphide mounds contemporaneous with mafic volcanism, such as spreading ridges.

ASSOCIATED DEPOSIT TYPES: Vein and stockwork Cu (-Au) mineralization; Mn and Fe-rich cherts; massive magnetite (-talc) deposits.

EXPLORATION GUIDES

GEOCHEMICAL SIGNATURE: Cu, Zn; common depletion of Ca and Na; less common, local minor Na enrichment; possible local K enrichment; prominent Fe and Mn enrichment in footwall stringer zone.

GEOPHYSICAL SIGNATURE: Sulphide lenses usually show either an electromagnetic or induced polarization signature depending on the style of mineralization and presence of conductive sulphides.

OTHER EXPLORATION GUIDES: Mafic ophiolitic volcanic rocks; transition to argillite; clustering or alignment of deposits indicative of fault control; ochre and exhalite (chert) horizons; regional pyritic horizons.

ECONOMIC FACTORS

GRADE AND TONNAGE: Published average is 1.6 Mt containing 1.7 % Cu, 0-33 g/t Ag; 0-1.9 g/t Au, 0-2.1 % Zn (Cox and Singer, 1986). B.C. examples: Chu Chua reserves - 1.043 Mt, 2.97 % Cu, 0.4 % Zn, 8.0 g/t Ag, 1.0 g/t Au; Anyox deposits - 0.2 to 23.7 Mt, approx. 1.5% Cu, 9.9 g/t Ag and 0.17 g/t Au.

IMPORTANCE: Deposits at Anyox produced 335,846 tonnes copper, 215,057 kg silver and 3,859 kg gold. Worldwide these deposits are generally significant more for their higher grades and polymetallic nature, than their size.

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