STIBNITE VEINS and DISSEMINATIONS I09

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Modified for Yukon by A. Fonseca
Refer to preface for general references and formatting significance.
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IDENTIFICATION

SYNONYMS: Quartz-stibnite, simple antimony, syntectonic stibnite, mesothermal Sb-Au.

COMMODITIES (*BYPRODUCTS*): Sb (*Au*).

EXAMPLES: **(Yukon): Yukon Antimony (Becker-Cochrane 105D 027)**;

(British Columbia - *Canada/International*): a) Veins - Minto (092JNE075) and Congress (092JNE029), Bridge River area; Snowbird (093K036); *Lake George (New Brunswick, Canada), Beaver Brook (Newfoundland, Canada*), *Murchison Range deposits (South Africa), Caracota and numerous other deposits in the Cordillera Occidental (Bolivia);* b) Disseminated - *Caracota and Espiritu Santo (Bolivia), many deposits (Turkey).*

GEOLOGICAL CHARACTERISTICS

CAPSULE DESCRIPTION: Stibnite veins, pods, disseminations and stibnite-bearing quartz and quartz-carbonate veins occur in, or adjacent to, shears, fault zones and brecciated rocks in sedimentary or metasedimentary sequences.

TECTONIC SETTING: Any orogenic area, particularly where large-scale fault structures are present

DEPOSITIONAL ENVIRONMENT / GEOLOGICAL SETTING: Fault and shear zones, notably in fault splays and fault-related breccias in which shallow to intermediate-depth hydrothermal systems have been operative.

AGE OF MINERALIZATION: Deposits range from Paleozoic to Tertiary age.

HOST/ASSOCIATED ROCK TYPES: Any faulted lithologies with a wide variety of rock types; sedimentary and metasedimentary rocks are commonly present. British Columbia deposits tend to be near major fault zones with attendant serpentinized mafic and ultramafic rocks.

DEPOSIT FORM: Stibnite occurs in veins; also as fine to coarse grains in sheared or brecciated rocks. Some stibnite is disseminated in carbonate-altered wallrocks surrounding structures and may form within pressure shadows at crests of folds. Massive stibnite-pyrite replacements which may form pods or lenses up to tens of metres long, are relatively uncommon, but are sources of rich ore.

TEXTURE/STRUCTURE: Veins have fine to coarse-grained, commonly euhedral bladed crystals of stibnite, quartz and carbonate in masses of stibnite. Quartz and quartz-carbonate gangue minerals range from fine to coarse grained, commonly with white 'bull quartz" present.

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ORE MINERALOGY [Principal and *subordinate*]: Stibnite, pyrite, arsenopyrite; *sphalerite, galena, tetrahedrite, marcasite, chalcopyrite, jamesonite, berthierite, gold, cinnabar, scheelite, argentite and sulphosalt minerals. Other than stibnite, the overall sulphide content of the veins is low.*

GANGUE MINERALOGY [Principal and *subordinate*]: Quartz, calcite, dolomite; *chalcedony, siderite, rare barite and fluorite.*

ALTERATION MINERALOGY: Quartz-carbonate envelopes on veins; some silicification, sericite, and intermediate argillic alteration. Chlorite, serpentinization and 'listwanite' (quartz-carbonate-talc-chromian mica-sulphide minerals) green-coloured alteration may be present when mafic and untramafic rocks are involved.

WEATHERING: Stibnite weathers to various oxides of yellowish (kermsite) or whitish (cerrantite or stibiconite) colour.

ORE CONTROLS: Fissure, shear zones and breccia associated with faults. Some open-space filling in porous rocks and structurally induced openings (joints, saddle reefs, ladder veins). Minor replacement in limestones.

GENETIC MODEL: The origin is not well documented. Deposits are spatially closely associated with, and in many ways resemble, low-sulphide gold-quartz (mesothermal) veins. Their (mutual) origin is thought to be from dilute, CO_2 rich fluids generated by metamorphic dehydration. Structural channelways focus the hydrothermal fluids during regional deformation. Some deposits are associated with felsic intrusive bodies, for example a Tertiary rhyolite plug at Becker-Cochran deposit, Yukon, and with porphyry W-Mo mineralization in granitic rocks at the Lake George Sb deposit, New Brunswick.

ASSOCIATED DEPOSIT TYPES: Quartz-carbonate gold (low-sulphide gold-quartz vein or I01), polymetallic vein Ag-Pb-Zn (I05), epithermal Au-Ag: low sulphidation (H05), hotspring Au-Ag (H03), Sn-W vein (??), W-Mo porphyry (L07); silica-carbonate Hg (I08), placer gold (C01, C02); possibly Carlin-type sediment-hosted Ag-Ag (E03).

COMMENTS: Occurrences of typical stibnite veins in the Bridge River gold camp in British Columbia were thought to be part of a regional deposit zoning pattern. The deposits are now known to be younger than the gold deposits by about 15-20 Ma. Farther north, the Snowbird deposit near Stuart Lake, has been shown to be Middle Jurassic in age by radiometric dating and is interpreted to be related to large-scale crustal structures. This deformation possibly involves the Pinchi fault system in which the largest known mercury deposits in the province are found.

EXPLORATION GUIDES

GEOCHEMICAL SIGNATURE: Sb, As, Au, Ag, Pb, Zn; locally W or Hg.

GEOPHYSICAL SIGNATURE: VLF surveys may detect faults.

ECONOMIC FACTORS

TYPICAL GRADE AND TONNAGE: Veins typically have high grade but small ore shoots; the disseminated deposits are also relatively small. Grade-tonnage data from 81 "typical" vein deposits (predominately, hand-sorted ore from USA mines) is 180 t with 35 % Sb; 10 % of the deposits contained > 1 g/t Au and > 16 g/t Ag. The disseminated deposits average 88 000 t with an average grade of 3.6 % Sb. **The Yukon Antimony deposit is larger than average, with 127 000 tonnes at 4% Sb.**

ECONOMIC LIMITATIONS: Antimony is currently a low-priced metal so only high-grade deposits are mined. Deposits (veins and disseminations) containing gold offer the best potential.

IMPORTANCE: Bolivia, Turkey and China dominate the antimony market; Cordilleran production will likely be only as a byproduct from precious metal bearing deposits.

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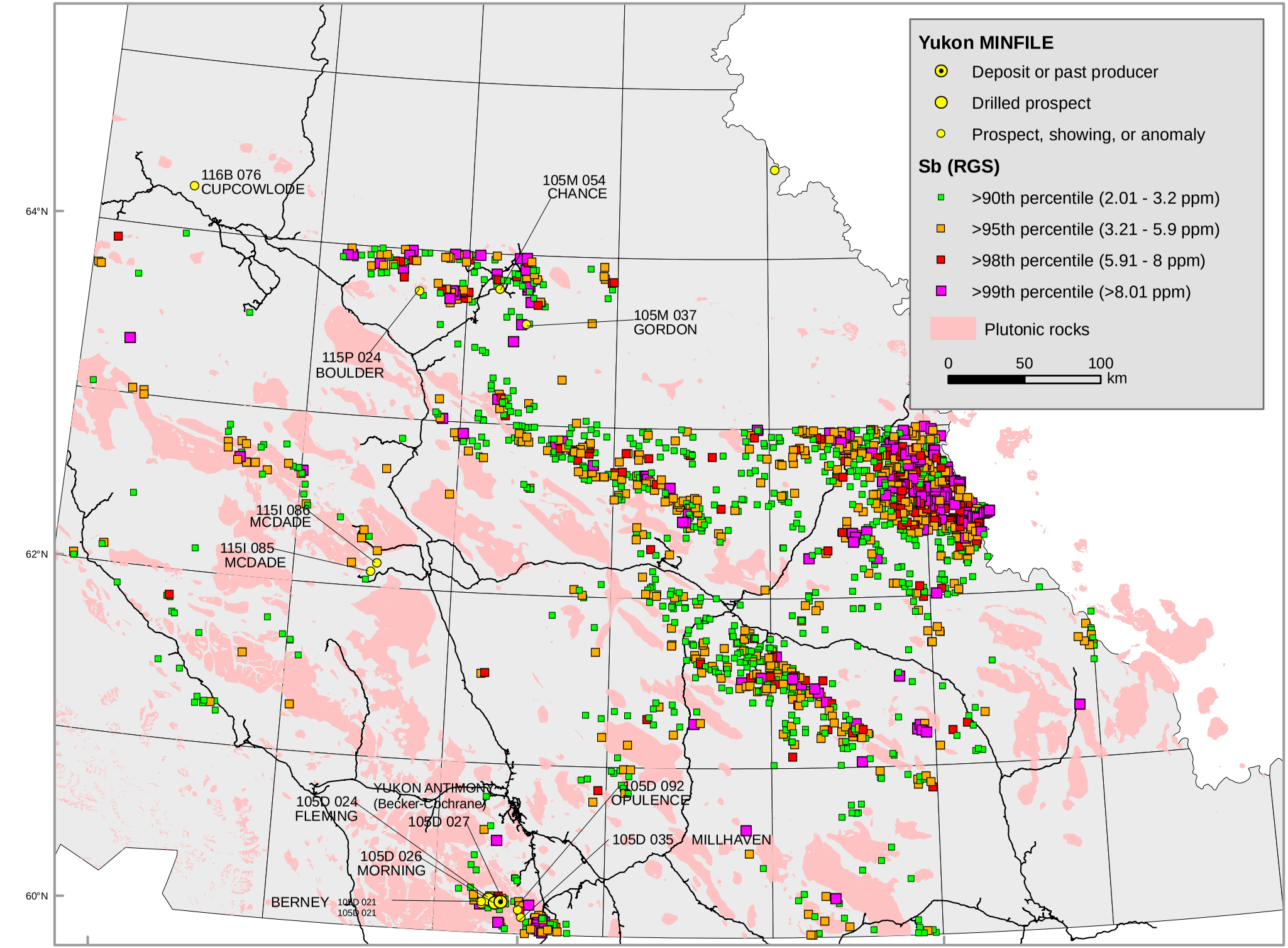
I09 - Stibnite veins and disseminations - BC deposits

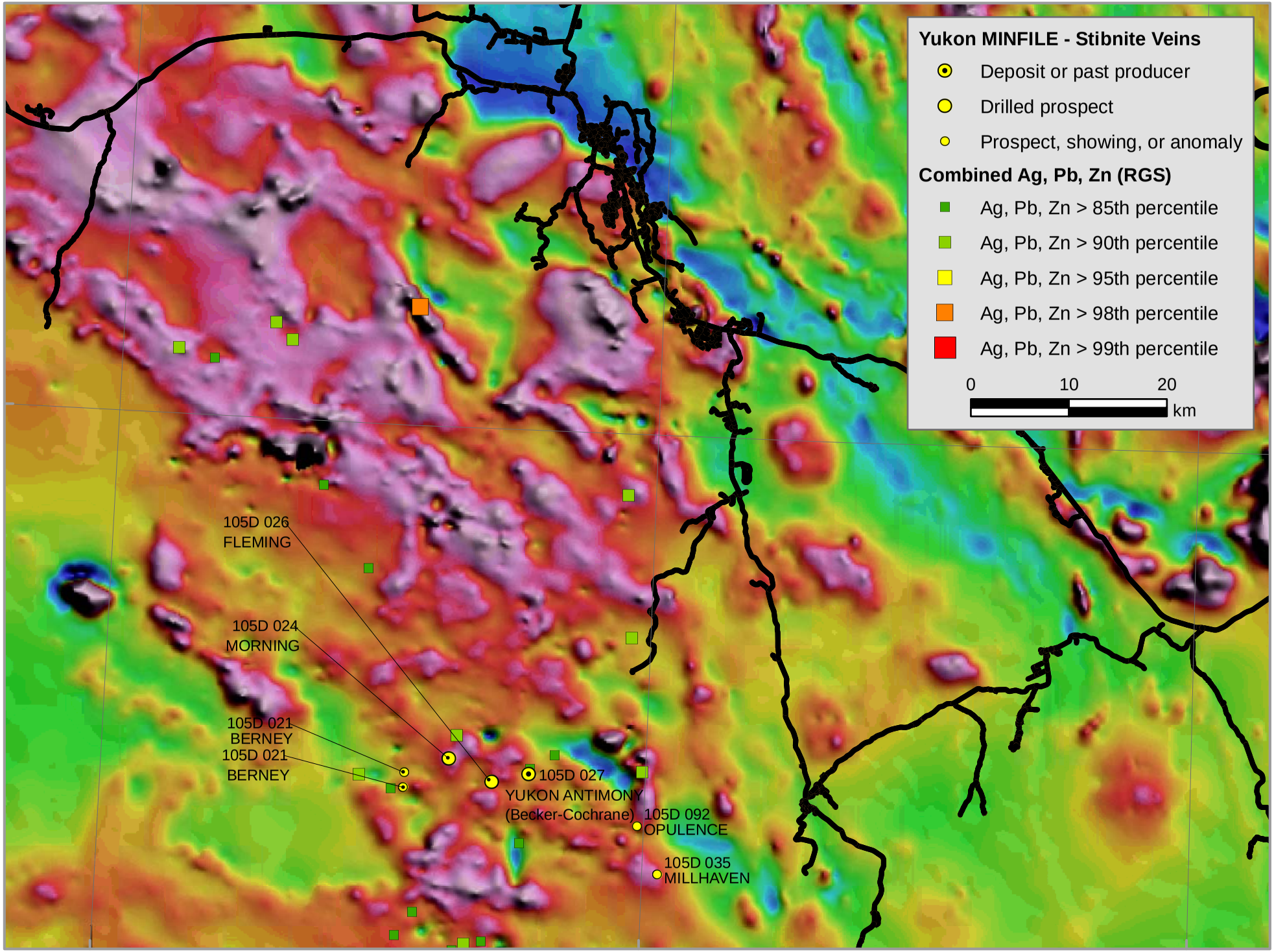
Deposit	country	tonnes	Sb %
MINTO	CNBC		
CONGRESS	CNBC		
SNOWBIRD	CNBC		
YUKON ANTIMONY	CNYT	127 000	4

Yukon MINFILE

MINFILE	NAMES	STATUS
105D 027	BECKER-COCHRAN, YUKON ANTIMONY	DEPOSIT
105D 024	CHIEFTAIN HILL, OCEAN, MORNING	DRILLED PROSPECT
115I 085	CAR, MCDADE	PROSPECT
105M 037	GORDON	PROSPECT
105D 035	MILLHAVEN	SHOWING
105D 092	OPULENCE	SHOWING
115I 086	ROWLINSON, MCDADE, LEE	SHOWING
105M 054	CHANCE	SHOWING
105D 021	BERNEY	ANOMALY
116B 076	LAWRENCE, CUPCOWLODE	UNKNOWN



Map of Yukon showing Stibnite vein occurrences, Sb regional geochemistry and the distribution of plutonic rocks



Map of Wheaton River region, south central Yukon showing stibnite vein occurrences, Ag-Pb-Zn geochemistry and regional magnetics