

TECTONIC SETTING OF LISTWANITE-LODE GOLD DEPOSITS IN THE ATLIN AREA, N.W. B.C.

NTS (104N/12)

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SCALE 1:20 000

LEGEND

QUATERNARY

Qhm HYDROMAGNETITE: WHITE POWDERY WITH A UNIFORM TEXTURE AND COMPOSITION; NO BEDDING OR STRUCTURE EVIDENT; THICKNESS RANGES FROM 1 TO 1.1 M

MISSISSIPPIAN(?) TO UPPER TRIASSIC(?)

CACHE CREEK OPHIOLITE ASSEMBLAGE

SEDIMENTARY ROCKS

MTcc LIMESTONE: MASSIVE, GREY TO BUFF WHITE, LIGHT TO DARK GREY WEATHERING; CHESTNUT MASSIVE, SUBSIDIARILY CRIPPLED; LOCALLY ASSOCIATED WITH LIMESTONE BUT RELATIONSHIP IS POORLY DEFINED
MTcl TECTONICALLY UNDEFORMED LAMINATED LIMESTONE, BRECCHIATED AND FRAGMENTED WITH QUARTZITE LENSES (INCLUDING MINOR CHERT AND BASALT); GENERATED BY HYDROTHERMAL SEQUESTRATION
MTca ARGILLITE-CHERTY ARGILLITE, DARK GREY TO BLACK (GMAPHIC), FINE-GRAINED, SHEARED AND FLASBY (TECTONIZED); CHESTNUT MASSIVE, DARK GREY TO GREEN WITH ARGILLACEOUS PARTINGS; MAY BE UNDEFORMED

CRUSTAL ROCKS

MTcm METABASALT: OPAQUE-GREEN, MASSIVE, FINE TO MEDIUM GRAINED; MAFIC MINERALS UP TO 20% CHLORITIZED; USUALLY DISPERSED (5-20%) WITH DISSEMINATED PYRITE (TRACE TO 10%); MINOR DIABASE AND MICRODIABASE UNDEFORMED
MTev CARBONATIZED METABASALT: WEATHERS ORANGE BROWN, GENERALLY MASSIVE TO BRECCHIATED WITH SPALLS AS VENEETS AND SPALL FILLING BRECCIA; TRACES TO ACCESSORY AMOUNTS OF MARSHOPITE
MTcg GABBRO TO DIORITE, DARK GREY TO BUFF WHITE, MEDIUM GRAINED EQUIGRAULAR; ALTERED FELDSPAR (PLAGIOCLASE) AND MAFIC MINERALS ARE CHLORITIZED; LOCALLY FOLIATED

MANTLE ROCKS

MTcd DUNITE: DARK GREEN, FINE TO MEDIUM GRAINED EQUIGRAULAR; WEATHERS CHARACTERISTIC TANNISH-BROWN; USUALLY DISPERSED (5-20%) WITH DISSEMINATED PYRITE (TRACE TO 10%); DISSEMINATED 0.1-0.4 CM DIAMETER SPINES
MTch MARSHOPITE: DARK GREEN TO BLACK, FINE TO COARSE-GRAINED PORPHYROBLASTIC; MARSHOPITE CRYSTALS (UP TO 1 CM) ARE COMMON; OTHER MINERALS INCLUDE QUARTZ, K-FELDSPAR, EPIDOTE, AND CLINOPTILOID; GENERALLY UNDEFORMED; MARSHOPITE CRYSTALS ARE USUALLY ORIENTED PARALLEL TO THE TECTONIC STRIKE; MARSHOPITE CRYSTALS ARE USUALLY ORIENTED PARALLEL TO THE TECTONIC STRIKE; MARSHOPITE CRYSTALS ARE USUALLY ORIENTED PARALLEL TO THE TECTONIC STRIKE
MTcb SEVEN WHITE BAYNETE: ALTERED EQUIGRAULAR OR SUB-EQUIGRAULAR TO DULL GREY WEATHERING; EPIDOTE CRYSTALS (USUALLY 0.5-1.0 MM) BLACK BANDS OF BARITE (ALTERED CHLORITIZED); ACCESSORY MARSHOPITE AND CARBONATE
MTco LISTWANITE: CARBONATIZED SEAMY MARSHOPITE; BUFF WHITE TO DULL GREY WEATHERING; STRONG BROWN COLOUR; FAULT CONTROLLED INTENSITY OF ALTERATION; QUARTZ STRINGS AND SPALLS; USUALLY DISPERSED (5-20%) WITH DISSEMINATED PYRITE (TRACE TO 10%); HIGHER ABUNDANCES IMMEDIATELY ASSOCIATED WITH QUARTZ VEINS OR AREAS OF QUARTZ FLOODING; SPALLS USUALLY 1-2 CM

INTRUSIVE ROCKS

CRETACEOUS (?)

FOURTH OF JULY BATHOLTH
Jkd GRANODIORITE TO GRANITE: BUFF WHITE TO DULL PINK; MEDIUM TO COARSE-GRAINED; K-FELDSPAR; MICROCLINITE; HORNBLENDE-BIOTITE CHLORITIZED (5-20%)

JURASSIC

Jg GRANITE: PALE PINK; K-FELDSPAR; PHENOCRYSTS UP TO 2 CM (HORN) IN A MEDIUM-GRAINED MATRIX OF QUARTZ, PLAGIOCLASE AND Biotite; ACCESSORY SPINEL, CLINOPTILOID, EPIDOTE AND MAGNETITE; K-Ar AGE DATED (DOWNE) AS 187 ± 3 Ma (DANBEAN, 1988)

SYMBOLS

Geological boundary (defined, approximate)
assumed, inferred from aeromagnetics)
Tectonic foliation, banding (metamorphic)-S₁
Schistosity S₂
Milange orientation (defined by clast orientation or dominant shearing direction)
Dike (inclined, vertical; d - diorite, g - granodiorite, m - mafic)
Vein (inclined, vertical; c - carbonate, otherwise quartz)
Lineation (arrow indicates plunge)
Fault or shear zone (defined, approximate)
assumed, inferred from airphotos)
Thrust fault (defined, approximate)
assumed, inferred from aeromagnetics)
Isolated outcrop, approximate outcrop location
Drill hole (location, vertical, inclined)
Cross section line
K-Ar isotopic age locality; mariposite dating in progress
K-Ar date from Dawson (1988)
MINFILE occurrence (mineral, placer; see table for listing of occurrences)

MARGINAL NOTES

Harzburgite is an ultramafic rock type (peridotite) composed predominantly of olivine (60-90%) and orthopyroxene (10-60%) and is believed to represent the residuum after partial melting of the upper mantle during the formation of oceanic crust at spreading centers. These mantle rocks are subsequently tectonically transported from their place of origin to present crustal levels, during oceanic accretion.

As a major objective of the Listwanite Project in defining the tectonic setting of listwanite-lode gold deposits in the Atlin region, ultramafic rocks and their contact relationships in the areas of Monarch Mountain and the town of Atlin were mapped at the present scale by the authors. Geology in the eastern sector of the map sheet is obtained from other sources, as indicated. Contact relationships in these areas have been re-evaluated to conform with the tectonic relationships defined by the current mapping. These modifications are model oriented and should be regarded as preliminary at this stage.

Later high angle faulting in the Union Mountain area may be much more prevalent than indicated.

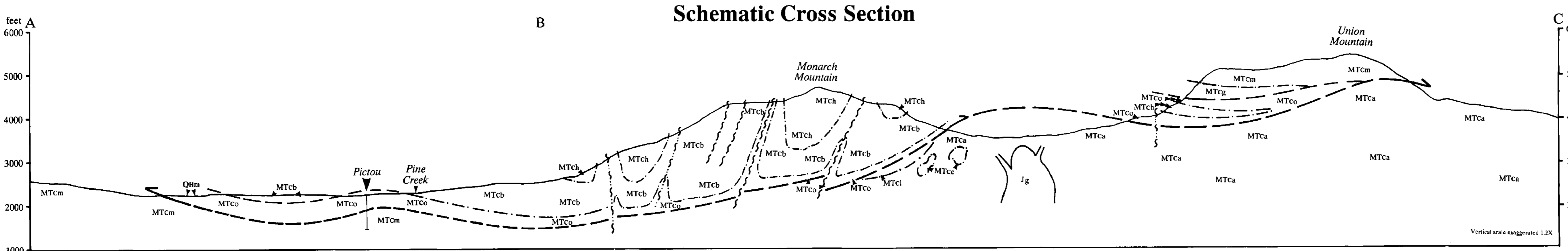
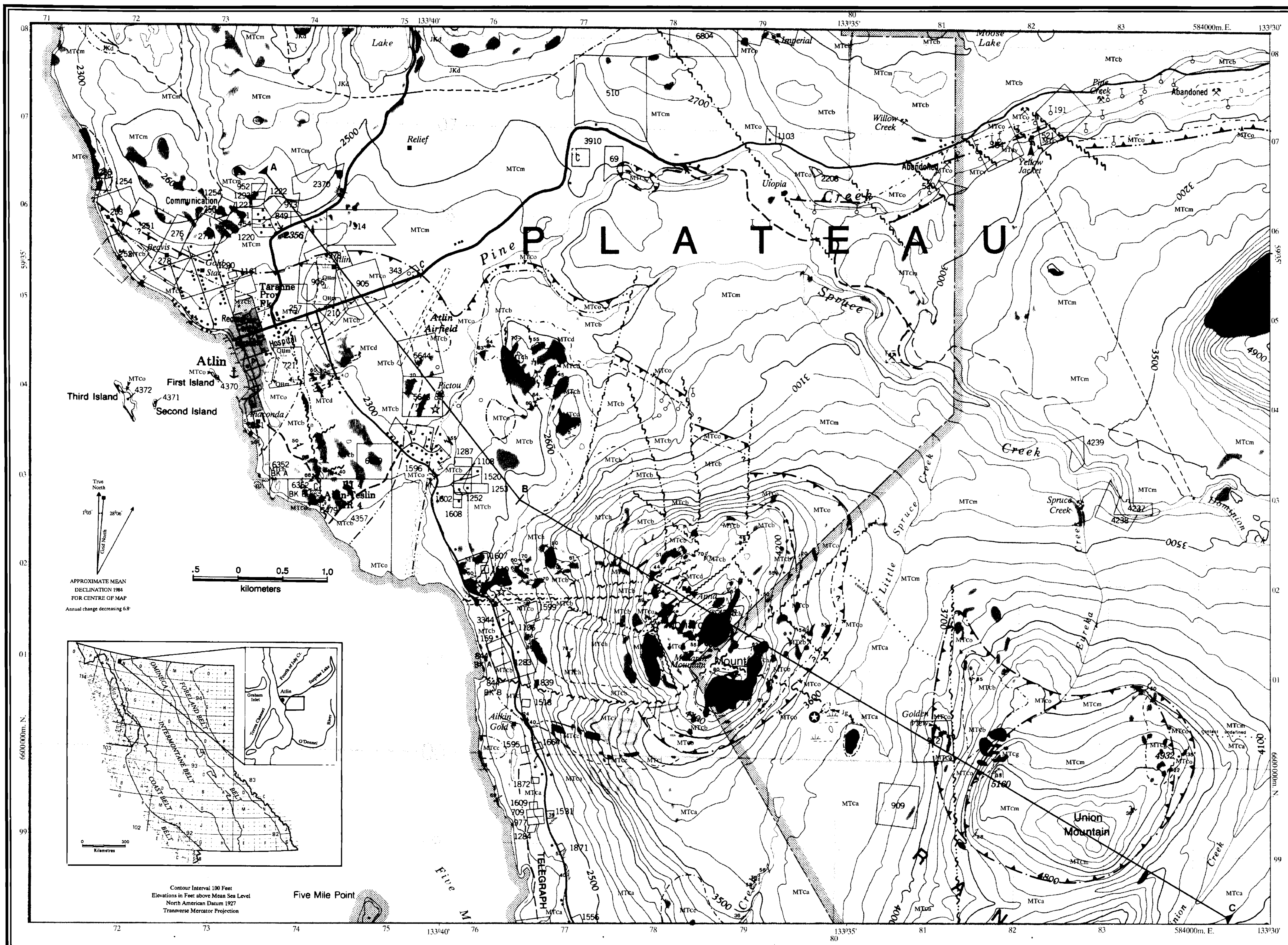
Contacts indicated as inferred from aeromagnetics on the map are taken from McIvor and Bozek (1988).

Thrust contacts where indicated are represented by thrust zones, with alteration and deformation (commonly in the form of milange) affecting both hanging and footwall lithologies. These zones may vary in character and width along the thrust surfaces and may not be as uniform as depicted in the cross section.

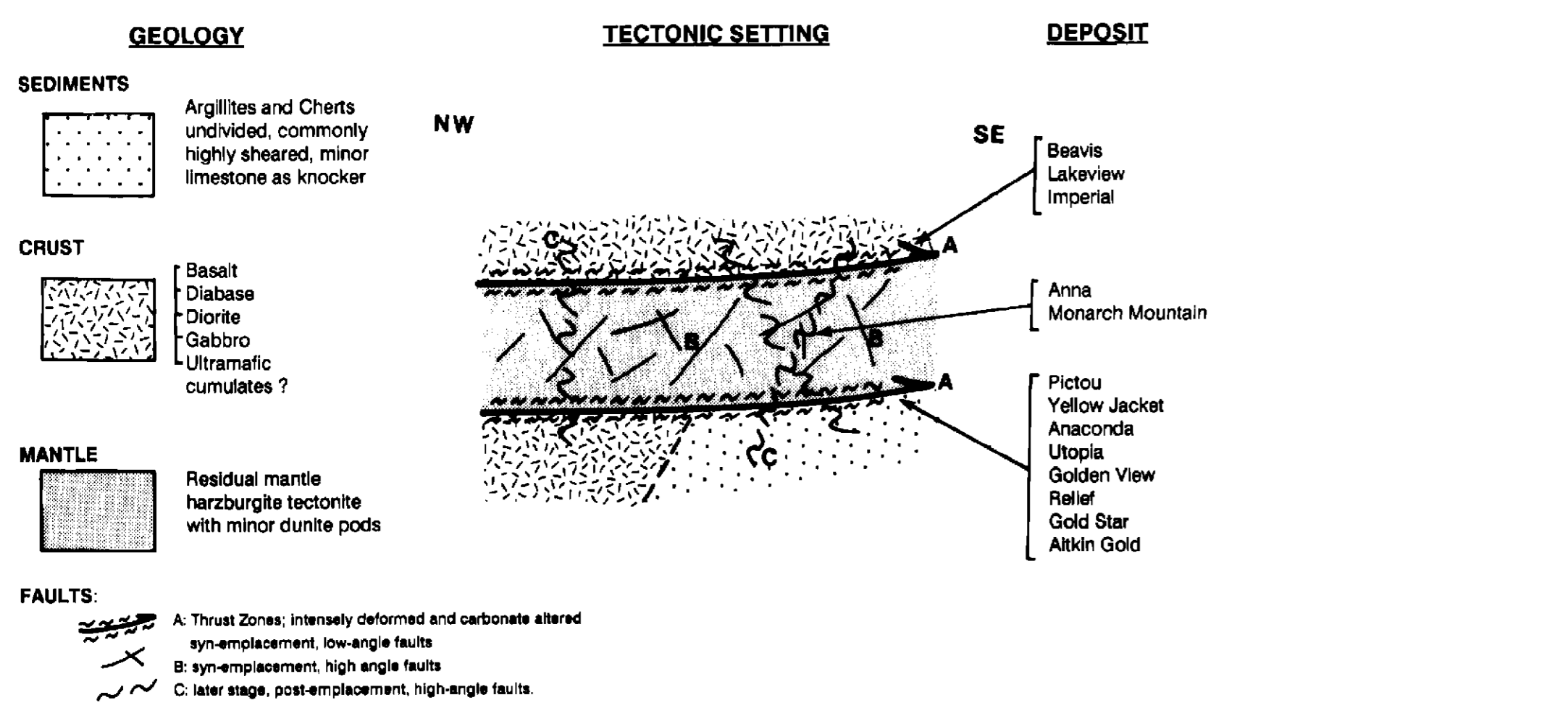
Drill core intersections at the Pictou, Yellowjacket and Heart of Gold prospects indicate a down hole progression from hanging wall ultramafic rocks through the carbonatized and tectonized thrust zone into the footwall lithologies and support the present interpretation.

ADDITIONAL SOURCES

Bloodgood, M.A., Rees, C.J. and Lefebvre, D.V. (1989a): Geology and Mineralization of the Atlin Area, Northwestern British Columbia; B.C. Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork 1988, Paper 1989-1, pages 311-322.
Bloodgood, M.A., Rees, C.J. and Lefebvre, D.V. (1989b): Geology of the Atlin Area; B.C. Ministry of Energy, Mines and Petroleum Resources, Open File 1989-15a, 1:50,000 scale.
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Lefebvre, D.V. and Gunning, M.H. (1988): Geological Compilation Map of the Atlin Area, B.C. Ministry of Energy, Mines and Petroleum Resources, Open File 1988-24, 1:25,000 scale.
Marud, D. (1989): Yellow Jacket Property, British Columbia, Arent Claim Area, DDH Targets; Homestake Mineral Development Company, In-house Map, 1:200 scale.
McIvor, D.F. (1988): Summary Report, Results of Rotary Reverse Circulation Drilling Program on the Pictou Property, Atlin Mining Division; B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report # 17548.
McIvor, D.F. and Bozek, J. (1988): Atlin, British Columbia Geology; Homestake Mineral Development Company, In-house Map, 1:10,000 scale.



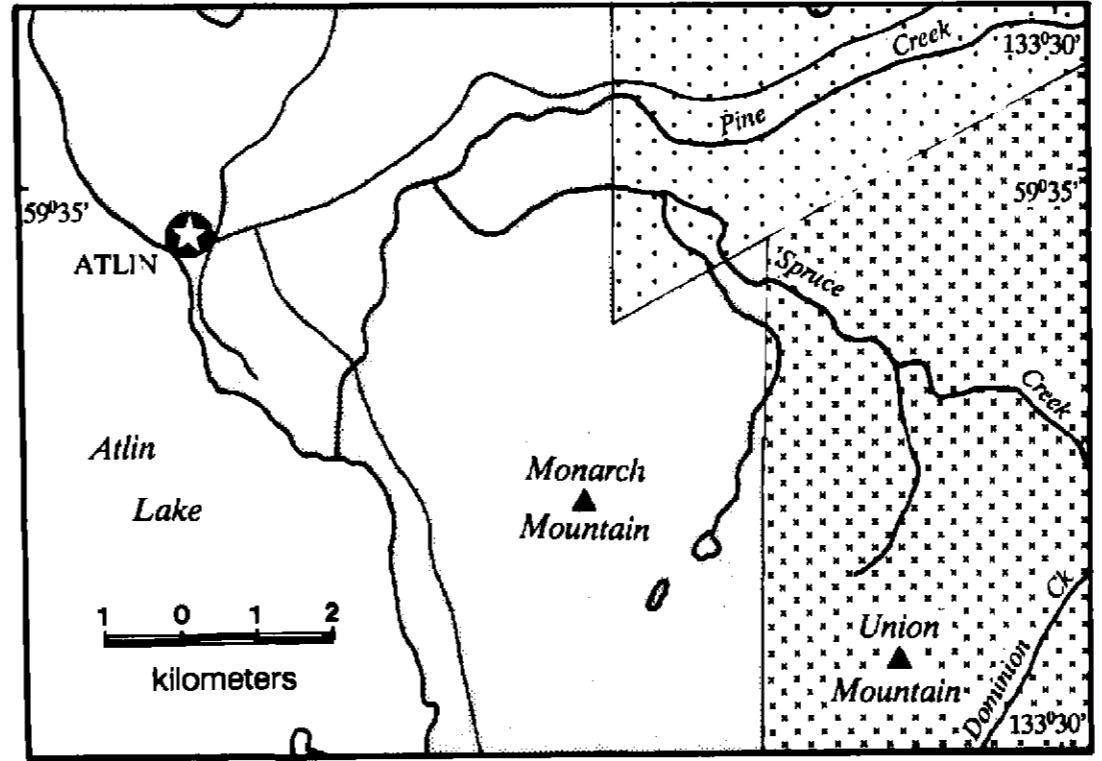
LITHOTECTONIC SETTING OF LISTWANITE-LODE GOLD DEPOSITS NEAR ATLIN, B.C.



MINFILE OCCURRENCES (104N/12W)

MINFILE Number	Name	UTM ZONE 8 UTM E	UTM N	Commodity
104N07	Bear's	57237	665530	Au,Ag
104N08	Imperial	57066	669847	Au,Ag,Cu,Pb
104N09	Aika Gold	57639	660380	Au
104N10	Willow Creek	58050	667240	Au (placer)
104N11	Pine Creek	58798	667262	Au (placer)
104N12	Spruce Creek	58257	669224	Au (placer)
104N13	Golden View	58150	669229	Au,Cu,Mo,Ag
104N14	Yellow Jacket	58200	667700	Au,Ag
104N15	Pictou (L.5643)	57540	663701	Au,Ag,Pb,Zn,Mg
104N16	Relief	57592	666667	Au,Ag,Mg
104N17	Axeconda	57462	663355	Au,Ag,Mg
104N18	Monarch Mountain	57813	660163	Ag
104N19	Atlin	57428	665381	Hg
104N20	Gold Star	57267	665300	Au,Ag
104N21	Anna	57823	660103	Au,Ag,Cr
104N22	Utopia	57920	666300	Pb,Zn,Cr

NOTE: Abbreviations used, Au-Gold, Ag-Silver, Cu-Copper, Pb-Lead, Zn-Zinc, Mo-Molybdenum, Mg-magnesia, Ab-Abasco, Hm-Hydromagnesite and Cr-Chromium.
REFERENCE: MINFILE Map 104N, Atlin (1:250 000), B.C. Ministry of Energy, Mines and Petroleum Resources, December 1988.



Geological data collected by authors
Geology modified from Bloodgood et al. (1989) and Lefebvre and Gunning (1989)
Data incorporated from Homestake Mineral Development Company (1986-1988)