BC Ministry of Energy & Mines

BRITISH COLUMBIA GEOLOGICAL SURVEY

Geological Survey & Development Branch

GEOSCIENCE MAP 2004-4

Accompanies Bulletin 94

GEOLOGY OF THE ATLIN AREA, NORTHWESTERN BRITISH COLUMBIA

UTM NAD83 Zone 8
Elevation in metres
NTS 104N/11W&12E

Geology by C.H. Ash

Scale 1:25 000

0 1 2
KILOMETRES

LEGEND

QUATERNARY

- Qal — Unconsolidated glacial till and poorly sorted alluvium
- Placer areas (Levson and Kerr, 1992)
- 13 — HYDROMAGNESITE: white, powdery with a uniform texture and composition, no bedding or structure evident, thickness ranges from 0.1 to 1.1 metres

MIDDLE JURASSIC

FOURTH OF JULY BATHOLITH (172 +/- 3 Ma, U-Pb zircon age, Mihalynuk et al., 1992)

- 12 — GRANODIORITE: buff-white to dull pink, medium- to coarse-grained, k-feldspar megacrystic, megacrysts up to 2 cm (20-40%) in a medium-grained matrix of quartz, plagioclase, biotite, accessory magnetite and sphene
- 12a — FELDSPAR PORPHYRY: buff-white to dull pink fine grained with 15 to 30 %, 4 to 9 millimetre feldspar phenocrysts, hornblende phenocrysts from 3 to 6 millimetre varies from trace to 15 %; unit typically occurs as 0.5 to 2 metre wide dikes and small stocks.

MISSISSIPPIAN TO MIDDLE JURASSIC

SEDIMENTARY ROCKS

- 11 — WACKE: grey, grey-green weathering, with abundant chert clasts and lesser clasts of argillite, quartz and limestone with the latter typically weathering out on surface, locally well bedded
- 10 — SEDIMENTARY TECTONIC BRECCIA: tan to rusty-brown, polymictic with angular to rounded fragments of variably bedded to massive limestone and siltstone from several centimetres to metres in size cemented by iron-magnesite, includes minor chert and basalt fragments
- 9 — LIMESTONE: massive, grey to buff-white, light to dark grey weathering, typically recrystallized
- 8 — ARGILLITE: dark grey to balck (graphitic), fine grained, typically sheared and flaggy
- 7 — CHERTY ARGILLITE: dark to pale grey, silicious siltstone, impure chert, typically massive, locally bedded
- 6 — CHERT: varies from dark to light grey to buff white to red brown to black, massive to commonly ribboned with thinner argillaceous interbeds, where containing interbeds the unit is labeled 6/7
- MELANGE: siliceous argillite with blocks and lenses of limestone, volcanic rock and chert (outcropping units indicated)

LATE PALEOZOIC

OCEANIC CRUSTAL ROCKS

- 5a — METABASALT: grey-green, typically massive, fine- to medium grained, locally autobrecciated, to flowbanded to pillowed, variably carbonatized (5-20 %) with disseminated pyrite (trace to 10 %); minor metadiabase, undivided
- 5b — CARBONATIZED METABASALT: weathers orange-brown; generally massive to brecciated with quartz as veinlets and space filling breccia; traces to accessory amounts of mariposite
- 4 — METAGABBRO: dark grey to buff white, medium to coarse grained equigranular to locally varitextured and variably carbonate altered
- 3a — PERIDOTITE (WEHRLITE?): black to dark grey, dull to light grey weathering, typically highly serpentinized, locally displays poikilitic textures on well washed surfaces with oikocrysts from 1 to 3 centimetres in size
- 3b — LISTWANITE (carbonatized serpentinite): similiar to 1c (ca. 169 Ma, Ar-Ar Mariposite ages; Ash, 2001)

MANTLE ROCKS

- 2 — DUNITE: dark green, medium-grained equigranular; weathers characteristic tan- brown; variably serpentinized (50 to 100%); occurs as podiform bodies hosted by harzburgite; trace to 4 %, 1-4 mm disseminated chrome-spinel
- 1a — HARZBURGITE: dark green to black, medium- to coarse-grained porphyroclastic; differential erosion caused by the more resistant orthopyroxene imparts a rough brown weathered surface; accessory chrome-spinel and clinopyroxene; generally 40-60 % serpentinized but primary textures are commonly preserved; typically foliated and locally banded
- 1b — SERPENTINITE-BASTITE: altered equivalent to 1a; light to dull weathering; locally mylonitic; minor to moderate talc; accessory magnetite and carbonate

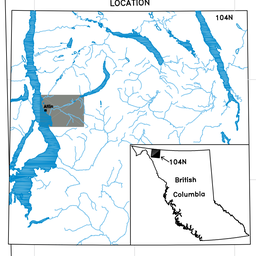
ALTERATION

- 1c — LISTWANITE (carbonatized serpentite): buff-white to dull grey, weathers distinctive orange-brown; fault controlled intensity of alteration; quartz stringers and episodic veins (auriferous?); accessory to moderate amounts of mariposite with higher abundances immediately associated with quartz veins or areas of quartz flooding; sulphides variable (trace to 10 %), (ca. 169 Ma, Ar-Ar Mariposite ages; Ash, 2001).

SYMBOLS

- Geological contact (defined, approximate, inferred, inferred from aeromagnetics)
- Fault or shear zone (approximate, inferred, inferred from airphoto linear)
- Thrust fault (approximate, inferred, inferred from airphoto linear)
- Tectonite foliation (S1)
- Tectonite banding (metamorphic) (S1b)
- Schistosity–shearing fabric (S2)
- Bedding
- Dike (inclined, verrtical; d=diorite)
- Outcrop location
- Drill hole location (tables indicate down hole progression of units) — e.g. 1b,1c,6
- Lode gold showing
- Sample location: whole rock geochem; mineral phase chemistry
- Trench
- Fossil locality with GSC reference number

LOCATION



REFERENCES

Ash, C.H. (1994): Origin and Tectonic Setting of Ophiolitic Ultramafic and Related Rocks in the Atlin Area Northwestern British Columbia; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Bulletin 94, 48 pages.

Ash, C.H. (2001): Ophiolite Related Gold Quartz Veins in the North American Cordillera; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Bulletin 108, 140 pages.

Bloodgood, M.A., Rees, C.J. and Lefebure, D.V. (1989): Geology of the Atlin Area; BC Ministry of Energy, Mines and Petroleum Resources; Open File 1989-15a.

Gareau, M.B. and Price, S. (1988): 1987 Diamond Drilling Report on the Spruce Creek Property, B.C. Ministry of Energy, Mines and Petroleum Resources, Shukisan 1-6, 13; Karen 6-8; Kulshan 1-3; Assessment Report # 17165.

Lefebure, D.V. and Gunning, M.H. (1988): Geological Compilation Map of the Atlin Area; BC Ministry of Energy, Mines and Petroleum Resources, Open File 1989-04.

Levson, V.M. and Kerr, D.E. (1992): Surficial Geology and Placer Gold Settings of the Atlin - Surprise Lake Area; BC Ministry of Energy, Mines and Petroleum Resources,Open File 1992-7.

Marud, D.E. (1988): Summary Report, Surface Drilling, Arent 1, Arent 2, Beama and Adjacent Claims, North and South Claim Groups, Yellowjacket Property Atlin Mining Division; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Assessment Report # 17295.

Marud, D.E. and Southam, P. (1988): Summary Report Diamond Drilling Arent 1, Arent 2 and Adjacent Claims North and South Claim Groups, Yellowjacket Property Atlin Mining Division, *B.C. Ministry of Energy, Mines and Petroleum Resources*, Assessment Report #18808.

McIvor, D. (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 # 17546.

McIvor, D. (1988): Summary Report, Mineral Exploration Activity on the Heart of Gold Property (Porsche, Millionaire, Goldstart, Goldstar 2, Anna 1-8 Mining Claims) Atlin Mining District, *B.C. Ministry of Energy, Mines and Petroleum Resources*, Assessment Report # 17997.

McIvor, D. and Bozek, J. (1988): Homestake Mineral Development Company, unpublished company map.

Mihalynuk, M.G., Smith, M., Gabites, J.E., Runkle, D. and Lefebure, D. (1992): Age of emplacement and basement character of the Cache Creek terrane as constrained by new isotopic and geochemical data; *Canadian Journal of Earth Sciences*, Volume 29, pages 2463-2477.

Rich, A. (1988): Geological, Geochemical, Geophysical, Trenching and Diamond Drilling Report, GV15, GV23 and GV24 Mineral Claims; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Assessment Report 13269.

Walcott, P.E. (1985): Report on Seismic Refraction Survey Atlin Area, British Columbia; B.C. Ministry of Energy, Mines and Petroleum Resources, Assessment Report # 13410.

Fossil identification by M. Orchard, Geological Survey of Canada, Vancouver.

Field mapping completed 1989-1990; Bulletin released July/1994 (Ash, 1994).
Digitally remastered April/2004 by Martin Stewart.
Outcrops originally positioned on the NAD 27 NTS topographic map. Updating to NAD83 TRIM has caused some outcrops to appear displaces relative to other topographic features.