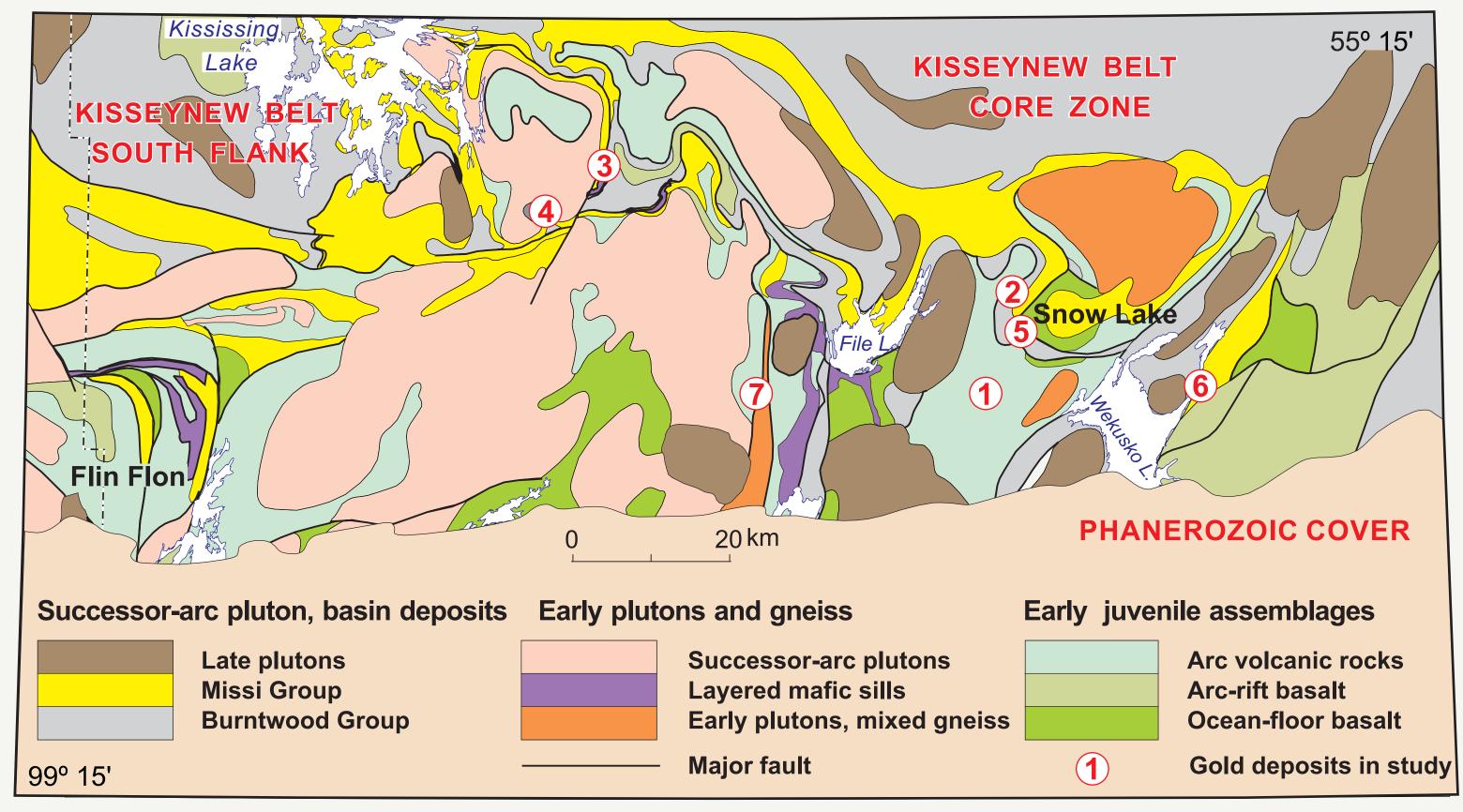


Project Summary

This project aims to develop a regional gold metallogenic model for the Snow Lake area. The initial fieldwork focussed on structural analysis and metallogeny in the New Britannia mine and the Northstar Lake areas. Future fieldwork will address the analysis of additional gold deposits, culminating in a synthesis of gold deposit formation within the tectonic framework of the Snow Lake area. The regional aspect of this project is intended to encourage regional gold exploration and provide support for the more detailed fieldwork of the accompanying PhD project (below).

The accompanying Ph.D. Project represents a cooperative three-year project between the MGS and GSC to support a PhD student based at McGill University. The focus of this study is the effects of medium to high-grade metamorphism on mineral deposits, largely focussed on gold-sulphides mineralization. Fieldwork includes detailed mapping and geochemistry, and isotopic studies of a series of mineral deposits in an attempt to characterize the effects of post-depositional metamorphism on the distribution or possible redistribution of mineralization within the selected deposits. An aspect of this research will be included in the regional gold metallogeny project.

Project Location



Generalized geological map of the Snow Lake area, showing the location of the selected gold deposits: 1) Chisel North mine, 2) Squall Lake, 3) Nokomis Lake, 4) Puffy Lake mine, 5) New Britannia mine, 6) East Wekusko Lake, and 7) North Star Lake.

Tectonic Framework

1 <i>//ineralization</i>	900	1850	1800 Remobilization		1750	
		She	ear-hosted			
Deformation					Brittle Faulting	
<i>letamorphism</i>	D ₁		D ₂ D ₃	D ₄	D ₅	
Sedimentation	Burr	ntwood Group → ⊢◯⊣ Missi Group → ⊢◯⊣				
Magmatism						
/olcanism	Pre-Accretion	Missi Group			<i>U-Pb Age Data</i> ⊢⊐⊣ Zircon U-Pb Age, 2σ error ⊢⊃⊣ Zircon Pb-Pb Age, 2σ error	

Cladogram depicting the tectonic framework for gold mineralization in the Flin Flon - Snow Lake greenstone belt. This study attempts to resolve the two periods of gold mineralization in prograding metamorphic conditions, with an emphasis on the possible remobilization of gold mineralization during peak metamorphism.

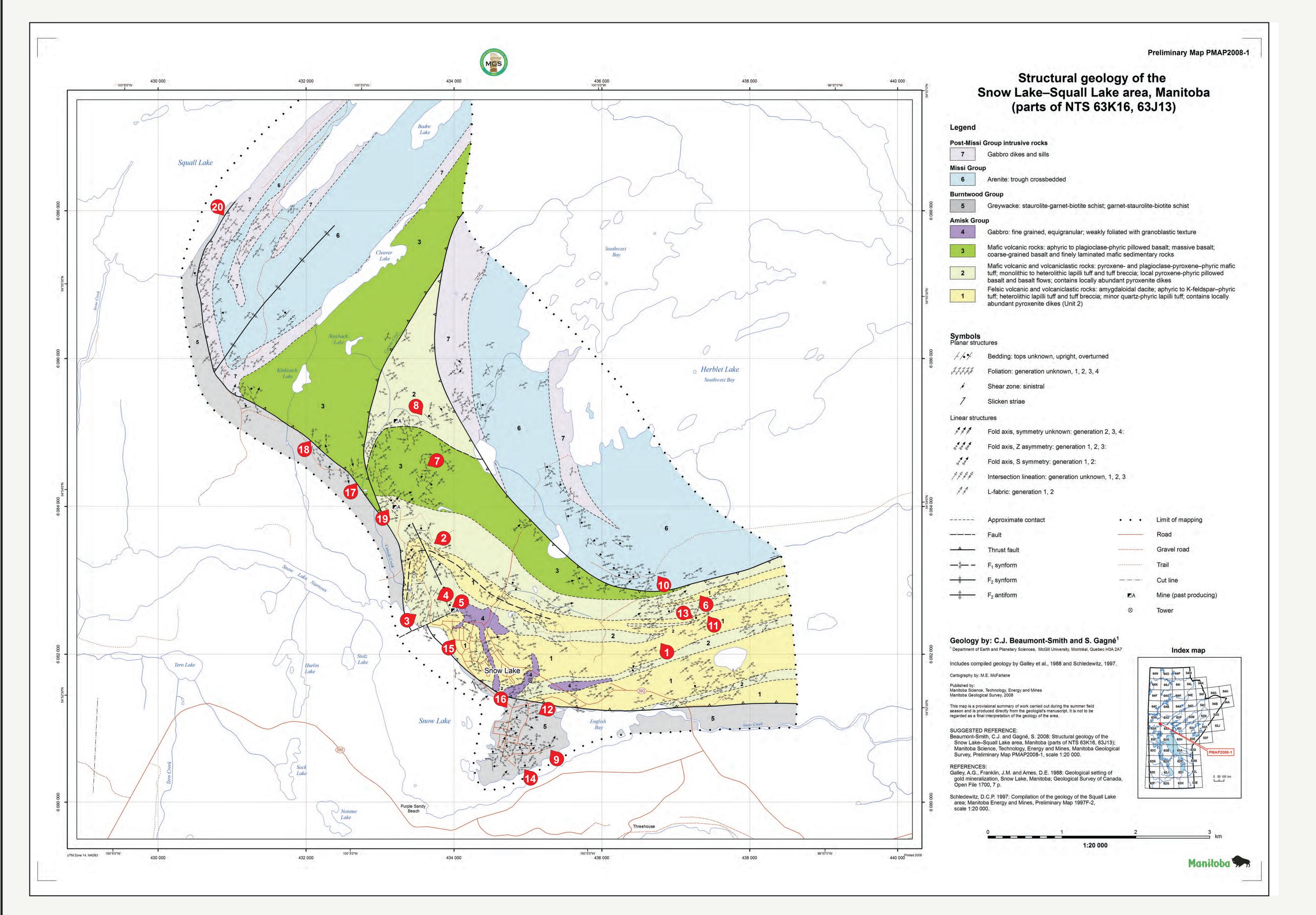
Structural Geology and Gold metallogenesis of the New Britannia Mine, Snow Lake, Manitoba

C.J. Beaumont-Smith, S. Gagné¹ and L. Lavigne²





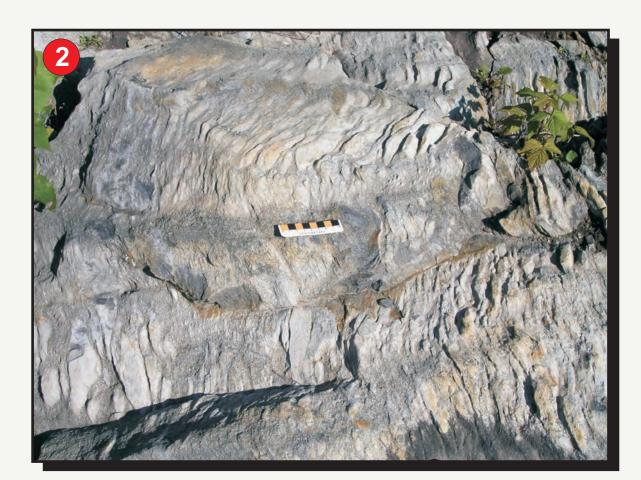
New Britannia Mine Horizon



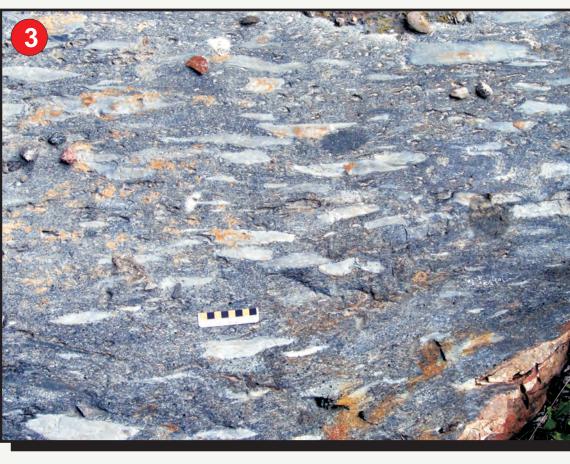
Stratigraphy



Bedded felsic lapilli tuff (unit 1).



Bedded felsic lapilli tuff (unit 1) from the Boundary zone surface trench. Normal clast grading indicates this unit is overturned prior to overprinting by refracting S₂ foliation.



Heterolithic, plagioclase-pyroxene phyric mafic lapilli tuff (unit 2).



Bedded pyroxene phyric fine lapilli tuff. The white spots are fine-grained lithic clasts in a normally graded pyroxene phyric matrix.



Plagioclase-py phyric mafic tuff units (unit 2).



(unit 1).

xene phyric autoclastic brecci (Unit 2) intruded by pyroxenite. The pyroxenite is interpreted as feeder dikes to overlying pyroxene



Pyroxenite dike (unit 2?) intruding felsic lapilli tuff



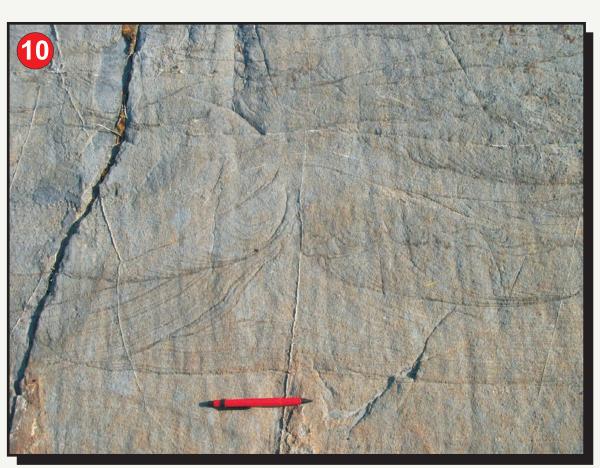
Ahyric pillowed basalt (Unit 3). Note the therma contraction cracks and minimal interpillow hyaloclastite, features that characterize this unit.



Bedded, pyroxene phyric mafic lapilli tuff of Unit 2 northwest of Birch Lake.



Burntwood Group staurolite schist (unit 5). These rocks represent metaturbidites that occupy the footwall of the McLeod Road thrust fault.

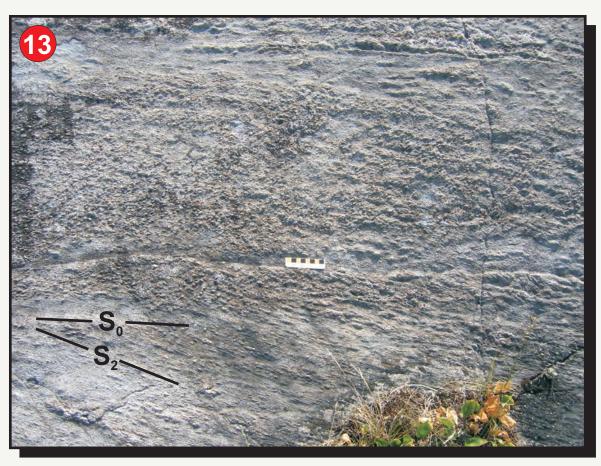


Missi Group trough crossbedded arenite (unit 6).

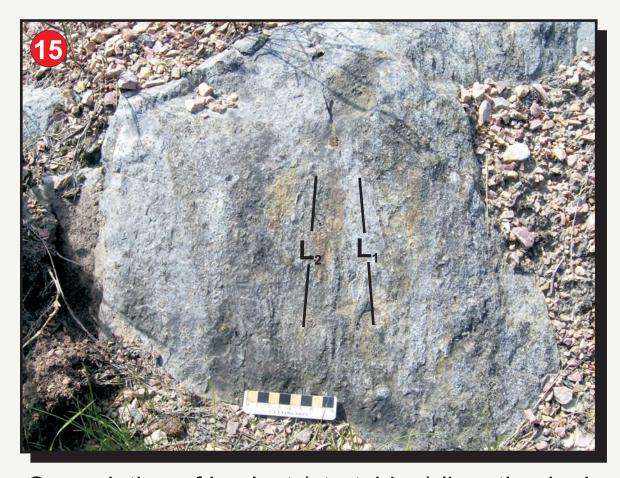
Fabric Elements



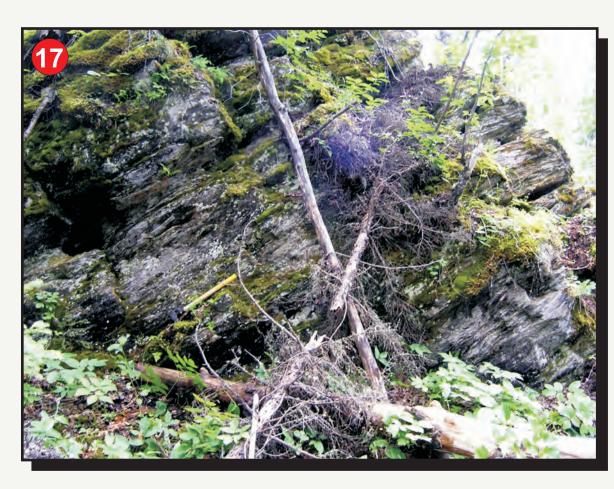
Overprinting of S_1 clast orientation by oblique S_2 foliation in felsic tuff breccia.



Obilque S₂ foliation developed in bedded, overturned felsic lapilli tuff.



Overprinting of L_1 clast (stretching) lineation by L_2 intersection lineation in felsic lapilli tuff.

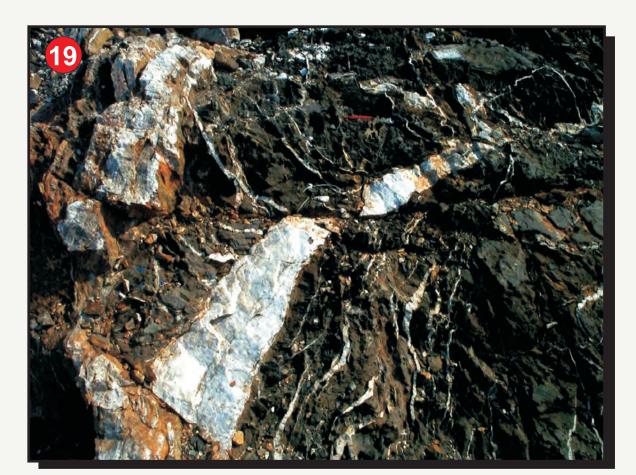


The McLeod Road thrust fault exposed as mafic tectonite.

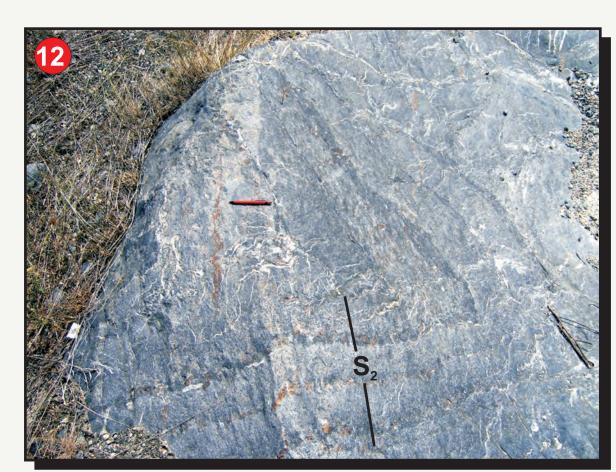
Gold Mineralization



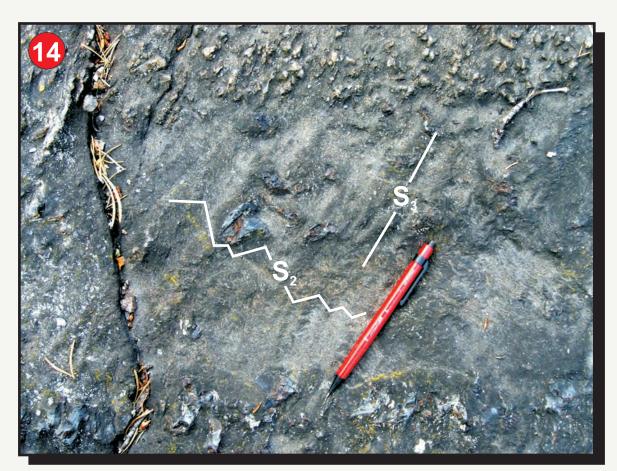
Peripheral carbonate alteration developed in pillowed basalt located in the structural hangingwall of the No. 3 zone.



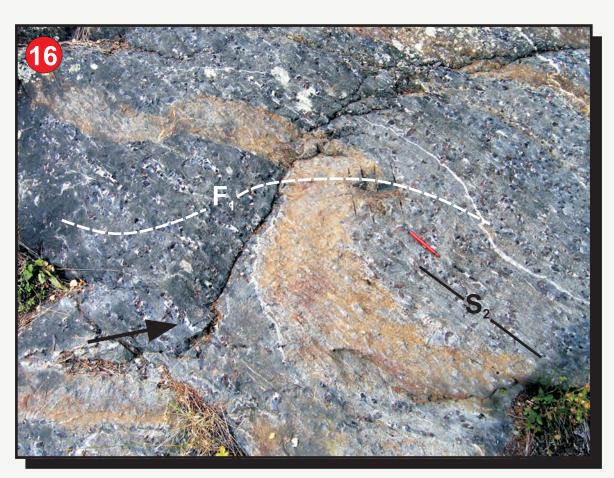
No. 3 zone surface exposure comprising laminated quartz veining, ladder veins hosted within an intensely ankerite-biotite altered shear zone. Note the open F_2 folding of the main vein and ladder veins.



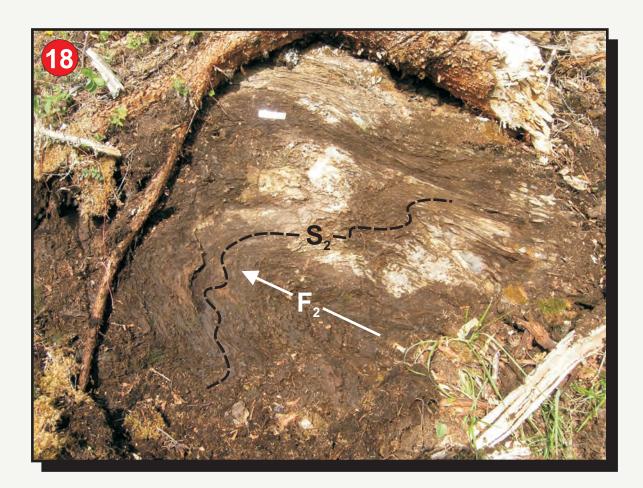
Shallowly-plunging F₁ fold overprinted by S₂ in Burntwood Group staurolite schist.



 S_3 defined by F_3 chevron folds developed in the pelitic interval of Burntwood Group metaturbidite.



Unfolding of Z-asymmetrical F_1 fold transected by differentiated S_2 foliation. Note the S_2 -parallel staurolite boudinage (arrow).



Tight, recumbent F₂ folding of the S₂ McLeod Road thrust fault mylonitic foliation reflecting coincident D₂ thrusting and folding.



ntensely potassium metasomatized (biotite foliated and silicified mafic lapilli tuff comprising No. 3 zone mineralization.



Margaret zone trench exposing mineralized quartz vein associated with highly silicified potassic alteration in the vicinity of the Missi Group-gabbro contact.