

Hilltop ClaimsGEOLOGYRegional Geology

The Adams Lake Sheet can be divided into two distinct areas; the northern and eastern portion underlain by the Shuswap Metamorphic Complex and the southern and western portion covered by younger Paleozoic metamorphics intruded by the Barriere Intrusion and the Raft Batholith. Form lines drawn on the G.S.C. Adams Lake Geology Sheet show a complex series of undulating anticlines and synclines generally trending in a northwesterly direction throughout the Shuswap Metamorphics. Broad east-west trending and northwest-southeast trending synforms have been produced by less intense deformation of younger metamorphic rocks. The Barriere Intrusion, found between these two structures, is an elongate body paralleling the axes of the synforms. Numerous mineral showings occur in proximity to the intrusives in the schistose rocks.

The Hilltop claims cover a portion of the northern contact of the Barriere Intrusion with Paleozoic metamorphic rocks including quartz-feldspar chlorite gneiss, quartz chlorite-graphite-sericite phyllite, limestone, chlorite schist and greenstone. Along the northern contact these members generally strike northwest to west and dip moderately to the north. The Barriere Intrusion is largely a medium grained biotite granite to biotite granodiorite.

Geology of the Hilltop Property

Four distinct units were recognized as members of the Paleozoic Metamorphic Unit 4a* and are listed below with probable age relationships:

* Reference to G.S.C. 1"= 4 miles, Adams Lake Geology

PROPERTY FILE

Assessment Report 3430 82M/114, 115

TABLE OF GEOLOGIC FORMATIONS

	<u>Unit</u>	<u>Probable Thickness</u>	<u>Geologic Description</u>
Jurassic- Cretaceous	5		Barriere Intrusion - medium grained biotite granite
Permian and Earlier	4	2000'+	Green chlorite schist to massive greenstone
	3	50'-800'	Massive white graphitic banded limestone
	2	200'-500'	Tan to black quartz graphite sericite chlorite phyllite
	1	1500'+	Green-black quartz feldspar chlorite to biotite gneiss

Unit 1, likely the oldest rock type found, consists of a medium-grained massive dark green to blackish foliated quartz-feldspar chlorite to biotite gneiss. Quartz and feldspar grains are generally elongate with the longest dimension parallel to the strike of the foliation. Subrounded quartz grains up to $\frac{1}{2}$ inch in diameter are not uncommon. Chlorite content varies between 10 and 30 percent and is remobilized into fractures near the intrusive contact. At the contact secondary fine grained brown to black biotite predominates. Generally all fractures are filled with quartz and later gypsum and manganese. The gneiss weathers buff grey green, limited outcrop occurs due to the very thick vegetation cover in the Otter Creek valley. No mineralization was noted in this unit.

The quartz feldspar chlorite gneiss grades, over tens of feet, into Unit 2, a well foliated black to tan quartz graphite-chlorite-sericite phyllite. The gradational contact consists of a green foliated chlorite schist to chlorite phyllite.

Individual sub-units, i.e. quartz sericite phyllite, are uneven and generally less than a few feet. Being more mobile than other units in the area, the phyllites exhibit many small scale structures caused by periods of metamorphism. This unit is often vuggy with fillings of dark brown limonite and black manganese stains. Manganese dendrites are common on sericite foliation surfaces. No copper mineralization was noted in this recessively weathered unit.

Overlying the phyllites is a massive white limestone inter-banded with black, graphitic crystalline limestone. This unit probably varies between 500 and 800 ft. in thickness decreasing in thickness to the east where it forms lenses and pods in the overlying greenstone. Generally the graphitic bands are less than 1 inch thick but are very numerous throughout the limestone. A few intervals of graphitic-chloritic phyllite of up to 10 ft. in thickness were also noted. Faults are commonly filled with dark green grey chlorite and graphite. In the eastern portion of the grid area the limestone outcrops as 200-300 ft. high bluffs where a small skarn deposit with minor amounts of chalcopyrite was found. Small irregular rusty zones on the bluffs appear to be caused by deposition of limonite from emergence of ground water that has collected iron from the overlying greenstone.

Unit 4, overlying the limestone, consists of a dark green highly foliated chlorite schist to a massive greenstone. This unit contains many visible fractures and shears as well as areas of intense alteration accompanied by copper mineralization.

The chlorite schist contains up to 50 percent chlorite with the remainder as quartz, feldspar and calcite. Bands of pinkish calcite up to 1 inch wide are not uncommon.

The greenstone is very massive, aphanitic and locally has an igneous texture. Subhedral pyrite and euhedral fine grained magnetite are common in the western portion while magnetite is the only mineral found east of line 120E on the grid. The contact relationship of all units with the intrusive is not well defined, however, an outcrop of chlorite schist and massive greenstone approximately 200 ft. from the batholith shows no alteration features. Stratigraphically, the lower portion of Unit 4 containing the copper showings also has a much greater amount of chlorite schist.

Unit 5, the northern portion of the Barriere Intrusion, consists of a medium grained pink to white phidiomorphic biotite granite. Outcrop is very sparse and all contacts are mapped as being approximate as they are based on percentages of intrusive float. The outcrop in Contact Creek (specimen W-23) is argillic altered with only quartz and almost totally kaolinized feldspar remaining. No mineralization was observed within the batholith.

Structural Geology

At least two periods of deformation are present in the metamorphic units mapped within the grid area. The first period likely produced the prominent foliation and possibly northerly trending and plunging folds. A later deformation is thought to have produced west to northwest plunging recumbent folds which were only observed in the "phyllites". Major fracturing appears to be post-Jurassic-Cretaceous as it displaces the Barriere Intrusion. Form lines drawn on foliation planes, noted on the Grid Geology Overlay Map, indicate a general strike of 060 degrees dipping approximately 20 degrees to the northwest. A broad low amplitude syncline with an axis trending 010 degrees plunging 20 degrees northward occurs along the northern portion of the grid line 104 east. A smaller

anticline of similar orientation exists roughly parallel to line 20 east. Smaller folds up to 1 ft. in amplitude observed in Unit 2 also have similar attitudes of -10 degrees plunging 10 to 20 degrees north. Small folds of less than 6 inches amplitude have axes trending 030-040 degrees and also plunge to the north. Large recumbent folds trending 310 degrees and open to the north appear to be caused by a later deformation.

Numerous faults are thought to exist but due to lack of outcrop have only been postulated. North-south trending faults cut the batholith, one of which may possibly define the intrusive contact found along 'Contact Creek'.

It may also be noted on the accompanying geological maps that between lines 48 to 56 east a north-south trending fault with left lateral movement has displaced the units by a few hundred feet. Northwest trending faults with smaller displacements occur in depressions forming drainage tributaries near the head of Otter Creek. Showings 1 to 5 occur along these northwest trending faults.

Economic Geology

Copper mineralization accompanying silicification, pyritization and potassium feldspar alteration occurs in the stratigraphically lower zone of Unit 4, close to the intrusive contact. The altered chlorite schist to greenstone is somewhat discontinuous likely due to faulting but extends for a minimum of 2500 ft. east of the granitic contact. Seven copper showings were found within this envelope of higher alteration. Argillic alteration is restricted to the lower portion of Unit 4 with greenstone above and underlying gneiss, phyllite and limestone being apparently unaltered. All showings and float locations are noted on the accompanying 'Grid Geology Map' in the appendix of this report. Float taken from each location has been

assayed and tabulated, giving an average of 0.43% copper. It is interesting to note that the granite in Contact Creek is altered but shows no traces of mineralization. A description of all known showings follows:

Number 1 - Located on line 32 east, 25 north, is the largest and possibly most complex copper showing. Copper mineralization occurs in a highly sheared to brecciated chlorite schist accompanied by pyrite, pyrolusite, quartz and potassium feldspar. Pyrite content generally varies between 1 and 3 percent. This occurrence, with a strike length of 120 ft., occurs on the eastern side of a northwest trending fault. Chip samples taken across the showing yielded low values with the best interval overaging .72% copper over 8 ft. Higher values do occur in the highly fractures, altered and pyritized chlorite schist rather than the igneous textured greenstone to foliated porphyry dyke. All rock types and assay results are noted on the accompanying map 'Showing No. 1'.

Number 2 - Located 300 ft. north of the first showing also appears to be associated with a northwest trending fault. This occurrence was found over a strike length of approximately 10 ft., is 5 ft. thick and consists of a highly silicified, K-feldspar altered, pyritized and fractured foliated greenstone to chlorite schist. Two grab samples assayed 0.12% and 0.39% copper. The major copper mineral found was chalcopryite with traces of bornite and covellite associated with quartz veins. Outcrop found along a road cut between the two showings was silicified, pyritized and K-feldspar altered but had only trace amounts of disseminated chalcopryite.

Number 3 - Also located on the same logging road approximately 200 ft. north of showing No. 2 consists of a highly fractured and pyritized chlorite schist to foliated greenstone with chalcopryite as fracture fillings and disseminated grains associated with quartz. A grab sample assayed 0.24% copper.

J.75

Numbers 4 and 5 - Discovered on the 'upper skid road' consists of highly altered chlorite schist and greenstone accompanied by up to 3 percent disseminated pyrite and chalcopryrite. Showing No. 5 occurs adjacent to the same northwest trending fault passing through showing No. 3. Grab samples for showing numbers 4 and 5 assayed 0.24% and 0.20% copper respectively.

Number 6 - Located at 38 east, 28 north, contains disseminated chalcopryrite, pyrite and pyrolusite associated with silicification and K-feldspathization of a chlorite schist. Chalcopryrite occurs throughout the outcrop length and appears to increase toward the southeast. A grab sample ran 0.25% copper.

J.55

Number 7 - Located closer to the granitic contact on line 18 east, 18 north, consists of a large area of rusty weathered highly fractured and sheared-foliated greenstone. Mineralization occurs as 1-3 percent disseminated pyrite accompanied by minor amounts of chalcopryrite. Small pods, less than 3 ft. in size, of pyrrhotite are found along fractures. Patchy areas of high silicification and potassium feldspar alteration also exist. A grab sample assayed 0.12% copper.

J.51

Number 8 - The only showing not found in Unit 4 is a pod of skarn within massive crystalline limestone located at 82 east, 23 north. The skarn composed of epidote, diopside, calcite, chlorite and garnet with minor pyrrhotite, pyrite and chalcopryrite is approximately 60 ft. long and 30 ft. thick. A northwest trending fault terminates the eastern portion of the skarn leaving small lenses of chlorite and epidote rich material on the opposite side. A 'higher grade' sample assayed 0.14% copper.

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Numbers 9 and 10 - Composed of highly fractured and sheared rusty weathering chlorite schist. Pods and lenses of pyrrhotite, with minor pyrite and traces of chalcopyrite, occur along the lower contact of Unit 4 in the northeastern portion of the grid area. Low values of less than 0.06% copper were obtained from grab samples. It is thought that much of the copper bearing float between lines 96 east and 112 east originates from these two showings.