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Geology of Tulsequah Map Area, British Columbia, 104K, by J. G. Souther

The file comprises geological map (Scale 1:250,000), annotated legend, list of mineral properties with notes and references, list of published reports on the geology of the area. Compiled from field work 1958-1960.

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GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF ENERGY, MINES AND RESOURCES
OTTAWA 4, CANADA

O. F. 7

Tulsequah Map Area, British Columbia
104 K

This open file material, extracted from a manuscript by J. G. Souther in preparation as a Geological Survey Memoir, comprises the following items:

1. Geological map, scale 1/250,000

2. Geological and mineral occurrence symbols used on the map.

3. Table of Formations. Map units correspond with the map and the table serves as an annotated legend.

4. List of Mineral Properties with notes and references.

5. List of references on the geology of the area.

Geology by J. G. Souther 1958, 1959, 1960

Geological boundary (defined, approximate, assumed) . . . . . 

Bedding (horizontal, inclined, vertical, overturned) . . . . . 

Bedding (direction of dip known, upper side of bed unknown) . . . . . 

Schistosity, gneissosity (inclined, vertical) . . . . . 

Anticline . . . . . 

Syncline . . . . . 

Trend of complexly folded beds . . . . . 

Major dyke swarm. . . . . 

Zone of hydrothermal alteration, silicification and pyritization . . . . . 

Fault (defined, assumed) . . . . .

Thrust fault (defined, assumed). . . . .

Fossil locality . . . . . Ⓕ

Mineral occurrence . . . . . ×Cu

Mineral property . . . . . 3⚒

MINERAL SYMBOLS
(Lode occurrences only)

Asbestos	Asb	Molybdenum	Mo
Copper	Cu	Silver	Ag
Gold	Au	Zinc	Zn
Lead	Pb		

TABLE OF FORMATIONS

SEDIMENTARY AND VOLCANIC ROCKS

Era	Period or Epoch	Formation (thickness in Feet)	Lithology
Cenozoic	Pleistocene and Recent	Map-unit 11	Alluvium, felsenmere, glacial outwash, till and alpine moraine; (11a) landslide
	Late Tertiary and Quaternary	Map-unit 10 Level Mountain Group (1500±)	Basalt, olivine basalt and related pyroclastic rocks; in part younger than some of 11
		Conformable contact	
		Map-unit 9 Heart Peaks Formation	Trachyte and rhyolite flows, pyroclastic rocks and related intrusions
		Unconformity	
Mesozoic and Cenozoic	Early Tertiary and Late Cretaceous	Map-unit 8 Sloko Group (4000'±)	Light-coloured rhyolite, dacite and trachyte flows, pyroclastic rocks and derived sediments
		Unconformity	
	Lower and Middle Jurassic	Laberge Group: Map-unit 7 Takwahoni Fm. (11,000')	Granite-boulder conglomerate, chert pebble conglomerate, greywacke, quartzose sandstone siltstone, and shale
		Facies Boundary	
		Laberge Group: Map-unit 6 Inklin Fm. (10,000')	Interbedded greywacke, graded siltstone and silty sandstone; pebbly mudstone, limestone pebble conglomerate and minor limestone
		Disconformity (local conformity ? local unconformity)	
		Map-unit 5 Sinwa Formation (2000'±)	Limestone; minor sandstone, argillite and chert

	Upper Triassic	Disconformity ?		
			Map-unit 4 Stuhini Group Undivided (12,000')	Andesite and basalt flows, pillow lava, volcanic breccia and agglomerate, lapilli tuff, volcanic sandstone, greywacke and siltstone
			Facies Boundary (local disconformity, local unconformity)	
			Map-unit 3 King Salmon Formation (4000')	Thick-bedded, dark-coloured greywacke, conglomerate, mudstone, siltstone and shale; minor andesitic lava, volcanic breccia, tuff, limestone and limy shale
		Unconformity		
esozoic and alaeozoic	Triassic and Older		Map-unit 2 (8600'+)	Fine-grained clastic sediments and intercalated volcanic rocks, mainly altered to phyllite and greenstone; chert, jasper greywacke and minor limestone
		Conformable contact		
	Permian		Map-unit 1 (2500')	Limestone, dolomitic limestone; minor chert, argillite and sandy limestone

METAMORPHIC ROCKS

lesozoic and alaeozoic		Map-unit N	Diorite gneiss, amphibolite, Megmatite
		Relation to N unknown: unconformably below Stuhini Group (4)	
		Map-unit M	Quartz-albite-amphibole gneiss; quartz-biotite schist; garnetiferous schist; augen gneiss and tremolite marble
		In part gradational with map units 1 and 2	

PLUTONIC ROCKS

Coast Plutonic Rocks

Mesozoic and Cenozoic	Cretaceous and Early Tertiary	Map-unit G Younger Quartz Monzonite	Medium-to coarse-grained, pink, biotite-hornblende quartz monzonite
	Intrusive contact		
	Pre Upper Cretaceous	Map-unit F Central Plutonic Complex	Granodiorite, quartz; minor diorite leuco-granite, migmatite and agmatite
	Relation to F unknown, intruded by G		
	Lower or Middle Triassic	Map-unit E	Fine-to medium-grained, strongly foliated diorite, quartz diorite and minor granodiorite

Minor Intrusions

	Cretaceous and Early Tertiary	Map-unit D	Felsite and quartz-feldspar porphyry
Mesozoic and Cenozoic	Relation to E unknown		
	Post Middle Jurassic	Map-unit C	Hornblende-biotite granodiorite; biotite-hornblende quartz diorite; hornblende diorite; augite diorite

Ultrabasic and Basic Rocks

Palaeozoic	Permian	Map-unit B	Fine-to medium-grained gabbro and pyroxene diorite
		Intrusive contact	
		Map-unit A	Peridotite, serpentinite, gabbro and pyroxene diorite

LIST OF MINERAL PROPERTIES

The locations of mineral properties listed here are shown on the accompanying map, ----A. The brief summary descriptions are based on field observations, published reports, and information supplied by company geologists. For more detailed descriptions of many of the properties the reader is referred to the reference listed below.

1. Polaris Taku Mine (Formerly Whitewater)

References: Minister of Mines, B.C. Ann. Repts.: 1929, p. 142; 1930, p. 122; 1931, p.61; 1932, p.64; 1933, p.172; 1935, p.B27, G47; 1936, p.B21; 1937, p.A7, B3,40,42; 1938, p.A33,39,B24; 1939, p.35,42,64; 1940, p.23,51; 1941, p.24,53; 1942, p.26,53; 1946, p.35,61; 1947, p.62 1948, p.61; 1949, p.72; 1950, p.73; 1951, p.40,74 Smith, Alexander, 1948; p. 112; Kerr, F.A., 1948, p.65;

The Polaris Taku Mine was in operation from 1937 unitl 1951, with the exception of the war years, 1942 to 1946, when production was suspended. It is a gold property, the gold occurring in fine needles of arsenopyrite disseminated in a fault-bounded wedge of Stuhini volcanic rocks. The deposits are shear zones containing numerous replacement veins adjacent to which the wall rock is carbonatized and locally albitized.

2. Tulsequah Chief

References: Minister of Mines, B.C. Ann. Repts.: 1924, p.89; 1926, p.106; 1928, p.103; 1929, p.136; 1930, p.122; 1936, p.321; 1946, p.61; 1947, p.68-70; 1948, p.63; 1949, p. 73; 1950, p.74; 1951, p.40; 1952, p.39-75; 1953, p.42,81; 1954, p.A80; 1955, p.11,12,13; 1956, p.12,13; 1957, p.5

Smith, Alexander, 1948, p. 112; Kerr, F.A., 1948, p.5

The Tulsequah Chief Mine was operated by the Canadian Mining and Smelting Co. of Canada from 1951 until 1957. The ore deposits occupy shear zones in altered Stuhini volcanic rocks. The alteration is associated with large felsite dykes and northeasterly trending faults. Ore minerals consists of massive, fine-grained, pyrite and chalcopyrite in lenses, and sphalerite, pyrite, and galena in a dense quartz-carbonite-barite gangue. Metals produced were copper, lead, zinc, gold, silver, and cadmium.

3. Big Bull (Manville)

References: Minister of Mines, B.C. Ann. Repts.: 1929, p.125,118 139; 1930, p.121; 1931, p.62; 1936, p.B21; 1946, p.6 1947, p.68-69; 1948, p.62; 1949, p.73; 1950, p.74; 1951, p.40,74; 1952, p.39,75; 1953, p.42,81; 1954, p.47,80; 1955, p.A46,11; 1956, p.A47,12; 1957, p.A43,5.

Smith, Alexander, 1948, p.121; Kerr, F.A. 1948, p.61

The Big Bull Mine was operated during the same period as the Tulsequah Chief and ore from both mines was concentrated at the same mill. Mineralization at the Big Bull is similar to that at the Tulsequah Chief, comprising mixed sulfide replacement of sheared and highly altered Stuhini volcanic rocks. As at the Tulsequah Chief the alteration is related to dykes and northerly trending faults.

4. Ericksen-Ashby

References: Minister of Mines, B.C. Ann. Repts.: 1951, p.A74; 1952, p.A76; Kerr, F.A., 1948, p.71; 1964, Prospectu of Ericksen-Ashby Mines Ltd.

This property was first staked in 1929 and development work, including hand-trenching and drilling was carried out intermittently until 1963. In September,1963, Ericksen-Ashby Mines Ltd. was incorporated as a private company and in 1964 it began and extensive diamond drilling program on the property. Mineralization consisted of massive sulfide replacement of limestone lying immediately below the Stuhini volcanic rocks, which are cut by a large tabular body of fine-grained quartz monzonite. The minerals present are pyrite, sphalerite, galena, and freibergite.

5. Red Cap

References: Minister of Mines, B.C. Ann. Repts.: 1930,p.122; 1931, p. 63.

Mineralization on this property is related to the contacts of a small granodiorite stock. The adjacent Stuhini and King Salmon volcanic rocks have been silicified, carbonatized, and heavily pyritized for a distance as much as 3,000 feet from the contact. Within this altered zone are quartz-carbonite-pyrite veins with lesser amounts of sphalerite, galena, chalcopyrite, and arsenopyrite.

6. B.W.M.

References: Minister of Mines, B.C. Ann. Repts.: 1950, p. A75

This property is on a large rusty zone adjacent to a small quartz diorite stock that cuts Upper Triassic volcanic and sedimentary rocks. Both the stock and the altered wall rock are cut by tabular and irregular masses of pink quartz feldspar porphyry. Fracture zones within the porphyry and for several feet into the surrounding rock are filled with drusy quartz veins and vugs containing calcite, limonite, and chalcopyrite.

7. Thorn

References: Minister of Mines, B.C. Ann. Repts.: 1963, p. 6.

The Thorn group of claims, owned by Julian Mining Co. Ltd. of Vancouver, is in the bottom of a deep narrow valley occupied by a northwesterly flowing tributary of Sutlahine River. The ridge to the northeast is capped by several thousand feet of Sloko volcanics, whereas the ridge to the southwest consists of Stuhini pillow lavas. Intermittent outcrops in the creek bottom include andesite believed to be altered Stuhini lava and a green quartz-feldspar porphyry that may be part of a system of feeders for the overlying Sloko volcanics. The porphyry and nearby andesite are charged with disseminated pyrite and lesser amounts of chalcopyrite and, in addition, a stockwork of quartz veins with chalcopyrite, tetrahedrite, stibnite and enargite. The company reports significant values in copper, gold, silver, lead and zinc.

8. Bing

The Bing group is near the margin of a large body of foliated diorite adjacent to which the pre-Upper Triassic volcanic and sedimentary rocks have been intensely dioritized. In the vicinity of the property the dioritized rocks are cut by young feldspar porphyry dykes, sills, and irregular masses, which have caused further feldspathization and silicification of the intruded rock. Mineralization, comprising disseminated chalcopyrite and molybdenite, is related to fracturing within this altered zone. Chalcopyrite also occurs with pyrite in masses and knots of epidote.

9. FAE

References: Minister of Mines, B.C. Ann. Repts.: 1963, p. 7

Low grade disseminations of chalcopyrite and molybdenite occur in silicified fracture zones along the southern margin of a small locally porphyritic, quartz monzonite stock which cuts pre-Upper Triassic sediments and volcanics. A magnetite-rich skarn on the north side of the same body also contains small amounts of copper.

10. Nan

Float, bearing molybdenite, was discovered on the glacier at the head of the south fork of Sittakany River in 1961. Part of this comes from aplitic dykes that cross the valley at many places, but the greater part appears to have been supplied from a tabular body of pneumatallitically altered felsite, exposed in the cirque on the southern side of Mount Ogden. The body has an exposed length of over 5,000 feet and a maximum width of about 500 feet. Molybdenite is sporadically distributed throughout the body as small clots and fracture coatings.

11. Elaine

The Elaine claims are on the contact of a well-defined apophysis of quartz monzonite that cuts foliated diorite south of Trapper Lake. Small amounts of molybdenite are found as local disseminations within the quartz monzonite, but the main showing consists of three east-west trending quartz veins (up to 18 inches wide) within the diorite a short distance from the quartz monzonite contact. Coarse-grained molybdenite forms rosettes up to six inches across along the selvages of the veins.

12. Surveyor, and 13. Council

References: Minister of Mines, B.C. Ann. Repts.: 1930, p. 121

Kerr, F.A., 1948, p. 69

Both of these properties are in sheared and altered Stuhini volcanic rocks. The deposits consists of veinlets of massive and disseminated stibnite and pyrite in a quartz-carbonate gangue.

14. Baker Group

This property was not visited but is reported to cover a large altered zone in volcanic rock containing veins and disseminations of stibnite.

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