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Preliminary Map
ST. MARY LAKE
BRITISH COLUMBIA
(Descriptive Notes)

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DESCRIPTIVE NOTES FOR ST. MARY LAKE MAP, B.C.

The topography in this part of the Purcell Mountains is characteristically rugged, and effects of glaciation are pronounced. Timber-line is roughly 7,300 feet above sea-level, and below it the slopes are thickly grown with conifers except in areas subjected to recent forest fires.

Stratigraphy

The Proterozoic Purcell strata (1 - 6) form an apparently conformable sequence, and their subdivision is based solely on lithology, though similar rocks recur throughout the sequence and lithological changes are gradational. The Lower Division(1) of the Aldridge formation is at least 4,500 feet thick, and is a markedly rusty-weathering assemblage of quartzites of varied degrees of purity, and argillites; grey quartzite, with fine, dark laminations, and commonly crossbedded, is the most diagnostic rock. The lowest exposed beds, near Matthew Creek, are altered to quartz-mica schist. Near the top of the division, a zone of massive quartzite similar to that of the Middle Division is separated from it by beds typical of the lower assemblage. The Middle Division(2) is characterized by massive, light-coloured quartzite beds, with argillite partings. It is not particularly rusty-weathering except in certain zones containing beds that are relatively thin and argillaceous. The division is about 10,000 feet thick. It passes gradationally upward into the rusty-weathering thinly laminated argillite and argillaceous quartzite of the Upper Division(3), which is approximately 1,300 feet thick. The overlying Creston formation(4) contains a basal member(4A) that is distinctly recognizable east of St. Mary River, less distinct south of Meacham Creek, and either missing or indistinguishable north of Redding Creek; it consists of argillite containing abundant mud-cracks and displaying features that are apparently a result of preconsolidation deformation.

Strata mapped provisionally as Dutch Creek formation(6) are chiefly thinly laminated argillite, mostly black but locally grading to green on strike. They are crumpled, and stratigraphic tops are not apparent, but small isoclinal folds overturned eastward with approximately horizontal axes are thought to reflect major structures. The strata may possibly be Creston, but they do not resemble the Creston that underlies the Kitchener-Siyeh formation farther east.

Structure

The map-area is on the crest and western flank of a regional anticline that strikes and plunges northerly. Lithological variations and major faults combine to outline sub-areas with contrasting structures. The largest of such areas is bounded on the south by the St. Mary fault and on the west by the Hall Lake fault. The latter, which extends from Goat River to White Creek, is steep, and appears to reflect both vertical and lateral displacements. This sub-area, underlain chiefly by competent Aldridge strata stiffened by dioritic sills, is characterized by open folds and contains numerous faults. Among the more important of these faults are: the Alki reverse fault, which strikes northwesterly and dips southwesterly; two normal faults, one of them on the northern part of Bootleg Mountain and the other at the northwestern extremity of Matthew Creek, which strike easterly and dip northerly; and, near Meacham Creek, a group of steep and vertical faults that strike northerly and along which the western block is depressed relative to the eastern. The sub-area south of the St. Mary fault is underlain by strata that dip and face west and are partly repeated by steep, northerly striking faults. The sub-area west of the Hall Lake fault is, in the main, underlain by closely folded incompetent strata. Westward dips predominate, but some of the west-dipping strata are the under-limbs of overturned folds; unrecognized strike faults may occur in this area.

Mineral Deposits

The mineral deposits within the geologically mapped part of the area are of three main types. Quartz-calcite veins and lenses in dioritic sills(A), in and adjacent to which occur chalcopyrite, pyrite, pyrrhotite, and, less abundantly, galena and sphalerite, constitute one type. These have received considerable attention from prospectors, chiefly because of their copper content, but none has proved extensive. The workings in the vicinity of Mount Evans, those on Alki Creek, most of those at the headwaters of Pyramid Creek and the adjacent fork of Matthew Creek, and part of the Dominion group, are in deposits of this type. Deposits of a second type are fillings and replacements along faults and sheared zones and are not confined to any particular rock formation. They contain galena, sphalerite, pyrite, pyrrhotite, chalcopyrite, arsenopyrite, and hematite, and have been valued for their lead, zinc, and silver or gold contents. Some contain tungsten. They include the most promising deposits located on this map. The Dan Howe, Gold Ledge, Leader, Warhorse, Warren, and part of the Dominion group are of this type. Deposits of a third type are lenticular replacement veins and less regular bodies in limy beds of the Kitchener-Siych formation(5) in the southwest part of the map-area. They contain pyrite, galena, tetrahedrite, and minor chalcopyrite. The Storm King and Copper King deposits are in this category.

Blue Peter. Workings in or adjacent to this claim include two adits, two shafts, and a pit. One adit is driven for 120 feet along a zone of quartz stringers in fractured diorite. The zone, which is mostly 6 to 8 feet wide, contains considerable pyrrhotite and minor chalcopyrite. The other adit and shafts, all caved, and the pit, explore fractured diorite containing irregular quartz veins and a little chalcopyrite.

Bulldog. White quartz crops out widely on the hillside. Sulphides are sparse or lacking. The attitudes of adjoining strata and evidence in one of two shallow shafts and in the dump of a caved adit suggest that the great width of the exposure is due to oblique truncation of a mass of quartz 30 to 50 feet thick.

Copper King. A zone, 1 foot to 4 feet wide, bearing irregular quartz stringers is exposed for about 60 feet by a trench in buff-weathering dolomitic Kitchener-Siyeh strata. Tetrahedrite, pyrite, galena, and a little chalcopyrite occur in it. The claim may contain other workings not seen by the writer.

Dan Howe Group. A sheared zone in argillaceous quartzite immediately beneath and parallel with a dioritic sill contains lenticular quartz veins mineralized with galena accompanied by pyrrhotite, sphalerite, and arsenopyrite. It is explored by a 58-foot drift at the end of which is a 31-foot crosscut. The vein in the drift reaches a width of 6 feet, but narrows to 1½ feet or less at the face. The crosscut, entirely in sheared quartzite, intersects three other veins or branches from 4 inches to 1 foot wide. The workings, about 50 years old, are included in four claims staked jointly in 1951 by Michael Hretchka and William Dawe, Box 308, Vancouver, B.C.

Dominion Group. Two adjacent adits in quartzite explore shears and fractures in which galena, with smaller amounts of sphalerite, scheelite, and chalcopyrite, have been found in a quartz and garnet gangue. Lower on the hillside, an adit explores a small fault that passes from the top of a dioritic sill into quartzite. Lenses and veins of quartz occur along the part of the fault in diorite, but are essentially lacking along the part in quartzite. A little sphalerite and galena occur along the fault. Other workings farther east comprise a shallow shaft and short adit in the same sill and a short adit in quartzite. The property was owned in 1951 by Frank Tracy, 125 East Second Ave., Vancouver, B.C.

Evans Copper Group. Fractures in dioritic sills contain quartz and calcite, in and adjacent to which are found chalcopyrite, pyrrhotite, pyrite, and, in some instances, galena, in varied proportions. The mineralized fractures occur typically at sill margins and confined to the sills. Surface workings in Pollen Basin, on Mount Evans, explore two veins and a lens at and near the top of a faulted sill. A 163-foot adit (once named Whitefish) explores a sheared, epidotized, deeper part of the same sill. Other surface workings near Meacham Creek expose sparsely mineralized fractured diorite. North of the creek, a 77-foot adit, a shaft, and an open-cut (formerly referred to as Faller and Evangeline) explore a vein at the roof of a sill. The above old workings were restaked in 1951 by S. Nogalski and R. Sostad of Cranbrook, B.C.

Gold Ledge. The Alki fault zone in this vicinity contains considerable thicknesses of quartz. The principal working, in the foot-wall of the zone, is a 135-foot drift and 46-foot crosscut in T-pattern. The drift traverses thoroughly sheared rock containing numerous quartz stringers. The crosscut exposes 8 feet of quartz-filled breccia and 25 feet of fractured quartz, the total width of which is unknown. Arsenopyrite, galena, and pyrite are sparse sulphide minerals. Results of gold assays have proved discouraging.

Good Hope. A 235-foot adit in a dioritic sill explores a faulted vein, or two veins, of quartz and calcite 1 foot to 7 feet wide, in and adjacent to which chalcopyrite occurs sparsely.

Leader Group (Wellington). The Sawmill Creek fault contains quartz mineralized with galena, pyrite, chalcopyrite, sphalerite, scheelite, hematite, and stolzite (lead tungstate). The quartz is mostly 6 inches to 2 feet wide. Open-cuts, and a shaft and adit (both caved) prove the persistence of quartz for horizontal and vertical distances of at least 1000 and 200 feet respectively. In 1951, the property was under option to Estella Mines Limited, 916 Vancouver Block, Vancouver, B.C.

Storm King. A shaft in Macaroni Basin is sunk on mineralized quartz in dolomitic Kitchener-Siyeh strata. The shaft is filled with water, and there is no information on possible lateral workings. The dump contains a small pile of sorted ore heavily mineralized with pyrite, tetrahedrite, galena, and a little chalcopyrite and arsenopyrite. A selected sample of ore rich in galena and tetrahedrite contained 0.31 per cent of tin. Shipments of ore are said to have been made 45 or 50 years ago. Efforts to find extensions of the ore-zone in trenches do not appear to have been successful.

Warhorse Group. (Boy Scout). Intensely sheared argillaceous quartzites contain galena, sphalerite, pyrite, pyrrhotite, and minor chalcopyrite and arsenopyrite, partly associated with vein quartz and partly replacing sheared rock. The controlling shear-pattern strikes northwest and dips 60 degrees southwest. There are four adits, each exposing sulphides, the lowest about 700 feet vertically below the highest. In 1951, the property was under active exploration by the optionees, Thomas Consolidated Mines, Incorporated, 640 Peyton Bldg., Spokane 7, Wash., U.S.A.

Warren. Quartz in the Alki fault zone contains pyrite, arsenopyrite, galena, and sphalerite. An adit, shaft, and pit were excavated in the nineties on former claims called Warren and Wolmer.