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APPENDIX II

GEOLOGY

PROPERTY FILE

## Regional Geology

The Kennedy River Gold Camp claim lies within a tectonically active part of Vancouver Island. Triassic Karmutsen Formation volcanic rocks and Quatsino Formation limestone of the Vancouver Group and Jurassic Bonanza Group volcanic rocks have been intruded by granitic rocks. These granitic rocks are the Jurassic Island Intrusions granodiorite, and the Tertiary Sooke Intrusions quartz diorite (Muller 1977). Contacts between the intrusives and the wallrocks are usually discrete; the contacts are faulted in few places. The rocks have been transected by west-northwesterly to westerly trending, generally steeply dipping faults. Most of these faults are of Tertiary age (Henneberry 1987). Certain of the larger faults, such as the Mine Creek Fault, are probably older and may have been active since Jurassic time. The Mine Creek Fault has a strike length of 45 km. Gold-bearing quartz-sulphide veins within the district are found primarily along faults, therefore the veins are likely of Tertiary age (Pawliuk 1989).

## Local Geology

Interbedded Triassic Karmutsen Formation volcanic rocks exist in the southwestern portion of the Captain Hook mineral claim (Pawliuk 1989).

## Shack Vein

The Shack Vein is emplaced along a northeasterly trending fault which is probably a splay of the Mine Creek Fault. This gold- and silver-bearing quartz-sulphide vein averages 40 cm in width on the surface and dips 60 to 67 degrees to the northwest. The Shack vein is discontinuously exposed for 160 m along strike and extends to a depth of 142 m down-dip. The vein is open at depth and along strike at both ends (Pawliuk 1989).

The Shack Vein is composed of off-white to pale grey, locally brecciated quartz which is usually banded over a few cm near vein margins. Much of the vein quartz is coarsely crystalline. Subhedral to euhedral quartz crystals up to 9 mm wide and 45 mm long are present. The quartz crystals locally have smokey rims. The vein often contains wispy, lensoid wallrock andesite xenoliths that usually contain 5 or 10 percent disseminated pyrite (Pawliuk 1989).

Diamond drill cores of the Shack Vein contain an average of up to 2 or 3 percent pyrite, 3 percent pyrrotite, 4 percent chalcopyrite and up to 2 percent sphalerite. The sulphide mineral content of the vein in diamond drill cores averages about 2 or 3 percent. The sulphides occur as irregular masses

up to about 7 by 5 cm across filling cavities, and as hairline veinlets along irregular fracture surfaces. Pyrite in the central part of the Shack Vein in diamond drill hole SH-88-2 occurs as subhedral crystals up to 5 mm across. Vein quartz is locally corroded and invaded by sulphides (Pawliuk 1989).

Shack Vein in rotary hammer drill holes SH-88-A contains 3 percent carbonate. Shack Vein in diamond drill hole SH-88-1 contains about 1 percent carbonate within 2 cm of both hangingwall and footwall contacts. In the other drill holes, the Shack Vein contains no carbonate or only trace amounts. The carbonate content of Shack Vein therefore appears to increase with depth (Pawliuk 1989).

Traces of greenish grey, wispy chlorite locally line fracture surfaces within Shack Vein quartz. The contact between Shack Vein and the wallrocks is usually faulted with approximately 2 mm of grey mud and finely broken core present. In some places the contact is discrete (Pawliuk 1989).

#### Shack Vein Wallrock

Shack Vein intrudes Karmutsen Formation rocks and skarn on the Captain Hook and Giant Bear mineral claims. These wallrocks are generally fine grained, well-cemented and competent, except within a few centimetres of the vein contacts where the wallrocks are usually sheared and schistose (Pawliuk 1989).

Two or three percent, locally up to 10 percent, disseminated pyrite is usually present in wallrock within about 50 to 80 cm of vein margins. The wallrock is often weakly to moderately silicified within about 0.5 m to 2 m of vein margins. Karmutsen Formation andesite locally contains up to 5 percent kaolinite along hairline fractures within a few meters of vein margins (Pawliuk 1989).

#### Elite Vein

The Elite Vein strikes easterly to northeasterly and dips 55 to 80° to the north or northwest. It is emplaced along a shear or fault which is likely a splay of Canoe Creek Fault. The vein extends for 85 m along strike and to a depth of 52 m below surface. The Elite Vein is open at depth and along strike to the northeast; it may also be open along strike to the west (Pawliuk 1988).

The Elite Vein is composed of off-white to locally, pale grey or pale greenish white quartz with brown, greyish brown or brass coloured patches where sulphides are abundant. The vein quartz is fractured; chlorite and sulphides line some of the fracture surfaces. The vein is 75 to 90% quartz and 10 to 25% sulphide minerals. The sulphide minerals are mainly pyrite and pyrrhotite with lesser amounts of chalcopyrite, sphalerite, galena and arsenopyrite (?). The Elite Vein locally contains 1% carbonate, up to 6% sericite, traces of biotite and traces of jarosite (Pawliuk 1988).

The contacts between the Elite Vein and the wallrocks are discrete or locally faulted with up to 2 cm of fault gouge along vein margins (Pawliuk 1988).

#### Elite Vein Wallrock

The Elite Vein intrudes Karmutsen Formation andesite or andesite porphyry and Island Intrusions quartz diorite. These wallrocks are brecciated, silicified and carbonatized with fractures lined by quartz, carbonate and/or sulphides. Hornblende has been altered to chlorite and feldspars altered to clay minerals (Pawliuk 1988).

#### Black Vein

The Black Vein is emplaced along the easterly trending Bear Fault which is a splay of Mine Creek Fault. The Black Vein therefore, is likely the on-strike extension of the Bear Vein. The Black Vein is exposed for 43 m along strike and dips steeply. It extends to a depth of 36 m down dip and is open at depth (Pawliuk 1989 in prep.).

The quartz-sulphide Black Vein contains off-white to smokey grey to pale green quartz and averages about 5 to 10 % sulphide minerals. The Black Vein contains up to 68% pyrrhotite, 10% sphalerite, 10% pyrite and up to 3% chalcopyrite (Pawliuk, 1989 in prep.).

The contacts between the Black Vein and the wallrocks are usually discrete (Pawliuk 1989 in prep.).

### Black Vein Wallrocks

The Black Vein mainly intrudes Island Intrusions quartz diorite which is silicified, bleached and locally brecciated near vein margins. The quartz diorite locally contains up to 3% combined pyrrhotite and pyrite (Pawliuk 1989 in prep.).

Black Vein also locally intrudes Karmutsen Formation andesite which is weakly brecciated and carbonatized with local 1% pyrite (Pawliuk 1989 in prep.).

### Bear Vein

The Bear Vein is emplaced along the easterly trending Bear Fault which is a splay of the Mine Creek Fault. The Bear Vein, therefore, is likely the on-strike extension of the Black Vein. Bear Vein dips at 50 to 55° to the north. The vein likely extends for at least 135 m along strike and to a depth of 45 m down-dip. The vein is open along strike to the east and at depth (Pawliuk 1989 in prep.).

The Bear quartz-sulphide vein contains from traces to 4 or 5% combined pyrrhotite and pyrite, and local 5% spalerite. The vein locally contains up to 25% clay minerals, up to about 3% chlorite and traces of carbonate (Pawliuk 1989 in prep.).

The contacts between the Bear Vein and the wallrocks are discrete or locally faulted with up to 20 mm of fault gouge and finely broken core along vein margins (Pawliuk 1989 in prep.).

### Bear Vein Wallrocks

The Bear Vein intrudes Island Intrusions quartz diorite which is brecciated and silicified near vein contacts with feldspars locally altered to clay minerals (Pawliuk 1989 in prep.).

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