Felsic Intrusives

Numerous felsic intrusive rocks compositionally ranging from quartz monzonite to granitic. Grey-to-pink/red, medium-to-coarse grained with subhedral-to-euhedral feldspar, locally megacrystic. Mineralogy primarily consists of feldspar, quartz, and biotite/muscovite with minor hornblende. Commonly have deep hematitic staining and characteristic rounded weathering in outcrop. Massive-to-weakly foliated with foliation defined by weakly aligned feldspar and mica. Cross-cutting quartz veins and pegmatitic dikes less than 6 inches wide are common but not necessarily abundant. Quartz monzonite is considerably finer-grained and more foliated than the Rambler Granite, a coarse grained, strongly epidotized granite primarily encountered in underground mine workings (McCallum et al., 1976).

Figure 1 – Images of felsic intrusive rocks in the Shambhala claims area

Mafic Complex Rocks

The majority of rocks exposed in the Shambhala claims area are part of a tholeiitic mafic sequence adjacent to the larger and well-studied Mullen Creek Mafic Complex. These rocks are collectively amphibolitized and subsequently retrogressed to greenschist conditions, thus they are all technically amphibolites. The following will provide descriptions for the different phases of this amphibolitized complex that were encountered in the Shambhala claims area.

Metavolcanic/Aplitic Rocks

Volumetrically minor but seemingly apparent across much of the Shambhala claims area. Mostly appears as metabasaltic and aplitic dikes crosscutting metagabbroic/amphibolitic rocks near the no. 71 Adit. Metabasalt also appears near the Joker No. 4 Shaft. Metabasalt is very dark- to-greenish and very fine-grained with trace amounts of subhedral feldspar phenocrysts. Metabasalt can also feature a weak-to-moderate foliation. Aplitic dikes are greyish and are predominantly very fine-grained feldspar and quartz with trace hornblende and biotite phenocrysts that are weakly aligned to their contacts with amphibolitic country rock.

Figure 2 – Metabasalt (A+B) and Aplite (C+D)

Metagabbro

Dark grey- to-black, medium-to-coarse grained with local but significant hornblende and pyroxene porphyroclasts with quartz, calcite, biotite grain shadow infill. Relict olivine also locally significant. Dominated by plagioclase, hornblende, biotite, and pyroxene with minor epidote and magnetite. Weakly foliated with feldspar crystals defining foliation, and crosscut by chloritized metabasalt/ meta-andesite as well as aplitic granitic dikes and many epidote veins. Highly variable deformational states ranging from fresh gabbro to crystalloblastic orthoamphibolites (Loucks, 1976). Metagabbro outcrops also contain locally significant zones of metapyroxenite, a coarse-grained pyroxene dominated black rock with

massive texture, abundant magnetite, and pervasive retrograde chlorite. Outcrops of metagabbro and metapyroxenite are immediately adjacent to the No. 71 Adit.

Figure 3 – Metagabbro

Metadiorite

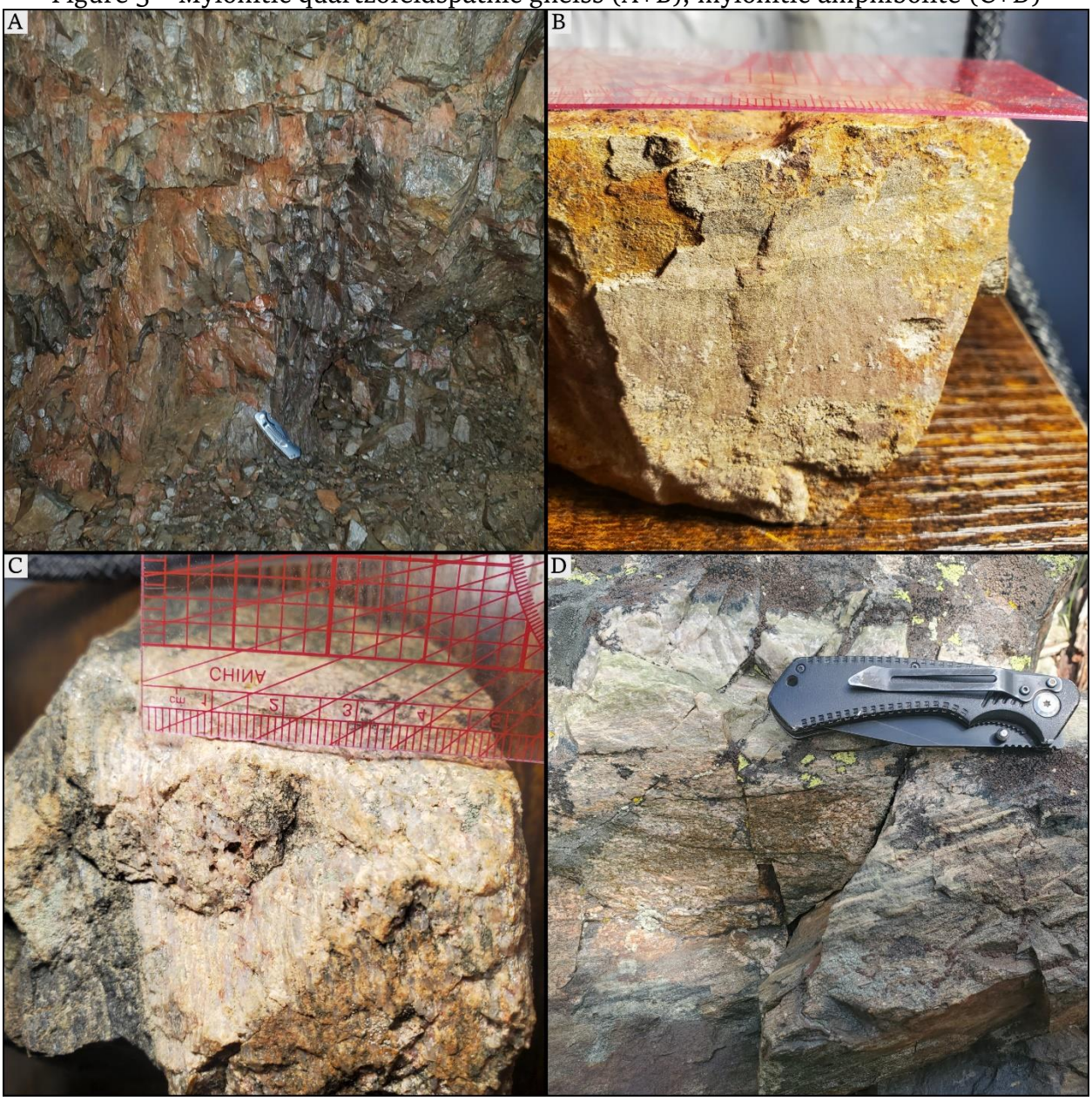
Very similar to metagabbro but features minor quartz and a much finer grain-size. Metadiorite is commonly dark grey- to-black, fine grained, and features an intense gossanous rind with hematite and limonite. Commonly crosscut by very fine quartz + calcite veins. Massive to moderately foliated texture with biotite defining foliation planes. Dominated by plagioclase biotite and quartz with minor hornblende, pyrite, and chalcopyrite. Commonly featured in the Joker No. 4 tailings pile.

Figure 4 – Metadiorite

Mylonitic quartzofeldspathic gneiss and mylonitic amphibolite

Most commonly light grey-to- light pink, very fine-grained and well-indurated quartzofeldspathic, chloritic mylonite with predominantly quartz, chlorite, white mica and epidotic + hematitic alteration. Very intense gossanous rind where outcrop is exposed as well as extensive quartz and calcite veining as well as hematite after pyrite. Mylonitic amphibolite also occurs, commonly near mylonitic quartzofeldspathic gneiss and mostly contains amphibole and feldspar with strong foliation planes defined by biotite. Mylonitic amphibole is a fine-to-coarse grained rock with mylonitic quartz stringers and extensive epidotic alteration.

Figure 5 – Mylonitic quartzofeldspathic gneiss (A+B), mylonitic amphibolite (C+D)



Quartz-biotite-feldspar gneiss

Displays gneissic foliations that vary from weakly gneissic to ptygmatic/irregular with local migmatitic zones and lenses. Lighter layers strongly resemble felsic orthogneiss (i.e., gneiss granodiorite) and is commonly much coarser-grained than the dark layers, which are defined by aligned biotite and hornblende. Gneiss has trace amounts of hematite after pyrite and evidence for propylitic alteration (epidote, chlorite, albite, and pyrite) as well as silicification. Commonly displayed in the Joker No. 4 tailings pile.

Figure 6 – Quartz-biotite-feldspar orthogneiss