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The map sheet is entirely within the Omineca tectonic belt, straddling the northern end of the Kootenay Arc, and includes the eastern edge of the Monashee Complex. Strata of the Kootenay Terrane in the northeastern portion are composed of the Upper Proterozoic to Lower Cambrian Hamill Group, Lower Cambrian Badshot Formation, Cambrian to Devonian(?) Lardeau Group and the upper Mississippian to (?)Permian Milford Group. Progressing to the southwest, Permian to Carboniferous Kaslo Group strata have been assigned to the Slide Mountain Terrane. The area east of Upper Arrow Lake is dominated by strata of the Quesnel Terrane, which includes the Triassic Slocan Group and Lower Jurassic Rossland Group. The Valhalla gneiss dome complex is exposed west of Upper Arrow Lake. This structure includes metamorphic rocks of the Proterozoic to (?)lower Paleozoic Monashee Complex and Lower Proterozoic core (basement) gneiss. The northwest structural trend of these strata have been disrupted by two Middle Jurassic plutons - the Kuskanax batholith in the northwestern portion of the map area and the Nelson batholith along the southern margin. Several stocks of Cretaceous or Middle Jurassic age are located to the east and south of the Kuskanax batholith. The Poplar Creek, Mobb Creek, North Fork, Ruby Range and Rapid Creek stocks comprise Middle Jurassic intrusions related to and located east of the Kuskanax pluton. Cretaceous intrusions include the Goat Canyon-Halifax Creek and Wragge Creek stocks.

Stratified rocks in the Nakusp map area have been complexly folded, faulted and metamorphosed. The major structural feature, the Columbia River fault, is a complex zone more than 250 kilometres in length that extends north from the Nakusp area to the Mica Dam area. It marks the eastern boundary of the Shuswap and Monashee metamorphic complexes. It dips gently east with major normal, dip-slip displacements.

The oldest rock unit of the Kootenay Terrane in the northeast portion of the map area is quartzite of the Hamill Group. This quartzite is overlain by limestone of the Badshot Formation. Collectively, these units form a distinctive marker horizon outlining major structural features of the Kootenay Arc.

The Lardeau Group is part of the Kootenay Terrane, forming a broad belt northeast of the Kuskanax batholith, extending from the Nakusp and adjacent Lardeau map sheet (082KSE) northward into the Revelstoke map sheet (082LNE). The Lardeau Group has been subdivided into six formations. The lowest stratigraphic unit consists of micaceous schist and marble of the Index Formation, which is successively overlain by dark siliceous phyllite of the Sharon Creek Formation, massive grey quartzite of the Ajax Formation, dark siliceous phyllite and greenstone of the Triune Formation, green phyllite and greenstone of the Jowett Formation, and limestone, phyllite and grit of the Broadview Formation. The Sharon, Ajax and Triune formations are not separated on the accompanying MINFILE map. The Milford Group unconformably overlies the Lardeau Group along the eastern margin of the Kuskanax batholith. The unconformity, commonly faulted, is an angular unconformity marked locally by metaconglomerate and amygdaloidal basalt. North of Mount Cooper the unconformity is marked by a basal cobble conglomerate. A limestone unit which ranges in thickness from several metres to several hundred metres is present near the base of the Milford Group. The Milford Group consists mainly of grey and brown argillite and quartzite, however, it also contains a chert band which extends south of Mount Cooper along Blue Ridge.

The Kaslo Group consists of andesitic tuffs and breccia metamorphosed from greenschist to amphibolite grade near the Kuskanax batholith. Sills of serpentinite, hornblende and pyroxene metadiorite and metagabbro have preferentially intruded the upper part of Kaslo and Milford groups strata. The largest of these serpentinite bodies forms a lenticular belt along the Blue Ridge, immediately northeast of the contact between the Kaslo and Slocan groups.

Mesozoic strata of the Quesnel Terrane outcrop west of the Kaslo Group. These include the Slocan Group and the Rossland Group. Slocan Group sedimentary strata disconformably overlie the Kaslo Group. At the base, conglomerate and sedimentary breccia composed of Kaslo detritus define the disconformity. A unit consisting of one or more limestone beds up to 30 metres in thickness intercalated with argillite, phyllite and quartzite, comprises the lower sequence. This unit is host to the stratabound polymetallic "replacement" deposits in the Slocan mining district. The upper sequence is composed of argillite, phyllite and quartzite. Near the top of the sequence strata become tuffaceous passing into metadacite and meta-andesite flows and tuffs. Predominantly mafic volcanic strata of the Rossland Group comprise the youngest sequence of layered rocks in the Nakusp map sheet.