# New data on Late Triassic to late Early Jurassic plutonic suites in the northern Golden Triangle region of northwest British Columbia

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**Abstract**

New fieldwork focused on the southern Telegraph Creek area of the northern Golden Triangle and 16 previously unreleased U-Pb zircon dates help better define Late Triassic to Early Jurassic plutonic suites and contribute to a better understanding of the relationship between magmatism and mineralization. The Late Triassic Stikine plutonic suite, which hosts the Schaft Creek deposit, is represented by the Hickman and Nightout plutons (ca. 225-219 Ma). Ranging in composition from pyroxenite to foid syenite to monzodiorite, the Late Triassic Galore plutonic suite (ca. 212-204 Ma) is thought to be syn-collisional; it hosts the Galore Creek and Copper Canyon porphyry deposits. At least two significant mineralizing events are recorded at Galore Creek, with the younger event partially hosted by a syenite to monzodiorite unit. Several other small syenite to monzodiorite intrusions west of Galore Creek, and south of Hankin Peak have been reassigned to the Galore suite. The Texas Creek plutonic suite (ca. 204-188 Ma) is restricted to the Ball Creek area, following the reassignment of other Early Jurassic plutons. The monzodiorite and monzonite porphyritic intrusions that host the Mary and Williams porphyry occurrences are likely part of Texas Creek suite such as exposed in the Stewart-Iskut volcanic belt. With apparently limited related mineralization, the Cone Mountain plutonic suite (ca. 185 Ma) is restricted to the western side of the study area. This suite was emplaced following a 30 m.y. hiatus in northern Stikinia, overlapping with emplacement of the Long Lake suite (ca. 188-183 Ma) along the Stikinia-Yukon-Tanana suture.

**Keywords:** Plutonic rocks, Stikinia, Golden Triangle, Porphyry Cu-Au-Mo, Galore Creek, Schaft Creek, Mary, Williams, Stikine plutonic suite, Galore plutonic suite, Texas Creek plutonic suite, Cone Mountain plutonic suite, Hickman pluton, Nightout pluton, Triassic, Jurassic

## 1. Introduction

This paper describes the initial results from a study of plutonic rocks in the southern Telegraph Creek area (104G/01-08, 11) and Oweegee dome area (104A/12) of northwestern British Columbia on the traditional lands of the Tahltan First Nation (Figs. 1, 2). This is the first year of a multi-year project to develop a framework for Paleozoic to Eocene plutonism throughout the loosely defined region popularly referred to as the 'Golden Triangle' and determine the relationship between magmatic evolution and mineralization in the region. Fieldwork was devoted to studying and sampling typical exposures and drill core representing major plutonic bodies and mineralized intrusions, with a focus on sampling the entire compositional range for each plutonic suite.

In this paper we provide detailed descriptions of four Late Triassic to late Early Jurassic plutonic suites (Stikine, Galore, Texas Creek, and Cone Mountain) in the southern Telegraph Creek and Oweegee dome areas that host or generate the major porphyry and porphyry-related deposits in the Golden Triangle. We also introduce 16 previously unpublished U-Pb zircon ages, the full details of which are in Bailey et al. (2025).

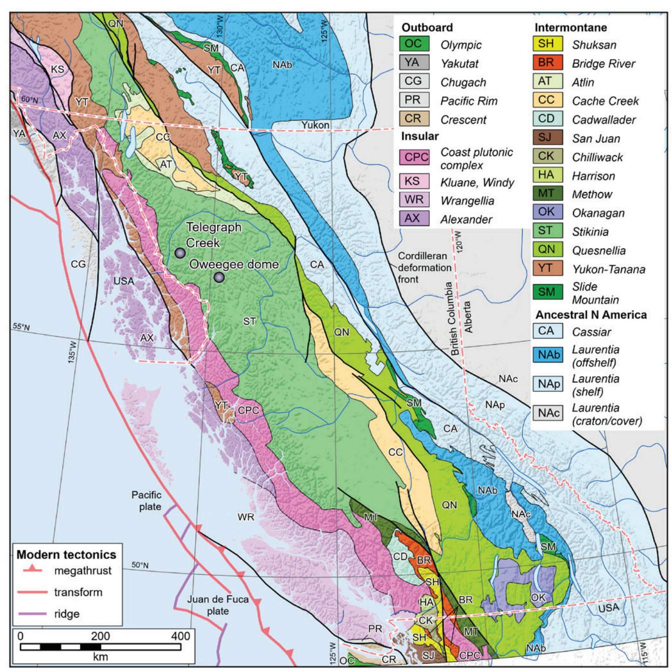


**Fig. 1.** Location of southern Telegraph Creek study area. Terranes after Colpron (2020).

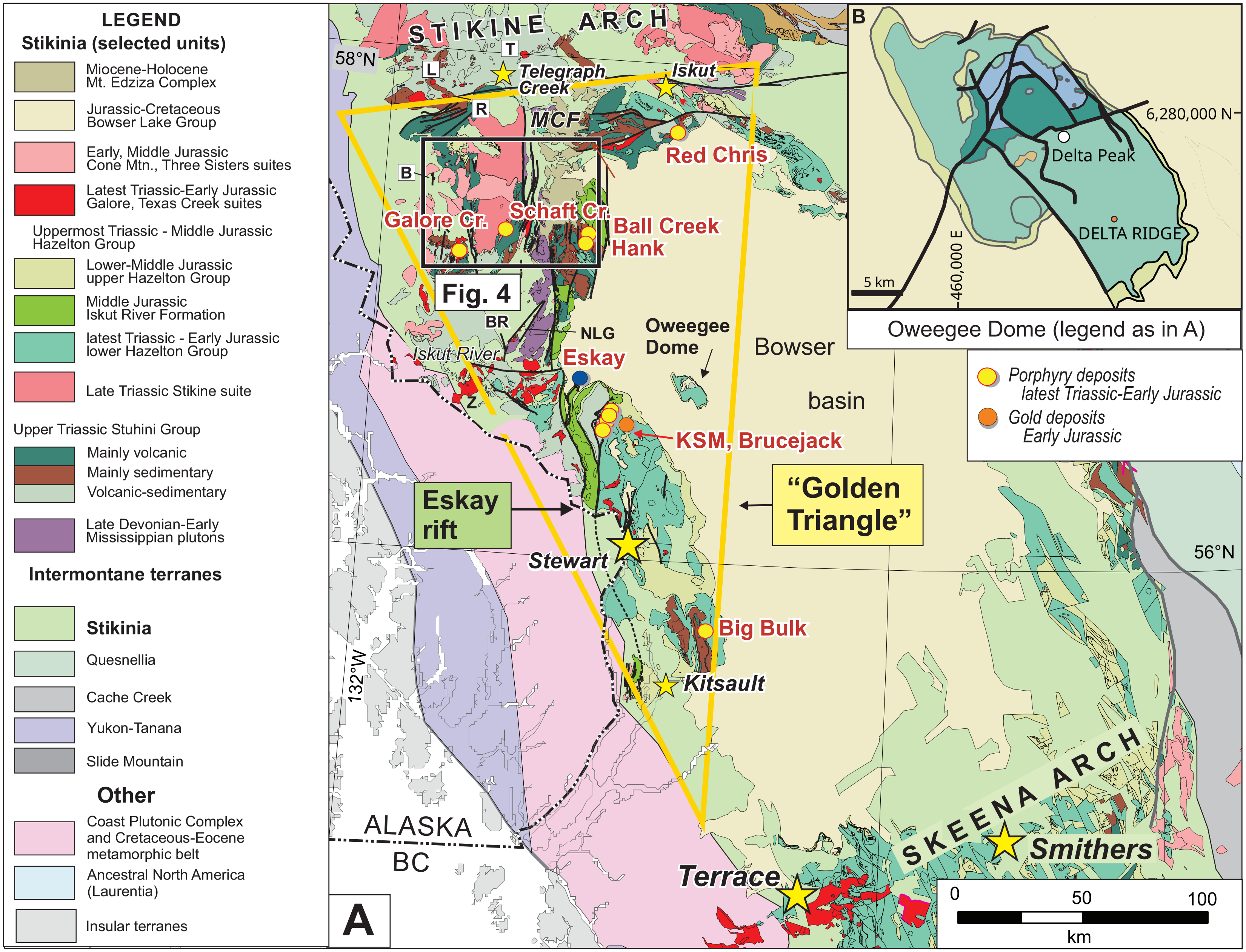


**Fig. 2.** Late Triassic to Middle Jurassic stratigraphy, plutonic suites and structural setting of northwestern Stikinia. Inset: local geology of the Oweegee Dome area. The Golden Triangle outlines the Cu-Au rich area of northwestern Stikinia that hosts porphyry, epithermal, and volcanogenic massive sulphide deposits. Abbreviations: L – Latimer Lake pluton, T – Tahltan syenite stock or Ten Mile Creek intrusion, R – Rugged Mountain pluton, B – Butterfly stock, BR - Burgundy ridge intrusions, NLG – Newmont Lake graben plugs, Z – Zippa Mountain body, and MCF – Mess Creek fault zone. After Nelson and van Straaten (2020).

## 2. Regional geological setting

The study area is in Stikine terrane (Stikinia), part of the Intermontane belt of the Canadian Cordillera (Figs. 1, 2). Stikinia is an island arc terrane consisting of a series of Paleozoic to Mesozoic arc-related successions and related plutonic rocks (e.g., Nelson et al., 2013). The Stikine and related Quesnel terranes host most of the porphyry deposits in the Canadian Cordillera (e.g., Logan and Mihalynuk, 2014).

Stikinia contains three unconformity-bounded volcano-sedimentary successions: the Stikine assemblage, Stuhini Group, and Hazelton Group (Figs. 2, 3; e.g., Nelson et al., 2013; Nelson and van Straaten, 2020). The Stikine assemblage, the oldest rocks in the study area, are a succession of Early Devonian to Permian mafic and bimodal volcanic rocks, carbonate rocks and minor fine-grained siliciclastic rocks. Along Mess Creek and Forrest-Kerr Creek (Fig. 4), the oldest units in the Stikine assemblage are locally cut by the More Creek plutonic suite (ca. 357 Ma, Early Mississippian; Logan et al., 2000) and Forrest-Kerr plutonic suite (ca. 370-369 Ma, Late Devonian; Logan et al. 2000).

The Stikine assemblage is unconformably overlain by the Stuhini Group (Upper Triassic) with the transition temporally associated with poorly understood Permian-Triassic deformation (Logan and Koyanagi, 1994). The Stuhini Group consists mainly of subaqueous, mafic to intermediate volcanic and volcaniclastic rocks but also includes ultramafic volcanic rocks (Logan et al., 2000; Milidragovic et al., 2016, 2018) and alkaline volcanic rocks (Logan and Koyanagi, 1994; van Straaten et al., 2023). The Gnat Lakes plutonic suite (Late Triassic), Stikine plutonic suite (ca. 230-219 Ma) and Galore plutonic suite (212-204 Ma) are all thought to be broadly coeval with the Stuhini Group (Figs. 3, 4). The Stikine plutonic suite hosts the Schaft Creek porphyry Cu-Au-Mo-Ag deposit; the Galore plutonic suite hosts the Galore porphyry Cu-Au-Ag deposit.

The Stuhini Group is unconformably overlain by the Hazelton Group (uppermost Triassic to Middle Jurassic). This transition and coincident latest Triassic deformation are thought to represent the collision between Stikine and Yukon-Tanana terranes (e.g., Nelson et al., 2022). The Hazelton Group is subdivided into two parts (Fig. 3). The lower part contains predominantly andesitic volcanic and siliciclastic sedimentary rocks, including a locally prominent basal conglomerate (Tipper and Richards, 1976; Nelson et al., 2018; Nelson et al., 2022). The andesitic volcanic rocks are coeval and comagmatic with intrusions of the Tatogga plutonic suite (ca. 208-202 Ma; Nelson et al., 2018; Zhu et al., 2018) and Texas Creek plutonic suite (ca. 204-188 Ma; Nelson et al., 2018; Nelson and van Straaten, 2020). Lower Hazelton Group units are restricted to the eastern side of the Telegraph Creek study area (Fig. 4).

Regionally, the lower part of the Hazelton Group is unconformably overlain by an upper succession of mafic to felsic volcanic rocks and siliciclastic sedimentary rocks (late Early to Middle Jurassic; Gagnon et al., 2012; van Straaten, 2024). Two outliers of this upper Hazelton

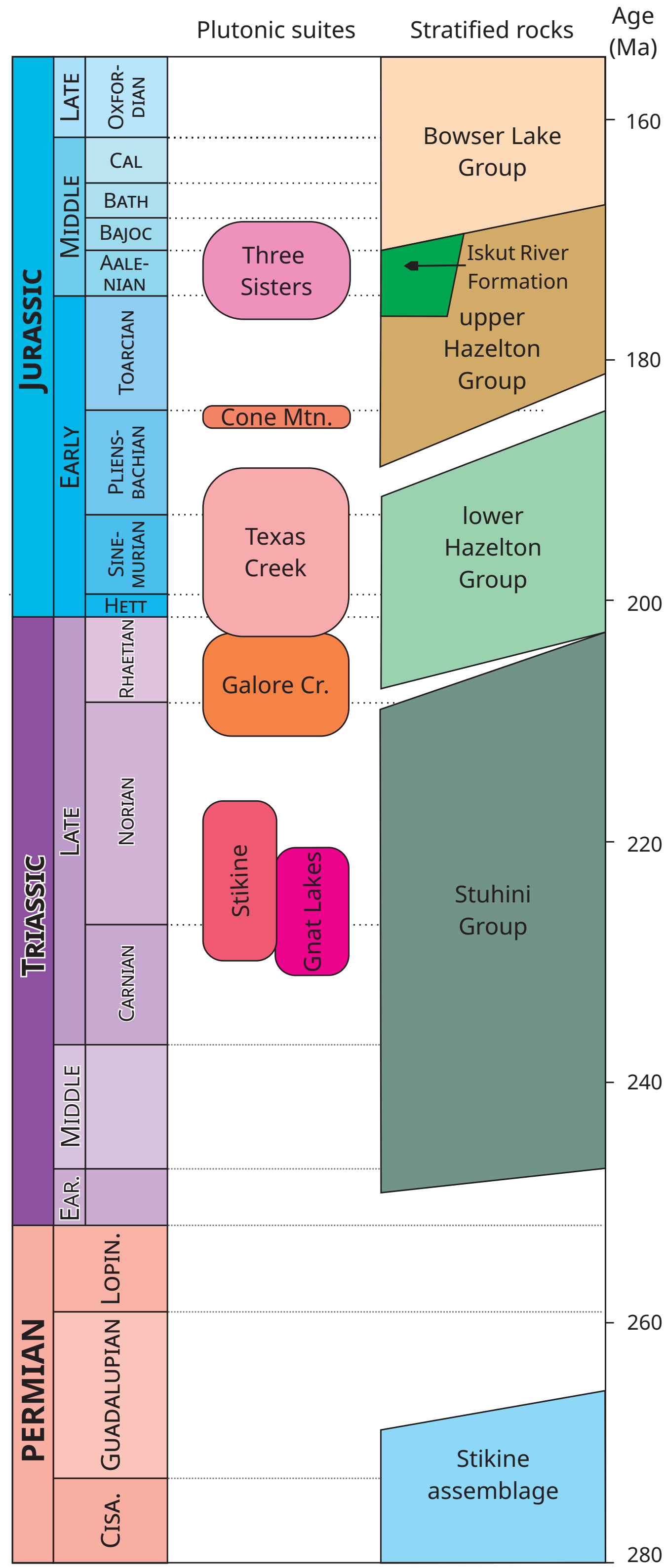


**Fig. 3.** Schematic Mesozoic volcano-sedimentary and intrusive framework of northwestern Stikinia. In this paper we focus on the Stikine, Galore Creek, Texas Creek, and Cone Mountain plutonic suites. Geological timescale after Cohen et al. (2013).

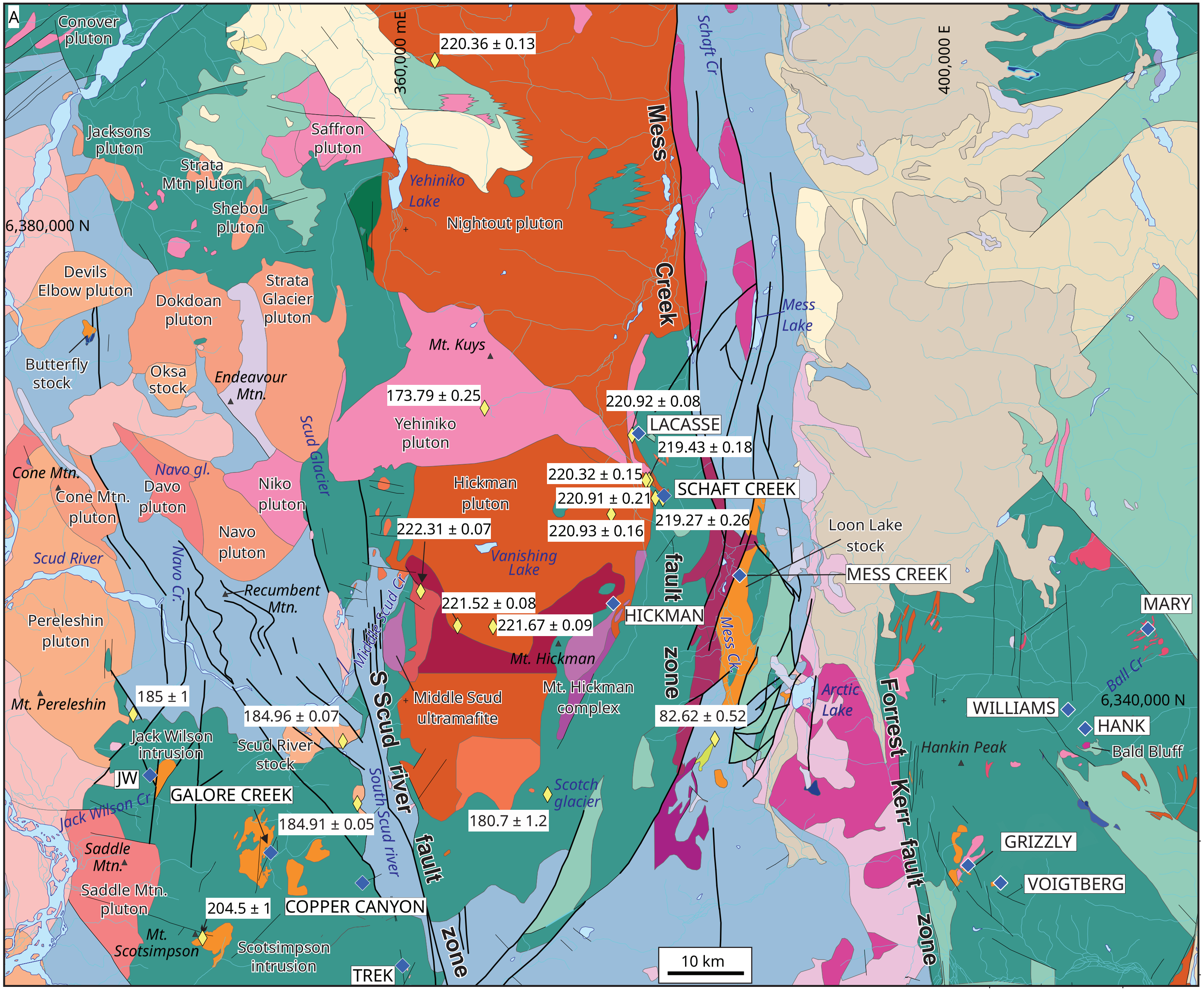


**Fig. 4.** Geological map of the southern Telegraph Creek area modified from Cui et al. (2017) with adaptions from Prince (2020) and this study. Triassic and Jurassic rock units are shown. All U-Pb zircon ages are from Bailey et al. (2025).


**Fig. 4.** Continued. Legend.

Group succession are in the northwest corner of the map area; additional exposures are on the eastern side (Fig. 4). The Cone Mountain plutonic suite (Fig. 2, ca. 185 Ma; Brown et al., 1996) was emplaced during the hiatus between the lower and upper parts of the Hazelton Group (Nelson et al., 2018). The repeated cycle of arc volcanic sequences ended with Middle Jurassic accretion of Stikinia to the Intermontane terrane collage and Ancestral North America, development of the Eskay rift (Fig. 2) and emplacement of the Three Sisters plutonic suite (177-169 Ma; Mihalynuk et al., 1992; Mihalynuk et al., 1994; Mihalynuk et al., 2004; Mihalynuk, 1999; Nelson et al., 2013).

North-trending lineaments, the South Scud river fault zone on the west, the Mess Creek fault zone on the east and, farther east, the Forrest-Kerr fault zone (Fig. 4), divide the Telegraph Creek area into four domains, each characterized by varying abundance of plutonic suites of differing ages. In some cases, these faults appear to control pluton emplacement, such as the Hickman pluton (Late Triassic).

## 3. Stikine plutonic suite

The Stikine plutonic suite (ca. 230-217 Ma; Late Triassic) refers to a series of large calc-alkaline plutons that extend across northern Stikinia (Anderson, 1984; Mihalynuk et al., 2016; Nelson and van Straaten, 2020; van Straaten et al., 2022; van Straaten, 2024). In the Telegraph Creek area, the suite includes the Hickman pluton (315 $km^2$), the Nightout pluton (544 $km^2$; part of the composite Hickman batholith), poorly exposed but extensively drilled intrusive bodies at the Schaft Creek porphyry Cu-Au-Mo-Ag deposit (Fig. 4; Souther, 1972; Holbek, 1988; Logan and Koyanagi, 1994) as well as the Lacasse occurrence (104G 190). Also included is an unnamed north-trending 31 $km^2$ body on the western side of Mess Creek (Fig. 4; Logan et al., 2000) and an intrusive breccia and feldspar porphyry dikes south of Delta Peak in the Oweegee dome (Fig. 2; Kelsch et al., 2023). Within the Stikine plutonic suite, we distinguish the following units: mafic intrusive (LTrSdg); diorite (LTrSd); plagioclase-megacrystic diorite (LTrSd.tm); quartz-monzonite (LTrSdqm); and granodiorite to quartz-monzodiorite (LTrSgd).

### 3.1. Hickman and Nightout plutons

Souther's (1972) 1:250,000 scale map shows the Hickman pluton as a roughly zoned body with a northern core of hornblende granodiorite and minor hornblende quartz-diorite and a western, southern and eastern margin of hornblende quartz-diorite, hornblende-pyroxene diorite, amphibolite and pyroxene-bearing amphibolite. Subsequent workers expanded this by identifying different compositional units, including a mafic unit of gabbro, hornblendite, quartz-diorite and monzodiorite (Souther, 1972; Nixon et al., 1989; Brown et al., 1996), a plagioclase-megacrystic quartz-diorite unit (Brown et al., 1996), a granodiorite to quartz-monzodiorite unit (Brown et al. 1996), and a quartz-monzonite to monzonite unit (Logan et al., 1993a; Logan and Koyanagi, 1994). Brown et al. (1996) described the Nightout pluton containing granodiorite that grades into subordinate tonalite, quartz-monzonite, monzodiorite, and diorite.

#### 3.1.1. Mafic intrusive unit (LTrSdg)

Our observations of the mafic intrusive unit (LTrSdg) 3.5 km north of the Mount Hickman complex were broadly consistent with previous workers (Souther, 1972; Brown et al., 1996). A salt and pepper, equigranular and locally pegmatitic, biotite-clinopyroxene-bearing hornblende-rich diorite encloses m- to cm-scale blocks of gabbro to hornblendite in an agmatitic zone. The hornblende gabbro to hornblendite blocks are dark grey, medium- to coarse-grained, equigranular to pegmatitic, hornblende porphyritic, and glomerophyric. The contact between these phases is generally cuspate-lobate, locally with a decrease in grain size towards the margin of the blocks suggesting magma mingling (Fig. 5a). Nixon et al. (1989) also noted angular to rounded xenoliths of pyritic diorite and hornfelsed sedimentary rocks. Locally, the gabbro is cut by an up to 4 cm pale-pinkish K-feldspar-plagioclase aplite dike which is in turn truncated by the hornblende-rich diorite. Both leucocratic 'restite' portions of the gabbro and the hornblende diorite feature trace to 2% titanite (Logan and Koyanagi, 1989). The hornblende-rich diorite phase appears to grade into a biotite-bearing hornblende quartz-diorite (LTrSd) with no obvious cross-cutting relationships and associated with a reduction in the percentage of inclusions. Quartz-diorite has variably been included within the diorite phase of Logan and Koyanagi (1994) and granodiorite-quartz-monzodiorite phase of Brown et al. (1996). Within the apparent gradational contact, we noted a margin parallel, well-developed fabric within the hornblende-rich diorite defined by hornblende alignment and elongation of inclusions previously interpreted by Nixon et al. (1989) as a flow foliation.

On the ridge northwest of the Mount Hickman mafic-ultramafic complex, we observed a pale-weathering, equigranular to plagioclase porphyritic, leucocratic, magnetite diorite and a dark grey gabbro to hornblendite (Fig. 5b) that we consider part of the mafic intrusive unit. We also consider a pale-white weathering, equigranular, clinopyroxene-bearing hornblende diorite, observed on the western margin of the Hickman pluton east of Middle Scud Creek that cuts volcaniclastic rocks of the Stuhini Group, part of the mafic intrusive unit.

The extent of the mafic intrusive unit is uncertain, especially near the southern part of the Hickman pluton towards the higher relief, glaciated, and inaccessible region west of Mount Hickman. On the eastern side of the Hickman pluton, the relationship and timing of gabbro and hornblendites of the mafic intrusive unit to a gabbroic unit in the Gnat Lake plutonic suite is also unclear. Brown et al. (1996) noted the granodiorite-quartz-monzodiorite of the Nightout pluton graded into a diorite-monzodiorite phase. Nielson (2023) reported a U-Pb zircon date of 225.53 ±0.82 Ma on a hornblende quartz-diorite from the mafic intrusive unit sampled at Hickman occurrence (MINFILE 104G 470).

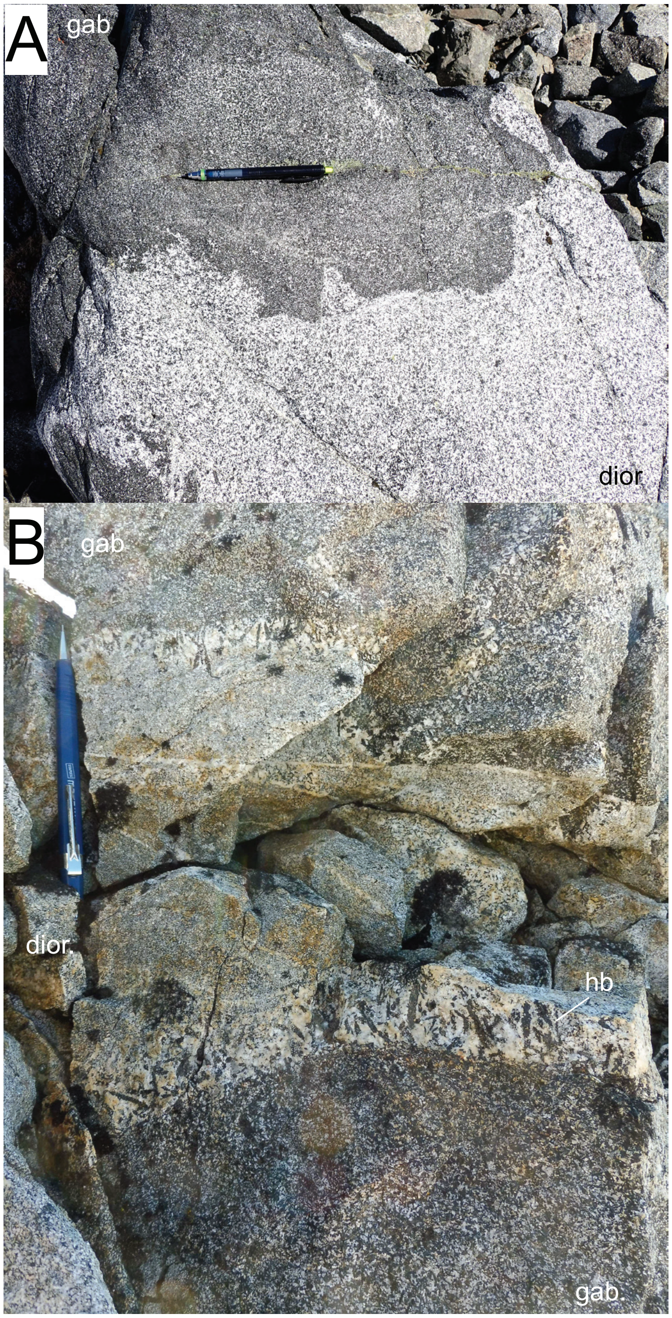


**Fig. 5.** Stikine plutonic suite mafic intrusive unit (LTrSdg). **a)** Irregular-cuspate contact between hornblende gabbro and hornblende-rich diorite. **b)** Contact zone between equigranular to plagioclase porphyritic, magnetite leuco-diorite and gabbro to hornblendite. The irregular contact between these phases is locally a 1-3 cm wide band of hornblende pegmatitic diorite.

### 3.1.2. Plagioclase-megacrystic diorite unit (LTrSd.tm)

This unit contains blue-grey weathering, crowded plagioclase porphyritic to megaporphyritic, magnetite-biotite-bearing hornblende diorite (Fig. 6a). On the southwestern and southeastern side of the Hickman pluton, Logan and Koyanagi (1994) described several small bodies of coarse-grained, magnetite-bearing biotite augite diorite with up to

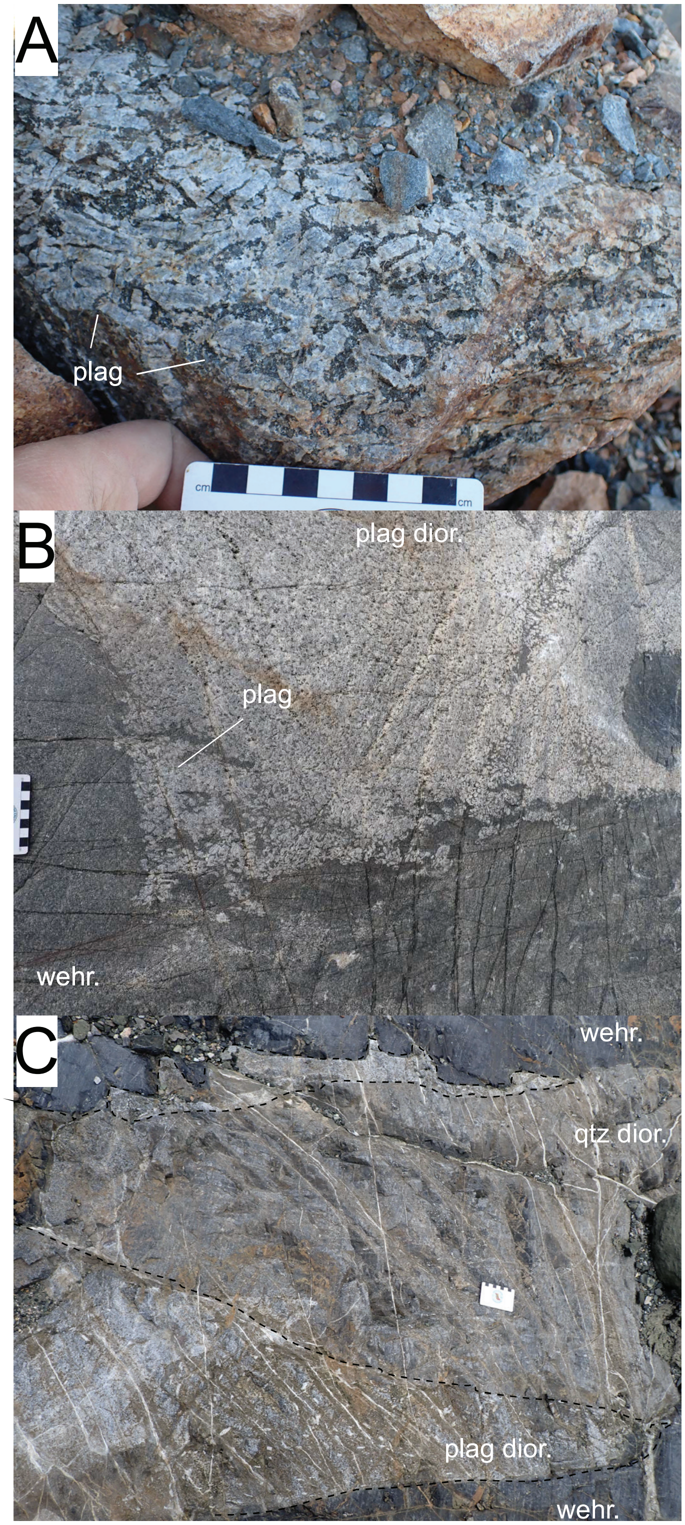


**Fig. 6.** Stikine plutonic suite plagioclase megacrystic diorite unit (LTrSd.tm) **a)** Crowded plagioclase porphyritic to megaporphyritic, magnetite- and biotite-bearing hornblende diorite with tabular, weakly aligned plagioclase crystals. **b)** Plagioclase megacrysts locally along the contact with the Middle Scud ultramafic body of the Gnat Lakes plutonic suite. **c)** Composite dike with a plagioclase megacrystic margin and fine-grained biotite quartz-diorite core cutting wehrlite of the Middle Scud ultramafite.

30% trachytic plagioclase phenocrysts (1.5 cm) that may be related to this unit.

The plagioclase-megacrystic diorite unit intrudes the northeastern margin of the Middle Scud ultramafic body of the Gnat Lake plutonic suite (Brown et al., 1996). The contact between these phases is locally cuspate-lobate, with ultramafic xenoliths within the diorite and plagioclase megacrysts locally along the contact with the ultramafic body (Fig. 6b). A composite dike with a plagioclase-megacrystic margin and fine-grained biotite quartz-diorite core cuts wehrlite of the Middle Scud ultramafite (Fig. 6c).

A sample of the plagioclase-megacrystic quartz-diorite from the western side of the Hickman pluton yielded a high-precision U-Pb zircon CA-TIMS age of 222.31 ±0.07 Ma (Bailey et al., 2025), currently the oldest precisely dated unit of the pluton.

### 3.1.3. Quartz-monzonite unit (LTrSdqm)

At the southern and eastern periphery of the Hickman pluton are small (<0.5 km$^2$) monzonite bodies (Logan and Koyanagi, 1989, 1994). North of the Scotch glacier (Fig. 4) we observed cream-weathering, medium-grained, equigranular to locally porphyritic pyroxene-hornblende-bearing biotite quartz-monzonite to quartz-monzodiorite with ~20% (0.5 to 1.5 cm) porphyritic K-feldspar. This phase is cut by several pink-orange weathering, feldspar porphyry dikes (Fig. 7a). The main intrusive is cut by a series of magnetite-quartz (±chalcopyrite) veins, with local magnetite breccias and rare 2-4 cm angular to subangular magnetite and quartz vein clasts within the intrusive (Fig. 7b).

The extent, timing, and relationship of the quartz-monzonite unit to the other Stikine plutonic suite units are poorly understood. Within the central Hickman body, a syenite to quartz-monzonite returned a 221.67 ±0.09 Ma CA-TIMS U-Pb zircon age (Bailey et al., 2025). One of the small bodies mapped as monzonite to quartz-monzonite south of the Scotch glacier returned a U-Pb LA-ICPMS zircon date of 180.7 ±1.2 Ma from a granodiorite (Bailey et al., 2025). It is unclear which of these dates applies to the quartz-monzonite unit northwest of the Scotch glacier. These two dates suggest the unit is either slightly older than the granodiorite to quartz-monzodiorite or significantly younger, which might indicate either two distinct periods of magmatism in the central and southern Hickman batholith or previously unrecognized magmatism in the region between emplacement of the Cone Mountain and Three Sisters suites.

### 3.1.4. Granodiorite to quartz-monzodiorite unit (LTrSgd)

The central and northern portion of the Hickman pluton and the entirety of the Nightout pluton have been mapped as granodiorite to quartz-monzodiorite with subordinate tonalite (Souther, 1972; Holbek, 1988; Brown et al., 1996). Brown et al. (1996) included an unfoliated, medium-grained, equigranular (biotite) hornblende tonalite as a possible marginal phase on the eastern side of the Nightout pluton. It intrudes the Yehiniko ultramafite and Stuhini Group rocks.

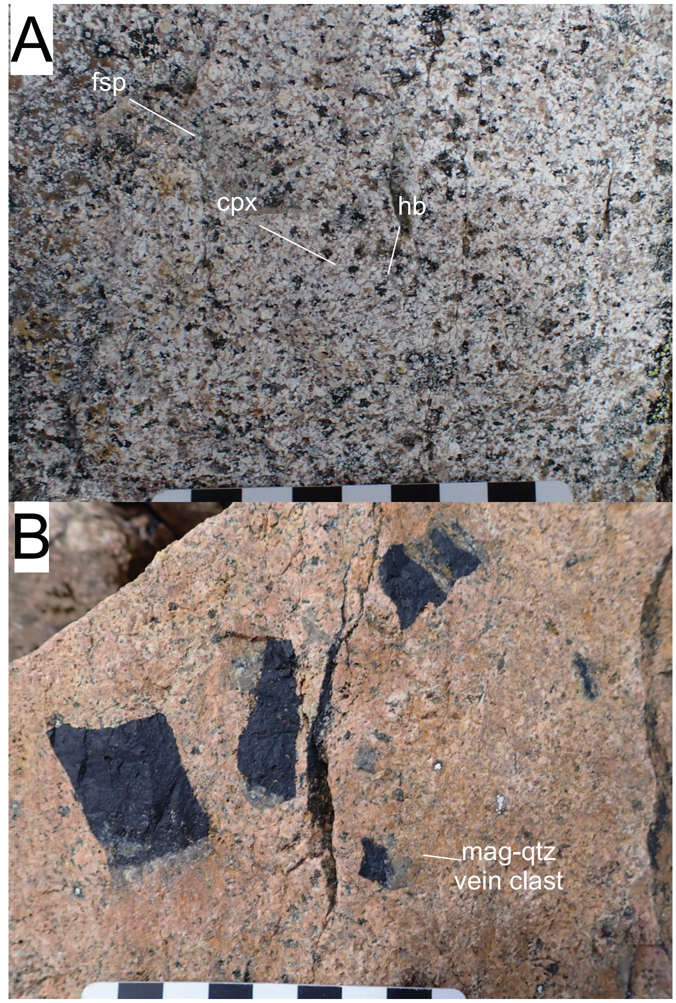


**Fig. 7.** Stikine plutonic suite quartz-monzonite unit (LTrSdqm). **a)** Medium-grained, crowded porphyry pyroxene-hornblende-bearing biotite quartz-monzonite with up to 20% porphyritic potassium feldspar. **b)** Rare angular to sub angular magnetite and quartz vein clasts in quartz monzonite.

Our mapping along a ridge ~3 km southeast of Mount Kuys suggests the granodiorite to quartz-monzodiorite unit is of greater extent than previously noted. We observed biotite hornblende granodiorite in an area previously mapped as Three Sisters plutonic suite granite.

The granodiorite phase in the Hickman and Nightout plutons is a light grey weathering, medium-grained, equigranular to porphyritic, biotite-hornblende, granodiorite with pink to grey, poikilitic, K-feldspar phenocrysts (averaging ~1 to 2 cm). As noted by Brown et al. (1996) the percentage of biotite is greater than hornblende in the Nightout pluton with parts of the central Hickman pluton containing biotite-bearing hornblende granodiorite. Brown et al. (1996) also noted a more well-developed magmatic foliation in the Nightout pluton. On the northeastern and eastern margin of the Hickman batholith, the percentage of quartz tends to decrease, suggesting a potentially continuous quartz-monzodiorite phase. The quartz-monzodiorite phase comprises a cream-weathering, medium-grained, porphyritic, biotite (-bearing) hornblende quartz-monzodiorite with pink to grey, poikilitic, K-feldspar phenocrysts (up to 2 cm). At the northern end of the Nightout pluton, 14 km northeast of Yehiniko Lake, subordinate light grey, equigranular, biotite hornblende granodiorite is cut by a series of 20 cm K-feldspar-megacrystic quartz-monzodiorite bands (Fig. 8a). A ~300 m-wide K-feldspar porphyritic, biotite-bearing hornblende quartz-monzodiorite cuts the gabbroic northeastern margin of the Mt. Hickman ultramafic body.

The granodiorite to quartz-monzodiorite unit (LTrSgd) is also at the Schaft Creek porphyry Cu-Mo-Au-Ag deposit with mineralization along the eastern contact of the Hickman pluton with Stuhini Group basaltic-andesitic volcanic, subvolcanic, and volcaniclastic rocks (Fig. 4; Spilsbury, 1995; Logan et al., 2000; Scott, 2008; Logan and Mihalynuk, 2014; Jutras and Bailey, 2016; Erbalaban, 2023). Rock types include: equigranular, hornblende-biotite granodiorite; equigranular to weakly porphyritic, hornblende quartz-monzodiorite to quartz-monzonite; and a series of 1 to 30 m wide porphyritic, hornblende quartz-monzodiorite to quartz-monzonite intrusives inferred to be syn-mineral dikes (Jutras and Bailey, 2016; Erbalaban, 2023). The granodiorite consists of a pink to light cream-grey weathering, medium-grained, equigranular to crowded porphyry biotite granodiorite. The equigranular to weakly porphyritic quartz-monzodiorite to quartz-monzonite cuts the main granodiorite phase and encloses granodiorite xenoliths (Erbalaban, 2023). The pale pink, medium-grained, equigranular to crowded porphyritic, biotite-bearing hornblende quartz-monzodiorite locally contain 0.5 to 1 cm quartz-biotite-sulphide miarolitic cavities and 0.5-1 cm quartz veinlets with K-feldspar haloes. Both the granodiorite and the quartz-monzodiorite contain cm-scale rounded diorite-gabbro xenoliths. The syn-mineral feldspar porphyry to crowded porphyry dikes are grey to white, variably mineralized and altered, and contain 20-50% 1-4 mm feldspars overprinted by albite and sericite alteration (Fig. 9). Where mafic minerals are preserved, they generally consist of biotite and hornblende (up to 15% combined). The inclusion of porphyritic intrusive clasts within hydrothermal breccias with mineralized cement indicates mineralization at the Schaft Creek deposit is associated with this latest phase of Stikine plutonic suite magmatism.

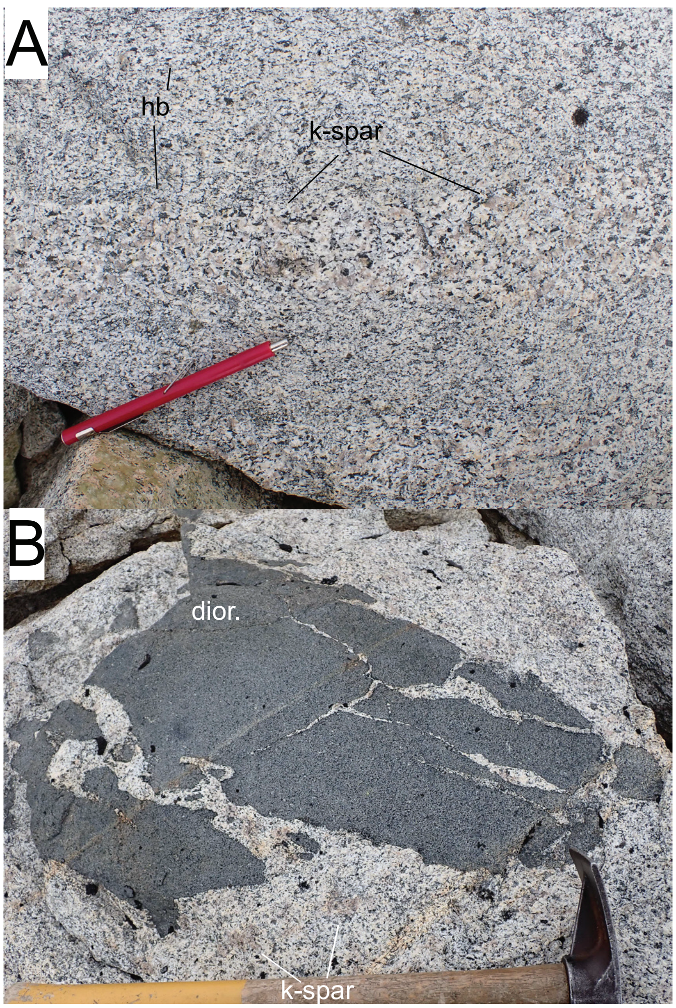


**Fig. 8.** Stikine plutonic suite granodiorite to quartz monzodiorite unit (LTrSgd). **a)** Equigranular, biotite hornblende granodiorite cut by potassium feldspar megacrystic quartz-monzodiorite bands, northeastern Nightout pluton. **b)** Fluidal hornblende biotite quartz-diorite inclusions in potassium feldspar megacrystic, hornblende biotite granodiorite, southeastern Nightout pluton.

Mafic xenoliths in the granodiorite to quartz-monzodiorite unit (LTrSgd) indicate relative timing with respect to the mafic intrusive unit (LTrSdg). The Hickman pluton contains up to 5% rounded 0.5 m medium-grained pyroxene-hornblende diorite xenoliths. In the southwestern part of the Nightout pluton are rare cm-scale elongate, rounded biotite-rich ultramafic and rare fluidal hornblende biotite quartz-diorite inclusions (Fig. 8b). Farther north in the quartz-monzodiorite phase are local cm-scale leucocratic rims surrounding mafic inclusions. The timing of the granodiorite to quartz-monzodiorite unit and the plagioclase-megacrystic diorite unit (LTrSd.tm) is less clear; gradational contacts led Brown et al. (1996) and Logan and Koyanagi (1994) to suggest the phases are contemporaneous.

Previously unreported high-precision U-Pb zircon CA-TIMS dates from the Hickman pluton are: 221.52 ±0.08 Ma

**Fig. 9.** Stikine plutonic suite granodiorite to quartz monzodiorite unit (LTrSgd) at the Schaft Creek deposit; porphyry to crowded porphyry with 20-50% feldspar.

from a biotite-hornblende granodiorite in the central part of the pluton and 220.93 ±0.16 Ma from a hornblende granodiorite on the eastern side of the pluton (Bailey et al., 2025). In addition, Bailey et al. (2025) report CA-TIMS dates from the Schaft Creek deposit including: 1) 220.32 ±0.15 Ma from granodiorite; 2) 220.91 ±0.21 Ma from quartz-monzodiorite; 3) 219.43 ±0.18 Ma and 219.27 ±0.26 Ma from syn-mineral porphyry dikes; and 4) 220.93 ±0.16 Ma (from 4.4 km north of the deposit within the Lacasse area; Bailey et al., 2025).

A CA-TIMS age from a biotite-hornblende granodiorite on the western side of the Nightout pluton of 220.36 ±0.13 Ma (van Straaten, 2024) might suggest a slightly younger crystallization age for the Nightout pluton and/or for the eastern Hickman pluton.

### 3.2. Unnamed pluton east of Mess Creek: Diorite unit (LTrSd)

Logan and Drobe (1993) and Logan et al. (2000) included a 2 km-long north-trending body west of the Loon Lake stock (LTrGdm; see below) as part of the Stikine plutonic suite. They mapped two units: an equigranular hornblende monzonite to diorite unit and a plagioclase porphyritic diorite unit. Equigranular hornblende meso-diorite at the southern end of the pluton contains m-scale blocks of pyroxene-rich mela-diorite. The mela-diorite contains distinctive poikilitic pyroxene phenocrysts (Fig. 10). We suggest that the diorite unit in this pluton is equivalent to the diorite phase of the mafic intrusive unit (LTrSdg) in the Hickman pluton (see above).

**Fig. 10.** Stikine plutonic suite, unnamed dioritic pluton east of Mess Creek. Fine- to medium-grained hornblende diorite in contact with porphyritic diorite containing blocky poikilitic pyroxene.

### 3.3. Monzonite unit, Oweegee dome area

Oweegee dome (Fig. 2 inset) is an inlier of Paleozoic to Middle Jurassic rocks in the west-central part of Bowser basin (Greig and Gehrels, 1995). The Oweegee dome Cu-Zn-Au occurrence (MINFILE 104A 165) includes a mineralized intrusive breccia (Delta ridge) and a poorly exposed porphyritic intrusion (Molloy ~500 m west of Delta ridge) emplaced into fine-grained siliciclastic rocks of the Stuhini Group. We noted three distinct phases, an intrusive breccia, a weakly mineralized hornblende-plagioclase-K-feldspar porphyry and a hornblende-plagioclase porphyry. The intrusive breccia is a sugary grey to orange weathering, clast-supported, altered, crackle breccia, with cm-scale porphyry clasts. Where less brecciated this phase appears to be an altered, medium-grained, equigranular to crowded porphyry monzonite. At the Molloy occurrence is a weakly mineralized, hornblende-plagioclase-K-feldspar-porphyritic monzonite to diorite. Faults obscure the relationship of these rocks with the breccia. Both phases are cut by a relatively unaltered (hornblende-) plagioclase-phyric intrusive. The age of the porphyritic diorite to monzonite intrusions in the Delta ridge area is reported to be 219-217 Ma (U-Pb zircon LA-ICP-MS, J. Kyba personal communication), affiliating them with the younger age range of the Stikine plutonic suite.

### 3.4. Summary, Stikine plutonic suite

Within the southern Telegraph Creek area the Stikine plutonic suite intrusions (ca. 225-219 Ma) are restricted to between the South Scud river and Mess Creek fault zones (Fig. 4). A combination of new geochronological data and observed crosscutting relationships indicate that the mafic intrusive unit (LTrSdg; ca. 225 Ma) and the plagioclase-megacrystic diorite phase (LTrSd.tm; ca. 222.3 Ma) are the oldest units. Agmatitic zones in the mafic intrusive unit provide evidence for magma mingling between a coeval to older hornblendite and gabbro phase with a more leucocratic hornblende diorite and quartz-diorite phase. The next oldest unit, the plagioclase-megacrystic diorite (LTrSd.tm) is coeval to slightly older than the granodiorite to quartz-monzodiorite unit (LTrSgd, ca. 221.5-220.3 Ma). The granodiorite to quartz-monzodiorite unit includes most of the Hickman and Nightout plutons and equigranular intrusions that host the Schaft Creek porphyry Cu-Au-Mo-Ag deposit. The timing and relationships of the quartz-monzonite unit in the southern part of the Hickman pluton with other units within the Stikine plutonic suite are poorly constrained. The youngest phase in the Stikine plutonic suite is a series of porphyritic, hornblende quartz-monzodiorite to quartz-monzonite dikes. With CA-TIMS ages of 219.43 ±0.18 Ma and 219.27 ±0.26 Ma (Bailey et al., 2025), these intrusions are interpreted as being responsible for formation of the Schaft Creek porphyry Cu-Au-Mo-Ag deposit and other occurrences along the eastern side of the Hickman pluton. Overlapping and younger ages of ca. 219-217 Ma (U-Pb zircon LA-ICPMS, J. Kyba personal communication) are reported from a porphyritic diorite to monzonite in the Delta Peak area of Oweegee dome (Fig. 2).

## 4. Galore plutonic suite (Late Triassic)

The Galore plutonic suite (previously Copper Mountain plutonic suite) consists of a series of small pyroxenite, foid syenite, and syenite to monzodiorite intrusive bodies and related dikes across northwestern Stikinia (Mortensen et al., 1995; Logan and Mihalynuk, 2014; Nelson and van Straaten, 2020).

The suite is defined by a unique alkaline intrusive-volcanic complex at Galore Creek (Fig. 4; Barr, 1966; Allen et al., 1976; Enns et al., 1995; van Straaten et al., 2023). A high precision CA-TIMS zircon and titanite age for the alkalic silica-undersaturated volcanic rocks (ca. 210 Ma; van Straaten et al., 2023) overlaps with previous ca. 210-208 Ma ages for the alkalic intrusions (Mortensen et al., 1995; Logan and Mihalynuk, 2014).

Galore plutonic suite intrusions occur along a north-trending belt of alkalic pyroxenite to syenite intrusive bodies from the southern Zippa Mountain body in the Iskut River area (Fig. 2; ca. 210 Ma; Lueck and Russell, 1994; Coulson et al., 1999, 2007; Zagorevski et al., 2014), alkalic intrusions at the Trek property (Fig. 4; MINFILE 104G 022; Close and Danz, 2012), the ~25 $km^2$ multi-stage Galore Creek intrusive body (Allen et al., 1976, Logan and Koyanagi, 1989; Logan and Koyanagi, 1994; Prince, 2020), the ~1 $km^2$ Copper Canyon intrusion (Petsel and McConeghy, 2008), the Butterfly stock, the Rugged Mountain, and Latimer Lake pluton in the Telegraph Creek area (Fig. 2; Neill and Russell, 1993; Brown et al., 1996). A second north-trending belt of porphyritic syenite to monzonite intrusions, commonly close to the margins of the Paleozoic Forest-Kerr and More Creek intrusive bodies includes the southern Burgundy ridge intrusions in the Andrei icefield (Fig. 2; ca. 208 Ma; Mihalynuk et al., 2011; Zagorevski et al., 2014; Enduro Metals Corp., 2021), intrusive bodies within the Newmont Lake graben (Fig. 2; Logan et al., 2000), unnamed intrusions south of Hankin Peak east of the Grizzly occurrence (Fig. 4; Logan et al., 2000), and the 20 $km^2$ Loon Lake monzonite stock (Logan et al., 2000). Based on textural, timing and compositional similarities we have tentatively included the 4.8 $km^2$ Scotsimpson intrusion (Prince, 2020), the 2.3 $km^2$ Jack Wilson intrusion, and a series of porphyritic to megaporphyritic dikes and plugs surrounding the Grizzly occurrence (Logan et al., 2000) as part of the Galore plutonic suite.

The Galore plutonic suite can be subdivided into three main units: a pyroxenite (LTrGum), foid-syenite to syenite (LTrGdf) and a syenite to monzodiorite unit (LTrGdm).

### 4.1. Pyroxenite unit (LTrGupx)

Several small (1 to 14 $km^2$) pyroxenite to syenite intrusive bodies occur south and north of the Stikine River in the Telegraph Creek area including the Butterfly stock, Rugged Mountain pluton, and Tahltan syenite stock or Ten Mile Creek intrusion (Neill, 1991; Neill and Russell, 1993; Brown et al., 1996). Hunt and Roddick (1994) reported a 204.1 ±2 Ma hornblende $^{40}Ar/^{39}Ar$ cooling age from the Butterfly stock. We identified a previously unmapped >0.1 $km^2$ body of medium-grained, equigranular gabbro to clinopyroxenite 6 km north-northwest of the Copper Canyon deposit. The biotite bearing-gabbro contains 20-35% altered feldspathoids (analcime?) in a fine-grained groundmass and locally intermixed ultramafic domains. The biotite clinopyroxenite locally contains biotite-rich domains (≥50% biotite) and 5-15% plagioclase.

### 4.2. Foid syenite to syenite unit (LTrGdf)

A series of small foid to foid-bearing, K-feldspar porphyritic to megacrystic clinopyroxene syenite intrusions are in the Galore Creek deposit area, where they are referred to as the Uhtlan intrusions (e.g., Enns et al., 1995; Prince, 2020). The earliest phases of this unit are extensively altered and mineralized (Enns et al., 1995; Logan, 2005; Prince, 2020).

The oldest intrusive rocks in the Galore Creek valley are a series of thin pseudoleucite porphyritic clinopyroxene syenite dikes (Fig. 11a; Enns et al., 1995). In the Copper Canyon deposit area, the oldest intrusive phase is a porphyritic foid syenite intrusive subdivided by previous workers into a marginal foid predominant syenite and an interior alkali feldspar predominant syenite (Fig. 11b; Petsel and McConeghy, 2008).

A subsequent series of intrusions progress from pseudoleucite megaporphyritic to porphyritic clinopyroxene foid syenite to clinopyroxene syenite lacking pseudoleucite (Enns et al., 1995). Based on the spatial association of these intrusions with mineralization and the intense degree of alteration, the timing of Central zone mineralization is considered to overlap with intrusion emplacement (e.g., Enns et al., 1995).

The youngest known foid-bearing phase is the ‘dark syenite’ of Allen et al. (1976) or dark orthoclase porphyry syenite of Enns et al. (1995). This is a dark grey, locally pseudoleucite-bearing, K-feldspar porphyritic to megaporphyritic, clinopyroxene syenite (Fig. 11c; Enns et al., 1995; Logan, 2005). We observed this phase to cut the pseudoleucite porphyritic syenite in the Galore Creek valley and the K-feldspar pseudoleucite porphyritic syenite in Copper Canyon. Mortensen et al. (1995) reported a 210 ±1 Ma U-Pb titanite and K-feldspar isochron age for this phase in the Galore Creek deposit area.

### 4.3. Syenite to monzodiorite unit (LTrGdm)

The syenite to monzodiorite unit (LTrGdm) is the most volumetrically significant unit of the Galore Creek plutonic suite. It includes syenite to monzodiorite intrusions in the Galore Creek deposit area, the Loon Lake monzonite stock and a series of megaporphyritic syenite dikes south of Hankin Peak. In this unit we include the Scotsimpson monzodiorite to syenite intrusion (Prince, 2020) and, tentatively, the Jack Wilson monzodiorite to monzonite intrusion and syenites to monzonites south of Hankin Peak.

#### 4.3.1. Galore Creek deposit area

In the Galore Creek deposit area this unit has been divided into the ‘Buckshot intrusions’ consisting of syenite to monzodiorite (Barr, 1966; Enns et al., 1995; Prince, 2020) and a later diorite phase referred to as the ‘Dendrite intrusions’ (Arychuk and Grandbois, 2022). The syenite to monzodiorite Buckshot intrusions are considered post-mineral at the Central zone (Prince, 2020) but at least some of the intrusions are considered pre- to syn-mineral relative to younger mineralized zones such as Southwest and West Fork (e.g., Schwab et al. 2008; Byrne and Tosdal, 2014).

An equigranular to porphyritic monzonite is thought to be

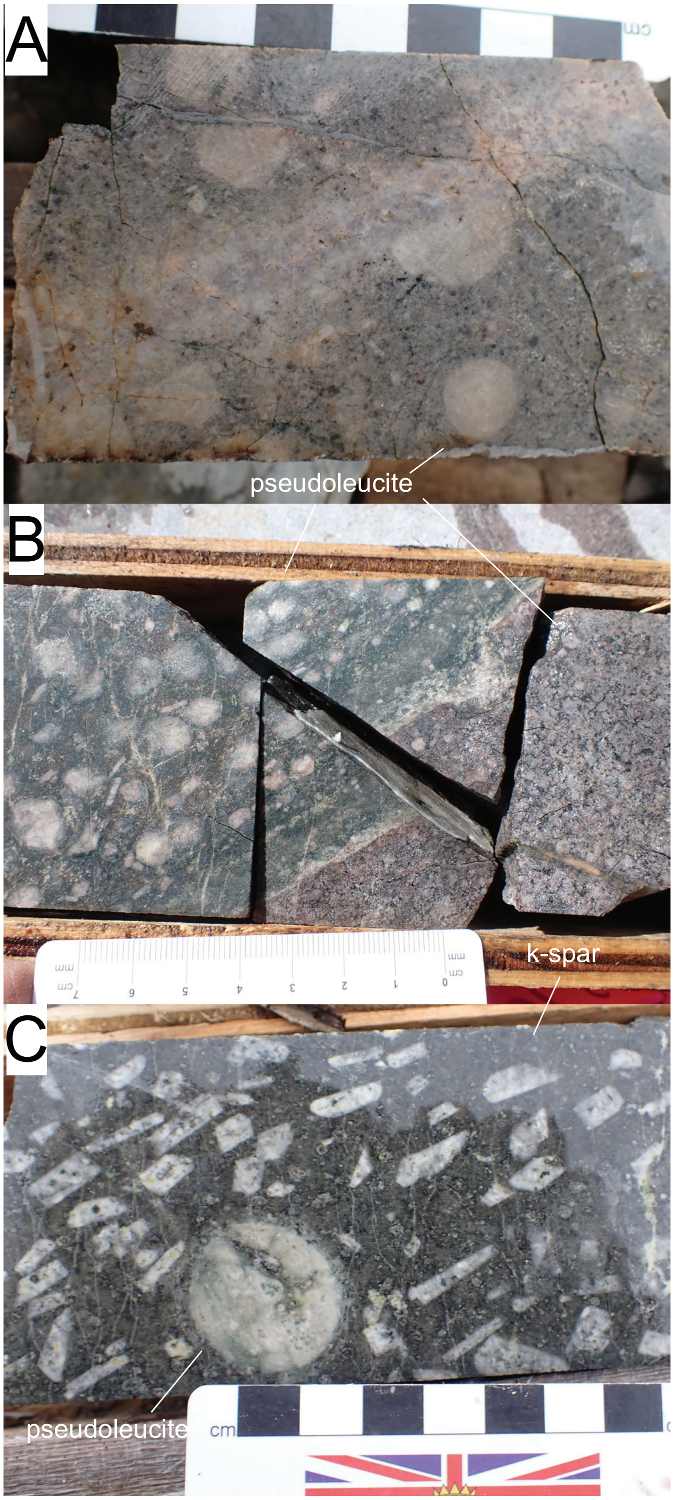


**Fig. 11.** Galore Creek plutonic suite foid syenite unit (LTrGdf). **a)** Pseudoleucite porphyritic clinopyroxene syenite with 5-10% equant pinkish pseudoleucite, 2-5% tabular potassium feldspar. **b)** Megaporphyritic pseudoleucite syenite 60 cm dike cross-cutting an altered medium-grained, crowded potassium feldspar-pseudoleucite porphyritic syenite, Copper canyon area. **c)** Pseudoleucite-bearing, potassium feldspar porphyritic to megaporphyritic syenite with 10-20%, stubby, aligned, potassium feldspar and 1-2% rounded to equant pseudoleucite phenocrysts in a dark grey aphanitic to fine-grained groundmass.

the oldest volumetrically significant phase in the Buckshot intrusions (Enns et al., 1995) and is well exposed in the Galore Valley (Logan, 2005). We observed this phase on the ridge southeast of Galore Creek and in drill core as a fine- to medium-grained, magnetic, equigranular to weakly porphyritic, biotite-bearing hornblende monzodiorite-monzonite with rare 3-5% (3-5 mm) pale elongate, K-feldspar. This phase cuts dark grey, foid-bearing K-feldspar-megacrystic syenite of unit LTrGdf (Fig. 12a).

The most aerially extensive intrusive in the Galore Valley is a series of megaporphyritic syenites (Logan, 2005) and/or monzonites to syenites (Prince, 2020). Enns et al. (1995) described these phases as alkali feldspar megaporphyry, biotite-hornblende-bearing clinopyroxene syenites. We observed a K-feldspar megaporphyritic, biotite-bearing hornblende to locally hornblende-bearing biotite syenite with pink to grey, zoned, elongate to angular subhedral, K-feldspar (0.8 to 4 cm) (Fig. 12b). As noted by previous workers (Enns et al., 1995) this phase cuts the earlier altered foid syenite intrusions.

A series of trachytic to porphyritic K-feldspar and biotite-phyric syenite to monzodiorite intrusions with aphanitic to fine-grained groundmass have been mapped within the southern, and western Galore Valley (Enns et al., 1995; Prince, 2020). An earlier finer-grained, miarolitic, monzodiorite phase has been interpreted as syn-mineral in the Southwest zone

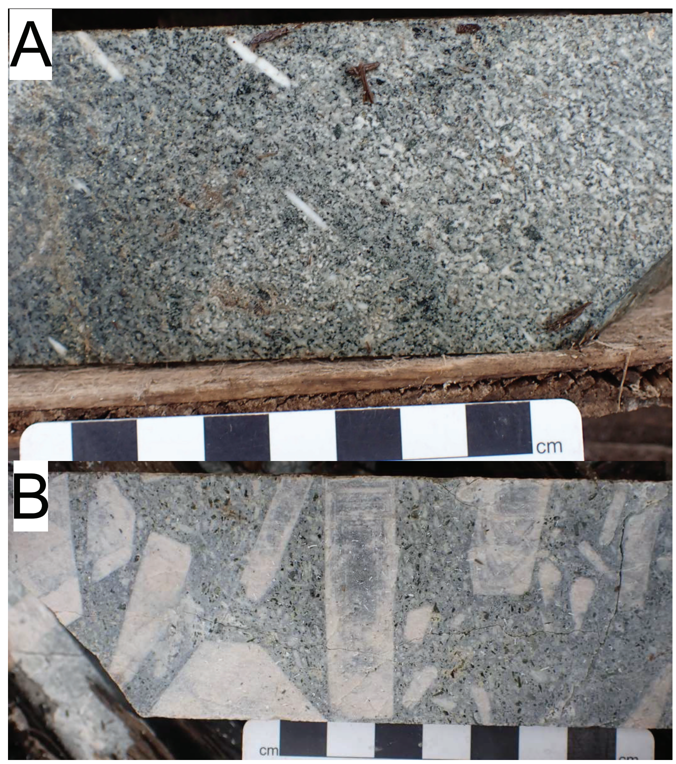


**Fig. 12.** Galore Creek plutonic suite syenite to monzodiorite unit (LTrGdm), 'Buckshot intrusion'. **a)** Fine- to medium-grained, equigranular to weakly porphyritic, biotite-bearing hornblende monzodiorite with sparse (3-5%) pale elongate, potassium feldspar. **b)** Potassium feldspar megaporphyritic, biotite-bearing hornblende syenite with pink to grey, zoned, tabular potassium feldspar.

(e.g., Byrne et al., 2010; Byrne and Tosdal, 2014; Prince, 2020). We observed a small 10-m outcrop in the West Fork area mapped as monzodiorite to monzonite (Penner et al., 2006; Byrne and Tosdal, 2014; Prince, 2020). This phase consists of a dark grey, foliated, trachytic, biotite syenite to monzonite(?) with highly elongate (> 1:5 aspect ratio), 3-5% pale K-feldspar (sanidine?), 15% (0.1-0.2 mm) biotite, and distinctive round miarolitic cavities (Fig. 13). Both the biotite and miarolitic cavities may be replaced by chalcopyrite and magnetite. A medium-grained, trachytic to megacrystic K-feldspar, biotite monzonite to syenite has been mapped in the south and west of Galore Valley and is thought to be post-mineral (Enns et al., 1995; Logan, 2005; Prince, 2020).

In the Central zone of the Galore Creek deposit is a lavender equigranular, seriate, trachytic textured, biotite-bearing, clinopyroxene quartz syenite with 50% (5-20 mm) K-feldspar and locally chalcopyrite (Enns et al., 1995), for which Logan and Mihalynuk (2014) reported an ID-TIMS 208.8 ±0.8 Ma U-Pb titanite age. Near Dendritic Creek we noted a lavender, crowded K-feldspar porphyritic to equigranular, biotite-bearing, leucocratic syenite intrusive. This intrusion is spatially associated with a series of 1 m-wide pale purple-grey, equigranular to K-feldspar porphyritic hornblende-bearing syenite dikes. These dikes cut a K-feldspar megaporphyritic to plagioclase porphyritic hornblende monzonite. Several m-scale poly- to monomictic, subrounded to subangular, magnetite cemented breccias with clasts of the above phases are at the contact between the monzonite and syenites.

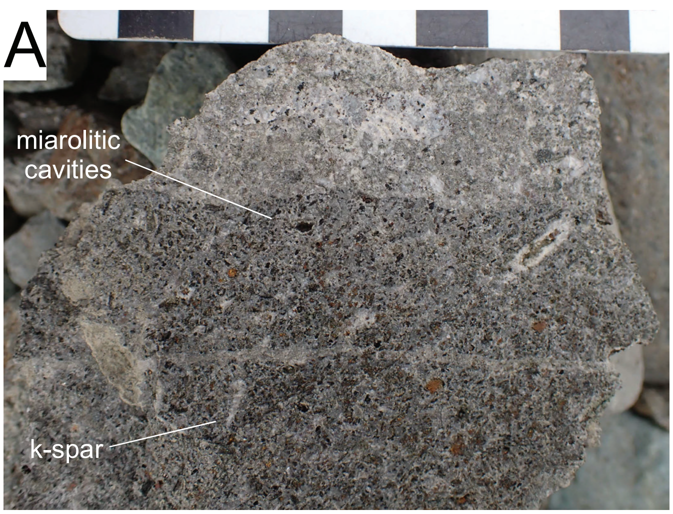


**Fig. 13.** Galore Creek plutonic suite syenite to monzodiorite unit from the West Fork area. Foliated, trachytic, biotite monzodiorite with 3-5% highly elongate (>1:8 aspect ratio), pale potassium feldspar (sanidine?), 15% (0.1-0.2 mm) biotite and distinctive rounded miarolitic cavities.

### 4.3.2. Loon Lake stock

The Loon Lake stock is a 16 km long, broadly north-south trending body on the eastern side of Mess Creek. Panteleyev (1973) and Logan et al. (2000) described the stock as containing crowded plagioclase porphyritic hornblende monzonite with 20-40% plagioclase (up to 7 mm) and up to 10% hornblende (3 mm), with lesser equigranular diorite and a less crowded plagioclase porphyry. Based on composition and association with mineralization Logan et al. (2000) assigned the stock to the Galore plutonic suite. We found the core of the central mapped intrusion was a red orange to yellow brown, strongly silica-clay-iron oxide ±pyrite altered rock. Alteration largely obscures primary textures although locally a pale feldspar porphyritic texture was recognizable. Alteration may be related to broad intervals of low-grade Cu-Au-Mo mineralization intersected in diamond drill holes at the nearby Mess Creek occurrence (MINFILE 104G 260; Bradford, 2008). Beyond the eastern margin of the Loon Lake stock, we noted several 5- to 20 m-wide pink weathering feldspar porphyry dikes intruding Stuhini Group volcanic rocks. These dikes consist of pinkish 10-30% porphyritic feldspar (1-4 mm) in a fine-grained sugary red-pink groundmass with local miarolitic cavities. Especially close to the main body of the intrusion these dikes are variably veined and clay- and iron-carbonate altered. The Loon Lake stock is bracketed to Late Triassic-Early Jurassic based on the intrusive contact with Upper Triassic rocks of the Stuhini Group and an unconformity with overlying Lower Jurassic conglomerate (Logan et al., 2000).

### 4.3.3. Scotsimpson intrusion

The Scotsimpson intrusion is a northeast-southwest trending body emplaced into Stuhini Group volcanic and sedimentary rocks and previously mapped as an unassigned Early Jurassic granodiorite to quartz-diorite (Logan and Koyanagi, 1994). We identified two main phases: an equigranular to porphyritic, hornblende monzodiorite; and a K-feldspar porphyritic to trachytic monzonite to syenite. The monzonite phase is cut by a plagioclase porphyry dike and both phases are cut by cm-wide pink, K-feldspar porphyritic syenite dikes. An equigranular syenite returned ID-TIMS U-Pb zircon age of 204.5 ±1 Ma, based on four concordant multigrain zircon fractions (Bailey et al., 2025). Because of this date and compositional and textural similarities to other units, we consider the intrusion part of the Galore plutonic suite.

The monzodiorite phase consists of fine- to medium grained, porphyritic to equigranular, hornblende monzodiorite to diorite with rare <1-5% (0.8-20 mm) elongate, trachytic K-feldspar megacrysts. This phase is commonly xenolith-rich with 1-3 cm clasts of irregular pink-white feldspar porphyry, rare angular magnetite-feldspar (Fig. 14a), rounded pervasively epidote altered rocks (3-7 cm), and rounded intermediate rocks. The monzodiorite is cut by 1.5- to 20-cm wide pink K-feldspar phyric syenite dikes. It appears to be in gradational contact with the monzonite phase.

The monzonite phase comprises a moderate grey weathering, K-feldspar pilotaxitic (trachytic) to-megacrystic, biotite-bearing, hornblende monzonite with 15-30% highly elongate, pink, K-feldspar (Fig. 14b). Locally developed cm-scale xenolith-rich layers contain plagioclase porphyry, hornblende gabbro, and mafic volcanic clasts. The monzonite phase is


**Fig. 14.** Galore Creek syenite to monzodiorite unit (LTrGdm), Scotsimpson intrusion. **a)** Fine- to medium grained, porphyritic to equigranular, hornblende monzodiorite with local <1-5% elongate, trachytic potassium feldspar megacrysts and rare angular magnetite-feldspar xenoliths. **b)** Potassium feldspar pilotaxitic (trachytic) to megacrystic, biotite-bearing, hornblende monzonite with 15-30% highly elongate, white to pink, potassium feldspar (1:10 aspect ratio).

locally cut by a ~2 cm-wide chalcopyrite ±bornite vein. This phase grades into a cream-weathering, fine- to medium-grained (0.1-3 mm), equigranular, biotite-bearing hornblende monzonite. It in turn is intruded by a series of 0.5 to >2 m, cream weathering, plagioclase hornblende-phyric dikes.

### 4.3.4. Jack Wilson intrusion

On the ridge northeast of Jack Wilson Creek, Logan et al. (1993b) mapped an elongate 2 $km^2$ hornblende granodiorite body, assigning it to the Hickman batholith of the Stikine plutonic suite. The body was described as a fine-grained, massive, strongly magnetic, subvolcanic diorite emplaced into Upper Triassic volcanic rocks (Logan and Koyanagi, 1994). The intrusion and adjacent volcanic rocks hosts the JW central occurrence (MINFILE 104G 021), a 2.5 $km^2$ propylitic alteration and magnetite breccia zone (Logan and Koyanagi, 1994).

We observed several intrusive phases at the northern end of the mapped body. The predominant phase is a dark-grey to light-grey weathering, texturally variable, fine- to medium-grained, equigranular to crowded feldspar porphyritic, hornblende diorite to monzodiorite. It is commonly adjacent to an aphanitic- to fine-grained, locally trachytic, hornblende-feldspar porphyry (Fig. 15). Because of textural and compositional similarity (especially to the trachytic monzodiorite to monzonite intrusions in the West Fork area) we tentatively reassign the Jack Wilson intrusion to the syenite to monzodiorite unit (LTrGdm) of the Galore plutonic suite.


**Fig. 15.** Galore Creek plutonic suite syenite to monzodiorite unit (LTrGdm) from the Jack Wilson intrusion. Weakly trachytic, hornblende-feldspar porphyry with ~10% elongate pale feldspar in an equigranular hornblende diorite-monzodiorite.

### 4.3.5. Unnamed intrusions south of Hankin Peak

South and east of Hankin Peak, Logan et al. (2000) mapped a series of 1 to 20 m-wide north-trending porphyritic to megaporphyritic syenite dikes that they assigned to the Galore plutonic suite. They also mapped a porphyritic monzonite stock, plug and related monzonite-syenite apophyses, which they assigned to the Texas Creek plutonic suite. These intrusions are associated with the Cu-Au-Ag Grizzly-Little Les occurrence, and the Voigtberg-Biskut occurrence (MINFILE 104G 079 and 146). Because we observed significant textural, compositional, and spatial overlap between the monzonites and syenites at the Voigtberg-Biskut and Grizzly occurrences, we consider that both are part of the Galore plutonic suite.

#### 4.3.5.1. Voigtberg area

Near the Voigtberg occurrence (Fig. 4) syenite-monzonite dikes cut across a succession of fine-grained siliciclastic rocks, carbonate rocks, epiclastic conglomerates and sandstones, and polymictic conglomerates containing volcanic, limestone and potassium feldspar trachytic clasts mapped by Logan et al. (2000) as Stuhini Group. These dikes include a porphyritic to megaporphyritic syenite, a porphyritic monzonite and a minor, variably altered, fine- to medium-grained biotite porphyry. The most common intrusive is the weakly to moderately, iron-carbonate-altered, orange to cream-grey, plagioclase porphyritic and potassium feldspar megaporphyritic biotite-bearing monzonite-syenite (Fig. 16a). Also exposed are an altered crowded megaporphyritic syenite (Fig. 16b) and a well-foliated and sparsely megaporphyritic monzonite.

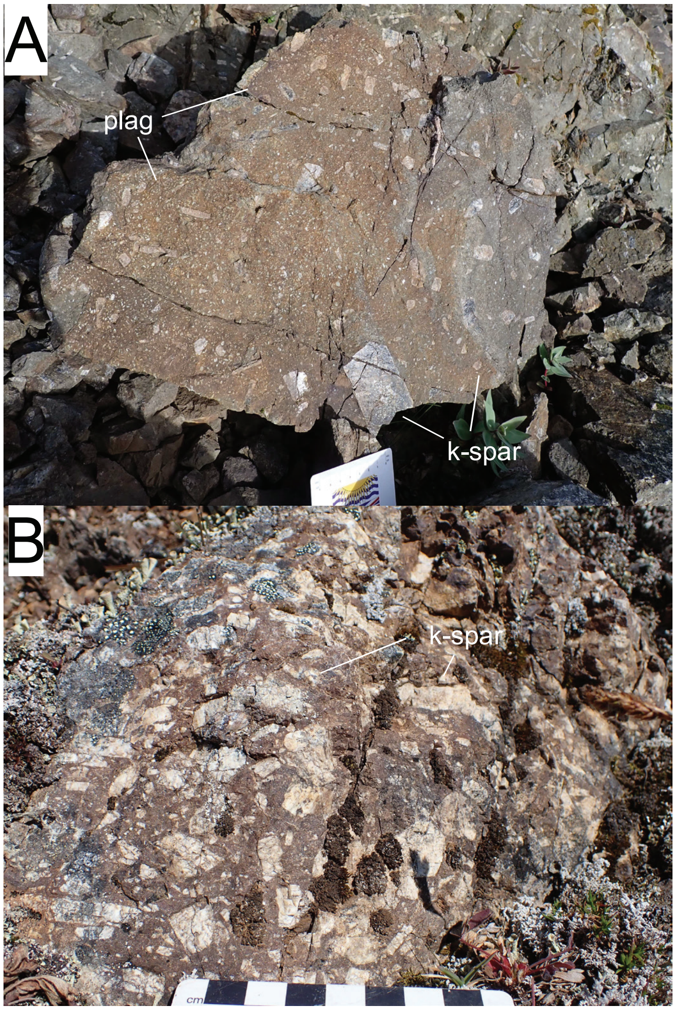


**Fig. 16.** Galore Creek plutonic suite syenite to monzodiorite unit (LTrGdm) near the Voigtberg occurrence. **a)** Plagioclase porphyritic and potassium feldspar megaporphyritic biotite-bearing monzonite-syenite with 10-20% commonly zoned, weakly aligned grey-pink potassium feldspar and 20-25% plagioclase. **b)** Altered, potassium feldspar megaporphyritic syenite to monzonite(?) with 20-30% pale creamy coloured tabular potassium feldspar in an altered dark red-grey aphanitic- to fine-grained groundmass.

#### 4.3.5.2. Grizzly area

Near the Grizzly occurrence (Fig. 4) are relatively unaltered to strongly iron carbonate altered m-thick potassium(?) feldspar porphyritic to megaporphyritic syenite-monzonite intrusions that cut volcanic agglomerate to polymictic breccia (Fig. 17). Locally we noted a weakly mineralized 5 m-wide, fine-grained biotite porphyry(?) adjacent to an intensely Fe-oxide mineralized zone. Logan et al. (2000) mapped an equigranular, medium-grained, hornblende-biotite-bearing monzonite to seriate-textured syenite outcropping 0.8 km northwest of the Grizzly occurrence.


**Fig. 17.** Galore Creek plutonic suite syenite to monzodiorite unit (LTrGdm) from near the Grizzly occurrence. Iron carbonate-altered, feldspar porphyritic syenite-monzonite with 20-30% tabular, pale potassium(?) feldspar.

### 4.4. Summary, Galore Creek plutonic suite

The Galore plutonic suite (Late Triassic) spans across plutonic domains defined by the South Scud river, Mess Creek, and Forrest-Kerr fault zones (Fig. 4). The oldest intrusive units consist of small foid syenite intrusions (ca. 210 Ma; LTrGdf) in the Galore Creek and Copper Canyon deposit areas and multiphase pyroxenite, syenite, and foid syenite intrusions of similar age outside of the map area (Neill, 1991; Coulson et al., 1999). At Galore Creek, the foid syenite to syenite unit (LTrGdf) is cut by the syenite to monzodiorite unit (LTrGdm). Limited geochronological data for the syenite to monzodiorite unit (ca. 204.45 Ma) appears to suggest either long-lived magmatism (ca. 210-204 Ma) or two magmatic episodes within the Galore plutonic suite. Additional Galore plutonic suite intrusions include the northerly trending Loon Lake stock within the parallel Mess Creek fault zone. A series of north-trending potassium feldspar porphyritic to megaporphyritic monzonite to syenite dikes and bodies in the eastern part of the Telegraph Creek area are texturally and compositionally similar to the megaporphyritic monzonite to syenite near Galore Creek (unit LTrGdm).

## 5. Texas Creek plutonic suite (latest Triassic to Early Jurassic)

The Texas Creek plutonic suite (ca. 204-188 Ma) is a series of economically significant intrusions comagmatic with the lower part of the Hazelton Group (Nelson et al., 2018; Febbo et al., 2019; Nelson and van Straaten, 2020). The suite is named after the Texas Creek batholith 24 km north of Stewart (Alldrick, 1993). The suite forms a north-trending belt along the western margin of Stikinia from the towns of Kitsault and Stewart north to Iskut (Fig. 2). The Texas Creek plutonic suite is genetically related to significant porphyry Cu-Au ±Mo systems including the KSM deposits (Febbo et al., 2019) and the Big Bulk porphyry (Hunter and van Straaten, 2020; Miller, 2023) and porphyry-epithermal Au deposits including the Brucejack mine (Tombe, 2015; Tombe et al., 2018; Board et al., 2020; McLeish, 2022). The Texas Creek plutonic suite in the Telegraph Creek area includes a series of small (<5 km$^2$) bodies along both sides of Ball Creek (Fig. 4) that Alldrick et al. (2006) referred to as fine- to medium-grained, porphyritic granodiorite intrusions and dikes. These intrusions appear to deflect from the prevailing northerly trend northeast along Ball Creek. On the eastern end of Ball Creek we recognize a unit of predominantly monzodiorite (EJTdmd), on the western side a unit of predominantly monzonite (EJTdm). The only published dates for the suite in the map area are 185.2 +4.5/-1.2 Ma (AA-TIMS U-Pb zircon) from the Bald Bluff porphyry (Kaip, 1997) and 188 Ma from the Williams porphyry (MINFILE 104G 434; Friesen, 2020).

### 5.1. Monzodiorite unit (EJTdmd)

Alldrick et al. (2006) mapped a cluster of eleven 0.04-0.26 km$^2$ intrusions surrounding the Mary-Ball Creek occurrence (MINFILE 104G 018) and an unnamed 4.4 km$^2$ body 6 km to the northwest.

#### 5.1.1. Mary occurrence area

The Mary occurrence includes porphyry Au-Cu-Mo and related mineralized zones of disseminated to fracture-controlled sulphides, quartz-sulphide stockworks that are partly hosted by porphyritic intrusions and igneous-cemented breccias (Razique and Harris, 2017; Jubinville and Stewart, 2024). A series of northeast-trending dikes and associated intrusive stocks of variably altered feldspar porphyritic hornblende monzodiorite to monzonite (Fig. 18) cut Stuhini Group volcanic and volcano-sedimentary rocks (Alldrick et al., 2006). We recognize three intrusive phases: an early altered K-feldspar porphyritic hornblende monzodiorite; weakly altered K-feldspar-megacrystic monzodiorite; and least-altered equigranular to crowded porphyritic monzodiorite phase.

The altered feldspar porphyry is a rusty to cream weathering, fine-to medium-grained, sparsely K-feldspar porphyritic hornblende monzodiorite. This is the most altered of the three phases, with moderate to strong quartz-sericite-pyrite overprinting earlier biotite alteration (Fig. 18a). The weakly altered K-feldspar-megacrystic phase is a light grey to orange weathering, seriate, biotite-bearing hornblende monzodiorite distinguished by 5-10% pink K-feldspar megacrysts (Fig. 18b). This phase ranges from being relatively unaltered to weakly sericite-carbonate-pyrite altered. In drill core, a mineralized, albite/sericite altered variant of this phase (Fig. 18c) is cut by cm-scale pyrite-molybdenite ±chalcopyrite veins.

#### 5.1.2. Unnamed intrusion north of Ball Creek

The 4.4 km$^2$ unnamed intrusive body 6 km northwest of the

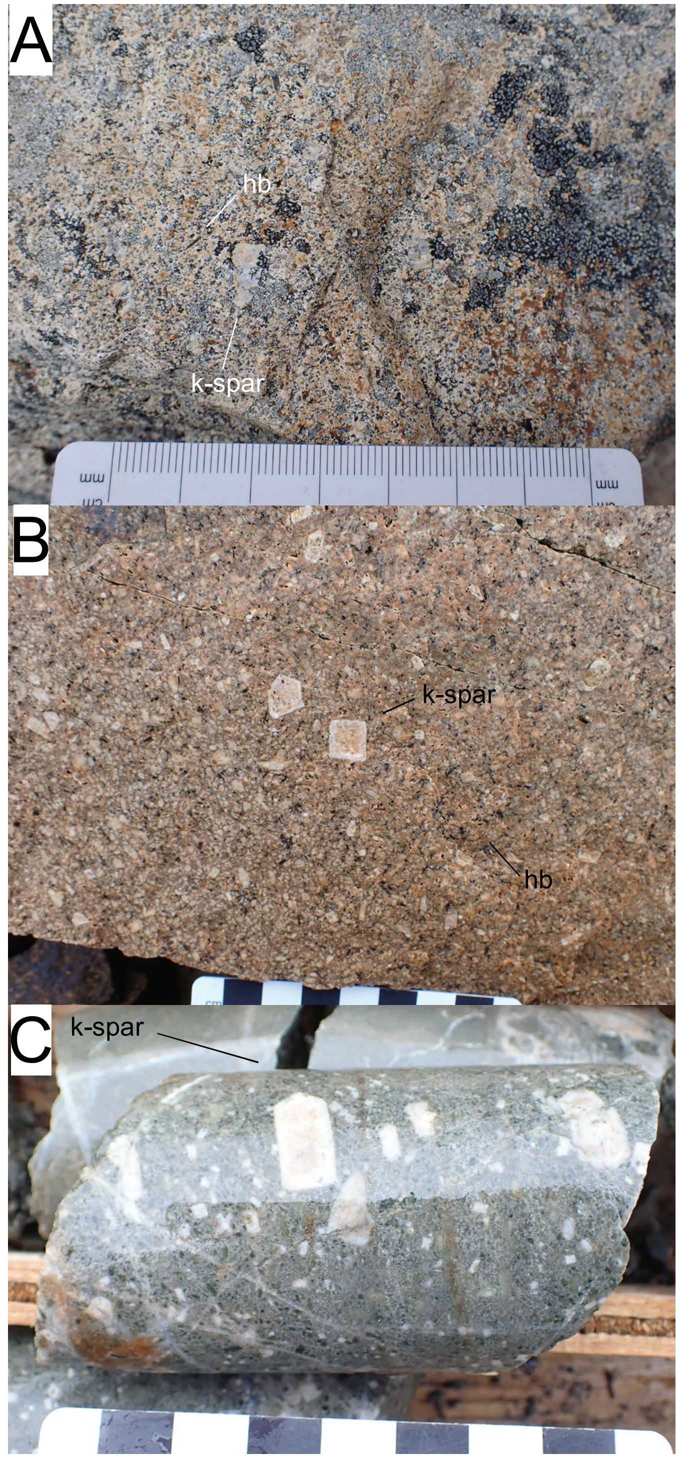


**Fig. 18.** Texas Creek plutonic suite monzodiorite unit (EJTdmzd) from the Mary porphyry occurrence. **a)** Quartz-sericite-pyrite altered, fine-to medium-grained, hornblende-potassium feldspar porphyry with 10% pink potassium feldspar, 10% hornblende, and 25% dull-grey plagioclase. **b)** Seriate to weakly potassium feldspar megacrystic, biotite-bearing hornblende-monzodiorite with 8-10% pink potassium feldspar megacrysts. **c)** Medium-grained, crowded, potassium feldspar porphyritic, hornblende-monzodiorite porphyry with 3-8% potassium feldspar, 20-40% altered plagioclase, and 2-5% hornblende.

Mary occurrence, mapped as granodiorite (Alldrick et al. 2006), contains a feldspar porphyry and subordinate tuff breccia with feldspar porphyry clasts. We noted at least two intrusive phases: an aerially extensive medium-grained crowded hornblende-feldspar-porphyry (Fig. 19) and a fine- to medium-grained quartz-hornblende-plagioclase-K-feldspar-porphyry. Both phases locally contain 1 to 3% elongate, rounded mafic xenoliths (1 to 7 cm).

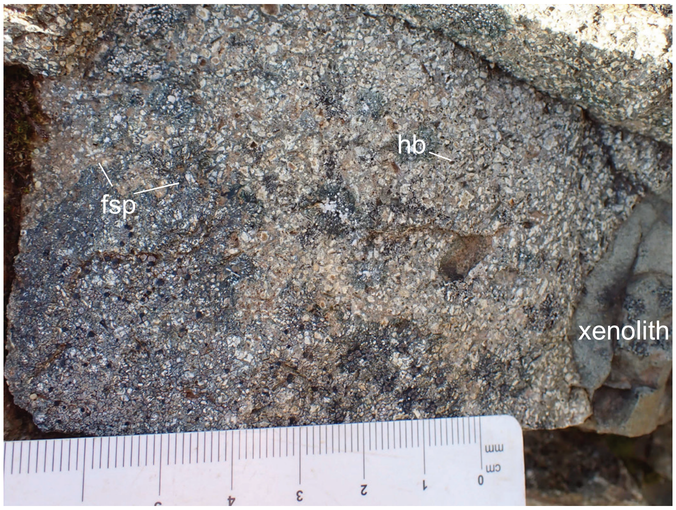


**Fig. 19.** Texas Creek plutonic suite monzodiorite unit (EJTdmzd) from the unnamed body 6 km northwest of the Ball Creek porphyry occurrence. Medium-grained, hornblende-feldspar phyric crowded porphyry.

### 5.2. Monzonite unit (EJTdm)

The monzonite unit (EJTdm) includes the Bald Bluff intrusion and related dikes, poorly exposed porphyritic monzonite and related breccias at the Williams occurrence, and a series of dikes 3.5 km northeast of Bald Bluff.

#### 5.2.1. Bald Bluff intrusion

The Bald Bluff intrusion (0.2 km$^2$) is a hornblende-K-feldspar porphyry with 5% coarse (5-20 mm) locally zoned K-feldspar (Kaip, 1997). Kaip (1997) described a steeply dipping margin-parallel foliation that shallows along the top of the intrusion. On the southwestern margin of the body, the porphyry is in contact with Hazelton Group sandstone and conglomerate consistent with the Early Jurassic date of Kaip (1997). Kaip (1997) and Jubinville and Stewart (2024) considered the contact intrusive, which suggests the porphyry is Early Jurassic or younger. On the southern margin, the foliated porphyry is cut by chalcedony veins. On the southwestern contact of the intrusion, we observed polymictic breccia with angular chalcedony clasts and K-feldspar crystals in a calcite, iron carbonate, and silica cement. Kaip (1997) related a clay-altered K-feldspar dike at the Au-Ag Hank occurrence (MINFILE 104G 107) to the Bald Bluff porphyry.

Alldrick et al. (2006) mapped a small (0.4 km$^2$) granodiorite intrusive body 3.5-km northeast of Bald Bluff. We observed a 5-10 m wide east-northeast trending monzonite dike that cuts polymictic conglomerate, volcanic breccias, and K-feldspar-phyric lapilli tuff. The dikes consist of a dark reddish-grey weathering, magnetic, hornblende-feldspar-porphyry with 30% altered feldspars (<1-3 mm), 5-10% bladed hornblende, and miarolitic cavities in a dark red-grey, aphanitic to fine-grained groundmass.

#### 5.2.2. Williams occurrence

The poorly exposed Williams porphyry Cu-Au prospect 1.8 km northwest of the Hank occurrence (MINFILE 104G 434; Fig. 4) consists of disseminated and vein-hosted mineralization in a porphyritic monzonite and an associated breccia zone along the contact with volcanic rocks of the Stuhini Group (Friesen, 2018). We observed an altered hornblende-K-feldspar-plagioclase porphyritic monzonite, related polymictic monzonite-cemented breccia, and feldspar porphyry dikes. The K-feldspar-plagioclase porphyritic monzonite is fine- to medium-grained with a distinctive red K-feldspar altered groundmass. The polymictic monzonite-cemented breccia has angular andesitic, feldspar porphyry clasts, rare quartz vein clasts, and chalcopyrite(>pyrite?) clasts within a red K-feldspar (?) and magnetite hydrothermally altered monzonite cement. Although contacts between the porphyritic monzonite and the breccia are obscured by sericite alteration, the matrix of the igneous-cemented breccia appears to be compositionally similar to the groundmass of the altered porphyritic monzonite. The polymictic monzonite-cemented breccia is cut by a series of m-wide dark grey weathering, fine- to medium-grained feldspar porphyry dikes that are overprinted by a lower vein abundance than the monzonite. An age of 188 Ma was reported for the Williams porphyry (Friesen, 2020).

### 5.3. Summary, Texas Creek plutonic suite

New geochronological data and our field observations suggest the intrusions assigned to the Texas Creek plutonic suite (Early Jurassic) are confined to east of the Forrest-Kerr fault zone (Fig. 4). The suite includes small feldspar porphyritic monzodiorite and monzonite intrusions that were emplaced into the Stuhini Group near its upper contact with the Hazelton Group (Alldrick et al., 2006; Nelson, 2019). Limited ages for these intrusions (ca. 188-185 Ma) suggest these may be some of the youngest Texas Creek plutonic suite intrusions in the region. In the Mary porphyry Au-Cu-Mo occurrence area (MINFILE 104G 018) mineralization is in feldspar-hornblende-biotite porphyritic intrusions and intrusive breccia (Jubinville and Stewart, 2024). The Williams porphyry Cu-Au occurrence (MINFILE 104G 434) is hosted by hornblende-feldspar porphyritic monzonite, and intrusive breccia (Friesen, 2018).

## 6. Cone Mountain plutonic suite (late Early Jurassic)

The Cone Mountain plutonic suite includes a series of aerially extensive granodiorite to diorite and quartz-monzonite plutons exposed between the Scud River and the town of Telegraph Creek (Figs. 2, 4). Except for the Valley of the Kings epithermal gold deposit on the Brucejack property (ca. 183 Ma; Board et al., 2020; McLeish, 2022), the suite was emplaced after the youngest Jurassic porphyry and porphyry-related mineralization in the Golden Triangle.

The Cone Mountain plutonic suite was first recognized as part of mapping by Brown et al. (1996) north of the Scud River. Within the study area only the Cone Mountain and Navo plutons were previously included in the suite. Based on new geochronologic data (Bailey et al., 2025), herein bodies previously considered as parts of the Stikine or Texas Creek suites (Pereleshin pluton, Scud river stock, and an unnamed intrusion along the South Scud river) are included in the Cone Mountain suite. Based on textural and compositional similarities, we also include the Saddle Mountain pluton (previously mapped as part of the Texas Creek suite), and the Davo pluton (previously unassigned) in the Cone Mountain suite. Below we subdivide the suite into three units: diorite (EJCd), granodiorite (EJCgd) and quartz-monzonite (EJCdqm).

### 6.1. Diorite unit (EJCd)

The diorite unit consists of texturally and compositionally heterogeneous hornblende diorite with subordinate hornblende gabbro, hornblende-rich diorite, and quartz-diorite. We mapped the unit in the southern part of the Cone Mountain pluton, the Navo pluton, and the eastern part of the Saddle Mountain pluton.

#### 6.1.1. Cone Mountain pluton

The Cone Mountain pluton (19.8 $km^2$) is mapped as an equigranular granodiorite to quartz-monzodiorite (Brown et al., 1992). Along the southern margin of body, 3 km southeast of Cone Mountain, we observed a medium-grained, equigranular to weakly plagioclase porphyritic, biotite-bearing hornblende-rich mela-diorite to meso-quartz-diorite. This diorite encloses m to cm blocks of hornblende pegmatitic diorite (with 2-4 cm hornblende). The hornblende pegmatitic diorite locally displays a moderately developed margin parallel fabric. Brown et al. (1992) reported a U-Pb zircon age of 184.7 ±0.6 Ma from granodiorite collected in the northern part of the pluton.

#### 6.1.2. Davo pluton

The Davo pluton was mapped by Brown et al. (1996) as a northwest-trending intrusion containing biotite hornblende diorite to quartz-monzodiorite. At the tongue of the Navo glacier, we observed a blue-grey, massive, medium-grained, equigranular to weakly plagioclase phyric, biotite-hornblende quartz-diorite cut by narrow (<2 m) hornblende-bearing biotite leuco-quartz-diorite dikes (Fig. 20a). The Davo pluton is in contact with the Navo pluton (Fig. 4; see below). Brown et al. (1996) described the contact near the headwaters of Navo Creek as a vertical zone of diorite schlieren 50 m wide. The eastern contact is a broad agmatitic zone that apparently continues from the eastern side of the Navo glacier to 3.5 km north of Recumbent Mountain. This agmatitic zone consists of

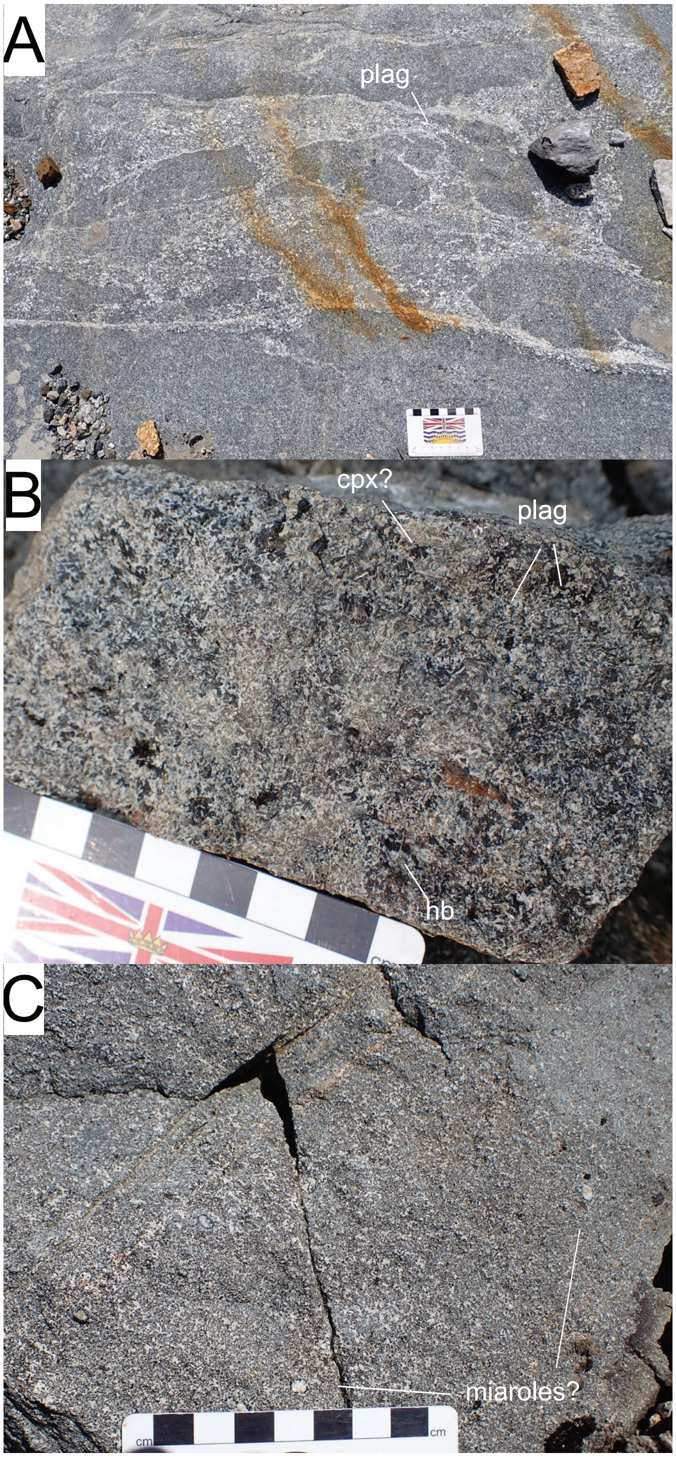


**Fig. 20.** Cone Mountain plutonic suite diorite unit (EJCd) from Davo pluton. **a)** Massive, medium-grained, equigranular to weakly plagioclase phyric, biotite-hornblende quartz-diorite intruded by subordinate (<5%) hornblende-bearing biotite-leuco-quartz-diorite. **b)** Medium-grained, equigranular to glomeroporphyritic gabbro to clinopyroxene hornblende-rich diorite. **c)** Fine- to medium-grained, equigranular to weakly porphyritic, hornblende-rich meso-diorite to hornblende-biotite leuco-quartz diorite with amygdules/possible miarolitic cavities.

hornblende gabbro to hornblende-rich diorite and hornblende meso-quartz-diorite to leuco-quartz-diorite. The most mafic phase is a fine- to medium-grained, equigranular to felted and glomeroporphyritic gabbro to hornblende-rich mela-diorite (Fig. 20b). The gabbro locally contains hornblende-biotite leuco-quartz-diorite and hornblendite segregations to dikes (<1 m wide) and rare <1 m clinopyroxenite xenoliths. An equigranular to plagioclase porphyritic biotite-hornblende meso-quartz-diorite cuts and incorporates this mafic phase as round to rarely angular xenoliths. The meso-quartz-diorite phase locally contains 0.5 cm possible miarolitic cavities (Fig. 20c). This phase grades into zones of leuco-quartz-diorite with rare cm-scale magnetite hornblendite xenoliths. Our observations suggest a crystallization sequence from gabbro/mela-diorite to meso-quartz-diorite to leuco-quartz-diorite.

### 6.1.3. Saddle Mountain pluton

Kerr (1948) and Logan and Koyanagi (1994) described the Saddle Mountain pluton as a medium-grained, biotite hornblende diorite to granodiorite with xenolith-rich zones of partially assimilated volcanic and sedimentary rocks and K-feldspar porphyry and diorite blocks particularly abundant south of Saddle Mountain. Immediately north of Saddle Mountain are exposures of texturally heterogeneous diorite to quartz-diorite. A fine-grained, equigranular, hornblende diorite phase exhibits gradational to sharp contacts with a medium- to coarse-grained, hornblende pegmatitic leuco-quartz-diorite phase with 15-35% acicular to blocky hornblende phenocrysts (Fig. 21).

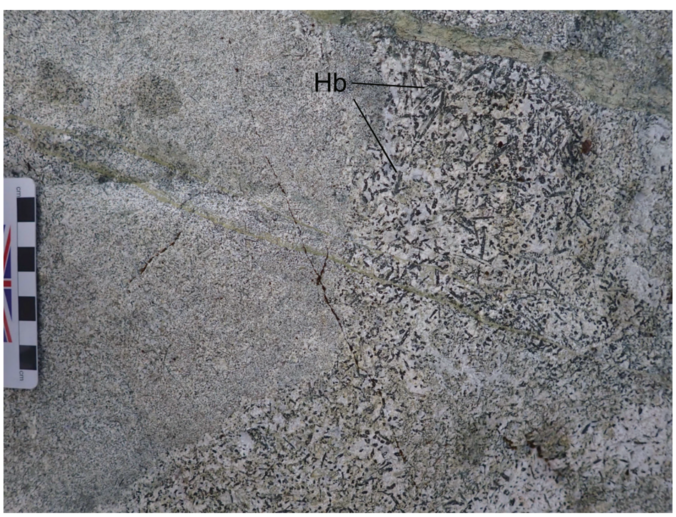


**Fig. 21.** Cone Mountain plutonic suite diorite unit (EJCd) from Saddle Mountain pluton. Fine- to coarse-grained, equigranular, to hornblende and plagioclase porphyritic, hornblende-rich diorite to quartz-diorite (with sharp to gradational contacts). Encloses hornblende pegmatitic, leuco-quartz-diorite lenses with 15-35% porphyritic acicular to blocky hornblendes (4-20 mm).

### 6.2. Granodiorite unit (EJCgd)

This granodiorite unit was described by Souther (1972) as a texturally heterogenous hornblende-biotite granodiorite to hornblende quartz diorite and by Brown et al. (1996) as a biotite hornblende granodiorite to quartz-monzodiorite commonly associated with complex agmatitic zones of diorite, granodiorite and aplite. The granodiorite was emplaced along joints in the Early Jurassic diorite plutons (Brown et al., 1996). The unit is developed in the Navo pluton, the eastern part of the Saddle Mountain pluton, and in an unnamed intrusion along the South Scud river, north of the Copper Canyon deposit.

### 6.2.1. Navo pluton

The granodiorite unit 1.5 km east of the Navo glacier is a pale grey, medium-grained, equigranular to weakly K-feldspar-megacrystic, biotite granodiorite (Fig. 22). This unit encloses a ~50 m wide agmatitic zone with <1 to 10 m-scale round to angular blocks of hornblende gabbro to leuco-quartz-diorite similar to the diorite unit (EJCd). The leuco-quartz-diorite and granodiorite locally display gradational contacts. Our observations suggest that the diorite unit (EJCd) and granodiorite unit (EJCgd) are co-magmatic, consistent with relationships identified by Souther (1972).


**Fig. 22.** Cone Mountain plutonic suite granodiorite unit (EJCgd) from Navo pluton. Medium-grained, equigranular to weakly potassium feldspar megacrystic, biotite-granodiorite with 15% K-feldspar megacrysts.

### 6.2.2. Unnamed intrusion along the South Scud river, north of Copper Canyon deposit

A small north-south trending intrusion west of South Scud river assigned to the Stikine plutonic suite (Logan and Koyanagi, 1994), was reassigned by Prince (2020) to a hornblende biotite granodiorite unit of the Cone Mountain plutonic suite. An equigranular hornblende quartz-monzonite sample from this intrusion returned a CA-TIMS 184.91 ±0.05 Ma U-Pb zircon age (Bailey et al., 2025), supporting this reassignment.

### 6.3. Quartz-monzonite unit (EJCdqm)

Logan and Koyanagi (1994) mapped several equigranular to potassium-megacrystic biotite quartz-monzonite to hornblende granite bodies between the Stikine River and the South Scud river, including the northeastern part of the Saddle

Mountain pluton, the Scud River stock, and the Pereleshin pluton, as parts of the Texas Creek plutonic suite. A new CA-TIMS 184.96 ±0.07 Ma U-Pb zircon age from a porphyritic hornblende monzodiorite sample of the Scud River stock and a new LA-ICPMS 185 ±1 Ma U-Pb zircon age from the quartz-biotite monzonite unit of the southeastern Pereleshin pluton (Bailey et al, 2025) indicate that these bodies are part of the Cone Mountain plutonic suite.

#### 6.3.1. Saddle Mountain pluton

On the northeastern margin of the Saddle Mountain pluton is a crowded K-feldspar-megacrystic to locally equigranular hornblende biotite to hornblende-bearing quartz-monzonite to quartz-monzodiorite. These rocks form small (<1 m) dikes and dm-scale irregular masses, locally cutting and including round inclusions of equigranular diorite. The monzonites display gradational contacts with quartz-diorite (unit EJCd), suggesting they are co-magmatic.

#### 6.3.2. Scud River stock

Mapped as an Early Jurassic biotite hornblende granodiorite (Logan et al., 1993a), the Scud River stock includes a medium-grained, equigranular to weakly porphyritic (clinopyroxene-hornblende-bearing) biotite quartz-monzonite to quartz-monzodiorite (Fig. 23) with subordinate biotite quartz-diorite. The intrusion is cut by local cm-scale pink aplite veins.

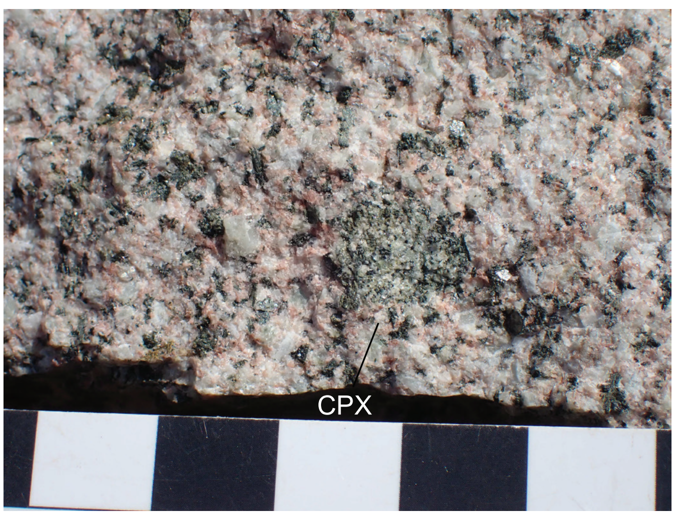


**Fig. 23.** Cone Mountain plutonic suite quartz monzonite unit (EJCdqm) from Scud River stock. Medium-grained, equigranular to weakly porphyritic clinopyroxene- hornblende-bearing biotite quartz-monzonite with rare clinopyroxene(?) rich inclusions.

#### 6.3.3. Pereleshin pluton

The Pereleshin pluton consists of medium- to coarse-grained, equigranular to porphyritic to K-feldspar-megacrystic, hornblende biotite quartz-monzodiorite to granite (Fig. 24; Brown and Gunning, 1989; Logan and Koyanagi, 1994; Brown et al., 1996). This intrusion displays locally well-developed igneous layering that is cut by local cm-scale pink aplite and K-feldspar-quartz-plagioclase pegmatite veins.

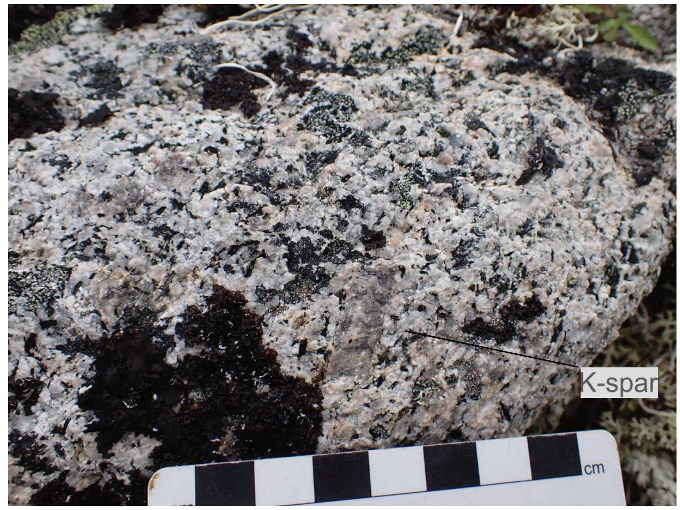


**Fig. 24.** Cone Mountain plutonic suite quartz monzonite unit (EJCdqm) from Pereleshin pluton. Medium-grained, hornblende phyric, potassium feldspar megaporphyritic quartz monzodiorite with 15% elongate hornblende, 5-10% poikilitic pink-grey potassium feldspar and trace titanite.

It also contains cm-scale, rounded, medium-grained diorite inclusions. The pluton is cut by Eocene(?) hornblende biotite granodiorite (Brown and Gunning, 1989).

### 6.4. Summary, Cone Mountain intrusive suite

In the Telegraph Creek study area, the Cone Mountain plutonic suite intrusions are restricted to the region west of the South Scud river fault zone. New geochronological data (Bailey et al., 2025) and lithological observations expands the number of Cone Mountain plutonic suite intrusions in the area. The compositionally heterogenous diorite (EJCd) is the oldest unit with gradational to cross-cutting relationships with the granodiorite unit (EJCgd, ca. 185 Ma) and quartz-monzonite unit (EJCdqm, ca. 185 Ma). Four ca. 185 Ma U-Pb zircon ages for this suite in the map area suggest that magmatism was short lived.

## 7. Discussion: Tectonics and metallogeny

Both the Stikine plutonic suite and Galore plutonic suite are thought to be broadly coeval with the Stuhini Group and to have formed in an arc setting (Nelson and van Straaten, 2020), with significant porphyry-related mineralization at the end of the magmatic cycle. New geochronological data indicate that most of the Late Triassic phases of the Hickman batholith were emplaced in a short (2 m.y.) interval (ca. 222-220 Ma). This was shortly followed by the Stikine suite intrusions (ca. 219 Ma), which are considered responsible for formation of the Schaft Creek porphyry Cu-Au-Mo-Ag deposit and other occurrences along the eastern Hickman margin (e.g., Lacasse). Late Triassic phases of the Hickman batholith, mineralization at the Schaft Creek deposit, and ultramafites define a northerly trend, nearly transverse to the orientation of the main Stuhini arc axis (Nelson and van Straaten, 2020). The Mess Creek and the

South Scud river fault zones coincide with the apparent lateral extent of Stikine suite magmatism and may have facilitated the ascendence of Late Triassic metal-rich fluids and ultramafic magmas. This would be consistent with previous suggestions of slight east-west extension across the Hickman batholith during the Late Triassic (Nelson and van Straaten, 2020). The emplacement of small volume monzonite-diorite intrusions into Stuhini Group sedimentary rocks in the Oweegee dome area is consistent with localized intrusive centres in the back-arc region of the Stuhini arc.

The age, structural control, small volume, and alkalic chemistry led Nelson and van Straaten (2020) and van Straaten et al. (2023) to attribute the Galore plutonic suite and related alkalic volcanic rocks to post-subduction processes. There are at least two mineralization episodes at the Galore Creek porphyry Cu-Au deposit. The most significant episode is thought to have been when the foid syenite unit was emplaced; later episodes are considered coeval with emplacement of the syenite to monzodiorite unit (Enns et al., 1995; Prince, 2020). Different degrees of exhumation could explain regional differences in associated mineralization between Galore Creek and regional Late Triassic pyroxenite-syenite bodies.

The Texas Creek plutonic suite and related mineralization at the Mary Au-Cu-Mo, Williams porphyry Cu-Au, and Hank epithermal Au-Ag-Cu occurrences formed ca. 9 Ma before the accretion of Stikinia to the Intermontane terrane collage and Ancestral North America. These small volume, shallow-level porphyritic monzodiorite and monzonite intrusions were emplaced into Stuhini Group rocks and are associated with igneous-cemented breccias and potentially coeval(?) volcanism. Although much more restricted than in the southern Iskut River region, these intrusions are spatially associated with Early Jurassic sedimentary and volcanic rocks interpreted as being in the lower part of the Hazelton Group (Nelson et al., 2018). These characteristics are broadly comparable to other Texas Creek intrusions along the Stewart-Iskut volcanic belt including the Mitchell intrusions in the southern Iskut River region (e.g., Febbo et al., 2019; Nelson and van Straaten, 2020). These intrusions are inferred to have formed during minor extension or transtension in the back-arc region of the main Hazelton arc (Toodoggone belt to the Skeena arch; Nelson et al., 2022).

Emplaced in the hiatus between the lower and upper parts of the Hazelton Group, the Cone Mountain plutonic suite intrusions locally contain possible miaroles and, immediately north of the study area, appear to have been emplaced within 1 km of a ca. 185 Ma, unconformity (Brown et al., 1996; van Straaten, 2024) suggesting shallow emplacement. The plutonic suite was emplaced immediately following a period of shortening, uplift, and erosion as shown by a ca. 30 m.y. unconformity across the Stikine arch (Fig. 2; Nelson et al., 2022; van Straaten et al., 2022; van Straaten, 2024). In southwestern Yukon, the Long Lake plutonic suite (late Early Jurassic, ca. 183-188 Ma) was emplaced at mid-crustal levels along the Stikinia-Yukon-Tanana suture. It is part of a series of latest Triassic to Early Jurassic intrusions formed during the collision of Stikinia and Yukon-Tanana (Sack et al., 2020; Colpron et al., 2022). There is only limited known mineralization associated with the Cone Mountain plutonic suite. In contrast, intrusions interpreted as syn- to late-mineral in the Valley of the Kings epithermal gold deposit of the southern Iskut River region were emplaced at ca. 183 Ma (Board et al., 2020; McLeish, 2022).

## 8. Conclusion

We present new data on the four major Late Triassic to Early Jurassic plutonic suites of the northern Golden Triangle. The re-assignment of intrusions to the four main plutonic suites will improve relating magmatic and mineralization events in this prospective region. In the study area, the Stikine suite was emplaced during a 6 m.y. interval (ca. 225-219 Ma) culminating with the formation of the Schaft Creek deposit and likely associated with arc-transverse extension. The post-subduction Galore plutonic suite (ca. 212-204 Ma) hosts the Galore Creek deposit and consists of pyroxenite, foid-syenite to syenite, and syenite to monzodiorite units. We have reassigned several small intrusive centres to the syenite to monzodiorite unit of the Galore suite including the Scotsimpson, Jack Wilson, and smaller intrusions associated with the Grizzly-Voigtberg occurrence. The Texas Creek plutonic suite (204-188 Ma) consists of several small volume, porphyritic, shallow monzodiorite and monzonite intrusions in the Ball Creek area following the reassignment of former Texas Creek plutonic suite intrusions west of the South Scud river fault zone. This reassignment is more consistent with the characteristics and overall regional orientation of Texas Creek suite intrusions along the Stewart-Iskut volcanic belt. Extensive late Early Jurassic magmatism of the Cone Mountain plutonic suite is contemporaneous with the emplacement of the Long Lake plutonic suite in Yukon, and the end of a 30 m.y. unconformity across the Stikine arch. Both suites are associated with the collision of Stikinia and Yukon-Tanana. The similar composition and textures of Paleozoic to Jurassic intrusions in this region underline the significance of analytical techniques such as geochronology to correctly map these plutonic suites. Further analytical work, including petrography, lithogeochemistry, geochronology, and radiogenic isotope geochemistry is in progress.

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