REFINEMENT AND LOCAL CORRELATION OF THE UPPER SNIPPAKER RIDGE SECTION, ISKUT RIVER AREA, B.C. (104B/10W and 11E)

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INTRODUCTION

A 1:20 000-scale regional mapping project in the western part of the Iskut map area was carried out to augment the extensive regional work conducted by federal and provincial surveys in the area (Lefebure and Gunning, 1989; Anderson, 1989; Anderson and Bevier, 1990; Anderson and Thorkelson, 1990; Alldrick *et al.*, 1990; Britton *et al.*, 1990; Fletcher and Hiebert, 1990) and to refine local and regional stratigraphic correlations. The study will provide an updated geological framework for mineral target identification and for specific economically related studies (*e.g.*, Rhys and Godwin, 1992; Rhys and Lewis, 1993, this volume). The "Bronson corridor", a structural trend along strike from the Snip gold mine operated by Cominco Metals Ltd., is of particular interest to this study because the Snip, Stonehouse and Inel gold deposits lie on or close to this trend.

The study area lies in the eastern Boundary Ranges of the Coast Mountains (Figure 2-14-1) and is bounded to the southwest by the Coast Mountains, to the east by the Snippaker Creek valley and to the north by the Iskut River. Elevations vary from 100 metres to 2300 metres above sea level, with steep-sided glaciated valleys. Treeline is at approximately 1000 metres. Vegetation below treeline includes Douglas fir and Sitka spruce, with abundant devil's club and slide alder.

Access to the area is by fixed-wing aircraft to the 1500-metre airstrip at Bronson Creek. Fieldwork was based at Cominco Metals' Snip camp by Bronson airstrip. Day traverses and flycamps utilized a helicopter, or ground transport along the Bronson - Johnny Mountain road.

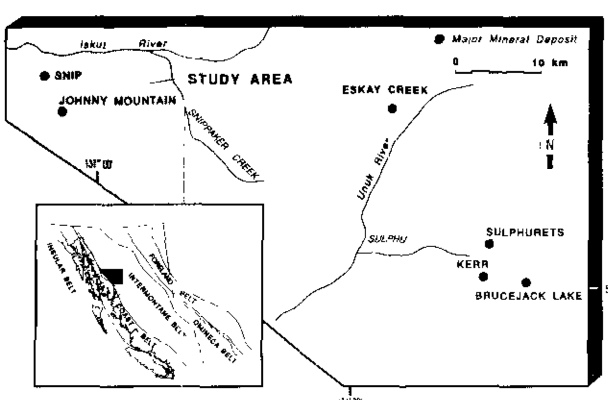

Figure 2-14-1. Location of study area.

STRATIGRAPHY

Alldrick (1989) noted that "Nomenclature for early to middle Mesozoic strata in northwest British Columbia is evolving". In the area of the Bronson corridor, rocks of Jurassic age comprise a discrete sequence of cliff-forming volcanic and volcanogenic rocks which are exposed on ridge crests along the corridor (Alldrick *et al.*, 1990; Britton *et al.*, 1990; Metcalfe *et al.*, in preparation). The age of the unit at the base of this succession has not yet been determined. The succession overlies a sequence of dominantly clastic sedimentary rocks with minor intercalated volcanic rocks. Fossils obtained from this sequence on Snippaker Ridge indicate a Late Triassic age (Nadaraju and Smith, 1992a; 1992b). These rocks are therefore part of the Stuhini Group. Biostratigraphic data are not available for sedimentary strata on the southwest side of Bronson Creek and on the southwest side of Johnny Mountain, but their lithologic similarity to the rocks exposed on Snippaker Ridge suggests that they are coeval (J.R. Atkinson, Skyline Gold Corporation, personal communication, 1990; D. Rhys, personal communication, 1991)

This paper presents a section across the contact between the underlying sedimentary strata on Snippaker Ridge and the overlying intermediate volcanic and volcanogenic rocks. The location of the section is shown in Figure 2-14-2. This contact is also exposed on the southwest side of Bronson Creek and has, in that area, been interpreted either as a low-angle fault or an angular unconformity (Alldrick *et al.*, 1990). An unconformable stratigraphic contact between overlying intermediate to felsic volcanic rocks and underlying baked clastic sedimentary rocks was observed at the break of slope on Johnny Ridge during the course of 1992 fieldwork, indicating that this basal contact is an angular unconformity. A detailed description of the Johnny Ridge section is included in a study by Metcalfe *et al.* (in preparation).

SNIPPAKER RIDGE SECTION

A section from northwest to southeast along Snippaker Ridge, through Snippaker Mountain and the unnamed peak immediately to the south, is shown in Figure 2-14-3. The strata at the top of this section are relatively flat lying and are weakly deformed. The section is based upon information from four traverses carried out in the vicinity of Snip-

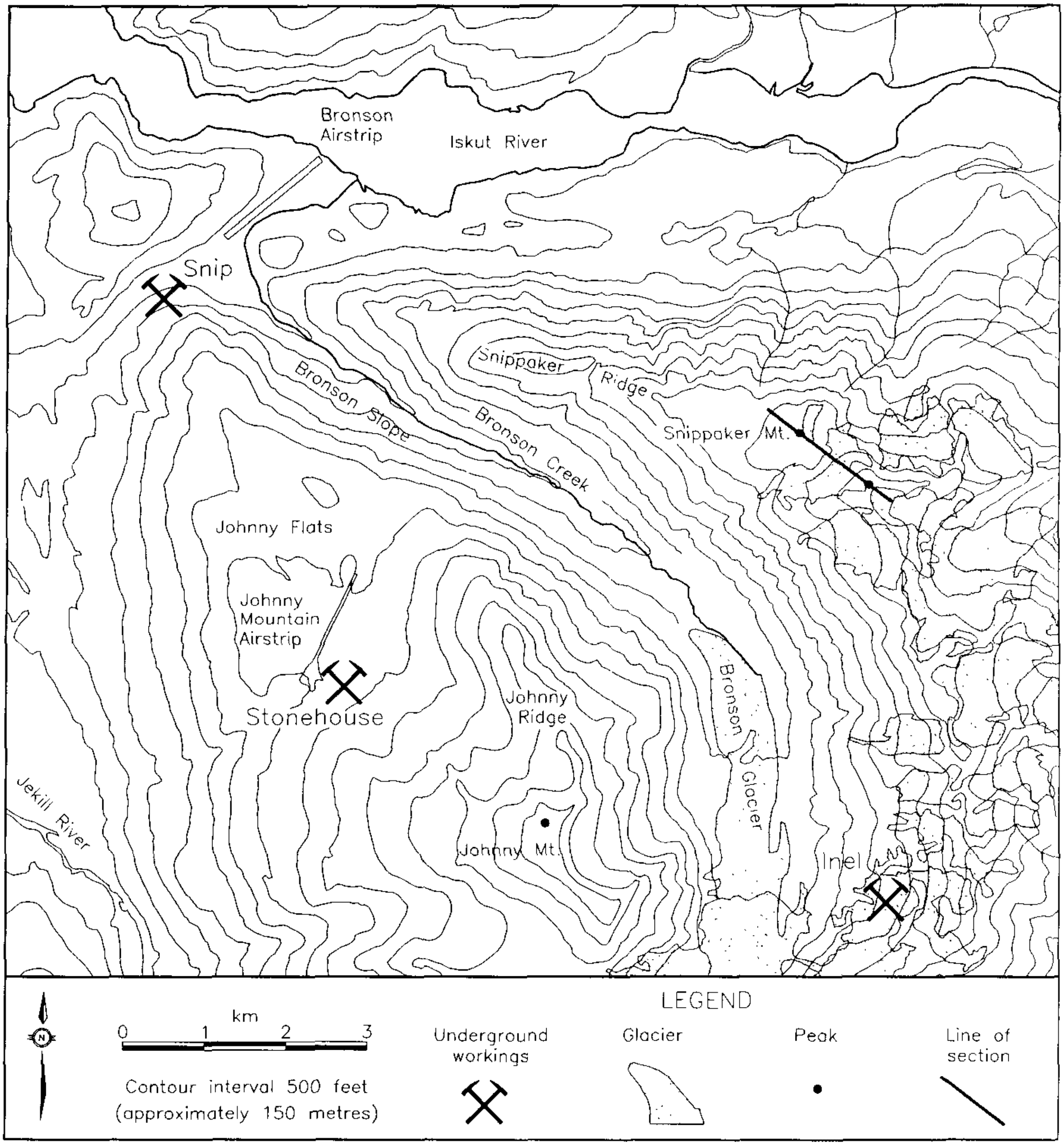

Figure 2-14-2. Location of Snippaker Ridge section (*see* Figure 2-14-3).

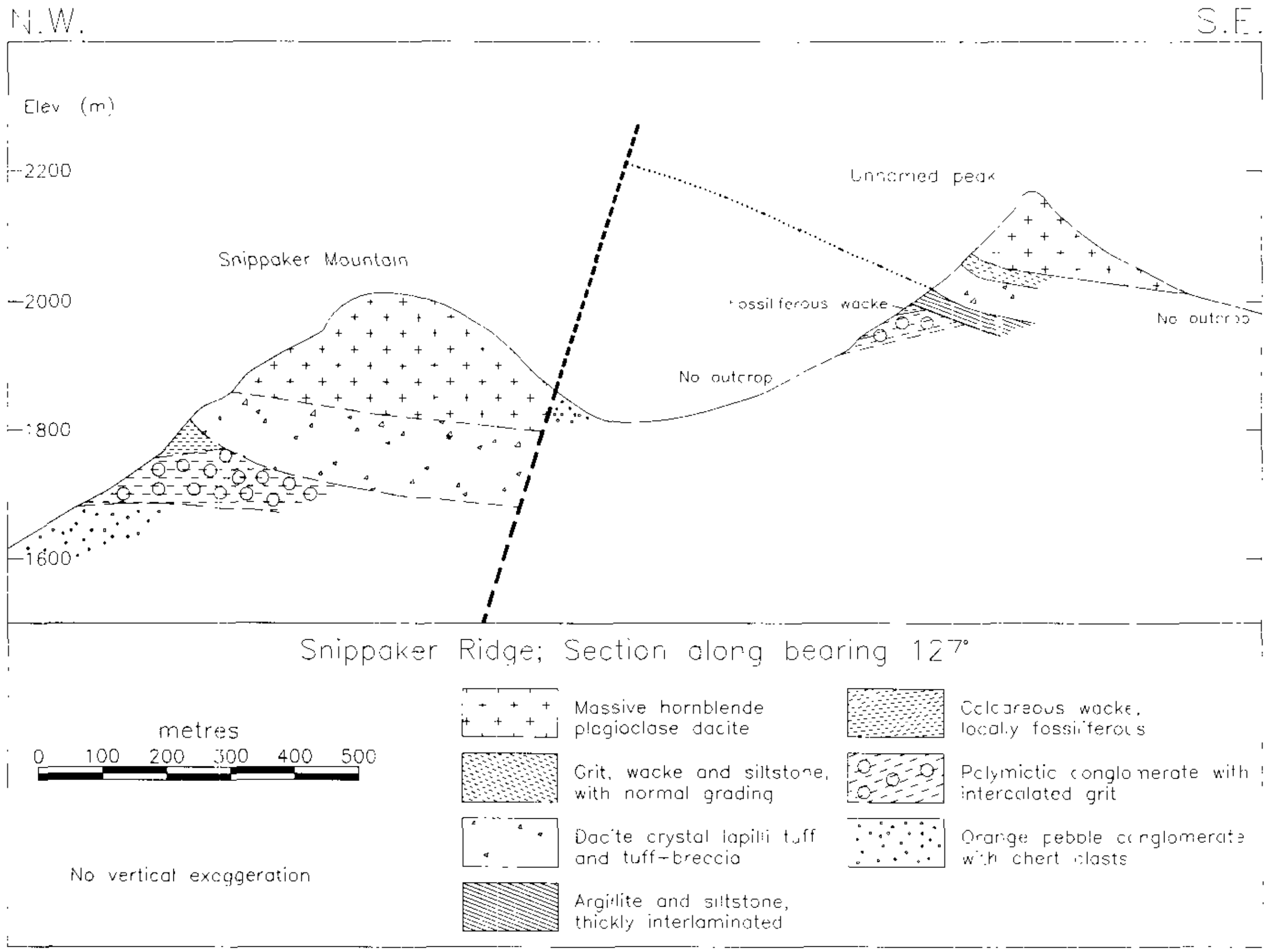

Figure 2-14-3. Snippaker Ridge section.

TABLE 2-14-1
STRATIGRAPHIC SUMMARY

THICKNESS	LITHOLOGY	CONTROL
————	Skyline rhyolite, not exposed on Snippaker Ridge	192 ± 3 Ma
>180 m	Massive plagioclase±hornblende phyric dacite	
- - - - - -	unconformity, hornfelsed basal contact of dacite	
25 m	Grey siltstone grading downsection to grit	
=======	loss of exposure	
50 m	Pale green, orange-weathering dacite crystal lapilli tuff	
——- - -	unconformity, hornfelsed sedimentary rocks at basal contact of dacite	
30 m	Thickly laminated dark grey siltstones and wackes	
- - - - - - -	unconformity	
<5 m	Orange-weathering wacke with fossiliferous horizon	Norian
No base	Polymictic boulder conglomerate with grit horizons and some calcite matrix, weakly fossiliferous	

paker Mountain. Lithologic descriptions and stratigraphic observations are summarized in Table 2-14-1.

Siltstone-Wacke Sequence

The most commonly occurring lithology on Snippaker Ridge is a thick sequence of thinly bedded to thickly laminated siltstone and wacke with less common argillite, grit and conglomerate horizons. Previous mapping (Graf, 1985, unpublished data) indicates that the sequence near Snippaker Peak is well bedded; bed thickness varies from 1 centimetre to as much as 200 metres. At the top of the siltstone-wacke sequence is a paraconformable series of coarse grits and polymictic conglomerates which contain chert pebbles and weather to a distinctive orange colour near Snippaker Mountain. The upper contact was not observed.

Polymictic Conglomerate

The siltstone-wacke sequence is overlain by a series of coarse grits and polymictic conglomerates. The basal contact of this unit was not observed. The unit is a mottled dark greenish grey, weathering to a medium grey or brownish grey. The largest clasts are 2 metres across, but clast size ranges down to small cobbles or, locally, gravel. The clasts are angular to rounded and are dark green, maroon or medium to light grey in colour. Clast lithologies include intermediate to mafic feldspar-phyric volcanic rocks and thickly to thinly laminated siltstone and wacke. The unit is massively bedded, locally with thick interlaminae of siltstone, scour surfaces and graded bedding.

The conglomerate unit includes both clast and matrix-suspended facies. Locally, the matrix is calcareous and, less commonly, fossiliferous, containing unidentified bivalve shell fragments. The contact with the overlying unit is gradational.

Fossiliferous Wacke

The conglomerate grades upsection, over a thickness of approximately 10 metres, to a calcareous wacke. This unit is massively bedded and weathers to a distinctive orange or ochre. An estimate of the thickness of this unit is hindered by poor exposure, but the total thickness does not exceed 15 metres. The wacke contains a horizon rich in macrofossils. These include scleractinian corals, gastropods, bivalves, brachiopods and ammonites that have been identified as Norian in age (Nadaraju and Smith 1992a, 1992b). The fossiliferous wacke is therefore part of the Stuhini Group and the date is a minimum age for the underlying sedimentary strata. The upper contact of this unit with the overlying sedimentary rocks was observed in only one outcrop and appears unconformable.

Banded Siltstone/Argillite

Overlying the fossiliferous wacke with apparent unconformity is a sequence of thickly laminated to thinly bedded black argillites and siltstones. The sedimentary rocks are medium to dark grey on fresh and weathered surfaces, dip gently to moderately to the south and are exposed in the section on the north slope of the peak to the south of Snippaker Mountain (Figure 2-14-3). The unit was not seen in the Snippaker Mountain section. In the section to the south of Snippaker Mountain, it is recessively weathering, with incomplete exposure, but the thickness is estimated to be 30 metres.

Dacite Crystal-Lapilli Tuff

The sedimentary succession is overlain by a massive unit of crystal-lapilli tuff of intermediate, probably dacitic composition, with a measured thickness of approximately 50 metres. The unit is pale green in colour and weathers to a rusty orange or beige. Lapilli are commonly 0.5 to 1 centimetre in size, angular to subrounded and matrix supported. Phenocrysts are dominantly feldspar.

The basal contact of the dacite is subparallel with bedding in the underlying clastic sedimentary sequence and dips moderately to the south in most exposures. The contact locally cuts bedding surfaces. The underlying sedimentary rocks are well cleaved but are also baked adjacent to the contact, which is therefore an unconformity rather than a tectonic contact and marks the base of the volcanic succession on Snippaker and Johnny ridges.

Volcanic Grit-Wacke-Siltstone

The top of the lower dacite unit on the peak to the south of Snippaker Mountain is not exposed. Overlying this unit is a thin sequence of epiclastic conglomerate and grit, grading upsection to siltstone. The unit dips moderately to gently to the south. The total thickness of this unit does not exceed 25 metres. The clastic sedimentary rocks are interpreted as representative of local reworking of the underlying dacite and are absent from the Snippaker Peak section. Similar epiclastic horizons occur in the lower part of the dacite succession on Johnny Ridge (Metcalfe *et al.*, in preparation).

Massive Hornblende Plagioclase Dacite

The epiclastic sedimentary unit is unconformably overlain by a massive unit interpreted as a lava flow or, possibly, a recrystallized crystal tuff. The top of the unit is eroded on Snippaker Mountain but a total thickness of 180 metres is exposed. In the section preserved on Johnny Ridge, the thickness of the dacite unit is in excess of 300 metres.

The rock is a plagioclase±hornblende-phyric dacite. Fresh surfaces are medium to dark grey, weathering through dark grey-green to grey or light grey. Phenocrysts comprise 20 per cent subhedral plagioclase, 1 to 4 millimetres in size, and 5 per cent subhedral hornblende, 1 to 3 millimetres in size, in a grey to grey-green aphanitic groundmass. Epidote alteration causes the greenish hue and is patchy to pervasive after both plagioclase phenocrysts and groundmass. Rare flow-banding is visible on lightly weathered surfaces.

The unit is apparently without sedimentary interbeds or structures at all locations examined on Snippaker Ridge. The dacite is a cliff-former and caps the sedimentary sequence at least as far south as the Inel workings (Figure 2-14-2).

CORRELATION OF THE SNIPPAKER RIDGE SECTION

The 1992 fieldwork carried out on the Snippaker Ridge section permits a correlation to be made across the valley of Bronson Creek, using previously acquired information. Both sections are of intermediate to felsic volcanic or volcanogenic rocks, each overlying a predominantly sedimentary succession. Contacts on either side of the valley are stratigraphic and unconformable rather than structural. One U-Pb zircon date of 192±3 Ma has been obtained (M.L Bevier, unpublished data) from a rhyolite unit stratigraphically above the massive dacite on Johnny Ridge, suggesting that the volcanism is Early Jurassic in age. The unconformity described here is therefore interpreted as marking the onset of Early Jurassic volcanism in the Snippaker Mountain - Johnny Mountain area.

One structural observation can be made regarding the flat-lying basal contact of the dacite. On Snippaker Ridge, this contact is exposed at an elevation of 1800 to 1900 metres; on the Johnny Mountain side, the contact is exposed at an elevation of 1100 metres. The disparity of elevations is not caused by an observable southwest dip to the contact on either ridge and supports the hypothesis of a significant structural discontinuity in the valley of Bronson Creek (Lefebure and Gunning, 1989), with the Johnny Mountain block being downthrown.

Outcrops of dacitic volcanic rocks occur near the base of slope, on the southwest side of Bronson Creek, overlying a steeply northeasterly dipping sedimentary sequence. It is not certain that these units are equivalent to the Snippaker and Johnny Ridge dacites. If a correlation is made, this will imply still greater displacement along the Bronson Creek structure.

MINERALIZATION

Three significant gold deposits and a number of interesting prospects lie within or close to the Bronson corridor. Each of the three deposits contains galena with lead isotope compositions that suggest the lead separated from its radioactive parents during the Early Jurassic (Godwin *et al.*, 1991). The onset of intermediate to felsic volcanism during this period is therefore of considerable significance. The heat source (or sources) associated with the volcanic rocks and their intrusive equivalents probably generated and maintained the hydrothermal systems which supplied the base and precious metal mineralization present in this area.

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