

GEOLOGIC NOTES

The following text is summarized from Haggart et al. (1998). Further details can be found at that source.

Upper Jurassic to (?) Lower Cretaceous Bowser Lake Group

Clastic strata underlie virtually all of the map area. On the basis of age and lithological similarity, these rocks are correlated with the Bowser Lake Group, distributed widely across other parts of Nass River map area (103P) to the north (Evenchick, 1996a, b; Evenchick and Mustard, 1996). Two distinct lithofacies are found within the Bowser Lake Group strata of Kiteen River map area: turbidite deposits and massive fine-grained clastic deposits. The two facies may represent different stratigraphic levels within the Bowser Lake Group, although present evidence for this interpretation is inconclusive. The turbidite facies consists of thin-bedded siltstone turbidite deposits (aggregating up to 25 m in thickness) within thick (>25 m) shale sequences, as well as thin- to thick-bedded sandstone turbidites within thinner shale sequences. Siltstone turbidites in fine-grained strata typically show Bouma T₁ or T₂ units. Sandstone turbidites typically include Bouma T₄ units. Grading is generally indeterminate, although truncated ripple stratifications and local conglomerates are present locally. Conglomerates is a minor component of some sandstone turbidite flows; such beds reach 40 cm thickness and about 12 m in lateral extent. Conglomerates include pebbles to small cobbles of argillite, metaconglomerate, and chert; granitic clasts are not seen. In the turbidite facies, individual flow deposits are interstratified with shale intervals, ranging from several centimetres to several metres in thickness. The siltstone/sandstone to shale ratio is greater in thinner shale intervals. Shale intervals are generally massive or parallel laminated. Organic debris, sometimes forming coalified mats several centimetres thick and 75 cm in lateral extent, is sometimes found within the shale intervals. Fossils, excluding plant debris, are extremely rare in the turbidite facies, consisting of poorly-preserved and stained bivalves and other rare bivalves.

The massive fine-grained clastic facies comprises massive to, rarely, parallel-laminated mudstone, silty mudstone, and siltstone, locally pyritic and lacking turbidites. Siltstone is sometimes found as lenticular deposits within the shale, or as distinct beds. Fossils are moderately common, mostly bivalves and other bivalves, and rare gastropods. Horizontal burrow morphologies are common, generally oxidized to orange colour. Plant debris, principally branches and coalified mats to 5 mm thick and up to 75 cm in lateral extent, is also common.

Turbidite sequences observed in the Bowser Lake Group suggest distal submarine fan and fan-channel environments. Strata of the massive, fine-grained facies may represent deep-water shelf environments, significantly shallower than the submarine fan environments represented by the turbidite facies. No tuffaceous strata are found within Bowser Lake Group rocks of Kiteen River map area.

Exposures of Bowser Lake Group strata in the Nass River valley are nearly all gently to moderately dipping (<45°), as are exposures on the flanks of the Nass Ranges on the east margin of the valley, and along the course of Kiteen River. This supports the suggestion of Haggart et al. (1998) that these strata may represent the lower part of the Bowser Lake Group succession found in the map area, lying both structurally and stratigraphically beneath the Bowser Lake Group exposures found at higher elevations.

Eocene (?) Mt. Priestly Stock

The only plutonic rocks in the map area are found in the southwestern corner, forming a body roughly 5 km in diameter south of Mt. Headley and north of Mt. Priestly. The intrusion was called the Mt. Priestly stock by Carter (1981), who identified minor fracture-controlled mylonitization. Lithologies include equigranular, unfoliated, tonalite and quartz diorite. Hornblende is generally more abundant than biotite, and minor titanite is present locally. The contact with the country rocks is typically sharp and discordant, although in some areas an extensive stockwork of dykes cuts sedimentary strata near the pluton margin. No additional stocks were noted in Kiteen River map area, although felsic and mafic dykes intruding Bowser Lake Group strata are common locally on the west and south slopes of Mt. Headley, several kilometres north of the Mt. Priestly stock. Carter (1981) obtained an emplacement-age K-Ar date of 49 Ma from the Mt. Priestly stock.

Late Mesozoic and (?) Younger Dykes

Dykes of rhyolitic to basaltic compositions cut Bowser Lake Group rocks in many areas but are most abundant adjacent to the Mt. Priestly stock, oriented subparallel to the local structural grain. Basaltic dykes are considered to be related to Pleistocene volcanism; some include ultramafic xenoliths. A felsic dyke in the southeast part of the map area gave a U-Pb date of 83.1 ± 0.2 Ma (V. McNicol, pers. comm., 1998), indicating that some intrusive activity in the region is of Late Cretaceous age. Other felsic dykes are considered related to magmatism associated with the Eocene (?) Mt. Priestly pluton. Felsic dykes cutting Bowser Lake Group strata north of Mt. Priestly appear to be overlain by basaltic volcanic vent facies strata of Pleistocene age.

Pleistocene Volcanic Strata

Areally extensive exposures of Pleistocene volcanic rocks are found in the valleys east and south of Mt. Headley, and on the north and west sides of the high mass north of Mt. Priestly; smaller exposures outcrop farther north in the map area. Two distinct volcanic facies are noted. The vent facies consists predominantly of heterogeneous basalt breccia, flow breccia, scoria, and cinder deposits, with local inclusions of sandy rock half breccia. In the north half of the map area, vent facies deposits approximate cinder cone morphologies, and include basalt breccia, scoria and cinder lithologies and textures, with depositional dips of up to 44°. The flow facies includes fine-grained, slightly vesicular basalt and columnar basalt showing large, plagioclase phenocrysts and small phenocrysts of olivine and titanite, but lacking ultramafic nodules. The flows southeast of Mt. Headley have a total thickness of about 80 m and a basal surface that slopes gently east, suggesting that the source was up the drainage. The Mt. Headley flows rest on about 30 m of unconsolidated, presumably Pleistocene glacial sediments. The basalt flows are lithologically similar to young volcanic rocks elsewhere in Nass River map area, especially those in Hoan Creek, dated at 175 000 ± 50 000 years by ⁴⁰Ar-³⁹Ar, and those near Cranberry Junction (Evenchick et al., 1997).

Structural Geology

A ubiquitous foliation is the most common fabric seen in fine-grained strata of the map area. This can sometimes be related to original depositional fabric or, when oriented oblique to bedding, attributable to stress regime variations. Large-scale compressional features are seen commonly in areas underlain by turbidite facies of the Upper Jurassic Bowser Lake Group. North-south-trending, eastward-vergent structures are developed in Bowser Lake Group rocks in the central and east-central portions of the map area, principally large-scale folds but also some thrusts. In the northeast part of the map area such structures trend northeast, and in the southeast part of the map area they trend northeast. Broad folds in the Nass River valley on the western margin of the map area typically have greater linear extent than those found at higher elevations to the east; the map patterns of these folds, however, are broadly parallel with the trends seen in the eastern part of the map area. In addition, fold orientations within the Bowser Lake Group in the Nass River valley appear to control the development of the topography in this region. A vertical dyke cutting folded Bowser Lake Group strata in the southeast part of the map area provided a U-Pb date of 83.1 ± 0.2 Ma (V. McNicol, pers. comm., 1998), suggesting that deformation of Bowser Lake Group rocks took place sometime during Early to Late Cretaceous (pre-Campanian) time.

References

- Carter, N.C., 1981: Porphyry copper and molybdenum deposits, west-central British Columbia: British Columbia, Ministry of Energy, Mines and Petroleum Resources, 150 p.
- Evenchick, C.A., 1996a: Geology, Cranberry River, British Columbia (103 P/10); Geological Survey of Canada Open File 3204, scale 1:50 000.
- 1996b: Geology, Brown Bear Lake, British Columbia (103 P/15); Geological Survey of Canada, Open File 3225, scale 1:50 000.
- Evenchick, C.A. and Mustard, P.S., 1996: Bedrock geology of north-central and west-central Nass River map area, British Columbia, in Current Research 1996-A; Geological Survey of Canada, p. 45-65.
- Evenchick, C.A., Aldrick, D.J., Currie, L.D., Haggart, J.W., McCuaig, S., McNicol, V., and Woodworth, G.J., 1997: Status of research in the Nass River multidisciplinary geoscience project, British Columbia, in Current Research 1997-A; Geological Survey of Canada, p. 21-30.
- Haggart, J.W., Woodworth, G.J., and Justason, A., 1998: Update on geological mapping, southeast Nass River map area, British Columbia, in Current Research 1998-A; Geological Survey of Canada, p. 69-77.

Geology by J.W. Haggart, G.J. Woodworth and A. Justason, 1997
Map compilation by J.W. Haggart

Any revisions or additional geological information known to the user would be welcomed by the Geological Survey of Canada

Digital base map from Geomatics Canada published at the same scale. Generalized and modified by the Geological Survey of Canada

Copies of this map may be obtained from the Canada Map Office, Natural Resources Canada, Ottawa, Ontario K1A 0G8

Digital data entry J. Ferreira, 1997

Digital cartography by I.G. Bracke, 1998

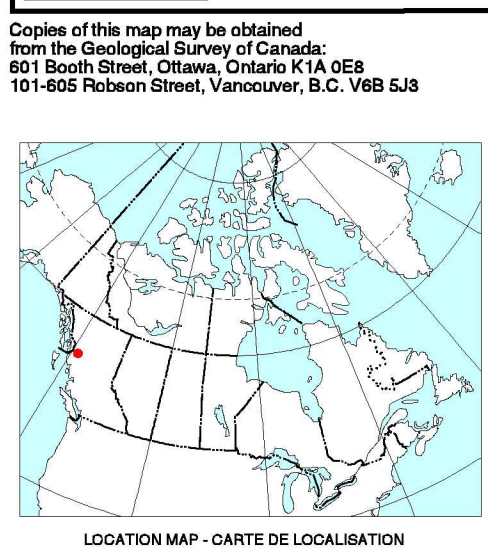
Electrostatic plot produced by the Geological Survey of Canada

Mean magnetic declination: 1998, 24° 8' East, decreasing 0.2° annually. Residual may vary from 24° 2' East in the SW corner to 24° 14' East in the NE corner of the map.

Contour lines and drainage have been modified from NAD83 to NAD27

Elevations in feet above mean sea level

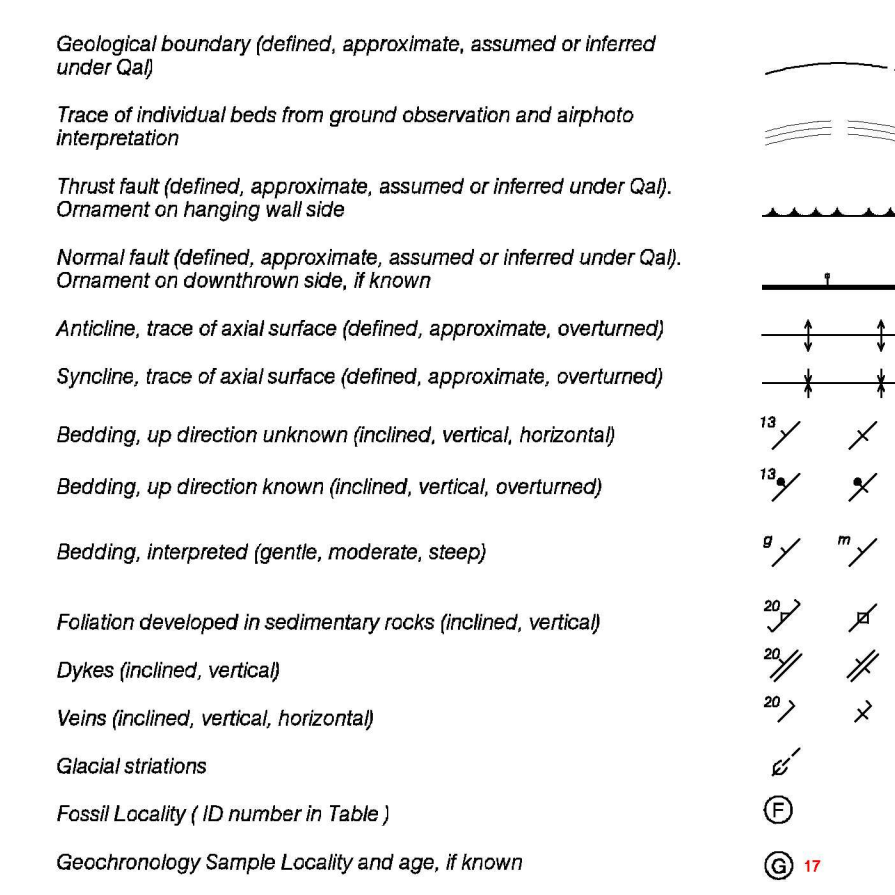
Contour interval 100 feet



LOCATION MAP - CARTE DE LOCALISATION

LEGEND

- SEDIMENTARY AND VOLCANIC ROCKS**
- QUATERNARY**
 - Qal Quaternary Alluvium
 - Qpb Pleistocene Flow Deposits: Basalt flows, breccia
 - Qpc Pleistocene Cinder Cone Deposits: Scoriaeous basalt, breccia
- UPPER JURASSIC to (?) LOWER CRETACEOUS BOWSER LAKE GROUP**
 - UJ-7KBU Turbiditic sandstone, siltstone and shale, rare conglomerates, undifferentiated
 - UJ-7KBI Turbiditic sandstone, lesser siltstone and shale
 - UJ-7KBS Massive siltstone and shale
- INTRUSIVE ROCKS**
- TERTIARY**
 - Tg Eocene(?), Mt. Priestly Stock; mafic granodiorite, tonalite



MACROFOSSIL COLLECTIONS

ID	GSB Locality	Field Number	UTM Coordinates	Age	Identified Taxa
1	C-303665	HFB-97-178	520282E, 6139251N	Oxfordian/Kimmeridgian (?)	<i>Buchia concentrica</i> (Sowerby) (?)
2	C-303666	HFB-97-221A	521852E, 6142929N	Oxfordian/Kimmeridgian (?)	<i>Buchia concentrica</i> (Sowerby) (?)
3	C-303667	HFB-97-218	521800E, 6142929N	Late Jurassic (?)	<i>Buchia</i> (?) sp.
4	C-303668	HFB-97-225	521033E, 6143337N	Late Jurassic (?)	<i>Buchia</i> (?) sp.
5	C-303669	HFB-97-227	520543E, 6143544N	Oxfordian/Kimmeridgian (?)	<i>Buchia</i> (?) sp.; <i>Buchia concentrica</i> (Sowerby) (?)
6	C-303670	HFB-97-228	520044E, 6143550N	Late Jurassic (?)	<i>Buchia</i> (?) sp.
7	C-303671	HFB-97-230	520144E, 6144194N	Mesozoic	<i>Pachydictya</i> (?) sp.
8	C-303672	HFB-97-232	519845E, 6144460N	Indeterminate	Mollusk shell fragments
9	C-303673	HFB-97-304	522905E, 6142860N	Berriasian (?)	<i>Buchia</i> (?) cf. <i>vulgarensis</i> (Lalouette) (?)
10	C-303674	HFB-97-308	522297E, 6133238N	Tithonian (?)	<i>Buchia</i> cf. <i>placchi</i> (Gastb.)
11	C-303675	HFB-97-316	522323E, 6129225N	Oxfordian/Kimmeridgian (?)	<i>Buchia</i> cf. <i>concentrica</i> (Sowerby) (?)
12	C-303676	HFB-97-324	524824E, 6144345N	Late Jurassic (?)	<i>Buchia</i> (?) sp.
13	C-303677	HFB-97-326	524772E, 6144520N	Late Jurassic (?)	<i>Buchia</i> (?) sp.
14	C-303678	HFB-97-348	520530E, 6146260N	Tithonian (?)	<i>Buchia</i> cf. <i>blanfordiana</i> (Stoliczka) (?)
15	C-303679	HFB-97-356	512000E, 6129350N	Oxfordian/Kimmeridgian (?)	<i>Buchia</i> cf. <i>concentrica</i> (Sowerby) (?)
16	C-303680	HFB-97-448	517140E, 6133380N	Tithonian (?)	<i>Buchia</i> cf. <i>blanfordiana</i> (Stoliczka) (?)
17	C-303681*	HFB-97-483, HFB-97-614	520705E, 6148820N, 518750E, 6145070N	Tithonian (?)	<i>Buchia</i> cf. <i>fischeriana</i> (O'Drigny)
18	C-303682	HFB-97-636	514310E, 6142250N	Late Jurassic to Early Cretaceous	<i>Acrostruthis</i> (?) sp.
19	C-303683	HFB-97-504	511039E, 6139240N	Late Jurassic (?)	<i>Buchia</i> (?) sp.
20	C-303684	HFB-97-505	511150E, 6142950N	Late Jurassic (?)	<i>Pachydictya</i> (?) sp.
21	C-303685	HFB-97-506	510900E, 6143100N	Late Jurassic (?)	<i>Pachydictya</i> (?) sp.
22	C-303686	HFB-97-508	508500E, 6134400N	Mesozoic	<i>Bellerophon</i> , <i>Indeterminata</i>
23	C-303687	HFB-97-549	507705E, 6131400N	Tithonian (?)	<i>Buchia</i> cf. <i>blanfordiana</i> (Stoliczka) (?)
24	C-303688	HFB-97-671	602250E, 6128265N	Late Jurassic (?)	<i>Pachydictya</i> sp.
25	C-303689	HFB-97-748	528200E, 6127630N	Late Jurassic (?)	<i>Bivalves</i> , <i>Indeterminata</i>
26	C-303690	HFB-97-745	528775E, 6142200N	Tithonian (?)	<i>Buchia</i> , <i>Indeterminata</i>
27	C-303692	HFB-97-134B	519625E, 6148675N	Late Jurassic (?)	<i>Buchia</i> (?) sp.
28	C-303693	HFB-97-200	522300E, 6130650N	Tithonian	<i>Buchia</i> cf. <i>blanfordiana</i> (Stoliczka)
29	C-303694	HFB-97-202	522300E, 6130450N	Late Jurassic (?)	<i>Buchia</i> (?) sp.
30	C-303695	HFB-97-206	519725E, 6140700N	Late Jurassic (?)	<i>Bivalves</i> , <i>Indeterminata</i>
31	C-303696	HFB-97-245A	507500E, 6127925N	Tithonian	<i>Buchia</i> <i>mosquensis</i> (von Buch)
32	C-303697	HFB-97-313	515325E, 6134525N	Tithonian (?)	<i>Buchia</i> cf. <i>blanfordiana</i> (Stoliczka) (?)
33	C-303698	HFB-97-321	517425E, 6133025N	Oxfordian/Kimmeridgian (?)	<i>Buchia concentrica</i> (Sowerby) (?)
34	C-303699	HFB-97-AM-1	513400E, 6125700N	Tithonian (?)	<i>Buchia</i> cf. <i>blanfordiana</i> (Stoliczka) (?)
35	C-303700	HFB-97-AM-2	513000E, 6121310N	Late Jurassic (?)	<i>Buchia</i> (?) sp.

* mixed collection

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GEOLOGY

KITEEN RIVER

BRITISH COLUMBIA (103P/7)

Scale 1:50 000 - Échelle 1:50 000

Universal Transverse Mercator Projection / Projection transversale universelle de Mercator

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