Detailed Micropaleontological Reports, Biostratigraphic Notes, Stratigraphic Columns, and Isotopic Data Tables

All of the fossils from this study are either curated at the Geological Survey of Canada (GSC) or with the individual researchers.

PRODUCTIVE CONODONT COLLECTIONS:
GSC CURATION NO. C-635269 (Godfrey Nowlan)
Tyler Allen, T1701 – 335.55
Cronin Formation/Road River Group; @ 335.55 m from base of section;

Fossils (number of specimens):
Phakelodus? sp. (1)

Remarks: This sample produced one large specimen possibly assignable to the protoconodont genus Phakelodus. The specimen is encrusted with mineral (quartz?) grains that render it essentially opaque. The tip of the specimen shows clearly that the material is phosphatic. Phakelodus is a long-ranging genus that occurs in Middle Cambrian to earliest Ordovician strata. The species is most similar to Phakelodus tenuis (Müller).

GSC CURATION NO. C-635271 (Godfrey Nowlan)
Tyler Allen, T1701 – 514.11
Cronin Formation/Road River Group; @ 514.11 m from base of section;

Fossils (number of specimens):
cordylodiform element indeterminate (1)
polygnathid element (1)
ramiform element indeterminate (1)

 Thermal: CAI 2 - 3.

Remarks: The ramiform and polygnathid elements recovered in the sample are Devonian contaminants, presumably due to a lab error. The only specimen that is likely from this sample is an unidentifiable cordylodiform element. The specimen has a deep basal cavity like that of Cordyodus proavus. The posterior process is broken and encrusted. It is possible that this sample is of late Cambrian age.

GSC CURATION NO. C-635272 (Godfrey Nowlan)
Tyler Allen, T1701 – 568.49
Cronin Formation/Road River Group; @ 568.49 m from base of section;

Fossils (number of specimens):
Inarticulate brachiopod fragments
*Phakelodus* sp. (2)
*Proconodontus* sp. (2)

Thermal: CAI 2 - 3.

Remarks: This sample yielded one moderately well-preserved specimen of *Proconodontus* and one broken fragment. The better specimen has a broken cusp tip but preserves the tip of the basal cavity that extends into the base of the cusp. It is most similar to *Proconodontus muelleri muelleri* Miller. This suggests a late Cambrian *Proconodontus* Zone age for the sample.

**GSC CURATION NO. C-635273 (Godfrey Nowlan)**
Tyler Allen, T1701 – 662
Cronin Formation/Road River Group; @ 662 m from base of section;

Fossils (number of specimens):
*Cordyloodus proavus* Müller (6)
*Proconodontus?* sp. (2)
*Teridontus* sp. (1)
polygnathid element (1)

Thermal: CAI 3.

Remarks: This sample has some moderately well-preserved specimens of *Cordyloodus proavus* Müller as well as a number of fragmentary specimens. The specimens assigned to *Proconodontus?* sp. may be broken specimens of *C. proavus*. A single specimen is assigned to *Teridontus* sp. may be a representative of *T. nakamurai* (Nogami). The sample is of late Cambrian age, likely the *Cordyloodus proavus* Zone of Miller (1988).

**GSC CURATION NO. C-635274 (Godfrey Nowlan)**
Tyler Allen, T1701 – 680;
Cronin Formation/Road River Group; @ 680 m from base of section;

Fossils (number of specimens):
*?Cordyloodus* sp. (1)

Thermal: CAI 2 - 3.
Remarks: Only a portion of the main cusp is preserved in this fragmentary specimen. The basal cavity extends well into the cusp, suggesting that it is similar to *C. proavus*. An age cannot be determined on the basis of this fragment. Thermal maturity is an estimate based on this single fragment.

**GSC CURATION NO. C-635275 (Godfrey Nowlan)**

Tyler Allen, T1701 – 703
Cronin Formation/Road River Group; @ 703 m from base of section;

Fossils (number of specimens):
*Proconodontus posterocostatus* Miller (3)

Thermal: CAI 3.

Remarks: Three specimens are assigned to *Proconodontus posterocostatus* Miller. One is a well-preserved element missing only the lower part of the base. One is a fragmentary specimen preserving the base to cusp transition and one is a cusp, showing the diagnostic posterior costa of the species. This presence of this taxon suggests a Late Cambrian age for the sample. Typically, *P. posterocostatus* predates the appearance of *Cordylodus proavus* and defines the *P. posterocostatus* subzone of the *Proconodontus* Zone that immediately underlies the *Cordylodus proavus* Zone. This occurrence may suggest fault repetition of older strata in the section.

**GSC CURATION NO. V-003549 (Michael J. Orchard)**

Justin Strauss, J1518-25.3
106E/13: 65.8706, 135.7658. NAD83, UTM Zone 8: 465068E, 7305700N.
Upper Peel River Canyon section, @25.3 m above datum.
Processing comments: large heavy concentrate, split 1/8.

Results: conodonts
Taxa (number of specimens):
*Histiodella holodentata* Ethington and Clark, 1981 (1)
*Periodon?* sp. (1)
*Tropodus?* sp. (2)
coniform elements indeterminate (3)
oistodiform element (2)
CAI: 4.5 – 5.5

Assessed age: Middle Ordovician, Darriwilian (=Llanvirnian).
Comments: A small collection, with a single diagnostic element. Species of *Histiodella* characterize Dapingian and Darriwilian strata and have been used to subdivide this interval in the North American Midcontinent Province as also represented in China, Baltoscandia, Newfoundland (Stouge, 2012), and Argentina (Mestre and Heredia, 2012). The multielement apparatus was described from Oklahoma by McHargue (1982), who described adenticulate species older than that represented in this collection. The single carminate P1 element provides the basis for the species identified and the age assigned. The oistodiform elements may represent
the M element of the same apparatus, but the other elements are separate taxa but less distinctive and generally poorly preserved

**GSC CURATION NO. V-003551 (Michael J. Orchard)**
Justin Strauss, J1518-98.35
106E/13: 65.8706, 135.7658. NAD83, UTM Zone 8: 465068E, 7305700N.
Upper Peel River Canyon, @98.35 m above datum.
Processing comments: large heavy concentrate, split 1/8.
Results: conodonts, calcispheres.
Taxa (number of specimens):
*Belodina compressa* Branson and Mehl, 1933 (8)
*Coelocerodontus?* sp. (2)
*Drepanoistodus* sp. (8)
*Panderodus* sp. (30)
*Plectodina?* sp. (2)
*Protopanderodus liripipus* Kennedy, Barnes and Uyeno, 1979 (20)
*Pseudooneotodus* aff. *P. nostras* Moskalenko, 1973 (1)
*Walliserodus?* sp. (10)
CAI: 4-5
Assessed age: Early Late Ordovician, probably Sandbian (late Llandeilo - early Caradoc).
Comments: Conspicuous in this collection are common coniform elements, which far outnumber rare ramiform elements. There are no pectiniform elements that characterize deeper water habitats of this age, but rather the fauna is typical of a North American Midcontinent fauna. *Belodina* is recognized by the presence of both a geniculate coniform (eobelodiniform) M element and rastrate S elements, as reconstructed by Leslie (1997). The species *compressa* is given by the straight antero-basal margin of the compressiform element (Sweet, 1979, p. 59). Maximum age given is the equivalent age of the original *compressa* Zone of Sweet (1984); younger faunas of the Katian are generally represented by the younger species *B. confluens*. Distinctive *Protopanderodus* lack denticulate elements and are assigned to the species that is known to occur in the Upper Ordovician *taerensis* Zone and younger strata of the Road River Group (McCracken, 1989). The *Pseudooneotodus* resembles an ornate species known from the Chertov Stage in Siberia, equivalent to the Sandbian. The most common but less diagnostic species are elements of a multielement *Panderodus* species. *Plectodina?* is represented by a single complete ramiform element.

**GSC CURATION NO. V-003553 (Michael J. Orchard)**
Justin Strauss, J1519
106E/13: 65.8706, 135.7658. NAD83, UTM Zone 8: 465068E, 7305700N.
Upper Peel River Canyon.
Results: conodonts
Taxa (number of specimens):
*Bergstroemognathus extensus* Graves and Ellison, 1941 (1)
*Juanognathus variabilis* Serpagli, 1974 (1)
*Periodon* sp. (1)
coniform element indet. (1)  
ramiform element indet. (1)  
CAI: 5.5 - 6  
Assessed age: Early Ordovician, Floian (= mid Arenig)  
Comments: A sparse but diverse collection. *Bergstroemognathus* is known from the Arenig of China, Argentina, Australia, and Norway, and from the Ibexian of the USA, and the Middle Ordovician of Iran. Zhen et al. (2001) reviewed the speciation, age, and multielement composition of the genus. *Juanognathus* was erected on the basis of Lower Ordovician elements from Argentina. Both named species were reported by Pyle and Barnes (2002) from the Skoki Formation in northeast British Columbia, where they (co-) occur in successive subzones of the *Oepikodus communis* Zone (of the Midcontinent) = *O. evae* Zone of the North Atlantic, regarded as of mid Arenig age. Both species were also reported from strata of this age in the Haywire Formation in Nahanni map area (Pohler and Orchard, 1990). This interval is now known to correspond to the late Early Ordovician Floian Stage in terms of current Global Standard chronostratigraphy.

**GSC CURATION NO. V- 003558 (Michael J. Orchard)**

Tiffani Fraser, 15-TF-05-140  
106E/13: 65.8765, 135.7483. NAD83, UTM Zone 8: 465873E, 7306346N.  
Upper Peel River Canyon section, @140 m above datum.  
Processing comments: large heavy concentrate, split 8.  
Results: conodonts  
CAI: 4-5  
Taxa (number of specimens):  
*Oulodus?* sp. (1)  
*Belodella resima* Philip, 1965 (1)  
*Panderodus* sp. (7)  
*Wurmiella ‘excavata’* Branson & Mehl, 1933 (28)  
Assessed age: Silurian; Ludlow – Pridoli.  
Comments: This small fauna is dominated by the multielement apparatus originally termed “Apparatus H” by Walliser (1964, p. 14) in his seminal work on Silurian conodonts from Cellon in the Carnic Alps. Most if not all 6 elements recognized by Walliser are present in the collection although few are complete. No other pectiniform elements are present but the apparatus is accompanied by the long-ranging coniform elements *Belodella* and *Panderodus*. *Wurmiella* was assigned to the genus *Ozarkodina* by most early workers until modern taxonomic revision by Murphy et al. (2004) resulted in this new genus. Elements of this taxon are common and long ranging in Silurian strata but are apparently largely confined to it (Corradini & Corriga, 2010). Recent reassessment of the Cellon Section succession (Corradini et al., 2015) shows that *W. excavata* occurs from the late Llandovery through Pridoli, although *Belodella* first appears in the Ludlow.

**GSC CURATION NO. V- 003560 (Michael J. Orchard)**

Tiffani Fraser, 15-TF-07-18.5  
106E/13: 65.8770, 135.7450. NAD83, UTM Zone 8: 466023E, 7306406N.  
Upper Peel River Canyon section, @18.5 m above datum.
Results: conodonts

Taxa (number of specimens):

- *Belodella* sp. (1)
- *Oulodus*? sp. (2)
- *Panderodus* sp. (4)
- *Wurmiella*? sp. (2)

CAI: 4-5

Assessed age: Silurian.

Comments: This small fragmentary fauna lacks complete conodont elements that can be assigned to a particular species. The coniform elements *Belodella* and *Panderodus* occur also in collection V-003558 along with the other genera named here. However, *Wurmiella* occurs as only 2 fragments of a P1 element, and both it and *Oulodus* are questionably identified. The similarity with V-003558 suggests the two collections could be Silurian correlatives.

BARREN CONODONT COLLECTIONS

GSC CURATION NO. V-003550 (Michael J. Orchard)

Justin Strauss, J1518 – 95.24

106E/13: 65.8706, 135.7658. NAD83, UTM Zone 8: 465068E, 7305700N.

Upper Peel River Canyon section, @95.24 m above datum.


Results: no fauna

GSC CURATION NO. V-003552 (Michael J. Orchard)

Justin Strauss, J1518 – 287.2

106E/13: 65.8706, 135.7658. NAD83, UTM Zone 8: 465068E, 7305700N.

Upper Peel River Canyon section, @287.2 m above datum.


Processing comments: Poor solubility.

Results: no fauna

GSC CURATION NO. V-003554 (Michael J. Orchard)

Tiffani Fraser, 15-TF-05 – 2

106E/13: 65.8765, 135.7483. NAD83, UTM Zone 8: 465873E, 7306346N.

Upper Peel River Canyon section, @2 m above datum.


Results: no fauna

GSC CURATION NO. V-003555 (Michael J. Orchard)

Tiffani Fraser, 15-TF-05 – 48.8

106E/13: 65.8765, 135.7483. NAD83, UTM Zone 8: 465873E, 7306346N.

Upper Peel River Canyon section, @48.8 m above datum.


Processing comments: Poor solubility.

Results: no fauna

GSC CURATION NO. V-003556 (Michael J. Orchard)
Tiffani Fraser, 15-TF-05 – 53.5  
106E/13: 65.8765, 135.7483. NAD83, UTM Zone 8: 465873E, 7306346N.  
Upper Peel River Canyon section, @53.5 m above datum.  
Results: no fauna

GSC CURATION NO. V-003557 (Michael J. Orchard)  
Tiffani Fraser, 15-TF – 05-88  
106E/13: 65.8765, 135.7483. NAD83, UTM Zone 8: 465873E, 7306346N.  
Upper Peel River Canyon section, @88 m above datum.  
Results: no fauna

GSC CURATION NO. V-003559 (Michael J. Orchard)  
Tiffani Fraser, 15-TF-05 – 160.5  
106E/13: 65.8765, 135.7483. NAD83, UTM Zone 8: 465873E, 7306346N.  
Upper Peel River Canyon section, @160.5 m above datum.  
Results: no fauna

GSC CURATION NO. C-635266 (Godfrey Nowlan)  
Tyler Allen, T1701 – 0.66  
latitude 65.884392° N; longitude -135.582853° E; NAD83; NTS 106-E-13.  
Upper Peel River Canyon section, @ 0.66 m above datum; Con. No. 1829-1.  
Probable age: Early Cambrian – Early Ordovician.  
Results: no fauna

GSC CURATION NO. C-635267 (Godfrey Nowlan)  
Tyler Allen, T1701 – 284.91  
latitude 65.884392° N; longitude -135.582853° E; NAD83; NTS 106-E-13.  
Upper Peel River Canyon section, @ 284.91 m above datum; Con. No. 1829-2.  
Probable age: Early Cambrian – Early Ordovician.  
Results: no fauna

GSC CURATION NO. C-635268 (Godfrey Nowlan)  
Tyler Allen, T1701 – 305  
latitude 65.884392° N; longitude -135.582853° E; NAD83; NTS 106-E-13.  
Upper Peel River Canyon section, @ 305 m above datum; Con. No. 1829-3.  
Probable age: Early Cambrian – Early Ordovician.  
Results: no fauna

GSC CURATION NO. C-635270 (Godfrey Nowlan)  
Tyler Allen, T1701 – 386.63  
latitude 65.884392° N; longitude -135.582853° E; NAD83; NTS 106-E-13.  
Upper Peel River Canyon section, @ 386.63 m above datum; Con. No. 1829-5.  
Probable age: Early Cambrian – Early Ordovician.
Results: no fauna

GSC CURATION NO. C-635276 (Godfrey Nowlan)
Tyler Allen, T1701 – 716
latitude 65.884392° N; longitude -135.582853° E; NAD83; NTS 106-E-13.
Upper Peel River Canyon section, @ 716 m above datum; Con. No. 1829-11.
Probable age: Early Cambrian – Early Ordovician.
Results: no fauna

GSC CURATION NO. C-635277 (Godfrey Nowlan)
Tyler Allen, T1701 – 737.1
latitude 65.884392° N; longitude -135.582853° E; NAD83; NTS 106-E-13.
Upper Peel River Canyon section, @ 737.1 m above datum; Con. No. 1829-12.
Probable age: Early Cambrian – Early Ordovician.
Results: no fauna

GSC CURATION NO. C-635278 (Godfrey Nowlan)
Tyler Allen, T1701 – 785.4
latitude 65.884392° N; longitude -135.582853° E; NAD83; NTS 106-E-13.
Upper Peel River Canyon section, @ 785.4 m above datum; Con. No. 1829-13.
Probable age: Early Cambrian – Early Ordovician.
Results: inarticulate brachiopod fragments
Remarks: A single fragment of an inarticulate brachiopod is present that does not allow any interpretation of age.

GSC CURATION NO. C-635279 (Godfrey Nowlan)
Tiffani Fraser, 17-TF-03 – 4.9
latitude 65.884392° N; longitude -135.582853° E; NAD83; NTS 106-E-13.
Upper Peel River Canyon section, @ 4.9 m above datum; Con. No. 1829-14.
Probable age: Early Cambrian – Early Ordovician.
Results: inarticulate brachiopod fragments and mineralized burrow?
Remarks: The sample yielded only fragments of probable inarticulate brachiopods. A cylindrical grain with encrusting black grains, may be a remnant of a burrow about 1 mm long. No age determination can be made for this sample.

REPORT ON THE BIOZONAL AND STAGE BOUNDARY LEVELS IN THE LOWER ORDOVICIAN THROUGH LOWER DEVONIAN PORTIONS OF THE PEEL RIVER UPPER CANYON COMPOSITE SECTION – MICHAEL J. MELCHIN

This report documents the biozonal and stage boundary levels for the following sections: 17-TF-03, J1727, J1611, J1729, J1518, 15-TF-07, 15-TF-05, J1609, and J1610. These biozonal assignments are based on our data and those of Jackson and Lenz (2000, 2003, 2006) Lenz and Pedder (1972), Lenz and Chen (1985), and Lenz (1982). For the Lower Ordovician I have used the graptolite zonal scheme of Jackson and Lenz (2000, 2003, 2006), although Rhabdinopora parabola Biozone was not previously found in Yukon. I have also included references to the equivalent biozonal level nomenclature in Cooper and Sadler (2012), where it differs from the
zonal names used in Yukon. For the Middle and Upper Ordovician, I have used the Laurentian zonation as presented in Loydell (2012), except for the interval between the Diplacanthograptus caudatus and Dicellograptus complanatus biozones, which is incomplete in our section. The segment that is recognizable can be referred to as the Diplacanthograptus spiniferus Biozone, as used in eastern North America (e.g. Goldman et al., 1999, see also Cooper and Sadler, 2012). The Silurian and Lower Devonian biozonations used are mainly those of Melchin et al. (2012) and Becker et al. (2012), respectively, with some exceptions. The lower Aeronian is divided into the Demirastrites triangulatus-D. pectinatus and Rasritites orbitus biozones as used in Melchin et al. (2017); I have used the Yukon Cyrtograptus sakmaricus-D. laqueus rather than the C. lapworthi Biozone for the penultimate-ultimate biozones of the Telychian; and I have used the upper Pragian to Emsian Neomonograptus yukonensis Biozone in the broad sense, as employed by Lenz (2013), encompassing the combined N. thomasi, N. yukonensis and N. pacificus biozones of Becker et al. (2012).

Using the lithologic logs and biostratigraphic data presented in Jackson and Lenz (2000, 2003, 2006), Lenz and Pedder (1972), Lenz and Chen (1985), and Lenz (1982) it is possible to very closely correlate those previously published data with our measured sections and graptolite sample levels through most of the succession. Nevertheless, there is to be expected some imprecision in the levels of correlation of particular samples and biozonal and stage boundaries based on the slight variations that result from sections being measured by different people in different years. For this reason, the levels of biozonal and stage boundaries in our sections that are based on the previous work of Lenz and colleagues, which are identified here, are all considered to be approximate.

Section 17-TF-03
Base of Staurograptus dichotomous/Rhabdinopora parabola Biozone – 64 m. This is the lowest graptoloid-bearing sample in the succession and is lowest sample identifiable as being Ordovician based on graptolites. It can be assigned to this zone based on the occurrence of Rhabdinopora parabola. Although there are fragmentary specimens of benthic graptolites below this level, none of those samples provide any detailed biostratigraphic information based on their graptolites. As a result, the base of the Ordovician is somewhere below this level. The only sample representing this biozone is at our collection at 64 m.

Base of Anisograptus matanensis Biozone – approximately 79 m. This is based on data in Jackson and Lenz (2000, 2003). We have no collections in this boundary interval, but what we do have above and below is consistent with this. This is equivalent to the Anisograptus and R. scitulum biozones of Cooper and Sadler (2012).

Base of Adelograptus tenellus Biozone – approximately 94 m. The highest sample of underlying biozone is at ~87 m so there is ~ 7 m uncertainty (downward) in the placement of this zonal boundary. This is based on data in Jackson and Lenz (2000, 2003). We have very few collections in this interval, but what we have is consistent with this.

Base of Adelograptus antiquus Biozone – approximately 141 m. This is based on data in Jackson and Lenz (2000, 2003). We have no collections in the boundary interval, but what we have above and below is consistent with this. The base the of Adelograptus antiquus Biozone of Jackson and
Lenz approximates the base of the *Aorograptus victoriae* Biozone of Cooper and Sadler (2012). The highest sample of underlying biozone is at ~136 m so there is ~7 m uncertainty (downward) in the placement of this zonal boundary.

**Section J1727**

Base of *Kiarerograptus pritchardi* Biozone – 1.3 m. This level for the base of the *Kiarerograptus pritchardi* Biozone is based on our data, including the first appearance of *K. pritchardi*, and is consistent with the data of Jackson and Lenz (2000, 2003). The base of *Kiarerograptus pritchardi* Biozone is approximately equivalent to a level within uppermost part of the *Aorograptus victoriae* Biozone of Cooper and Sadler (2012) and the rest of the *Kiarerograptus pritchardi* Biozone is equivalent to the *Areneograptus murrayi* Biozone of Cooper and Sadler. The highest sample of the underlying *Adelograptus antiquus* Biozone is ~7.7 m below this level, so there is ~7.7 m uncertainty (downward) in the placement of this zonal boundary.

Base of combined *?Hunnegraptus copiosus/Paradelograptus kinnegraptoides* Biozone – approximately 38 m, based on data of Jackson and Lenz (2000, 2003). The combined *?Hunnegraptus copiosus/Paradelograptus kinnegraptoides* Biozones is equivalent to the *Hunnegraptus copiosus* Biozone of Cooper and Sadler (2012). There is 5 m uncertainty (downward) on the level of the base of this biozone.

Base of *Tetragraptus approximatus* Biozone and the base of the Floian Stage – 134.9 m. This is based on our data, including the first occurrence of *T. approximatus*. There is approximately 18 m uncertainty (downward) in the placement of this zonal boundary.

Base of *Pendeograptus fruticosus* Biozone – 209.1 m. This is based on our data, including the first occurrence of *P. fruticosus*. There is approximately 6 m uncertainty (downward) in this level.

Base of *Didymograptus bifidus* Biozone – approximately 229 m. This is based on data in Jackson and Lenz (2006). Our lowest *Didymograptus bifidus* Biozone sample is at 236.4 m. Our *Didymograptus bifidus* Biozone is equivalent to the combined *Didymograptus protobifidus/Isograptus primulus* Biozone of Cooper and Sadler (2012). I would estimate that there is about 10 m uncertainty (downward) on this level of the base of this biozone.

According to our data, the highest graptolite-bearing sample in J1727 is at 244.8 m, which is just 1.9 m below the top of the section. The J1727 244.8 m sample is still in the *Didymograptus bifidus* Biozone, probably the upper part (equivalent to the *Isograptus primulus* Biozone of Cooper and Sadler, 2012).

Lenz and Pedder (1972) reported an occurrence of *Isograptus cauduceus* subsp. cf. *victoriae* from their 960’ (292.8 m) sample, which is approximately 4.9 m below the top of our J1727 section. They considered this occurrence to indicate the base of the *I. cauduceus* Biozone, which was renamed the upper Dapingian *Parisograptus cauduceus australis* Biozone by Jackson and Lenz (2006). However, as noted above, our collections have yielded well-preserved specimens of *Didymograptus bifidus* only 1.9 m below the top of this section and also a very well-preserved
specimen of *Isograptus lunatus* 2.4 m above the base of the immediately overlying J1611 section (see below). Both of these occurrences indicate an upper Floian age for the upper part of J1727 and lowermost part of J1611. Given that *Isograptus cauduceus* subsp. cf. *victoriae* was the only species reported by Lenz and Pedder (1972) in their collection, that it was only named in open nomenclature (not positively identified), and that there are isograptid taxa in the upper Floian that closely resemble what is now known as *Isograptus victoriae*, we feel that the available data indicate that the upper part of our J1727 and lowermost part of J1611 are upper Floian rather than Dapingian (Yapeenian) in age, as suggested by Jackson and Lenz (2006).

**Section J1611**
Base of *Isograptus lunatus* Biozone – 2.4 m. The boundary between the *I. lunatus* Biozone and the underlying *D. bifidus* Biozone is somewhere between J1727-244.8 m and J1611-2.4 m. I would likely place it just below the J1611-2.4 m sample but with an uncertainty of about 4.3 m (downward). Our only graptolite-bearing sample from J1611 is at 2.4 m, in the *Isograptus lunatus* Biozone (uppermost Floian), where it is represented by one very well-preserved specimen of *I. lunatus*. This biozone was not found by Jackson and Lenz (2006). As described above, they had placed this interval within the upper Dapingian *Parisograptus caduceus australis* Biozone. I found no evidence of the *P. caduceus australis* Biozone in our section. In this respect, the Peel River upper canyon succession is quite different from this interval from the Peel River lower canyon succession (PR4 in Jackson and Lenz, 2006), in which they recognized no *Isograptus lunatus* Biozone, but there is an 11 m gap separating the upper part of the *D. bifidus* Biozone from an at least 8 m thick *Parisograptus caduceus australis* Biozone.

Base of the *Levisograptus austrodentatus* Biozone and base of the Darriwilian Stage and Middle Ordovician Series. In the interval of approximately 2.5-4.2 m, Lenz and Pedder (1972) reported a sample spanning the interval equivalent to J1611 1.2-4.2 m that contains an assemblage of taxa that Jackson and Lenz (2006) assigned to the *Levisograptus austrodentatus* Biozone (their *Undulogratus austrodentatus* Biozone), which is lower Darriwilian. If we assume that at least most of the graptolites in this collection came from the upper portion of this sample interval (i.e., above our 2.4 m level) then this is consistent with our data and indicates that the entire Dapingian is missing or very highly condensed at this section. Thus, I would place the base of the *Levisograptus austrodentatus* Biozone (and the base of the Darriwilian) somewhere in the interval between J1611 2.4 and 4.2 m.

Based on the evidence of Jackson and Lenz (2006), the *Levisograptus austrodentatus* Biozone extends upward through the rest of our section J1611, although their highest sample was approximately 4 m below the top of that interval.

**Section J1729**
Base of *Levisograptus dentatus* Biozone – 13.35 m. All of the graptolite samples from the shaly interval in J1729 indicate the lower (but not lowest) Darriwilian *Levisograptus dentatus* Biozone, indicated by the presence of a number of taxa, including *L. dentatus*. This is lower Darriwilian 2 (Vandenberg and Cooper, 1992), so it is equivalent to the lower part of *Undulogratus intersetus* Biozone of Cooper and Sadler (2012). The base of this biozone is somewhere between J1729-
13.35 m and approx. 4 m below the top of J1611 (the latter based on Lenz’s collections and determinations, as noted above).

**J1518**

Base of combined *Levisograpthus dentatus/Holmograpthus lentus* Biozone – 0.6 m. The basal samples at J1518 0.6 m and 1.25 m indicate either the *Levisograpthus dentatus* or *Holmograpthus lentus* Biozone, equivalent to the lower and upper *Levisograpthus intersetus* Biozone (respectively) of Cooper and Sadler (2012). Based on the species studied thus far, including *Levisograpthus primus* and *Loganograpus pertenuis*, it is not possible to clearly determine specifically which these two biozones is represented in these small samples.

We have no samples between 1.25 m and 25.7 m. However, Lenz and Pedder (1972) and Lenz and Jackson (1986) have some useful collections in this interval. Those samples indicate that the interval from somewhere above our 1.25 m sample to about 11 m includes the *Holmograpthus lentus* and at least part of the *Nicholsonograptus fasciculatus* Biozone (upper *Levisograpthus intersetus* Biozone to lower-middle *Archiclimacograptus decoratus* Biozone of Cooper and Sadler, 2012). There is no way to know where the zonal boundary between the *Levisograpthus dentatus/Holmograpthus lentus* Biozone and *Nicholsonograptus fasciculatus* Biozone is in this interval at this time. Lenz and Jackson (1986) reported *Nicholsonograptus fasciculatus* (which is restricted to the *N. fasciculatus* Biozone) from Peel River Upper Canyon, but, unfortunately, it is not possible to tell, from the information provided in the paper, exactly what level it comes from. However, it most likely comes from the interval between about 7 and 11 m in our section.

As far as I can tell there are no collections on record at all between about 11 m and our 25.7 m sample.

Base of *Pterograpthus elegans* Biozone – 25.7 m. Our 25.7 m sample and a Lenz and Pedder (1972) sample a few m above this (their 1,250’ sample) indicate the *Pterograpthus elegans* Biozone, including *Archiclimacograptus angulatus*, which is equivalent to the upper part of the *Archiclimacograptus decoratus* Biozone of Cooper and Sadler (2012). Lenz and Pedder (1972) have a collection taken from a ~10 m interval that is between approximately 45 and 55 m in our section. This collection contains graptolites that are still indicative of the *Pterograpthus elegans* Biozone, so that biozone must go up to at least 45 m, and our sample at 45.2 m is consistent with this. Our 54.2 m sample is also consistent with the *P. elegans* Biozone, although it could also represent the next interval up. As is the case in other regions of Laurentia, a zonal interval equivalent to the *Pseudoamplexograpthus distichus* Biozone of Baltica, or the lower part of the *Archiclimacograptus riddellensis* Biozone of Australasia, which overlies the *P. elegans* Biozone, cannot been identified in our section.

Base of *Hustedograpthus teretiusculus* Biozone – approximately 58.0 m, based on data from Lenz and Chen (1985). Lenz and Chen (1985), assigned the interval from 58 m up to somewhere between 61.0 and 62.0 m in our section to their *Glyptograpthus euglyphus* Biozone, although they showed that it is equivalent to the more widely used *Hustedograpthus teretiusculus* Biozone. This interval is equivalent to the upper part of the *Archiclimacograptus riddellensis* Zone of Cooper and Sadler (2012).
For the purposes of comparison with older literature regarding this section, I note that the interval from the base of our J1518 to approximately 20 m was assigned by Lenz and Pedder (1972) to the *Paraglossograptus etheridgei* Biozone and to the upper *Paraglossograptus tentaculatus* Biozone by Lenz and Jackson (1986). The interval above this was assigned by Lenz and Pedder (1972) to the *Hustedograptus teretiusculus* Biozone (although that is not consistent with its current usage of that biozonal name). Part of the same interval, but only up to somewhere below our 35 m mark, was assigned by Lenz and Jackson (1986) to the *Diplograptus decoratus* Biozone.

Base of *Nemagraptus gracilis* Biozone and base of the Sandbian Stage and the Upper Ordovician Series – 61.2 m. Our lowest sample representing the base of the Sandbian, the *Nemagraptus gracilis* Biozone, including *N. gracilis*, occurs at 61.2 m and this matches closely with the level marking the base of this biozone as described by Lenz and Chen (1985). Our nearest sample below this is at 54.2 m. However, Lenz and Chen (1985) had many samples through this interval. They found the base of the base of the *N. gracilis* Biozone to be at a level correlative with ~61-62 m in our section (4.5 m in their section) and in their appendix they give the correlation between the 1985 meterage and those they measured in 1976, which appear to be consistent with those in Lenz and Pedder 1972, where a lithologic log of the section is presented. The next sample below that in their section, which represents the *H. teretiusculus* Biozone (their *G. euglyphus* Biozone) is only 0.5 m lower. Therefore, accounting for uncertainties in measurements and correlation between the section of Lenz and Chen and ours it appears that that the base of the *N. gracilis* Biozone, and base of the Sandbian, is between 61.0 and 61.2 m.

Base of the *Climacograptus bicornis* Biozone – 69.1 m. This based on our lowest sample that marks the base of the upper Sandbian *Climacograptus bicornis* Biozone (~ *Diplograptus calcatus* Biozone of Cooper and Sadler, 2012), which includes *Climacograptus bicornis*. Lenz and Chen (1985) found that the *N. gracilis* Biozone was 7.0 ± 0.5 m thick. Therefore, the base of the *C. bicornis* Biozone must be at a level between 67.5 and 69.1 m.

Base of *Diplacanthograptus caudatus* Biozone and base of Katian Stage – 80.5 m, based on our lowest sample containing *Diplacanthograptus caudatus*. The highest upper Sandbian collection is our 80.1 m sample. Lenz and Chen (1985) did not recognize a *C. caudatus* Biozone and selected a slightly lower level (approx. 2 m lower) for the base of their *Dicranograptus clingani* Biozone. However, the base of the Katian is now formally defined at the GSSP at the level of the base of the *D. caudatus* Biozone and it can be clearly recognized at Peel River by the first appearance of *Diplacanthograptus caudatus* at 80.5 m.

Base of *Diplacanthograptus spiniferus* Biozone – 88.6 m, based on our data including the occurrence of *Amlexograptus praetypicalis*. This zonal level is equivalent to the Laurentian *Climacograptus tubuliferus* Biozone, as presented by Loydell (2102). The highest definite *D. caudatus* Biozone sample is 81.1 m, so the boundary between these biozones is somewhere between 81.1 and 88.6 m.

There are no graptolite samples in between, despite intensive searching. Lenz and Chen (1985) found nothing in this interval either (no samples in their section between 23.6 and 30.4 m).
There is another barren interval between the 88.6 m sample (approx. same level as Lenz and Chen’s 30.4 m sample) and 94.25 m. Lenz and Chen had no samples between their 30.4 m sample and 38.0 m.

We have no graptolite samples with faunas indicative of the *Dicranograptus kirki* or *Dicellograptus gravis* biozones (=*Pleurograptus linearis* Biozone), which occur between the *D. spiniferus* and *Dicellograptus complanatus* biozones. Lenz and Chen (1985) did not find any evidence of the presence of these zonal intervals either. Presumably strata of these ages, if present, occur in the unfossiliferous strata between 88.6 and 94.25 m.

Base of *Dicellograptus complanatus* Biozone – 94.25. This base on our data, including the appearance of *Styracograptus mississippiensis*. This appears to be the same stratigraphic interval that was identified as the *Orthograptus quadromucronatus* Biozone by Lenz and Chen (1985), which is consistent.

Base of *Dicellograptus ornatus* Biozone – 97.7 m. This sample is the only sample we have representing this biozone, indicated by the presence of *D. ornatus* and *Climacograptus hastatus*. The highest sample indicative of the *D. complanatus* Biozone is at 97.4 m and the base of the overlying *Paraorthograptus pacificus* Biozone is in the 97.8-97.9 sample. Therefore, this biozone appears to be no more than 0.4-0.5 m thick. Lenz and Chen (1985) found two samples indicative of this biozone, their 38.5 and 38.7 m samples.

Base of *Paraorthograptus pacificus* Biozone - 97.8-97.9 m. This biozone is marked by the first appearance of *P. pacificus* and it extends from this level up to just below the base of the Silurian.

The highest *pacificus* Biozone sample is 104.38 m. There is no biostratigraphic evidence of the presence of strata of the Hirnantian Stage.

Base of *Akidograptus ascensus-Parakidograptus acuminatus* Biozone and base of Silurian System – 104.52 m. This is indicated by the presence of *Parakidograptus acuminatus*. It appears that the lowest part of this biozonal interval, characterized by the presence of *Akidograptus ascensus* below the first appearance of *P. acuminatus*, is also missing from this section, in addition to demonstrably Hirnantian strata.

Base of *Cystograptus vesiculosus* Biozone – 109.35 m. This is based on the first appearance of *C. vesiculosus*. This biozone is equivalent to the combined *Atavograptus atavus-Huttagraptus acinaces* Biozone of Lenz (1982). The highest *A. ascensus-P. acuminatus* Biozone sample is 108.85 m.

Base of *Coronograptus cyphus* Biozone – 117.2 m. This is based on the first appearance of species of the genus *Coronograptus*. This is approximately equivalent to the *C. gregarius* Biozone of Lenz (1982). The highest *C. vesiculosus* Biozone sample is 114.0 m.

Base of *Demirastrites triangulatus* Biozone and base of Aeronian Stage – 127.5 m. This is based on the first appearance of species of the genus *Demirastrites*. As used here, this biozone approximately equals the *D. triangulatus* Biozone of Lenz (1982) and most of the combined *D.
triangulatus-D. pectinatus Biozone of Melchin et al. (2012). The highest C. cyphus Biozone sample is 126.0 m.

Base of Rastrites orbitus Biozone – 134.4 m. This biozone is marked by the first appearance of Rastrites orbitus. This biozonal interval is used here in the same sense as in Melchin (1989) in the Canadian Arctic Islands, where this interval was referred to as a subzone of the Campograptus curtus Biozone. However, Melchin et al. (2017) recognized this as a distinct biozone, overlying the D. triangulatus-D. pectinatus Biozone and underlying the L. convolutus Biozone. This interval is equivalent to the Neodiplograptus magnus and Perneroagraptus argenteus biozones of Lenz (1982). Additional work is needed to determine whether further biostratigraphic subdivision of this interval is possible, as had been proposed by Lenz (1982). It also equals the upper part of the D. triangulatus-D. pectinatus Biozone and underlying the L. leptotheca biozones of Melchin et al. (2012). The highest D. triangulatus Biozone sample is at 131.8 m.

Base of Lituigraptus convolutus Biozone – 146.2 m. A sample recorded by Lenz (1982) from approximately the same level contained L. convolutus and the species assemblage in our sample at this level is consistent with this. The highest orbitus Biozone sample is 141.9 m.

Base of Stimulograptus sedgwickii-S. halli Biozone – 163.6 m. Our samples from this interval contain specimens clearly assignable to either Stimulograptus sedgwickii or S. halli but lack complete rhabdosomes. It is normally not possible to tell which of these two closely similar species is present. Therefore, we recognize a combined S. sedgwickii-S. halli Biozone for this part of the succession. This interval is equivalent the S. sedgwickii Biozone of Lenz (1982) and Melchin et al. (2012). The highest recognizable L. convolutus Biozone sample is 162.7 m.

Base of Spirograptus guerichi and base of Telychian Stage – 167.8 m. Lenz (1982) had included S. guerichi within his concept of S. turriculatus (see Loydell et al. 1993). In addition to our collections, I have re-examined Lenz’s Peel River specimens in this interval and documented which specimens contain S. guerichi and which contain S. turriculatus, so I am able to clearly recognize both biozones in this succession. Therefore, the S. guerichi Biozone is equivalent to the lower part of S. turriculatus Biozone of Lenz (1982). The highest S. sedgwickii-S. halli Biozone sample is 165.1 m.

Base of Spirograptus turriculatus Biozone – approximately 182 m. This is based on a Lenz (1982) sample collected in 1977. This is equivalent to the upper part of the S. turriculatus Biozone of Lenz (1982). We collected no graptolite samples in the interval between 174.55 and 201.2 m, but the 1976 and 1977 collections of Lenz have several samples through this interval. The highest definite S. guerichi Biozone sample is at approximately 179 m.

Base of Streptograptus crispus Biozone – approximately 199 m. This is based my restudy of a Lenz (1982) collection from 1977. Lenz (1982) did not identify a S. crispus Biozone interval, but this is based on the occurrence of Cochlograptus veles that I found in this sample (not reported by Lenz), the first occurrence of which is indicative of this biozone, particularly in that it occurs with S. turriculatus, which is known to extend into the S. crispus Biozone. Lenz (1982) considered that the stratigraphic interval occupied by what I herein recognize as the S. crispus
Biozone, as well as all or at least some of what I identify as the *Monoclimacis griestoniensis-M. crenulata* Biozone (see below), to be part of the *S. turriculatus* Biozone. The zonal correlation chart in Lenz (1982, Table 1) correlated the European *S. crispus* and *M. griestoniensis* biozones with the lower part of his *O. spiralis* Biozone. My evidence from Peel River, however, based on study of both my samples and Lenz’s, indicates that strata that I have found to belong to the *S. crispus* and at least some of the *M. griestoniensis-M. crenulata* biozones were included by Lenz in the upper part of the *S. turriculatus* Biozone, not the *O. spiralis* Biozone. The highest sample that can be confidently assigned to the *S. turriculatus* Biozone is at approximately 188 m.

Base of combined *Monoclimacis griestoniensis-Monoclimacis crenulata* Biozone – 210.9 m. This interval has very few useful taxa, which require more study. One indicative taxon that extends into this interval is *Strepograptus loydelli*. This interval is interpreted to be above the top of the *S. crispus* Biozone because it is above the highest occurrence of *S. turriculatus* and below the base of *Oktavites spiralis* Biozone, which is marked by the first appearance of *O. spiralis*. The highest sample of the *S. crispus* Biozone is at 207.1 m.

Base of *Oktavites spiralis* Biozone – likely 234.7 m. The samples at 225.5 m or 228.9 m could possibly belong to this biozone, but this is uncertain at this time. The highest sample that could definitely be assigned to the *M. griestoniensis-M. crenulata* Biozone is 222.8 m. This usage of the *O. spiralis* Biozone correlates with its usage in Melchin et al. (2012). Lenz (1982) had included two collections from his 1977 sampling of this section that contained a taxon he referred to as *M. spiralis* cf. *contortus* (but not *O. spiralis* s.s.) in the *O. spiralis* Biozone. These two collections, which occur immediately below the first appearance of *O. spiralis* s.s., are here considered to be in the upper part of the *M. griestoniensis-M. crenulata* Biozone.

Base *Cyrtograptus sakmaricus-C. laqueus* Biozone – 274.6 m. This based on the occurrence of *C. laqueus*. The evidence from Lenz (1982) is that the *C. sakmaricus-C. laqueus* Biozone is at least 7 m thick, but it is not clear how our single sample from this biozone correlates with that ~7 m interval. This is equivalent to the *C. lapworthi* Biozone and the *C. insectus* Biozone of Melchin et al. (2012). Senior (2005) showed that *C. laqueus* occurs in the *C. insectus* Biozone in Arctic Canada. The highest *O. spiralis* Zone sample is at 268.2 m.

Base of Wenlock Series and Sheinwoodian Stage. The fact that the lightest carbon isotope values indicative of the Ireviken Excursion (see main text and Fig. S6) occur in the same interval as our sample containing *C. laqueus* indicates that this sample most likely indicates a level with the *C. insectus* Biozone (rather than the *C. lapworthi* Biozone), where the Ireviken Excursion has been shown to begin in some other regions. The fact that further, similarly light C-isotope values are not seen above this level at this section may be the result of missing or highly condensed strata, combined with our 2 m isotope sample spacing. In any case, the data suggest that the base of the Wenlock Series most likely occurs in the interval immediately above 274.6 m.

The J1518 285.8 m sample is likely Sheinwoodian based on identifications made on a sample sent to A.C. Lenz that included *Pristiograptus dubius*. It may belong to the *Cyrtograptus rigidus-Monograptus antennularus-M. belophorus* Biozone of Melchin et al. (2012), based on two other poorly preserved and questionably identified specimens made by Lenz, but it could be lower. It
appears to occur within the interval of the Ireviken excursion, which is consistent with these possibilities.

The sections above the top of J1518, spanning most of the Wenlock through Lower Devonian, all have relatively sparse biostratigraphic data – mostly too sparse to pick levels of zonal and stage boundaries with any reasonable level of precision. Therefore, with a few exceptions, in the rest of this report I mainly refer only to the suggested biostratigraphic levels of the graptolite samples without reference of the levels of biozonal or stage boundaries.

**Section 15-TF-07**

23.1-23.5 m – *Cyrtograptus lundgreni* Biozone, lower Homerian, indicated by the presence of *Testograptus testis*. This is consistent with sample reported by Lenz and Pedder (1972) from their 2,222’ level.

**Section 15 TF-05**

Approximately 4-5 m – *Colonograptus praedeubeli-C. deubeli* Biozone, or possibly *Colonograptus ludensis* Biozone Zone based on the presence of *Colonograptus deubeli*. This species is upper Homerian and ranges from *C. deubeli* Biozone into lower *C. ludensis* Biozone. In some places it is not possible to distinguish the *C. praedeubeli* Biozone from the *C. deubeli* Biozone due to overlap of the ranges of these taxa and the two biozones are grouped together. Therefore, this sample should be regarded as indicating a level within the global *C. praedeubeli-deubeli* Biozone (Melchin et al. 2012), or possibly to lower *C. ludensis* Biozone. As far as I am aware, this is the first report of graptolites from this interval in Yukon.

Approximately 13.5m – Graptolites in this sample are poorly preserved but also contains questionable *C. deubeli*, so they likely represent the same biozone as 15 TF 05 – ~4-5 m.

There is no biostratigraphic evidence for any Gorstian strata at this section.

72-74 m, 92.5-93.5 m and approximately 112 m – All three of these samples contain *Bohemograptus tenuis* and one also contains *B. helicoides*. All three of these samples occur in the lower-mid Ludfordian – either the Saetograptus *leintadinensis* Biozone or the *Bohemograptus tenuis* Biozone (*Bohemograptus* Biozone of Melchin et al. 2012). The latter is an interval biozone that is not defined by the first appearance of *Bohemograptus tenuis* but rather by the absence of other taxa that either end below this biozone or start above. The fact that these collections have yielded little else besides species of *Bohemograptus* and long-ranging species of *Pristiograptus* (i.e., no species of *Saetograptus* or other useful genera) suggests that *Bohemograptus* Biozone might be more likely, and this is consistent with its position relative to what we have identified as the Lau Excursion.

Approximately 168-170 m – There is a sample reported by Lenz and Pedder (1972) at their 2,968’ level (which correlates approximately with our 168-170 m interval) that contains graptolites identified as *Monograptus paraformosus*. This is now recognized as a junior synonym of *Formosograptus formosus*, indicative of the upper Ludfordian *Formosograptus formosus* Biozone.
Approximately 178-180 m – There is a sample reported by Lenz and Pedder (1972) at their 2,995’ (which correlates approximately with our 178-180 m interval) that contains a form identified by Lenz and Pedder as Monograptus trangrediens praecipuus. This has more recently been regarded as a junior synonym of Neocolonograptus transgrediens. This species is known to range globally through most of the Pridoli (except the basal biozone), but in northern Laurentia it has only been previously reported in the upper Pridoli. This suggests an age fairly high in the Pridoli, most likely within the M. perneri-N. transgrediens Biozone of Melchin et al. (2012).

Based on these two samples, the base of the Pridoli is between our 168-170 m and 178-180 m (probably just above the 168-180 m interval). In addition, if these identifications are correct, then the lower-mid-Pridoli is missing or condensed within this section.

Approximately 188-190 m – There is a sample reported by Lenz and Pedder (1972) at their 3,170’ level (which correlates approximately with our 188-190 m interval) that contains a form identified as Neocolonograptus transgrediens. Again, this suggests an age in the M. perneri-N. transgrediens Biozone of Melchin et al. (2012).

Section J1609

39.8 m and 43.3 m – These samples contain Neocolonograptus transgrediens and likely also represent the upper Pridoli M. perneri-N. transgrediens Biozone of Melchin et al. (2012).

Approximately 59 m – Lenz and Pedder (1972) reported Neomongraptus aequabilis from a level that is at approximately the 59 m in the J1609 section. This is Lenz and Pedder’s highest graptolite sample, just above their 3400’ level. This species is characteristic of the Monograptus uniformis Biozone, so it is basal Devonian. Note that Lenz and Pedder regarded the sample below this as also representing the lower Devonian. However, the key species in that sample (Uncinatograptus parangustidens) has been shown that it may occur in the uppermost Pridoli as well (Jackson et al. 1978), whereas our samples from J1609 – 39.8 and 43.3 m definitely contain N. transgrediens, which is not known to extend into the Devonian.

Therefore, our evidence suggests that the Silurian-Devonian boundary occurs between J1609 43.3 m and ~59 m.

Section J1610

6.95 m – This sample contains Neocolonograptus fanicus, which indicates lower (but not lowest) Pragian, the upper half of the falcarius Biozone in Becker et al. (2012). The J1610 2.8 and 20.4 m samples contain graptolites that are not positively identifiable but are consistent with N. fanicus. In some regions it is possible to recognize a distinct N. fanicus Biozone above the N. falcarius Biozone.

150.5-151.5 m up to 232.6 m – All of these samples represent the Neomongraptus yukonensis Biozone sensu lato, indicated by the presence of N. yukoneneis. This broadly defined biozone is
equivalent to the combined *N. thomasi-N. yukonesis-N. pacificus* biozones of Becker et al. (2012), which spans from mid-Pragian to lower Emsian. This is globally the highest known graptolite biozone and no graptoloid graptolites are known to occur above this interval. It has not proven possible, so far, to subdivide this biozone in northern Canada.

**References**


Sweet, W.C. 1979. Late Ordovician conodonts and biostratigraphy of the western Midcontinent Province. Brigham Young University Geology Studies, 26: 45-88.


Legend for symbology used in detailed stratigraphic logs provided below.
Figure S1: Detailed log of section J1728, Slats Creek and Cronin formations. Positive evidence for a given trilobite zone is depicted with a solid black line, whereas the stratigraphically highest sample with positive evidence for the underlying zone is represented by a dashed line. The shaded grey area between these lines thus represents stratigraphic uncertainty on the zonal boundaries.
Figure S2: Detailed log of section T1701, Cronin Formation, Road River Group. Positive evidence for a given conodont zone is depicted with a solid black line, whereas the stratigraphically highest sample with positive evidence for the underlying zone is represented by a dashed line. The shaded grey area between these lines thus represents stratigraphic uncertainty on the zonal boundaries.
Figure S3: Detailed log of section TF-17-03, Mount Hare Formation, Road River Group. Positive evidence for a given graptolite zone is depicted with a solid black line, whereas the stratigraphically highest sample with positive evidence for the underlying zone is represented by a dashed line. The shaded grey area between these lines thus represents stratigraphic uncertainty on the zonal boundaries.
Figure S4: Detailed log of section J1727, Mount Hare Formation, Road River Group.
Figure S5: Detailed logs of sections J1611 and J1729, Mount Hare Formation and Aberdeen Member, Road River Group.
Figure S6: Detailed log of section J1518, Mount Hare Formation, Road River Group. Recognition of the *S. turriculatus*, *S. crispus*, and *M. griestoniensis-M. crenulata* zones come from correlation with publications by Dr. Alf Lenz, and no uncertainty estimates are given. See explanation above, including information about abbreviated genus names.
Figure S7: Detailed logs of sections TF-15-05 and TF-17-07, Tetlit Formation, Road River Group. Graptolite fossils are relatively rare in this section, and so no uncertainty estimates are given; instead, all graptolite occurrences are indicated with arrows. The base of the Ludlow and base of the Gorstian are placed at the stratigraphic mid-point between the highest Homerian fossil and lowest Ludfordian fossil and denoted with a question mark. While there is no actual evidence for Gorstian strata, there is also no physical evidence for its absence. See explanation above for abbreviated genus names.
Figure S8: Detailed log of section J1609, Vittrekwa Formation, Road River Group.
Figure S9: Detailed log of section J1610, Vittrekwa Formation, Road River Group. The Neomongraptus yukonensis Biozone sensu lato is equivalent to the combined N. thomasi-N. yukonensis-N. pacificus biozones of Becker et al. (2012), which spans from mid-Pragian to lower Emsian. Confirmed occurrences in the combined thomasi-yukonensis-pacificus zone are indicated by arrows.