

Appendix 7.1-C

Tenas Project Fossil Impact Assessment Preliminary Study

**TENAS PROJECT
FOSSIL IMPACT ASSESSMENT
PRELIMINARY STUDY**

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EXECUTIVE SUMMARY

A Preliminary Study (PS) for a Fossil Impact Assessment, in the form of a desktop study, was completed to evaluate the potential impact of development activities related to the Tenas Project (the Project) on local potential fossil specimens. The objective of this PS is to provide sufficient background to appropriately evaluate the potential for Project activities to impact local fossil specimens.

The Project area is located approximately 7 km southwest of Telkwa, B.C., and its currently proposed area covers approximately 1,050 hectares. This report will focus on the Project Area (PA) of the Project, but also includes observations and a geological review of the regional study area (RSA) surrounding the Project Area for a broader context. The PA covers areas of sedimentary rock (Lower Cretaceous Bulkley Canyon Formation), volcanic rock (Lower Jurassic Hazelton Group), and intrusive rock (Late Cretaceous Bulkley Plutonic Suite). Volcanic rock is dominant within the Project's open pit. No Quaternary deposits are documented for the Project area; however a large Quaternary alluvium deposit is present immediately to the east of the Project Area within the RSA.

A large number of fossils have been documented within the area surrounding the Project (RSA) within proximity to the PA. Most fossils were documented in sedimentary rock, although a few exceptions have been documented within deposits of predominantly volcanic rocks. The ages of these fossils range from Lower Jurassic to Lower Cretaceous.

Because the fossiliferous sedimentary rock within the PA is expected to be subject to up to 24 m of excavation activities, and there are several fossiliferous sites documented within proximity to the Project boundaries, as well as present within the open pit (according to core samples previously collected), **the potential for project activities to impact fossil resources is high, however the significance of these fossils requires a more detailed analysis to be determined.**

ACKNOWLEDGEMENTS

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1. INTRODUCTION

1.1 Project Description and Location

The Tenas Project (the Project) is in the Bulkley Nechako region, 25 km south of Smithers and 7 km southwest of Telkwa, B.C. (Maps 1-2). The Project is expected to produce between 775,000 and 825,000 metric tonnes of steelmaking processed coal annually through open pit mining, with a mine life estimated to be approximately 25 years. The Project area (PA) consists of the mine site (including an open pit, material storage piles and water management), Tenas Access Corridor (TAC), additional haul/access roads, as well as rail infrastructure consisting of a 2.5 km rail loop that will connect to the existing CN Railway line (Appendix A).

Because of the open pit excavation methods for the mine site, there is a portion of the Project expected to have the most impact to the underlying (volcanic and sedimentary) rock. The Rail Infrastructure is expected to have some cuts in overburden at a maximum of four metres. The various road development related excavations are expected to mostly stay within four metres in depth below the existing topography, however the portion of the TAC within Goathorn Creek valley may have rock cuts of up to 24 metres.

Excavations for the roads and railway developments will impact sedimentary, intrusive, and volcanic rocks.

1.2 Preliminary Study Procedures and Objectives

The Project is currently in Stage 1, for which a Palaeontological Preliminary Study (PS) is required to assess its potential to impact fossil resources. According to the Fossil Impact Assessment (FIA) guidelines published by the British Columbia Heritage Branch (BCHB 2021), “the preliminary assessment of the risk to fossils is based on two factors: the underlying deposits or rock types affected by development activity and the proximity of development activity to known fossils”. It is important to note that this preliminary study is focused on the presence/absence of fossils, but the significance of these fossils is not discussed. Two tables are provided to help determine palaeontological resource potential (PRP) (Tables 1 - 2).

For Table 2 an additional breakdown of risk level definitions is provided as follows:

- A location is considered of “high risk” if a fossiliferous sedimentary deposit with known significant fossil resources occurs within the proposed development or locally (< 1 km from proposed development site);
- “medium risk” if a fossiliferous sedimentary deposit with known significant fossil resources occurs regionally (> 1 km from proposed development site);
- “low risk” if it is occasionally fossiliferous or has poorly understood geology with no local and few regional fossil resources;

- “very low risk” if it is composed of non-fossiliferous formations (including metamorphic or igneous) with no known regional fossil resources.

These tables are to be used as a reference point for the PS and recommendations made here will directly reflect how the Project location and proposed activities fall within the categories described in these tables. According to BCHB guidelines, if potential based on rock type is very low to low and the risk to fossil resources based on proximity to known fossils is very low to low, it will result in the recommendation that the Project activities will have low impact on fossil resources. However, if the Project activities fall into the “medium” or “high” potential categories for either Table 1 or Table 2, then the resulting recommendations will include the need for a Fossil Impact Assessment (FIA) to commence in advance of the Project development activities to further assess the significance of these fossil resources and associated effects and risks.

As a proactive measure, a Chance Find Protocol (CFP) is also submitted alongside this report. This protocol may be adjusted as Project approvals undergo review by BCHB during the next stages of the review process of the land disposition application.

Therefore, the objectives of this Palaeontological Resource Potential Analysis are to:

1. Describe the geological background research of the PA and RSA relevant to this Project;
2. List known fossil localities and illustrate them in relation to the Project area (Appendix D);
3. Assess the level of Palaeontological Resource Potential (PRP) of the Project area;
4. Identify the risk to fossils based on criteria detailed in Tables 1 and 2;
5. Make recommendations on what actions are required for the next stages of the Project to prevent development from adversely impacting significant fossil resources; and
6. Provide a Chance Find Protocol (CFP) for palaeontological resources

2. GEOLOGICAL SETTING

The Project area (PA) crosses over three distinct types of rock (Map 3) in a pattern that is repeated throughout the region (RSA) surrounding the Project area (Map 4). The types of rock documented for the PA footprint are volcanic (for the mine site, some portions of the road, and a small portion of the railway infrastructure), sedimentary (portions of the road and most of the railway infrastructure), and intrusive (for a portion of the road). In the northernmost reach of the RSA there are also areas documented as metamorphic rock as well as sedimentary and volcanic rock (Cui et al. 2017). The Quaternary sediments within the RSA are dominated by a thick and continuous till blanket (Fulton 1995), however a large alluvium deposit is documented east of the PA (Map 5).

The ages for the rock formations occurring within the PA include Early Jurassic (volcanic rocks), Early Cretaceous (sedimentary rocks), and Late Cretaceous (intrusive rocks) (Map 6). In addition to these ages, the RSA also includes sedimentary rock to the east of the PA of Paleocene to Eocene age, as well as Triassic strata in the northern corner (Map 7).

Although there are several distinct rock formations deposited within the PA (Map 8) and the RSA (Map 9), this report will focus only on the ones for which there are fossils documented.

Beginning within the PA, the volcanic rocks of Lower Jurassic origin represent the Telkwa Formation within the Lower Hazelton Group. The Telkwa Formation is locally composed of maroon, green, and purple subaerial andesitic to dacitic feldspar phyric flows, pyroclastic and epiclastic rocks, augite phyric to aphyric basalt, breccia, and welded tuff (Cui et al. 2017). Although it is composed mostly of marine and nonmarine volcanic and volcanoclastic rocks, there are local fossiliferous sediments which yielded Sinemurian fauna (Tipper and Richards 1976). The Telkwa Formation is at the base of the Hazelton Group and lies unconformably above Triassic volcanoclastic rocks of the Stuhini Group (and equivalents) or Paleozoic rocks of the Stikine assemblage (Gagnon et al. 2012). Within the Project area (PA) (Map 8) two different facies of the Telkwa Formation are documented: the Howson subaerial facies (in the mine site area) and the Babine shelf facies (east of the mine site, where some of the proposed roads of the PA are located). Both these facies are Sinemurian to Lower Pliensbachian in age (Tipper and Richards 1976). The strata of Howson subaerial facies are bright red, maroon, purple, pink, grey, and green; pyroclastic rocks. The intravolcanic sediments in this facies include conglomerate, sandstone, siltstone, mudstone, and marl representing stream and lacustrine deposits derived from the associated volcanics. However, rocks of the Howson subaerial facies have been extensively altered (Tipper and Richards 1976). The strata of the Babine shelf facies are represented by predominant subaqueous and subaerial pyroclastic rocks intercalated with marine sediments and intravolcanic nonmarine sediments. Discontinuous limestone beds and lenses, occasionally with a pelecypod and ammonite fossil fauna are common (Tipper and Richards 1976). The presence of significant fossils within Telkwa Formation deposits was also noted by Pálffy and Schmidt (1994). The extensive record of ammonite faunas obtained through measured sections near the Project area provided detailed

biostratigraphic data which allowed for a more accurate understanding of the temporal and lateral range of this formation (Pálffy and Schmidt 1994).

It is important to note that the mine area also contains Cretaceous Bulkley Canyon Formation deposits (as seen in Appendix B), as noted by Alldrick and Lin (2007), although the latest Geological Map by the British Columbia Geological Survey (2019) does not indicate this detail.

The fossiliferous sedimentary rock formation that intersects with the PA boundary is known as the Lower Cretaceous Bulkley Canyon Formation [formerly known as Kitsuns Creek Formation (Richards 1990)]. This formation is part of the Skeena Group and is Berriasian to Cenomanian in age (143-93 Ma) (Alldrick and Lin 2007). The Bulkley Canyon Formation is characterized by shallow water marine to fluvial deltaic sediments, micaceous sandstone, and greywacke. Quartzo-feldspathic and volcanic sandstone are also present, commonly reddish. It is typically medium- to thick-bedded. Lesser siltstone, gritty mudstone, dark grey to black shale including local coal seams, as well as polymictic volcanoclastic conglomerate and chert-pebble conglomerate also occur. Detrital muscovite is common to all units. Fine polymictic conglomerate is present at unconformity with underlying Bowser Lake Group (Alldrick and Lin 2007). The depositional environments within the Bulkley Canyon Formation deposits vary from fluvio-channel bodies (within overbank levee and crevasse splay deposits) interpreted to be a lower delta plain. In some locations the bidirectional paleocurrents indicate tidal influences (Bassett and Kleinspehn 1997). The rich fossil contents of the deposits in this formation provided detailed biostratigraphic data due to abundant macrofloral and pollen assemblages, particularly in the type section (Bassett and Kleinspehn 1997). The Telkwa coal fields yielded rich pollen and dinoflagellate assemblages with terrestrial to nearshore, restricted marine affinities of Barremian to early Albian age (Palsgrove and Bustin 1991). The youngest pollen assemblages, however, record a seasonally dry environment and occur in micaceous sandstones lacking coal (Bassett and Kleinspehn 1997).

Outside of the immediate Project PA, but still within the RSA, additional Hazelton Group deposits (from Smithers and Nilkitwa Formations) also have been documented as fossilbearing. These Upper Hazelton Group sedimentary deposits are particularly informative as they mark the transition from the volcanic phases observed in the Lower Hazelton Group volcanic rocks (as described for the Telkwa Formation in this report) to the Upper Hazelton Group with fine-grained clastic rocks, with an abrupt decline in volcanic activity and an initiation of sedimentation (Gagnon et al. 2012).

The Nilkitwa Formation is the most basal within the Upper Hazelton Group, and shows mudstone-dominated successions, locally characterized by anoxic conditions and accumulation of sediment rich in organic matter (Gagnon et al. 2012). These deposits are represented by shallow to deep marine shale, wacke, sandstone, siltstone, bioclastic limestone, feldspathic epiclastics, conglomerate, ash tuff, and basal conglomerate (Cui et al. 2017).

The fossiliferous Upper Hazelton Group Smithers Formation of middle Jurassic age, also found within the RSA boundaries, is composed of mudstone, siltstone, shale, and fine clastic sedimentary rocks. Additionally, argillite and siltstone, dark grey, thin-bedded siltstone, and

shale, with lenses of chert pebble conglomerate and compositionally similar fine to coarse sandstone can be observed (Cui et al. 2017). Shallow marine deposition of coarser-grained clastic sediments rich in volcanic detritus are also characteristic of this interval (Gagnon et al. 2012). Part of this fossiliferous area within the RSA to the west of the PA was formerly classified as the Bowser Lake Group Ashman Formation but has long been recognized as part of the Upper Hazelton Group (Evenchick et al. 2010; Gagnon et al. 2012).

3. PALAEOLOGICAL RESOURCE POTENTIAL AND RECOMMENDATIONS

3.1 Quaternary Paleontological Potential

The presence of limited documented Quaternary sediments within the PA (mostly till deposits), as well as in the RSA (Map 5), with only one alluvial deposit west of the PA indicates that the potential for Quaternary palaeontological resources to be impacted by Project activities is low. Additionally, no Quaternary fossils have been documented within the RSA to date. Therefore, according to BCHB guidelines outlined in Tables 1 and 2, **the concern for any Quaternary fossils in the Project Area is low.**

3.2 Pre-Quaternary Palaeontological Potential

The Project area PA traverses formations of sedimentary, volcanic, and intrusive rock (Map 3). In addition to these types of rock, the RSA also includes metamorphic rocks in its northwestern corner (Map 4). There are approximately 286 fossil sites documented within the RSA, as well as surrounding it, which makes this a “Fossil Important Area” according to the Ministry of Forests, Lands, Natural Resource Operations and Rural Development. A large cluster of these fossil sites occurs within sedimentary rocks (Bulkley Canyon Formation) (Maps 8 and 9) located within 1 km of the PA. Fewer fossils are documented within the volcanic deposits (Telkwa Formation), however at least one site occurs within proximity of the PA (Maps 8 and 9).

The nature of Project development activities indicate that the impact to the volcanic and sedimentary rocks within the mine site will be significant. Previous extensive drilling activities within project areas indicated the presence of fossil zones (Appendix B), and three drill cores within the proposed mine site yielded bivalve fossils (Appendix B, Appendix C). For the areas including the roads and railway infrastructure the impact to underlying rock (sedimentary, volcanic, and intrusive) will vary, ranging from up to four metres to up to 24 metres at the Goathorn Creek valley (thus impacting sedimentary rocks from Bulkley Canyon Formation) (Map 3) which is also considered a significant impact to the underlying rock. The volcanic rocks of the Telkwa Formation have fossiliferous potential with documented occurrences of fossils such as the bivalve *Myophorella* and *Weyla*, as well as brachiopods and ammonites such as *Paltechioceras* (Pálffy and Schmidt 1994). The highest concern for this Project is the Bulkley Canyon Formation sedimentary rock, as it has a high density of fossils documented within proximity to the Project boundaries, including macrofossils of the bivalves *Myophorella* and *Columbitrionia* sp.

The presence of fossiliferous sedimentary rock, as well as volcanic rock known to be fossiliferous within the Project footprint, added to the fact that the expected depth of excavations is significant, including within areas in close proximity (less than 1 km) to known fossil sites (Map 3) leads to the conclusion that **the concern for pre-Quaternary fossils in the Project Area is high** according to the parameters set by BCHB guidelines outlined in Tables 1 and 2.

4. CONCLUSIONS AND RECOMMENDATIONS

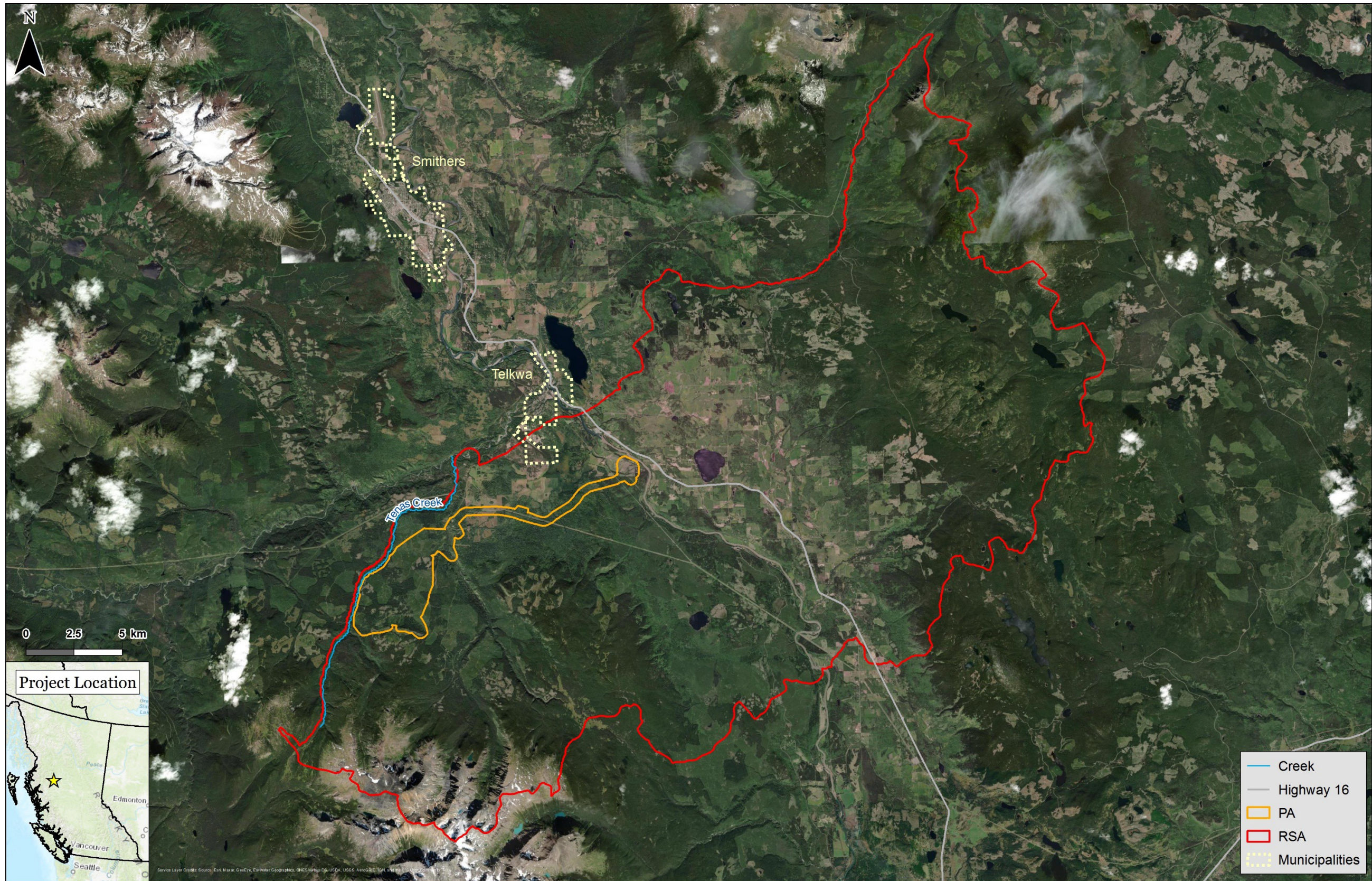
Based on the presence of fossiliferous sedimentary rock within the PA, the proximity of known fossiliferous sites within less than 1 km to the PA boundaries, and the expected depth of excavation activities (up to 24 metres within fossiliferous sedimentary rock), the **level of risk to local fossils is considered high**.

Therefore, following BCHB guidelines, **it is recommended that a Fossil Impact Assessment (FIA), including a field survey of the Project footprint's bedrock is completed in advance of the commencement of Project field construction activities** to further assess the risks of these activities to impact significant fossil resources.

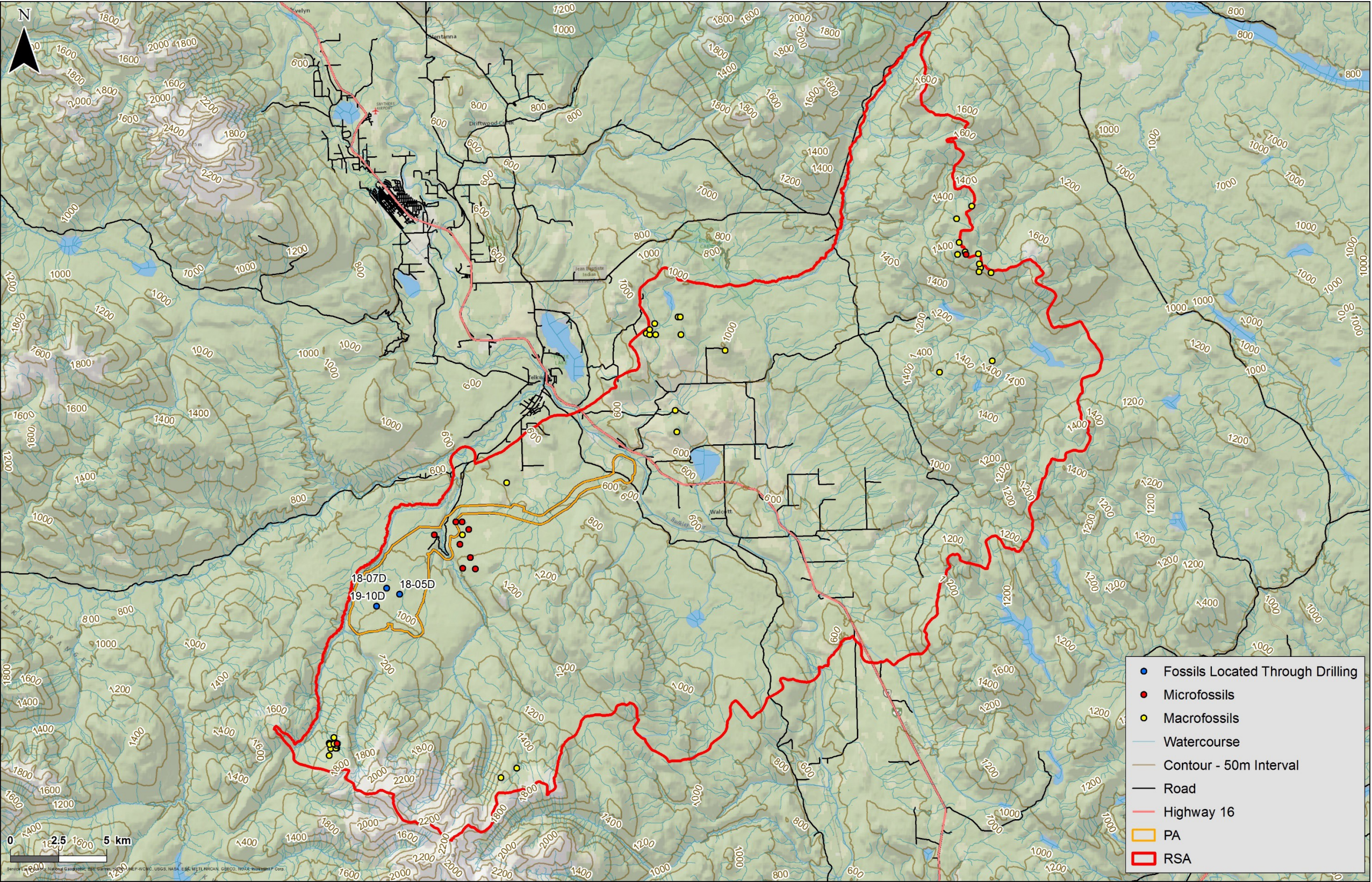
5. REFERENCES

- Alldrick, D.J. and Lin, C-Y. M. 2007. Geology of the Skeena Group, Central British Columbia. *British Columbia Geological Survey*, Open File 2007-8.
- Bassett, K.N., Kleinspehn, K.L. 1997. Early to middle Cretaceous paleogeography of north-central British Columbia: stratigraphy and basin analysis of the Skeena Group. *Canadian Journal of Earth Sciences*, **34**: 1644 – 1669.
- BCHB. 2021. Fossil Impact Assessment (FIA) Guidelines for Industry. Online resource: [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/fossil-management/fiaguidelines-abridgedforindustry_final.pdf]. Accessed on July 2021.
- Cui, Y., Miller, D., Schiarizza, P., and Diakow, L.J., 2017. British Columbia digital geology. British Columbia Ministry of Energy, Mines and Petroleum Resources, British Columbia Geological Survey Open File 2017-8, 9p. Data version 2019-12-19.
- Evenchick, C.A., Poulton, T.P., and McNicoll, V.J. 2010. Nature and significance of the diachronous contact between the Hazelton and Bowser Lake groups (Jurassic), north-central British Columbia. *Bulletin of Canadian Petroleum Geology*, **58**: 235 – 267.
- Fulton, R.J. 1995. Surficial Materials of Canada. Geological Survey of Canada, Map 1880A, Scale 1: 5 000 000.
- Gagnon, J.-F., Barresi, T., Waldron, J. W. F., Nelson, J.L., Poulton, T.P., and Cordey, F. 2012. Stratigraphy of the upper Hazelton Group and the Jurassic evolution of the Stikine terrane, British Columbia. *Canadian Journal of Earth Sciences*, **49**: 1027 – 1052.
- Pálffy, J. and Schmidt, K.L., 1994: Biostratigraphic and facies studies of the Telkwa Formation (Lower Jurassic), Smithers map area, British Columbia. *In*: Current Research 1994-E; Geological Survey of Canada, p. 29-38.
- Palsgrove, R. J., and Bustin, R.M. 1991 . Stratigraphy, sedimentology and coal quality of the Lower Skeena Group, Telkwa Coalfield, central British Columbia, NTS 93L/II. *In*: British Columbia Ministry of Energy, Mines and Petroleum Resources, Paper 1991-2, pp. 449-454.
- Richards, T.A. 1990. Geology of Hazelton map area (93M). *Geological Survey of Canada*, Open File 2322.
- Tipper, H.W. and Richards, T.A. 1976: Jurassic stratigraphy and history of north-central British Columbia. *Geological Survey of Canada*, Bulletin 270. 73 pp.

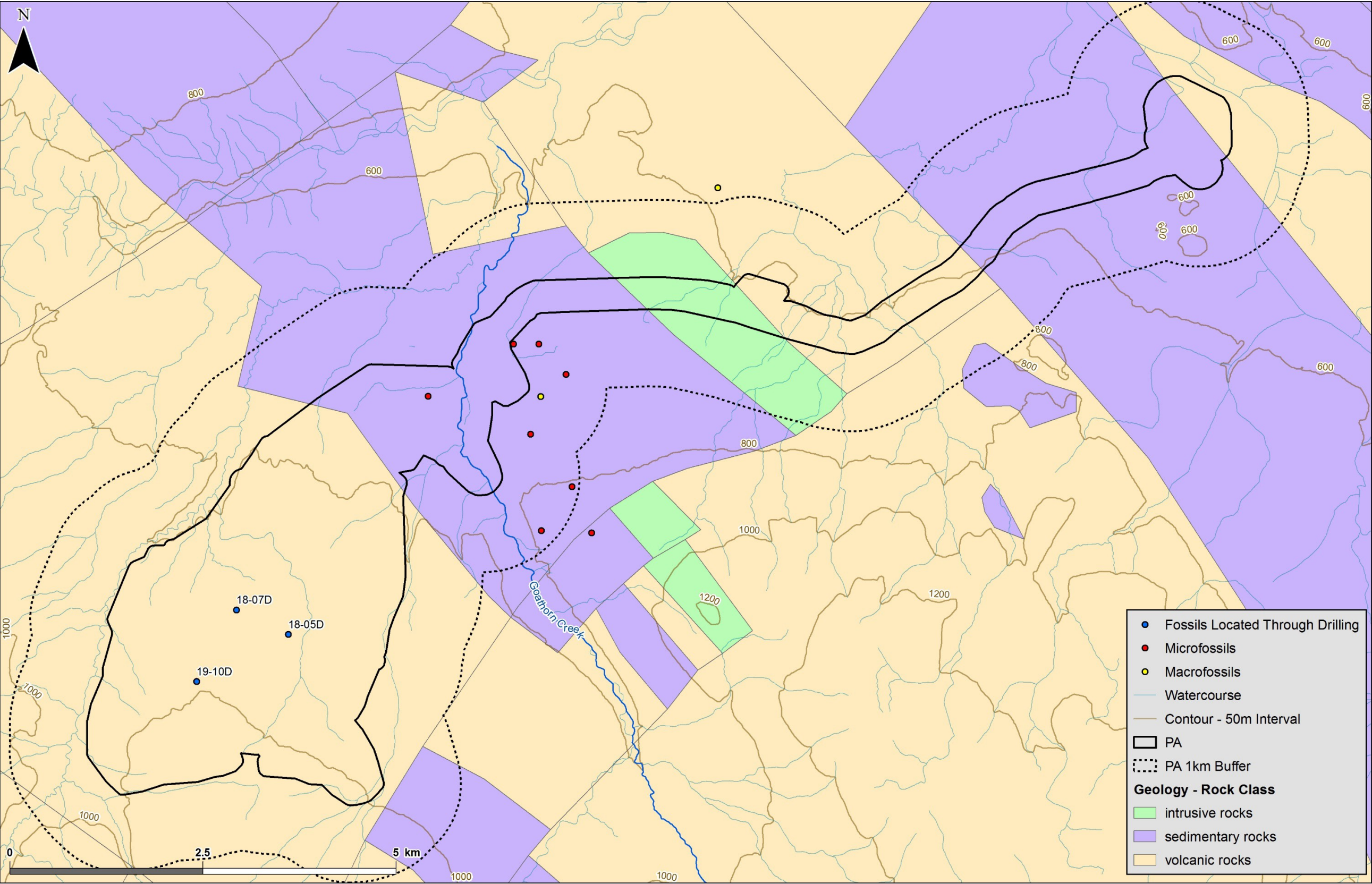
6. MAPS



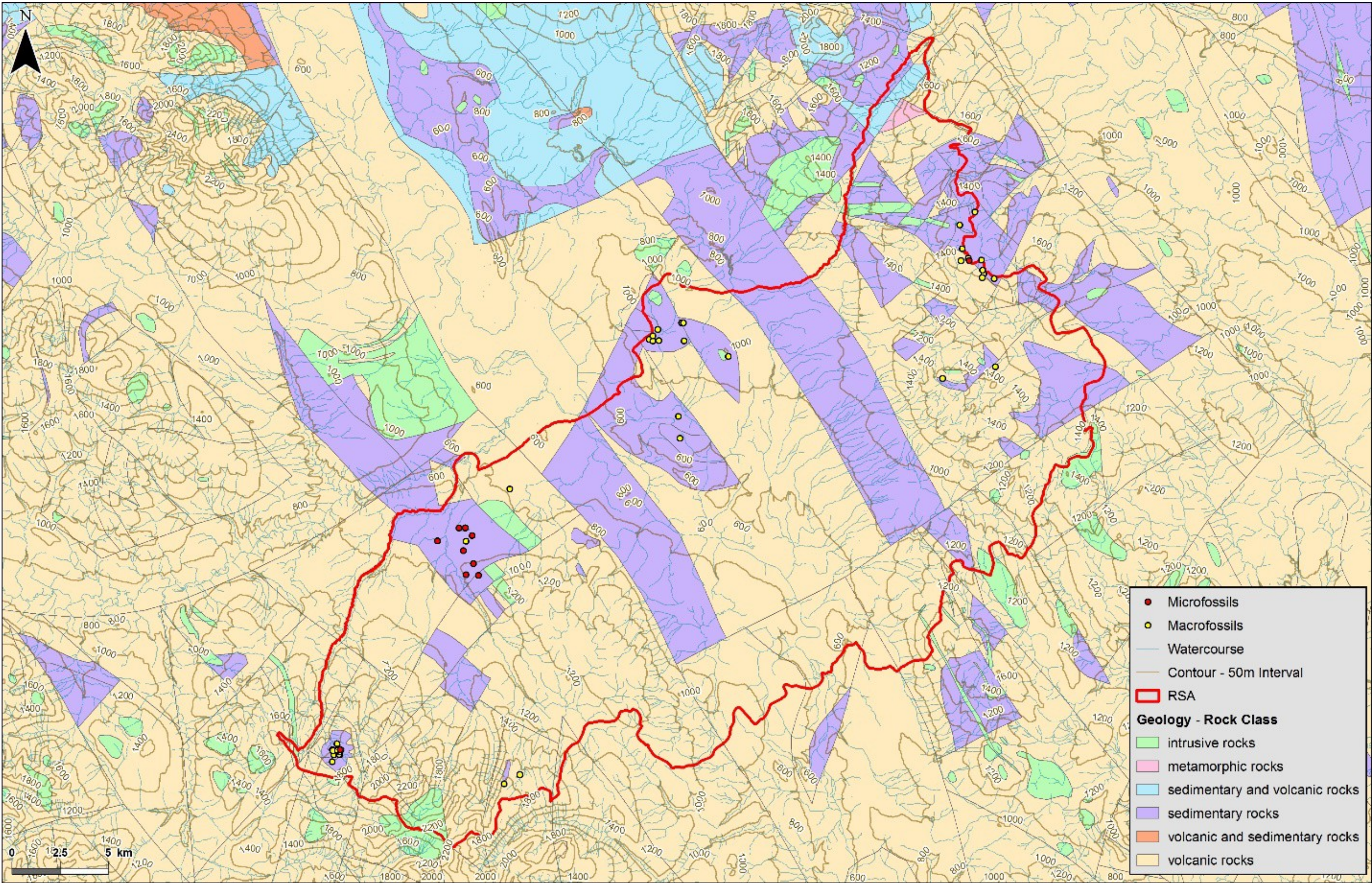
Map 1. Orthophoto of Project location, highlighting Regional Study Area (RSA) and Local Study Area (PA).



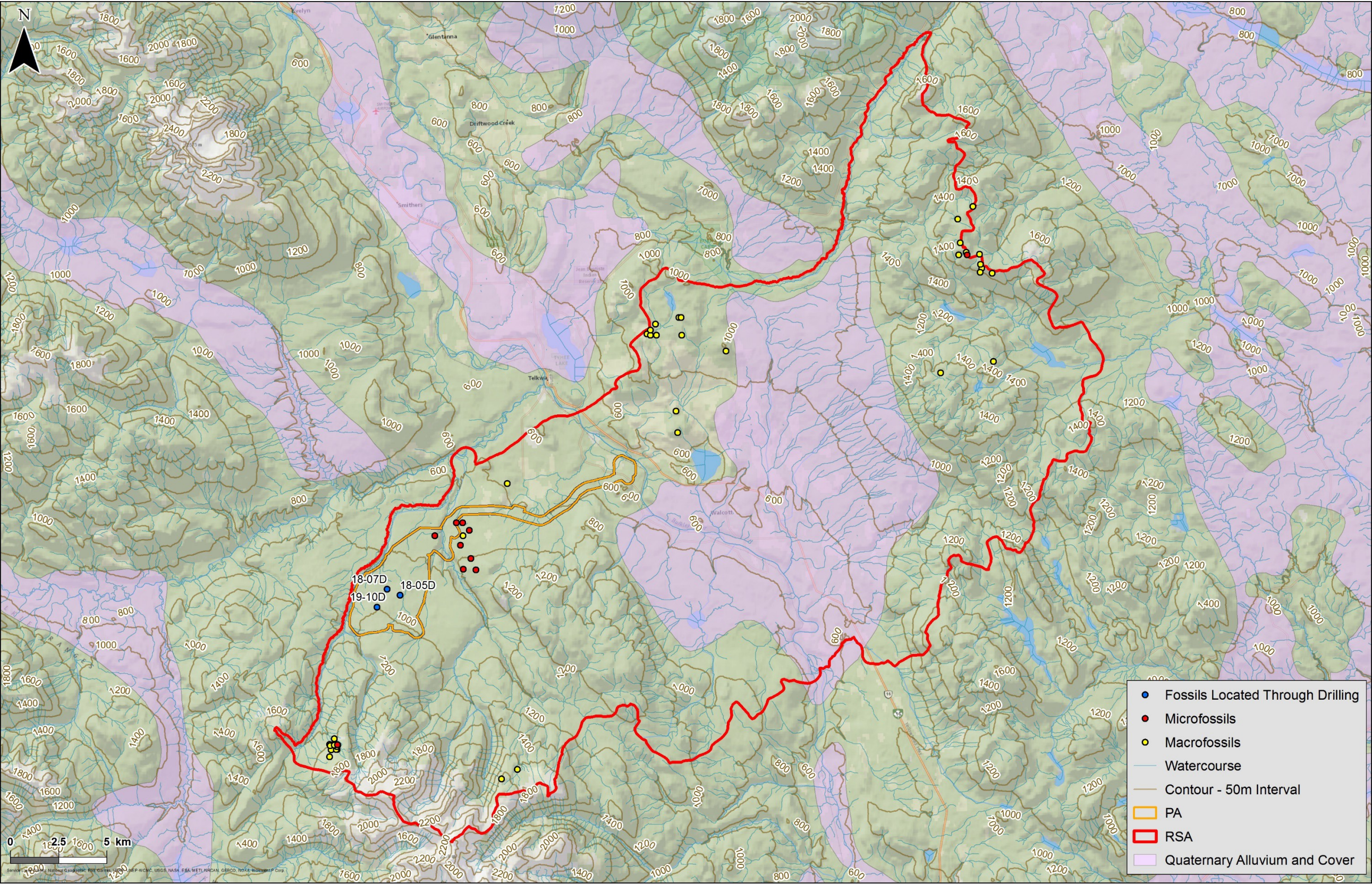
Map 2. Topographical map of Project location.



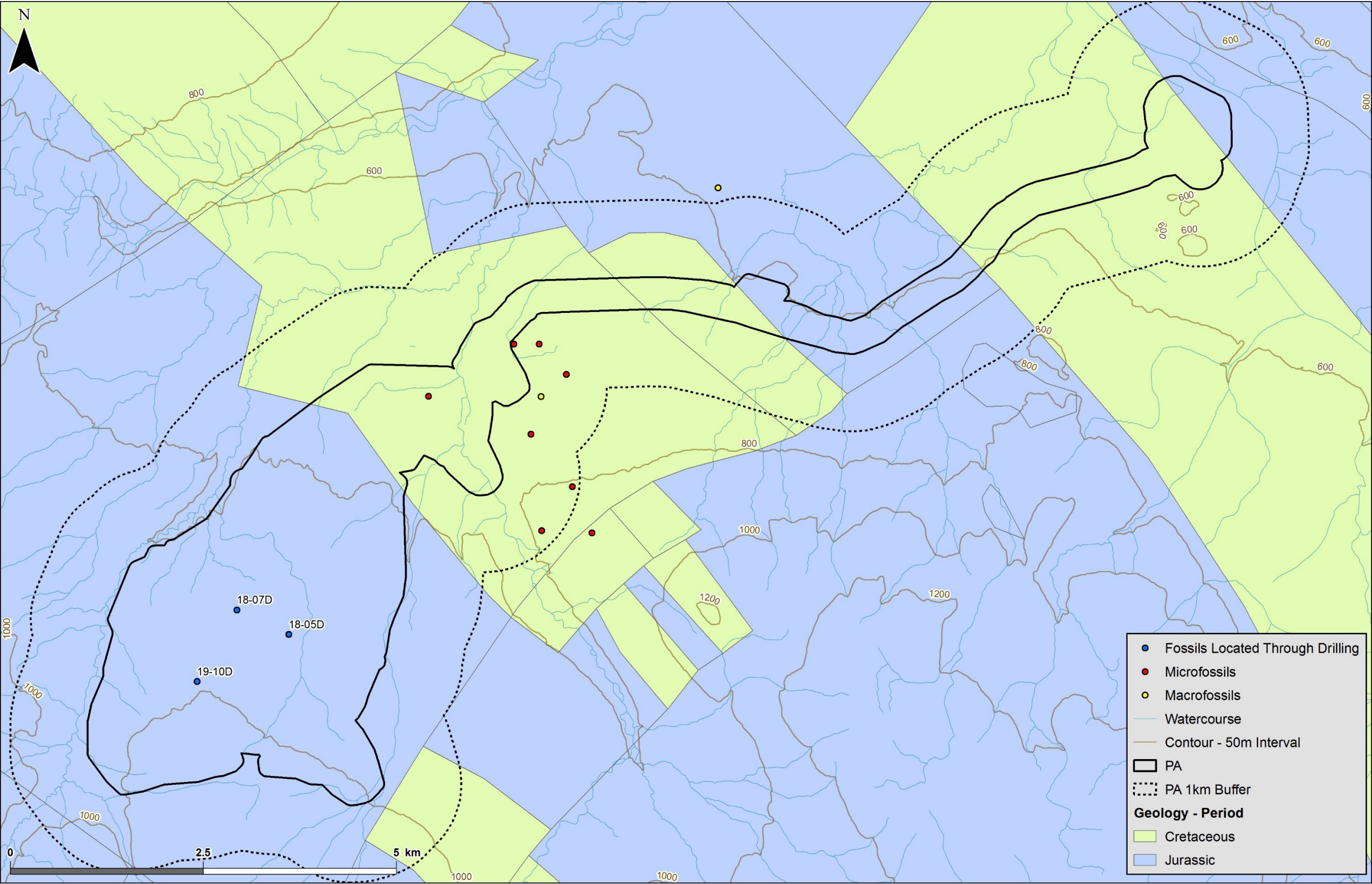
Map 3. Rock types documented within the PA and surrounding areas.



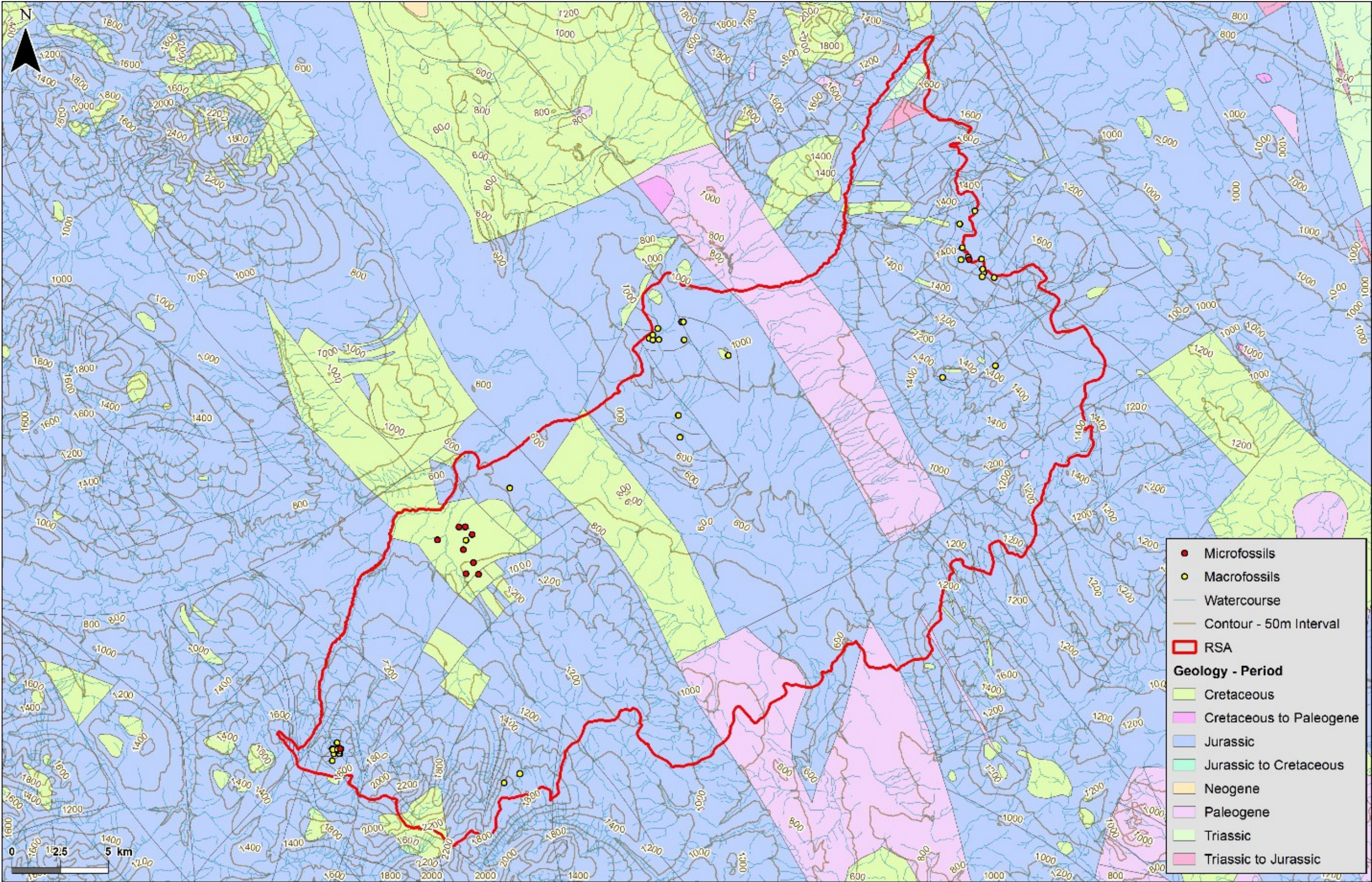
Map 4. Rock types documented within the RSA and surrounding areas.



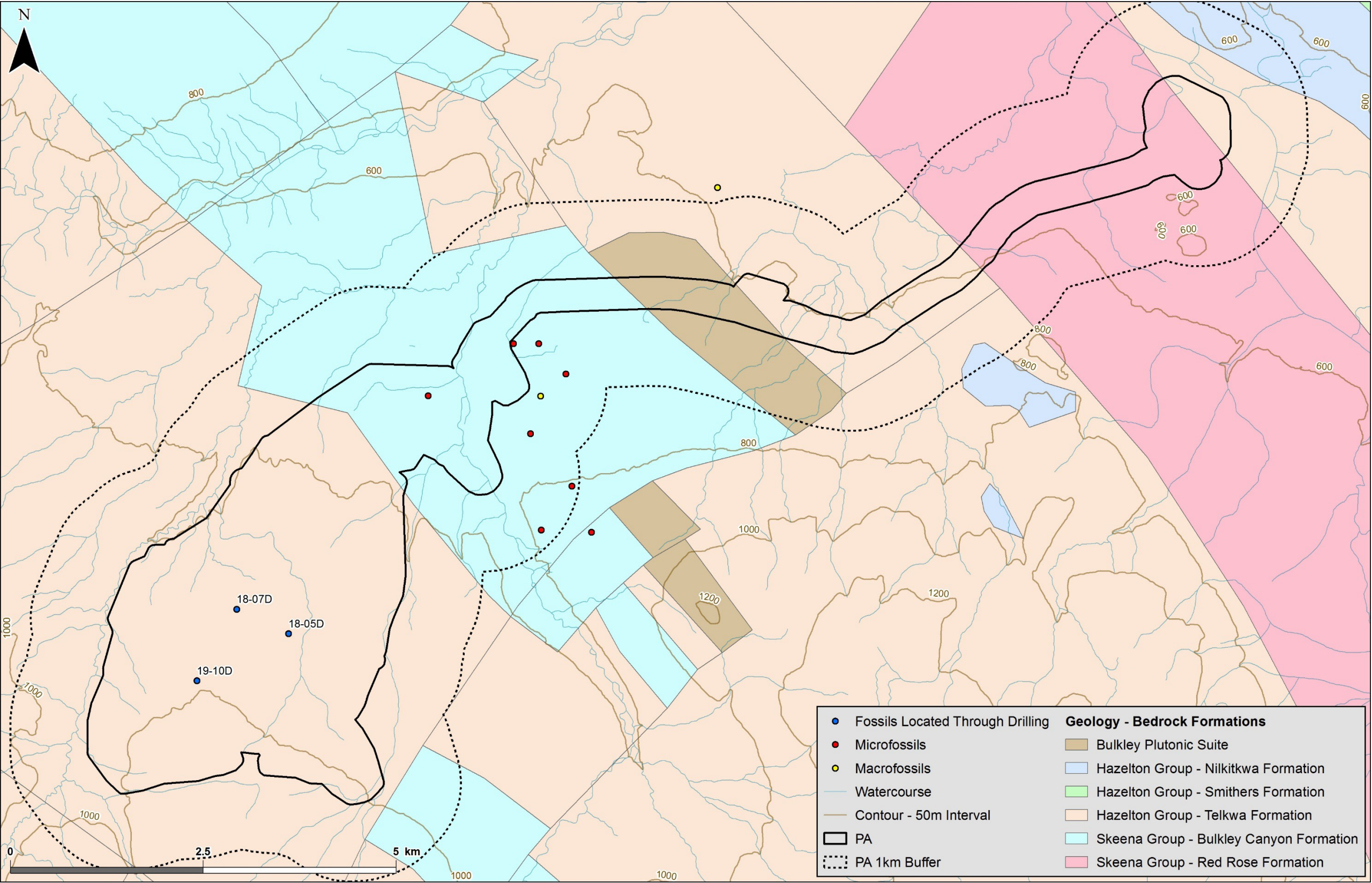
Map 5. Quaternary alluvium cover within the RSA and surrounding areas.



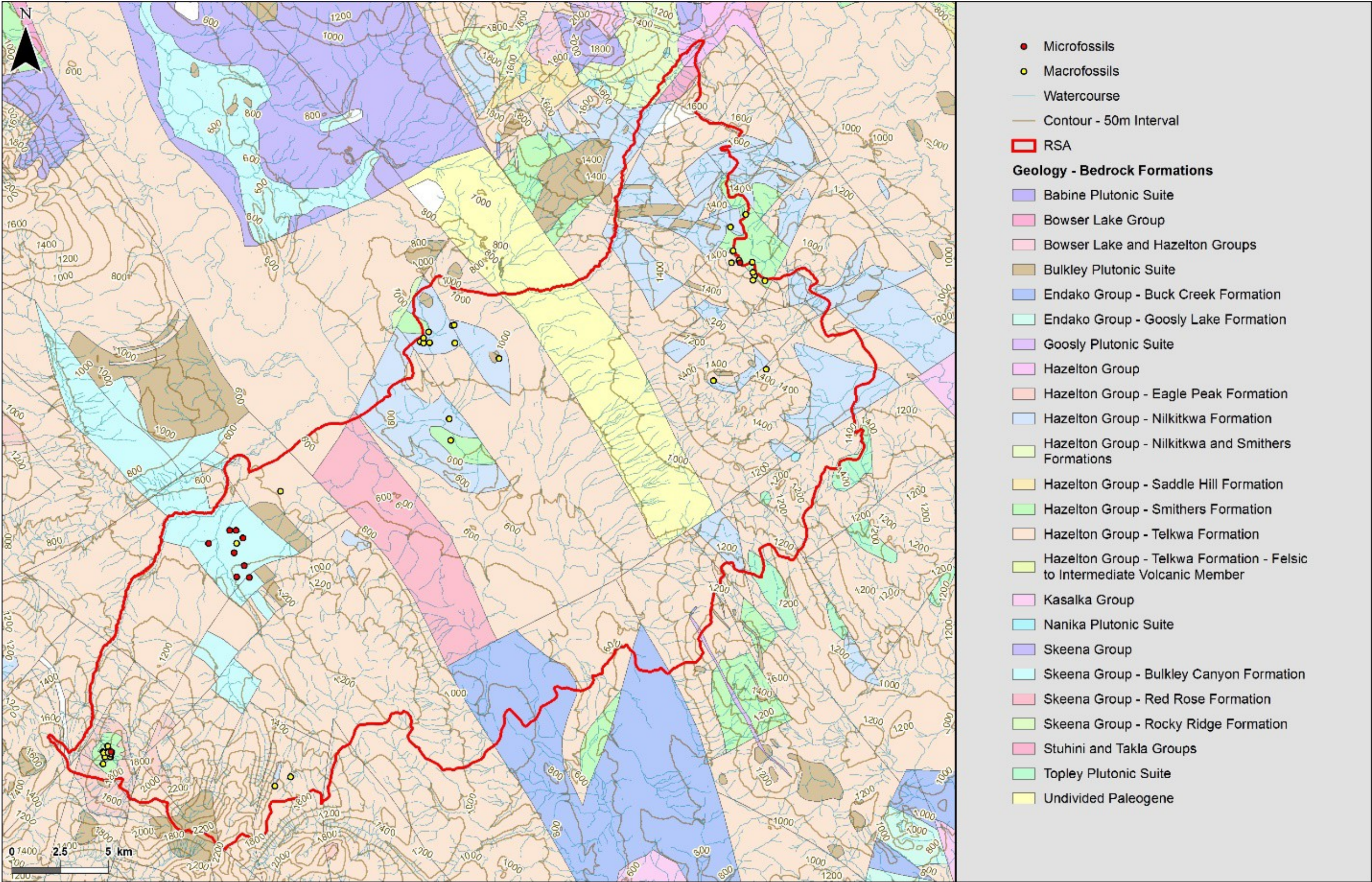
Map 6. Rock ages within the PA and surrounding areas.



Map 7. Rock ages within the RSA and surrounding areas.



Map 8. Bedrock formations within the PA and surrounding areas.



Map 9. Bedrock Formations within the RSA and surrounding areas.

7. TABLES

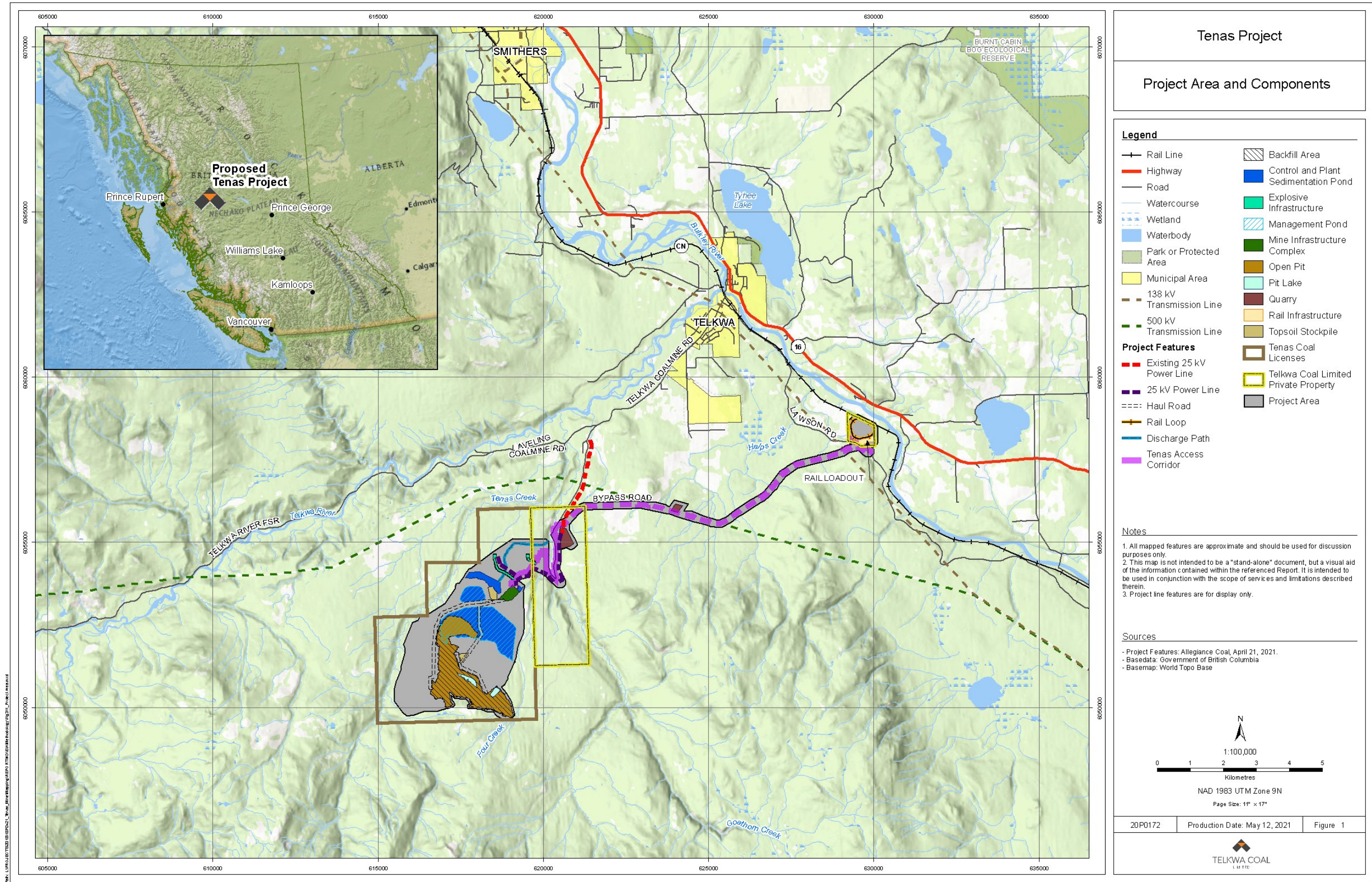
Palaeontological Resource Potential (PRP) Level	Deposit Type				Management Concern
	Quaternary (unconsolidated, loose)	Sedimentary (layered, cemented) Rock	Igneous (Volcanic) Rocks	Metamorphic (altered) rocks	
High	Cave; beach; pit; and marine deposits	Fossiliferous to highly fossiliferous with regular to consistent and predictable yield of significant fossils at risk of impact; e.g. marginal marine deposits, organic-rich rocks.			Concern is high, with FIA and field survey and monitoring of bedrock disturbance justified or necessary.
Medium/ Unknown	Moraines; outwash; lacustrine; travertine	Units in which fossil content varies, is unpredictable, scattered, or unknown; e.g., non-marine to distal marine deposits.			Careful consideration, with FIA and field survey likely justified.
Low	Thick glacial sand; colluvium; reworked gravel; high altitude fluvial	Units not known or likely to contain significant fossils; e.g., thick, uniform shale; coarse-grained sandstone; conglomerate.	Fossils can rarely be preserved in volcanic rocks		Concern is generally low.
Very Low	Highly weathered or slumped deposits	Weathering, corrosion and recrystallization	Nearly all igneous rocks are void of fossils	Low grade metamorphism can occasionally preserve fossils	Concern is negligible or not applicable.
Nil				High grade metamorphism destroys nearly all visible fossils	Concern is negligible or not applicable.

Table 1. Classification of Palaeontological Resource Potential (PRP) based on deposit types, according to BCHB guidelines.

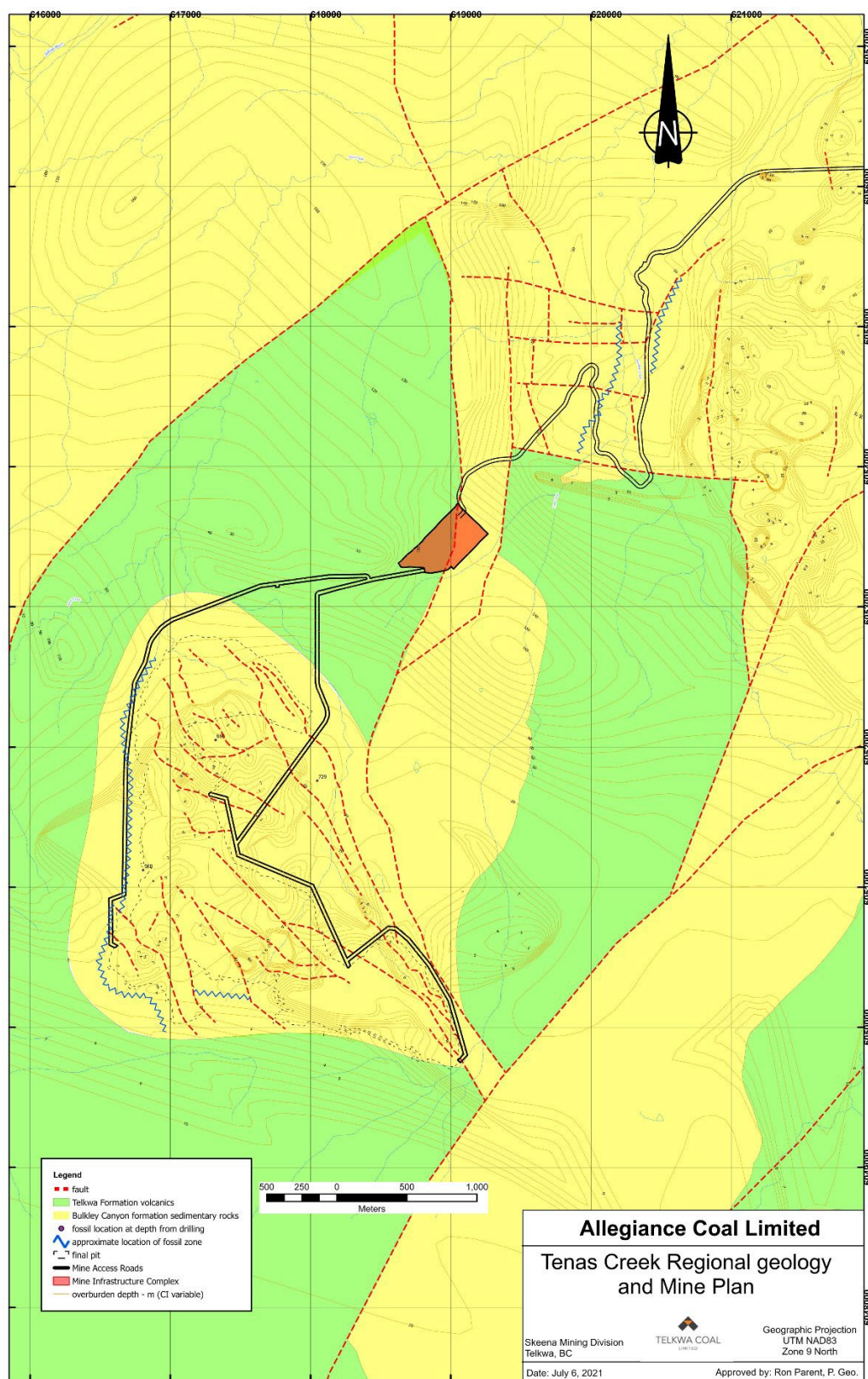
Fossil Potential (Proximity to Significant Resources)	Surface use only (if vegetated)	Minor surface disturbance (< 30 cm deep) (if vegetated)	Significant surface excavation (> 30 cm deep) or directly on sediment exposure
Local Known Fossil Site	Very Low Risk	Medium Risk	High Risk
High Fossil Potential	Very Low Risk	Low Risk	Medium Risk
No Record of Overlap	Very Low Risk	Low Risk	Low Risk

Table 2. Risk Matrix for palaeontological resources to be impacted by development, according to BCHRB guidelines.

APPENDIX A: PROJECT PLANS



APPENDIX B: TENAS MINE PLAN WITH FOSSIL ZONES AND REGIONAL GEOLOGY



APPENDIX C: PHOTOGRAPHS OF CORE SAMPLES WITHIN MINE SITE



Figure 1: Core sample 18-07D with indeterminate fossil bivalves (arrow).



Figure 2: Core sample 18-05D with indeterminate fossil bivalves (arrow).



Figure 3: Core sample 19-10D with indeterminate fossil bivalves (arrow).

APPENDIX D: FOSSIL OCCURRENCES WITHIN RSA

Site ID	Repository	Collection Year	Geological Period	Fossil Size Category	Fossil Common Names	Fossil ID	NTS Map Sheet Number
5836	GSC Ottawa	1969	Jurassic	macrofossil	ammonoid; bivalve	<i>Tmetoceras scissum</i> ; <i>Myophorella sp. aff. M. tipperi</i> ; <i>Grammatodon sp.</i> ; <i>Ostrea sp.</i>	093L/15
5837	GSC Ottawa	1969	Jurassic	macrofossil	ammonoid; belemnite	<i>Tmetoceras sp.</i>	093L/15
5845	GSC Ottawa	1969	Jurassic	macrofossil	ammonoid; belemnite	<i>Trigonia sp.</i> ; <i>Pleuromya sp.</i>	093L/10
5846	GSC Ottawa	1969	Jurassic	macrofossil	ammonoid; belemnite	na	093L/10
6119	GSC Ottawa	1969	Jurassic	macrofossil	ammonoid; gastropod	na	093L/11
6149	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; belemnoid; bivalve	<i>?Sonninia sp.</i> ; <i>Trigonia sp.</i> ; <i>Pleuromya sp.</i> ; <i>Pinna sp.</i> ; <i>Lima cf. L. tizglensis</i> ; <i>Jdonearca cf. J. haguei</i>	093L/10
6151	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve; belemnite; brachiopod	<i>Tmetoceras scissum</i> ; <i>Entolium sp.</i> ; <i>Pinna sp.</i> ; <i>Ostrea sp.</i> ; <i>Astarte sp.</i> ; <i>?Pleuromya sp.</i> ; <i>Grammatodon sp.</i> ; <i>Lima spp.</i> ; <i>Myophorella sp.</i> ; <i>Terebratula sp.</i>	093L/15
6152	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve; brachiopod	<i>Terebratula sp.</i> ; <i>?Weyla sp.</i>	093L/15
6165	GSC Ottawa	1970	Jurassic	macrofossil	bivalve fragment; ammonoid; belemnoid	na	093L/10
6182	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	<i>Trigonia sp.</i> ; <i>Pleuromya sp.</i>	093L/10
6183	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	<i>Trigonia sp.</i> ; <i>Pleuromya sp.</i>	093L/10
6184	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve; belemnite	<i>Tmetoceras scissum</i> ; <i>Ostrea sp.</i> ; <i>?Modiolus sp.</i> ; <i>Grammatodon sp.</i> ; <i>?Lima sp.</i>	093L/15
6185	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid fragment; belemnite fragment; bivalve fragment	<i>Tmetoceras sp.</i>	093L/15
6187	GSC Ottawa	1970	Jurassic	macrofossil	bivalve fragment	na	093L/10
6188	GSC Ottawa	1970	Jurassic	macrofossil	bivalve fragment	na	093L/10
6193	GSC Ottawa	1970	Jurassic	macrofossil	bivalve fragment	na	093L/10
6196	GSC Ottawa	1970	Jurassic?	macrofossil	ammonoid fragment; belemnite fragment; bivalve fragment	na	093L/10
6197	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve; brachiopod	<i>Tmetoceras scissum</i> ; <i>Troitsaia westermanni</i> ; <i>Trigonia sp.</i> ; <i>?Pinna sp.</i> ; <i>Pleuromya sp.</i> ; <i>Myophorella sp.</i> ; <i>Astarte sp.</i> ; <i>Grammatodon sp.</i> ; <i>?Entolium sp.</i>	093L/10
6198	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve; brachiopod	<i>Tmetoceras scissum</i> ; <i>Troitsaia westermanni</i> ; <i>Trigonia sp.</i> ; <i>?Pinna sp.</i> ; <i>Pleuromya sp.</i> ; <i>Myophorella sp.</i> ; <i>Astarte sp.</i> ; <i>Grammatodon sp.</i> ; <i>?Entolium sp.</i>	093L/10
6199	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	<i>Tmetoceras sp.</i> ; <i>?Pleuromya sp.</i> ; <i>Trigonia sp.</i> ; <i>?Pinna sp.</i>	093L/10
6200	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	<i>Tmetoceras sp.</i>	093L/10
6201	GSC Ottawa	1970	Jurassic	macrofossil	bivalve; ammonoid	<i>?Charmasseiceras sp.</i> ; <i>Weyla sp.</i>	093L/10
6204	GSC Ottawa	1970	Jurassic	macrofossil	bivalve	<i>Trigonia sp.</i> ; <i>?Pinna sp.</i>	093L/10
6205	GSC Ottawa	1970	Jurassic	macrofossil	bivalve	<i>Myophorella dawsoni</i>	093L/10
6210	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; belemnite; bivalve	<i>?Lima sp.</i> ; <i>Trigonia sp.</i> ; <i>Pinna sp.</i> ; <i>?Inoceramus sp.</i>	093L/10
6211	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; belemnite; bivalve	<i>?Lima sp.</i> ; <i>Trigonia sp.</i> ; <i>Pinna sp.</i> ; <i>?Inoceramus sp.</i>	093L/10
6213	GSC Ottawa	1970	Jurassic	macrofossil	bivalve	<i>Weyla sp.</i>	093L/10
6214	GSC Ottawa	1970	Jurassic	macrofossil	belemnite fragment; bivalve fragment	<i>Ostrea sp.</i>	093L/15
6216	GSC Ottawa	1970	Jurassic	macrofossil	bivalve; belemnoid	<i>Pinna sp.</i>	093L/10
6225	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	<i>Gowericeras costidensum</i> ; <i>Arctocephalites sp.</i> ; <i>?Parareineckia sp.</i> ; <i>Cobbanites sp.</i> ; <i>Inoceramus sp.</i> ; <i>Pleuromya sp.</i>	093L/11
6231	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6232	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	<i>Gryphaea sp.</i> ; <i>Pleuromya sp.</i>	093L/11
6233	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6243	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; belemnite fragment; bivalve	<i>Cobbanites sp.</i> ; <i>?Lilloettia sp.</i> ; <i>Trigonia sp.</i>	093L/11
6244	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; belemnite fragment; bivalve	<i>Anditrigonia plumasensis</i>	093L/11

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Site ID	Repository	Collection Year	Geological Period	Fossil Size Category	Fossil Common Names	Fossil ID	NTS Map Sheet Number
6245	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	<i>Kepplerites spp.</i> ; <i>Arctocephalites spp.</i> ; <i>Trigonia sp.</i> ; <i>Oxytoma cf. O. blairmorenis</i> ; <i>Modiolus sp.</i> ; <i>Pleuromya cf. P. obtusiprorata</i> ; <i>Pecten sp.</i>	093L/11
6246	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6247	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; belemnite; bivalve	na	093L/11
6248	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6249	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6250	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6251	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; belemnite; bivalve	na	093L/11
6256	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6257	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6258	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6259	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6260	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6261	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6262	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6263	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6264	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6269	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6270	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6271	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; belemnoid; bivalve; gastropod	<i>Kheraicerias cf. K. abruptum</i> ; <i>Kheraicerias sp.</i> ; <i>?Lilloettia sp.</i> ; <i>Pleuromya sp.</i> ; <i>Inoceramus sp.</i>	093L/11
6272	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; belemnoid; bivalve	<i>Lilloettia sp.</i> ; <i>Kheraicerias cf. K. abruptum</i> ; <i>Kheraicerias sp.</i> ; <i>Pleuromya sp.</i> ; <i>Modiolus sp.</i>	093L/11
6277	GSC Ottawa	1970	Jurassic	macrofossil	bivalve	<i>Myophorella montanaensis</i>	093L/11
6278	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	<i>Oppelia sp.</i> ; <i>Cobbanites sp.</i> ; <i>Gryphaea sp.</i> ; <i>Trigonia sp.</i> ; <i>Pecten sp.</i> ; <i>Inoceramus sp.</i> ; <i>Pleuromya sp.</i>	093L/11
6279	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	<i>Oppelia (Oxycerites) sp.</i> ; <i>Cobbanites talkeetnanus</i> ; <i>Zemistephanus sp.</i>	093L/11
6280	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6281	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6282	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	<i>Myophorella montanaensis</i>	093L/11
6283	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	<i>Gryphaea sp.</i> ; <i>Trigonia sp.</i> ; <i>Inoceramus sp.</i> ; <i>Pleuromya sp.</i>	093L/11
6284	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	<i>Arctocephalites (Cranocephalites) costidensus</i> ; <i>Parareineckia cf. P. shelikofana</i>	093L/11
6285	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6286	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6287	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6288	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6289	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6293	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6294	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; belemnite; bivalve	na	093L/11
6295	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6297	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	<i>Lilloettia sp.</i>	093L/11
6298	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	<i>Lilloettia sp.</i>	093L/11
6299	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	<i>Morrisiseras cf. M. morrisi</i> ; <i>Rhynchonella sp.</i>	093L/11
6300	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6333	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve; brachiopod	<i>Cobbanites sp.</i> ; <i>Trigonia sp.</i> ; <i>Pecten sp.</i> ; <i>Rhynchonella sp.</i>	093L/11

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6334	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve; brachiopod	<i>Epizigzagiceras crassicostratum</i>	093L/11
6339	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6340	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella montanaensis</i>	093L/11
6341	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6342	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	<i>Epizigzagiceras evolutum; Cobbanites talkeetnanus; Morrisiceras cf. M. vorrisi; Morrisiceras sp.; Gryphaea sp.; Pleuromya sp.</i>	093L/11
6343	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	<i>Epizigzagiceras evolutum; Cobbanites talkeetnanus</i>	093L/11
6346	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve; gastropod; belemnite	<i>Lilloettia buckmani; Lilloettia cf. L. lilloetensis; Phylloceras sp.; ?Xenocephalites sp.; Parareineckia sp.; Cobbanites sp.; Ostrea sp.; Pleuromya sp.; Goniomya sp.; Trigonina sp.</i>	093L/11
6347	GSC Ottawa	1970	Jurassic	macrofossil	bivalve	<i>Scaphotrigonia naviformis; Myophorella montanaensis; Anditrigonia plumasensis</i>	093L/11
6348	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6349	GSC Ottawa	1970	Jurassic	macrofossil	bivalve	<i>Myophorella yellowstonensis; Anditrigonia plumasensis</i>	093L/11
6350	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid fragment; bivalve fragment; belemnite	na	093L/11
6351	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	<i>?Lilloettia sp.; Kepplerites sp.; ?Xenocephalites sp.; Kheraiceris sp.; Trigonina sp. aff. T. dawsoni; Pleuromya sp.</i>	093L/11
6352	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6353	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; belemnite; bivalve	na	093L/11
6354	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; brachiopod; belemnite	na	093L/11
6355	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; brachiopod; belemnite	na	093L/11
6356	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; brachiopod; belemnite	na	093L/11
6357	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; brachiopod; belemnite	na	093L/11
6358	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6359	GSC Ottawa	1970	Jurassic	macrofossil	bivalve	<i>Myophorella montanaensis; Myophorella yellowstonensis; Scaphotrigonia naviformis; Anditrigonia plumasensis</i>	093L/11
6360	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; belemnite; bivalve; gastropod	na	093L/11
6361	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6362	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6363	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; belemnite; bivalve	na	093L/11
6364	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6365	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; belemnite; bivalve	na	093L/11
6366	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; belemnite; bivalve	na	093L/11
6367	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6368	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6369	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6370	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6371	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6372	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6373	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6374	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6375	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
6376	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11

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6378	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	<i>Kheraicerias cf. K. abruptum</i> ; <i>Kheraicerias sp.</i>	093L/11
6379	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; belemnoid; bivalve; gastropod	<i>Lilloettia buckmani</i> ; <i>Lilloettia lilloetensis</i> ; <i>Gryphaea sp.</i> ; <i>Pleuromya sp.</i> ; <i>Pinna sp.</i> ; <i>Astarte sp.</i> ; <i>Trigonia sp.</i>	093L/11
6380	GSC Ottawa	1970	Jurassic	macrofossil	bivalve	<i>Myophorella montanaensis</i>	093L/11
6613	GSC Ottawa	1971	undetermined	macrofossil	bivalve	? <i>Arctica sp.</i>	093L/11
6622	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella dawsoni</i>	093L/10
6624	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella tipperi</i> ; <i>Myophorella freboldi</i>	093L/10
6625	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella tipperi</i>	093L/10
6626	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	? <i>Orthotrigonia sp.</i>	093L/10
6627	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella tipperi</i>	093L/10
6628	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	? <i>Orthotrigonia sp.</i>	093L/10
6629	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella tipperi</i>	093L/10
6630	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	? <i>Orthotrigonia sp.</i>	093L/10
6631	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella tipperi</i>	093L/10
6668	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	? <i>Orthotrigonia sp.</i>	093L/10
6671	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella tipperi</i>	093L/10
6675	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella tipperi</i> ; <i>Myophorella dawsoni</i>	093L/10
6676	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	? <i>Orthotrigonia sp.</i> ; <i>Myophorella tipperi</i>	093L/10
6677	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid fragment; belemnoid; bivalve fragment	? <i>Sonninia sp.</i> ; ? <i>Pleuromya sp.</i>	093L/10
6678	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid fragment; belemnoid; bivalve fragment	<i>Myophorella dawsoni</i> ; <i>Myophorella freboldi</i>	093L/10
6679	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; belemnoid; bivalve fragment	? <i>Stephanoceras sp.</i>	093L/10
6680	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; belemnoid; bivalve fragment	<i>Myophorella dawsoni</i>	093L/10
6860	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella montanaensis</i>	093L/11
6861	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	<i>Megasphaeroceras rotundum</i> ; <i>Oppelia (?Liroxyites) sp.</i> ; <i>Cobbanites talkeetnanus</i> ; <i>Cobbanites talkeetnanus var. densicostatus</i> ; <i>Inoceramus sp.</i> ; <i>Pleuromya sp.</i> ; <i>Pecten sp</i>	093L/11
6862	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	<i>Cobbanites talkeetnanus</i>	093L/11
6863	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid	na	093L/11
6864	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6865	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6866	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid	na	093L/11
6867	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella montanaensis</i>	093L/11
6868	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6869	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	<i>Mepasphaeroceras? aff. M. rotundum</i> ; <i>Cobbanites sp.</i>	093L/11
6870	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid	na	093L/11
6871	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	na	093L/11
6872	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	? <i>Megasphaeroceras aff. M. rotundum</i> , <i>Cobbanites sp.?</i>	093L/11
6873	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve; brachiopod	<i>Parareineckia cf. P. shelikofana</i> ; <i>Arctocephalites (Cranoecephalites) cf. costidensus</i> ; <i>Megasphaeroceras cf. M. rotundum</i> ; <i>Cobbanites talkeetnanus var. densicostata</i> ; <i>Lima sp.</i> ; <i>Rhynchonella sp.</i>	093L/11
6874	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve; brachiopod	<i>Arctocephalites (Cranoecephalites) costidensus</i> ; <i>Parareineckia cf. P. shelikofana</i>	093L/11

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6875	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid	na	093L/11
6876	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve; belemnoid	na	093L/11
6877	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve; belemnoid	<i>Arctocephalites (Cranoecephalites) costidensus; Parareineckia cf. P. shelikofana</i>	093L/11
6878	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid fragment; bivalve	<i>Cobbanites cf. C. talkeetnanus; ?Lilloettia sp.; Pleuromya sp.</i>	093L/11
6879	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	<i>Lilloettia sp.; Kheraicerias spp.; Cobbanites sp.; Inoceramus sp.</i>	093L/11
6880	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	<i>Megasphaeroceras aff. M. rotundum; Gryphaea sp.; Lima sp.; Pecten sp.</i>	093L/11
6881	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid	<i>?Kheraicerias sp.</i>	093L/11
6882	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	<i>Kheraicerias cf. K. abruptum; Pleuromya sp.; Modiolus sp.; Inoceramus cf. I. obliquiformis</i>	093L/11
6883	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid fragment; belemnite; bivalve	<i>Kheraicerias spp.; Lilloettia spp.; Cobbanites sp.; Pleuromya sp.; Modiolus sp.</i>	093L/11
6884	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	<i>Lilloettia cf. L. lilloetensis; Kheraicerias cf. K. abruptum; Astarte sp.; Inoceramus sp.</i>	093L/11
6885	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve; belemnoid	<i>?Cobbanites? sp.; Kepplerites spp.; Lilloettia aff. L. lilloetensis; Kheraicerias sp.; Kosmoceras sp.; Xenocephalites aff. X. hebetus; Inoceramus cf. I. obliquiformis; Pleuromya cf. P. obtusipratorata; Astarte sp.</i>	093L/11
6886	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella sp. aff. M. dawsoni</i>	093L/11
6887	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve; brachiopod	<i>?Cobbanites sp.; Ostrea sp.; Gervillia sp.; Pleuromya spp.; Rhynchonella sp.</i>	093L/11
6888	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	<i>Kheraicerias cf. K. abruptum; Kheraicerias spp.; Cobbanites sp.; Kepplerites sp.; Pleuromya sp.; Inoceramus sp.; Inoceramus cf. I. obliquiformis</i>	093L/11
6889	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve; brachiopod	<i>Epizigzagiceras evolutum; Arctocephalites (Cranoecephalites) aff. A. pompeckji; ?Cobbanites sp.; Pecten sp.; Gervillia sp.; Ostrea sp.; Pleuromya sp.; Terebratula sp.; Rhynchonella sp.</i>	093L/11
6890	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve; brachiopod	<i>Arctocephalites (Cranoecephalites) costidensus; Arctocephalites (Cranoecephalites) aff. A. (C.) pompeckji; Epizigzagiceras evolutum</i>	093L/11
6891	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve; brachiopod	<i>Oppelia (?Oxycerites) sp.; ?Cobbanites sp.; Arctocephalites (Cranoecephalites) sp. aff. A. pompeckji; Ctenostreon cf. C. gikshanensis; Pleuromya sp.; Pinna sp.; Ostrea sp.; Terebratula sp.; Rhynchonella sp.</i>	093L/11
6892	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve; brachiopod	na	093L/11
6893	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid fragment; bivalve; belemnite	<i>Kheraicerias sp.; Cobbanites sp.; Kepplerites sp.; Pinna sp.; Modiolus sp.; Astarte cf. A. packardi; Inoceramus cf. I. obliquiformis</i>	093L/11
6894	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid fragment; belemnite; bivalve fragment	<i>Kheraicerias sp.; ?Lilloettia sp.; Cobbanites sp.; Kepplerites sp.; Pleuromya sp.; Inoceramus sp.</i>	093L/11
10133	GSC Calgary	1986	Jurassic	macrofossil	bivalve	na	093L/10
10134	GSC Calgary	1986	Jurassic	macrofossil	ammonoid; bivalve; gastropod	<i>Inoceramus sp.; Turritella-like sp.; Myophorella sp.; ?Protogrammoceras sp.</i>	093L/10
10135	GSC Calgary	1986	Jurassic	macrofossil	bivalve	<i>Myophorella sp. aff. M. tipperi</i>	093L/10
10136	GSC Calgary	1986	Jurassic	macrofossil	bivalve; brachiopod	<i>Pinna sp.</i>	093L/10
10139	GSC Calgary	1986	Jurassic	macrofossil	ammonoid; bivalve	<i>Protogrammoceras sp.; ?Protogrammoceres sp.; ?Tiloniceras sp.; Reynesocoeloceras sp.; Hyophoreila sp.; Pleuromya sp.</i>	093L/10
10142	GSC Calgary	1986	Jurassic	macrofossil	bivalve	<i>?Weyla sp.</i>	093L/15
10145	GSC Calgary	1986	Jurassic	macrofossil	bivalve; belemnite	<i>Myophorelia sp.</i>	093L/10
10146	GSC Calgary	1986	Jurassic	macrofossil	bivalve; belemnite	<i>Pinna sp.</i>	093L/15
13396	GSC Calgary	1988	Jurassic	macrofossil	bivalve; brachiopod	<i>Astarte sp.; Weyla sp. cf. W. alata</i>	093L/11
13397	GSC Calgary	1988	Jurassic	macrofossil	bivalve; brachiopod	<i>Weyla acutiplicata; ?Oxytoma cygnipes</i>	093L/11
13403	GSC Calgary	1988	Jurassic	macrofossil	bivalve; brachiopod	<i>Myophorella yellowstonensis; Camptonectes sp.; ?Pleuromya sp.; ?Cylindroteuthis sp.</i>	093L/11

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Site ID	Repository	Collection Year	Geological Period	Fossil Size Category	Fossil Common Names	Fossil ID	NTS Map Sheet Number
13404	GSC Calgary	1988	Jurassic	macrofossil	bivalve	<i>Iniskinites tenasensis</i> ; <i>Xenocephalites</i> sp.; <i>Inoceramus (Retroceramus)</i> sp.; <i>Pleuromya</i> sp.; <i>Ctenostreon</i> sp.	093L/11
19915	GSC Calgary	1989	Cretaceous	macrofossil	ammonoid	<i>Columbitrignia</i> sp.	093L/11
19916	GSC Calgary	1989	Cretaceous	macrofossil	ammonoid	<i>Myophorella (Yaadia)</i> sp.	093L/11
28242	GSC Calgary	2008	Jurassic	macrofossil	ammonoid	<i>Choffatia</i> sp.	093L/11
28243	GSC Calgary	2008	Jurassic	macrofossil	bivalve	<i>Pleuromya</i> sp.	093L/11
28244	GSC Calgary	2008	Jurassic	macrofossil	ammonoid	<i>Iniskinites tenasensis</i>	093L/11
28245	GSC Calgary	2008	Jurassic	macrofossil	ammonoid	? <i>Choffatia</i> (? <i>Elatmites</i>) sp.	093L/11
28246	GSC Calgary	2008	Jurassic	macrofossil	ammonoid	na	093L/11
28247	GSC Calgary	2008	Jurassic	macrofossil	ammonoid	<i>Xenocephalites</i> sp.	093L/11
28248	GSC Calgary	2008	Jurassic	macrofossil	ammonoid	? <i>Iniskinites robustus</i>	093L/11
28249	GSC Calgary	2008	Jurassic	macrofossil	ammonoid	? <i>Iniskinites robustus</i> ; <i>Iniskinites</i> sp.	093L/11
28250	GSC Calgary	2008	Jurassic	macrofossil	ammonoid	? <i>Epizigzagiceras</i> sp.	093L/11
28251	GSC Calgary	2008	Jurassic	macrofossil	ammonoid	<i>Choffatia</i> sp.	093L/11
28252	GSC Calgary	2008	Jurassic	macrofossil	bivalve	<i>Retroceramus</i> sp.	093L/11
28253	GSC Calgary	2008	Jurassic	macrofossil	ammonoid	<i>Iniskinites tenasensis</i>	093L/11
37718	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	<i>Oppelia (Oxycerites)</i> sp.	093L/11
37719	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	<i>Mepasphaeroceras</i> ? aff. <i>M. rotundum</i>	093L/11
37720	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid	<i>Mepasphaeroceras</i> ? aff. <i>M. rotundum</i>	093L/11
37721	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
37722	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid	<i>Morrisiceras</i> ? <i>dubium</i>	093L/11
37723	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid	na	093L/11
37724	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
37725	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
37726	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid	<i>Epizigzagiceras evolutum</i>	093L/11
37727	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid	<i>Epizigzagiceras evolutum</i>	093L/11
37728	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
37733	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid	<i>Arctocephalites (Cranocephalites) costidensus</i>	093L/11
37734	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	<i>Arctocephalites (Cranocephalites) costidensus</i>	093L/11
37736	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid	<i>Parareineckia</i> cf. <i>P. shelikofana</i>	093L/11
37739	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid	<i>Arctocephalites (Cranocephalites) aff. A. (C.) pompeckji</i>	093L/11
37747	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid; bivalve	<i>Cobbanites talkeetnanus</i>	093L/11
37748	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	<i>Cobbanites</i> sp.	093L/11
37749	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	<i>Cobbanites talkeetnanus</i>	093L/11
37751	GSC Ottawa	1971	Jurassic	macrofossil	ammonoid; bivalve	<i>Cobbanites talkeetnanus</i>	093L/11
37752	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
37753	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
37754	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
37893	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	<i>Zemistephanus</i> sp.	093L/11
38454	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella montanaensis</i>	093L/11
38455	GSC Ottawa	1970	Jurassic	macrofossil	bivalve	<i>Myophorella montanaensis</i>	093L/11
38456	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella montanaensis</i>	093L/11

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38457	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella montanaensis</i>	093L/11
38458	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella montanaensis</i>	093L/11
38463	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella tipperi</i>	093L/10
38464	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella tipperi</i>	093L/10
38465	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella tipperi</i>	093L/10
38466	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella tipperi</i>	093L/10
38467	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella tipperi</i>	093L/10
38469	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella tipperi</i>	093L/10
38470	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	<i>Myophorella tipperi</i>	093L/10
38474	GSC Ottawa	1970	Jurassic	macrofossil	bivalve	<i>Scaphotrigonia naviformis</i>	093L/11
38475	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	? <i>Orthotrigonia</i> sp.	093L/10
38476	GSC Ottawa	1971	Jurassic	macrofossil	bivalve	? <i>Orthotrigonia</i> sp.	093L/10
39005	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39006	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39007	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39008	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39009	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39010	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39011	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39012	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39013	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39014	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39015	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39016	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39017	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39018	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39019	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39022	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39023	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39024	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39025	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39027	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39028	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39029	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39030	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39031	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39032	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39033	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39034	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39035	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	na	093L/11
39936	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	<i>Troitsaia westermanni</i>	093L/10
39970	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	<i>Tmetoceras scissum</i>	093L/15

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39971	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	<i>Tmetoceras scissum</i>	093L/10
39977	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	<i>Tmetoceras scissum</i>	093L/10
39978	GSC Ottawa	1969	Jurassic	macrofossil	ammonoid	<i>Tmetoceras scissum</i>	093L/15
39979	GSC Ottawa	1970	Jurassic	macrofossil	ammonoid	<i>Tmetoceras scissum</i>	093L/15
39980	GSC Ottawa	1969	Jurassic	macrofossil	ammonoid	<i>Tmetoceras scissum</i>	093L/15
10821	GSC Calgary	1971	undetermined	microfossil	barren	na	093L/10
10831	GSC Calgary	1971	undetermined	microfossil	barren	na	093L/11
16807	GSC Calgary	1987	undetermined	microfossil	plant	na	093L/11
16808	GSC Calgary	1987	undetermined	microfossil	plant	na	093L/11
16809	GSC Calgary	1987	undetermined	microfossil	plant	na	093L/11
16810	GSC Calgary	1987	undetermined	microfossil	plant	na	093L/11
16811	GSC Calgary	1987	undetermined	microfossil	plant	na	093L/11
16812	GSC Calgary	1987	undetermined	microfossil	plant	na	093L/11
20480	GSC Calgary	1987	undetermined	microfossil	pollen; spores	na	093L/11
20481	GSC Calgary	1987	Cretaceous	microfossil	pollen; spores; dinoflagellate; algae	na	093L/11
20482	GSC Calgary	1987	Cretaceous	microfossil	pollen; spores; dinoflagellate	na	093L/11
20483	GSC Calgary	1987	Cretaceous	microfossil	pollen; spores; dinoflagellate	na	093L/11
20484	GSC Calgary	1987	Cretaceous	microfossil	spores	na	093L/11
20485	GSC Calgary	1987	Cretaceous	microfossil	pollen; spores; dinoflagellate	na	093L/11
20486	GSC Calgary	1987	Cretaceous	microfossil	pollen; spores; dinoflagellate	na	093L/11
20487	GSC Calgary	1987	Cretaceous	microfossil	pollen; spores	na	093L/11
20488	GSC Calgary	1987	Cretaceous	microfossil	pollen; spores	na	093L/11
20489	GSC Calgary	1987	Cretaceous	microfossil	pollen; spores	na	093L/11

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CHANCE FIND PROTOCOL FOR PALAEOLOGICAL RESOURCES IN BRITISH COLUMBIA – TENAS PROJECT

PHASE I

PREPARED FOR

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By

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December 1st, 2021

INTRODUCTION

Palaeontological resources (or fossils) in the Province of British Columbia are protected under the *Land Act* (LA), by the B.C. Fossil Management Office, Heritage Branch (BCHB). According to BCHB “...all fossils on Crown Land are property of the province and may not be sold or removed from the province. Collecting of fossils is prohibited without a permit”. Therefore, when a developer encounters a fossil during ground disturbing activities, it is required that the find is reported to the Heritage Branch. Additionally, fossils are qualified under the *Heritage Conservation Act* (HCA) as items having “heritage value” because of their scientific and educational worth. The HCA provides protection and regulation for fossils or fossil sites when they are designated as Provincial Heritage Objects or Sites under the HCA.

As thus, under section 12.2 of the HCA, a person must not “*damage, desecrate or alter a Provincial heritage site or a Provincial heritage object or remove from a Provincial heritage site or Provincial heritage object any heritage object or material that constitutes part of the site or object*”.

Therefore, the following guidelines are established, based on the latest BCHB guidelines (BCHB 2021), should the Project development activities come across any significant fossil materials.

Because the significance of fossils expected to be found within project lands has not yet been determined (pending the completion of a Fossil Impact Assessment, or FIA), these preliminary guidelines are not fully applicable to pre-construction activities, such as exploration. For the pre-construction activities, only items 3 to 6 are applicable to fossil finds (even when significance is undetermined), as these steps will aid with data collection for future palaeontological surveys, including the FIA.

Once the significance of fossils around the project area has been determined (through the completion of an FIA), the other steps of the protocol are expected to be followed as well, for project related construction activities. This protocol may also be adjusted to more specifically fit the expected impacts to fossil resources after more information has been gathered through the FIA.

PROJECT BACKGROUND INFORMATION

The Tenas Project (the Project) is located in the Bulkley Nechako region, 25 km south of Smithers and 7 km southwest of Telkwa, B.C. The Project area consists of the mine site and an

11 km bypass road (and additional haul/access roads), as well as rail infrastructure consisting of a 2.5 km loop that will connect to the existing CN Railway line (Figure 1).

Because of the open pit excavation methods for the mine site, this is the portion of the Project expected to have the most impact to the underlying (volcanic and sedimentary) rock. The railway infrastructure is expected to have some cuts to rocks at a maximum of 4 metres. The various road development related excavations are expected to mostly stay within 4 metres in depth, however the portion in Goathorn Creek valley may have rock cuts of up to 24 metres.

Excavations for the roads and railway developments will impact sedimentary, intrusive, and volcanic rocks.

FOSSIL POTENTIAL

The nature of Project development activities indicate that the impact to underlying (volcanic and sedimentary) rocks from Telkwa and Bulkley Canyon Formations within the mine site will be significant. For the areas including the roads and railway infrastructure, the impact to underlying rock (sedimentary, volcanic, and intrusive) will vary, ranging from up to 4 metres in some of the roads and railway infrastructure to up to 24 metres at the Goathorn Creek valley (thus impacting sedimentary rocks from Bulkley Canyon Formation). The Telkwa Formation deposits have fossiliferous potential, with documented occurrences of fossils such as the bivalve *Myophorella* and *Weyla*, as well as brachiopods and ammonites such as *Paltechioceras* (Figure 2). The sedimentary Bulkley Canyon Formation rock is of the highest concern for this project, as it has a high density of fossils documented within close proximity to the Project boundaries, including macrofossils of the bivalves *Myophorella* (Figure 3) and *Columbitrionia* sp. (Figure 4). Drill holes related to this project have confirmed that these deposits have potential to yield bivalve fossils (Figure 1).

CHANCE FIND PROTOCOL

The documented macrofossils for the Project area include a variety of bivalve and ammonoid shells. The images provided for reference (Figures 2-4) may serve as a general guide, although a much more extensive variety of fossils can be expected. Additional site-specific photographs may be added to this guide, should there be a field survey of the Project area preceding development. The field survey may help determine the presence and approximate locations of fossils and assess their significance. Once the BCHB has reviewed the Preliminary Study and

indicated the appropriate next actions by the proponent, it is anticipated that **fossils deemed significant** will require mitigation through a chance find protocol.

If any significant fossil sites (or significant individual fossils) are encountered during development activities, the following steps are to be followed:

1. Any ground disturbance in the immediate vicinity of the find is to be suspended, and the fossil(s) to be left in place;
2. A buffer of 30-50 metres around the find is to be established, and taped off. Work must be redirected to another area, until the following steps are taken;
3. As soon as possible, contact the Project Palaeontologist working on your project OR the B.C. Fossil Management Office, Heritage Branch directly to report the find;
 - a. Senior Project Palaeontologist at Lifeways of Canada Limited: Dr. Miriam Reichel-Bodner, 780-278-6697, miriam@lifewaysofcanada.com, www.lifewaysofcanada.com
 - b. BC Fossil Management Office: (778)-698-4186, Fossil.Management@gov.bc.ca, <https://forms.gov.bc.ca/industry/report-a-fossil/>
4. Photograph the specimen (in place), adding a scale (an object such as a pen or a coin may be used). Take GPS coordinates of the location, as well as altitude;
5. Include notes about the type of fossil (if known) and depth data (if found in an excavation, as opposed to the surface);
6. If the fossils are observed within test cores, the fossil bearing core is to be set aside in a safe place, for possible posterior transference to an adequate repository. Similarly, if fossils are observed on the surface, they are also to be set aside safely until they can be transferred to a fossil repository.
7. If required, the Project Palaeontologist will collect initial data and will contact the B.C. Fossil Management Office, Heritage Branch or the Royal B.C. Museum;
8. The Project Palaeontologist will develop a mitigation plan in cooperation with the BCHB; and
9. Work must not resume at that location until approved by the B.C. Fossil Management Office, Heritage Branch.

FIGURES

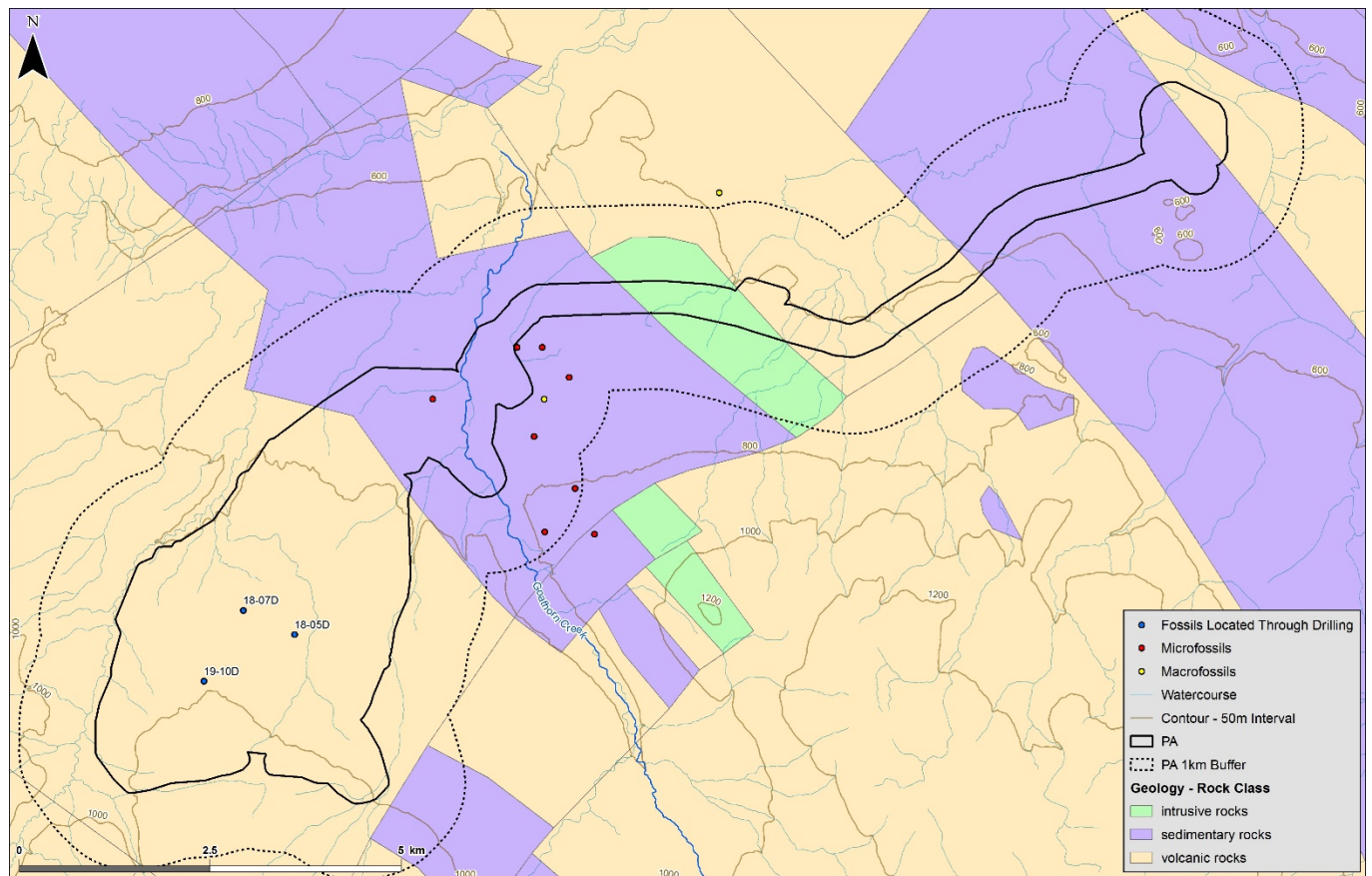


Figure 1. Map of the Project area (PA), showing rock types and known fossil localities. Note that mine site (west portion of PA, where the mine site is situated) is identified as Telkwa Formation (volcanic) rocks according to the latest BCGS geology map (Cui et al 2017). However, it has been determined that this area also contains Bulkley Canyon Formation (sedimentary) rocks (Alldrick and Lin 2007).



Figure 2. An example of a fragmentary ammonite *Paltechioceras* from the Telkwa Formation (modified from Pálffy and Schmidt 1994).

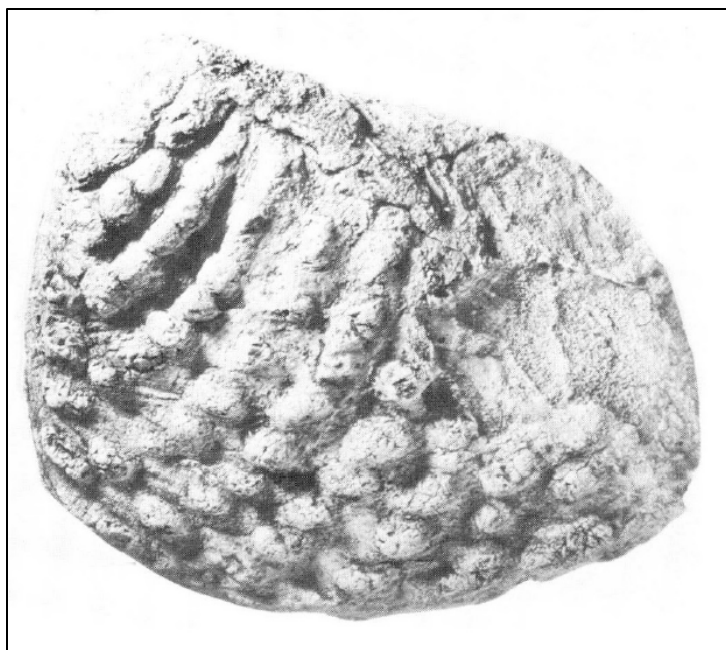


Figure 3. An example of a fragmentary bivalve *Myophorella*, such as those from the Bulkley Canyon Formation (modified from Poulton 1977).



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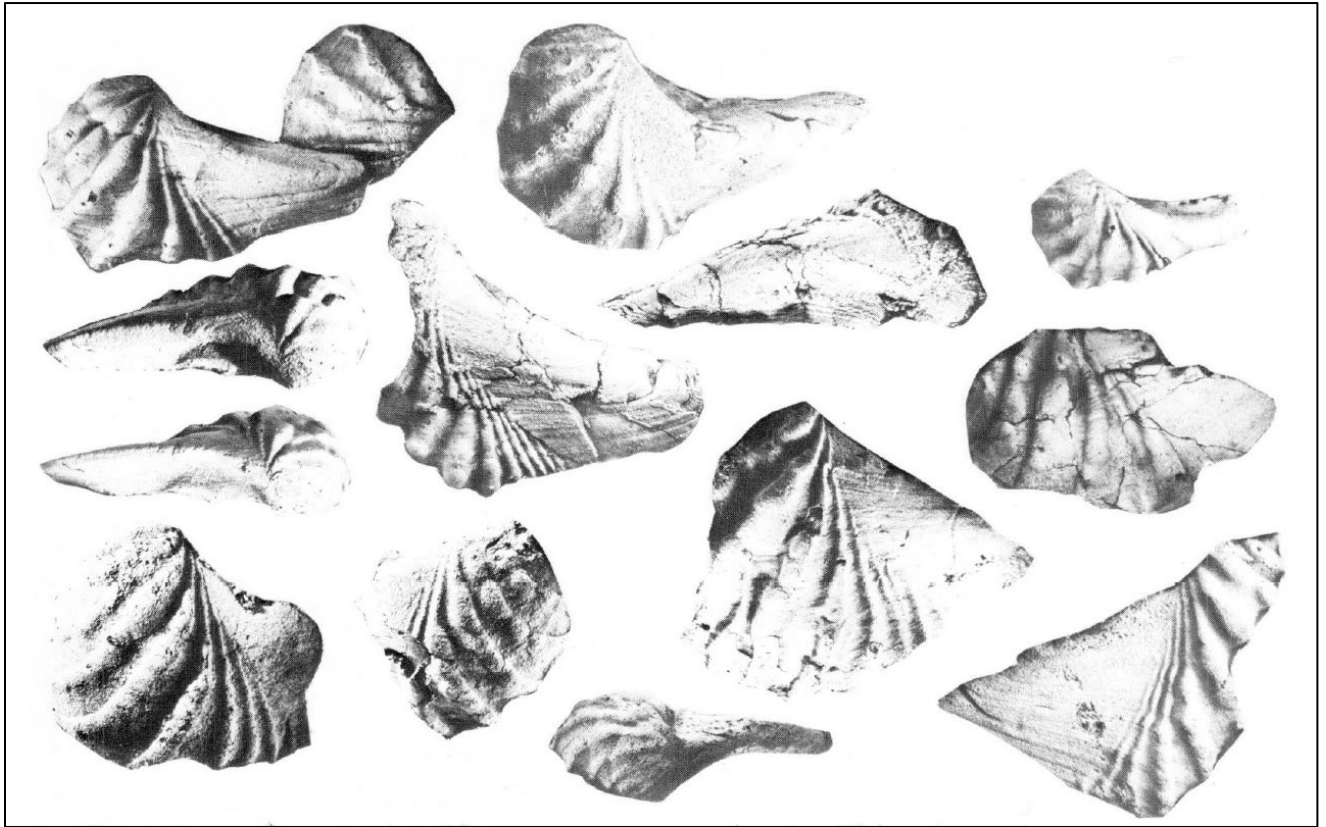


Figure 4. Examples of a the bivalve *Columbitrignia*, such as those from the Bulkley Canyon Formation (modified from Poulton 1977).

REFERENCES

Alldrick, D.J. and Lin, C-Y. M. 2007. Geology of the Skeena Group, Central British Columbia. *British Columbia Geological Survey*, Open File 2007-8.

BCHB. 2021. Fossil Impact Assessment (FIA) Guidelines for Industry. Online resource: [https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/fossil-management/fiaguidelines-abridgedforindustry_final.pdf]. Accessed on July 2021.

Cui, Y., Miller, D., Schiarizza, P., and Diakow, L.J., 2017. British Columbia digital geology. British Columbia Ministry of Energy, Mines and Petroleum Resources, British Columbia Geological Survey Open File 2017-8, 9p. Data version 2019-12-19.

Pálffy, J. and Schmidt, K.L., 1994: Biostratigraphic and facies studies of the Telkwa Formation (Lower Jurassic), Smithers map area, British Columbia. *In*: Current Research 1994-E; Geological Survey of Canada, p. 29-38.

Poulton, T.P. 1977. Early Cretaceous Trigonid Bivalves of Manning Provincial Park, Southwestern British Columbia. *Geological Survey of Canada*, Paper 76-9. 25 pp.