

Palaeontological Preliminary Study for the K2 Wind Project

September 2025

Prepared for:
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Project/File:
123222596

Executive Summary

K2 Wind Power Inc. (K2), a partnership between Westbank First Nation and Innergex Renewable Energy Inc., is applying to the British Columbia Energy Regulator to construct and operate the K2 Wind Project (the Project). The Project is being proposed in response to BC Hydro's 2024 Call-for-Power to acquire approximately 3,000 gigawatt hours per year of clean electricity. K2 is proposing to develop the Project on Pennask Mountain, approximately 40 kilometres west of West Kelowna, BC. The Project is proposed to consist of 28 wind-turbines, transmission lines, access roads and a substation, collectively referred to as the Project footprint.

In compliance with the Fossil Management Policy and Fossil Impact Assessment Guidelines for Industry, issued by the BC Fossil Management Office, a palaeontological preliminary study has been completed. This preliminary study reviews the relevant geological and palaeontological data to determine if the Project conflicts with previously recorded fossil sites and to assess the potential for unrecorded fossil sites within the Project area. Provincial sources of information, including BC's Important Fossil Areas and the Fossil Occurrence Database, were reviewed along with published geology maps and digital data, topographic maps, aerial imagery, and scientific literature.

The Project is situated along mountainous terrain around Pennask Mountain. Most of the strata are igneous rocks with nil palaeontological potential. Only the Sedimentary Facies of the Nicola Group consists of sedimentary rocks. Regionally, corals, clams, brachiopods, snails, ammonoids, and microfossils have been recorded in Nicola Group strata. Within a 5-km radius of the Project, there are eight recorded microfossil sites with conodonts and ichthyoliths. None of the fossil occurrences are considered significant as these microfossils are common and widespread. As no macrofossils have been recorded in the area, the local palaeontological potential of the rocks is considered low.

The likelihood of Project effects to significant palaeontological resources is considered low. No further palaeontological studies are recommended. A Chance Find Protocol for Fossil Discoveries is provided.



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1 Introduction

K2 Wind Power Inc. (K2), a partnership between Westbank First Nation and Innergex Renewable Energy Inc., is applying to the British Columbia (BC) Energy Regulator to construct and operate the K2 Wind Project (the Project). The Project is being proposed in response to BC Hydro's 2024 Call-for-Power to acquire approximately 3,000 gigawatt hours per year of clean electricity. K2 is proposing to develop the Project on Pennask Mountain, approximately 40 kilometres (km) west of West Kelowna, BC (Figure 1). The Project is proposed to consist of 28 wind turbines, transmission lines, access roads and a substation, collectively referred to as the Project footprint (Figure 2). The Project Study Area, which is a 1-km buffer around the Project footprint, has an area of approximately 8,514.6 hectares that will be considered in the development of the Project layout. The actual footprint of the Project, consisting of the wind turbines, roadways, transmission lines, substation and other supporting infrastructure, will occupy a considerably smaller area

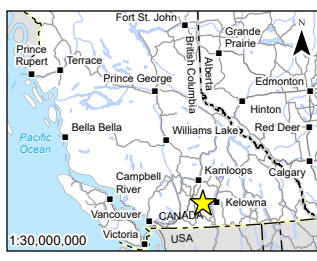
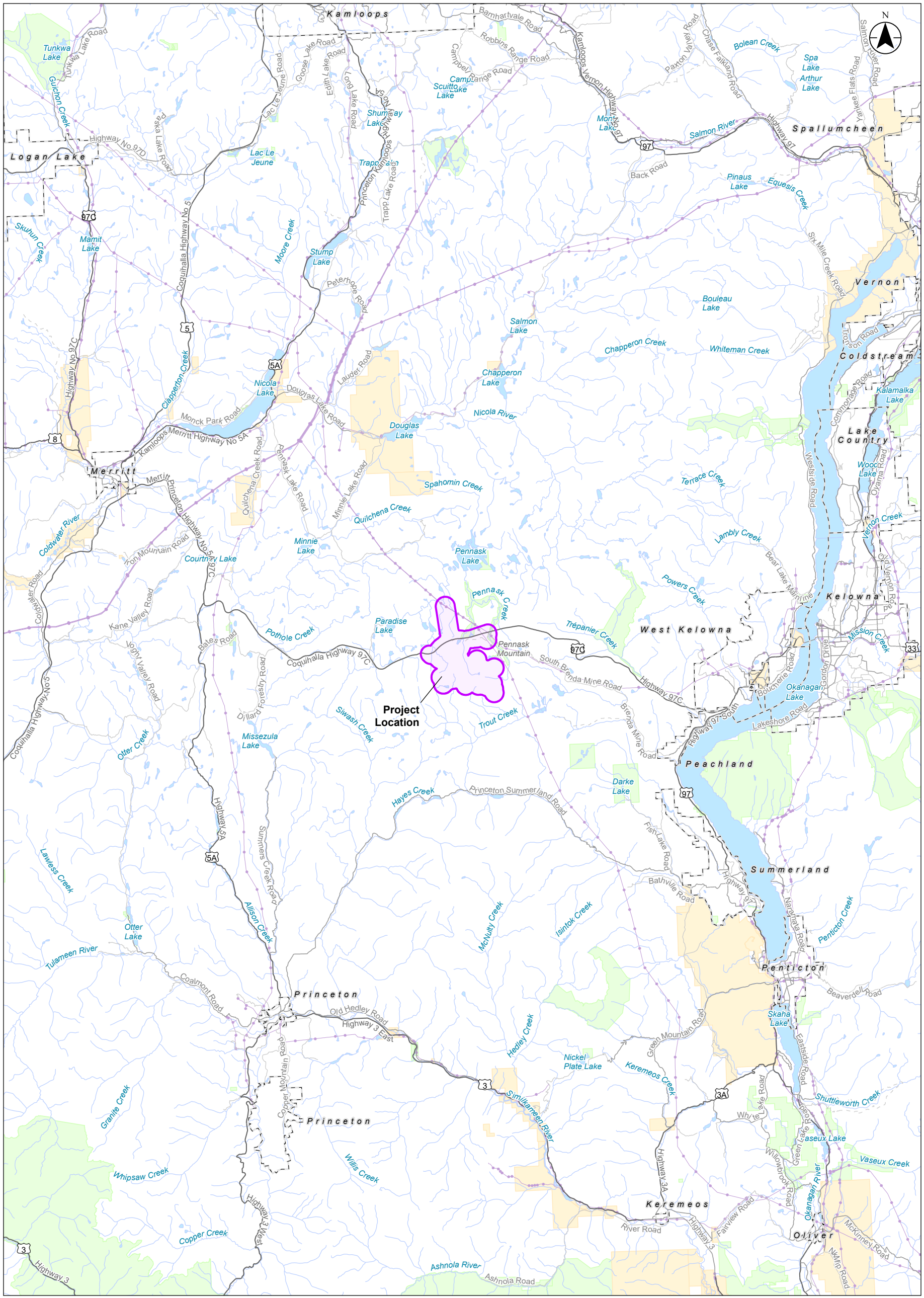
This document provides the results of a preliminary study of the palaeontological potential of the Project, in accordance with the *Fossil Management Policy* and *Fossil Impact Assessment (FIA) Guidelines for Industry*, issued by the BC Fossil Management Office (FMO), Ministry of Tourism, Arts, Culture, and Sport (Government of BC 2021, 2022).

Palaeontological (fossil) sites and objects on Provincial Crown land in BC are protected under the *Land Act*, which is administered by FMO. Fossils, or palaeontological resources, are the preserved remains, traces, or imprints of organisms from the geological past. Fossils include marks left behind by the organisms while they were alive, such as footprints (trace fossils). Fossils represent the historical record of the evolution and development of life on earth. They are important globally for their scientific, heritage, educational, and economic value (Government of BC 2022).

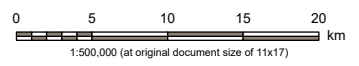
Palaeontological sites are non-renewable and are susceptible to alteration, damage, and destruction by development projects. The value of these resources cannot be measured in terms of individual fossils; rather, the value of palaeontological resources lies in the integrated information derived from the interrelationships of the individual specimens, associated features, spatial relationships (distribution) and context. Interpretation of fossil material is based on an understanding of the nature of the relationship between fossils and the sediments and surrounding strata. Removal or mixing of these strata results in the permanent loss of information basic to the understanding of these resources. As a result, palaeontological resources are increasingly susceptible to destruction and depletion through disturbance.

There are typically three stages to the fossil impact assessment and review process including preliminary study, impact assessment (FIA), and impact mitigation. The preliminary study is intended to identify and assess palaeontological resource potential or the likelihood that fossil sites are present. The objectives of the FIA are the identification and evaluation of palaeontological resources within a proposed development area and the assessment of possible impacts by the development on these sites. Impact mitigation is a course of action that results in the reduction or the elimination of the adverse impacts of a development. Mitigation can involve site salvage either before development or during palaeontological construction monitoring and institution of a chance find protocol.





- Highway
- Road
- Local Street
- - - Resource Road
- Railway
- Transmission Line
- Watercourse
- Waterbody
- Municipal Boundary
- First Nations Reserve
- Provincial Park, Ecological Reserve, or Protected Area
- Study Area



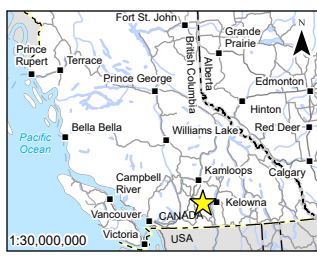
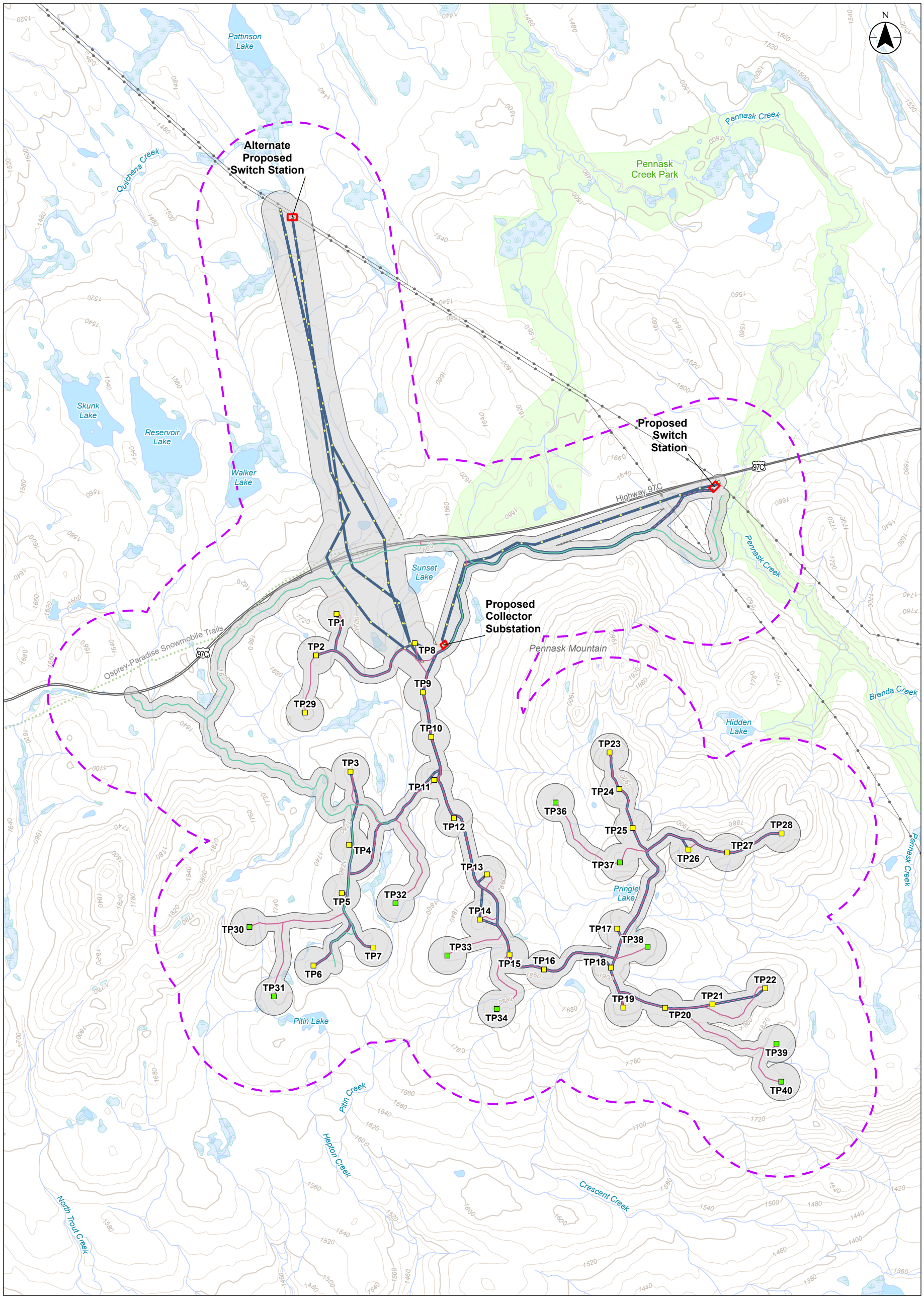
Project Location: Thompson-Nicola, BC
 Project Number: 12322596
 Requested by: LBOHACH 20250805
 Prepared by: RCOATTA 20250805
 Checked by: LBOHACH 20250805

Client/Project/Report: K2 Wind Power Inc. K2 Wind Project Palaeontological Preliminary Study

Figure No. 1
 Title: Location of Project

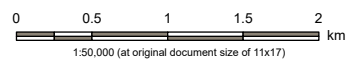
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Notes
 1. Coordinate System: NAD 1983 UTM Zone 10N
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada
 TRIM Contour Lines:

- Highway
- Road
- Local Street
- - - Resource Road
- ... Trail
- Transmission Line
- Index Contour (100 m)
- Intermediate Contour (20 m)
- Watercourse
- Waterbody
- Wetland
- Provincial Park, Ecological Reserve, or Protected Area
- Project Footprint
- Study Area
- Substation
- Proposed Wind Turbine Generators:
 - Turbine Pad Location
 - Alternate Turbine Pad Location
- Proposed Roads:
 - Existing Road
 - Proposed Road
- Proposed Transmission Lines:
 - Proposed Feeder Line
 - Proposed Transmission Line



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 Figure No.: 2
 Title: Project Layout

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Palaeontological Preliminary Study for the K2 Wind Project

Section 1: Introduction

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The objectives of this preliminary study are to:

- Identify previously recorded fossil sites, if present, within and around the Project Study Area
- Identify and assess the potential for unrecorded fossil sites within the Project footprint
- Assess potential impacts to palaeontological sites
- Determine the appropriate methods and scope of work for subsequent palaeontological studies, if needed



2 Methods

2.1 Background Information Review

Stantec Consulting Ltd. (Stantec) undertook a desktop study of relevant geological and palaeontological data to determine if the Project conflicts with previously recorded fossil sites and to assess the potential for unrecorded fossil sites within the Project footprint. The following information sources were reviewed:

- BC's Important Fossil Areas Map (Government of BC 2025a, internet site)
- Locations of previously recorded fossil sites, as documented in the Fossil Occurrence Database (Government of BC 2025b, restricted internet site)
- Bedrock geology digital data (BC Geological Survey 2025)
- Topographic maps and aerial imagery
- Scientific literature

2.2 Palaeontological Potential Assessment

Key factors considered in this assessment include:

- Palaeontological resource potential of the surficial deposits and underlying bedrock
- Proximity to known fossil sites
- Landscape and terrain features
- Depth of anticipated ground disturbance

Assessment of effects on palaeontological sites is largely qualitative and focused on the potential for impact. It considers not only the recorded sites in the area, but the potential for new, deeply buried sites to be discovered during project construction. Palaeontological resource potential, which is the likelihood of fossil occurrences, can be applied both to geological strata and to land areas (e.g., steep slopes where trenching is likely to encounter bedrock). Based on the FIA Guidelines for Industry (Government of BC 2021), there are five categories of palaeontological potential:

- **High Potential**, where fossils are expected or known. Strata with high palaeontological potential include Quaternary cave, beach, marine, and terrace deposits and sedimentary rocks that are fossiliferous to highly fossiliferous with a regular to consistent and predictable yield of fossils. Management concern is high, with field survey and monitoring of excavations often necessary;
- **Medium Potential**, where fossils are possible or unknown. Strata with medium palaeontological potential include Quaternary outwash and lacustrine deposits and sedimentary rocks with variable fossil content that is unpredictable, scattered, or unknown. Management concern is medium, with field survey and monitoring of excavations often necessary;



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- **Low Potential**, where fossils are unlikely. Strata with low palaeontological potential include Quaternary colluvium, thick glacial sand, and reworked gravel; sedimentary rocks where the units are not known or likely to contain fossils; and igneous volcanic rocks that rarely preserve fossils. Management concern is generally low;
- **Very Low Potential**, where fossils are rare (i.e., very unlikely). Strata with very low palaeontological potential include Quaternary highly weathered, slumped deposits and till; sedimentary rocks that have been weathered, corroded, or recrystallized; and igneous and low-grade metamorphic rocks. Management concern is negligible or not applicable; and
- **Nil**, or no chance of fossils. Strata with nil palaeontological potential include igneous and high-grade metamorphic rocks. Management concern is negligible or not applicable.

Evaluation of palaeontological potential is further refined by consideration of the heritage value of known fossils from a unit. Heritage value is the relative importance of a fossil or site based on abundance of material, quality of preservation, taxonomic value (e.g., new species), diversity, geographic value, biostratigraphic value, palaeoenvironmental value, aesthetic/public value, and cultural/spiritual value. Microfossils, such as pollen and foraminifera, are less than 1 mm in size and are widespread in sedimentary rocks. Their heritage value is considered low as they are not a unique or limited resource. Similarly, most trace fossils and invertebrates such as bivalves and snails are common and widespread. In contrast, any vertebrate remains, vertebrate trackways, and invertebrates such as ammonites and arthropods have high heritage value as they might represent unusual occurrences.

An interaction between the Project and palaeontological resources is considered likely when excavation occurs in strata with medium to high palaeontological resource potential. Anticipated interactions would be expected during ground disturbance where excavation encounters strata with medium to high palaeontological potential, such as bedrock, terrace alluvium, and lacustrine deposits. Project effects on palaeontological resources would be limited to the Project footprint.



3 Geological Setting

The Project is situated along Quesnelia Terrane of the Intermontane Belt (Wheeler et al. 1991). This is a package of igneous volcanic and intrusive rocks with volcanic-derived sedimentary rocks that were deposited in a volcanic island arc off the coast of North America in the Mesozoic.

3.1 Bedrock Geology and Palaeontology

The Project is situated along mountainous terrain around Pennask Mountain. The bedrock geology is illustrated in Figure 3. Most of the geological units are igneous rocks with only the sedimentary facies of the Nicola Group consisting of sedimentary rocks (BC Geological Survey 2025).

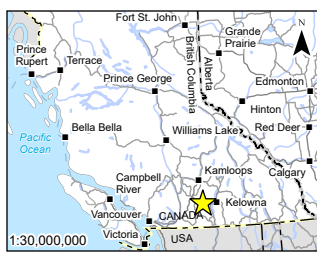
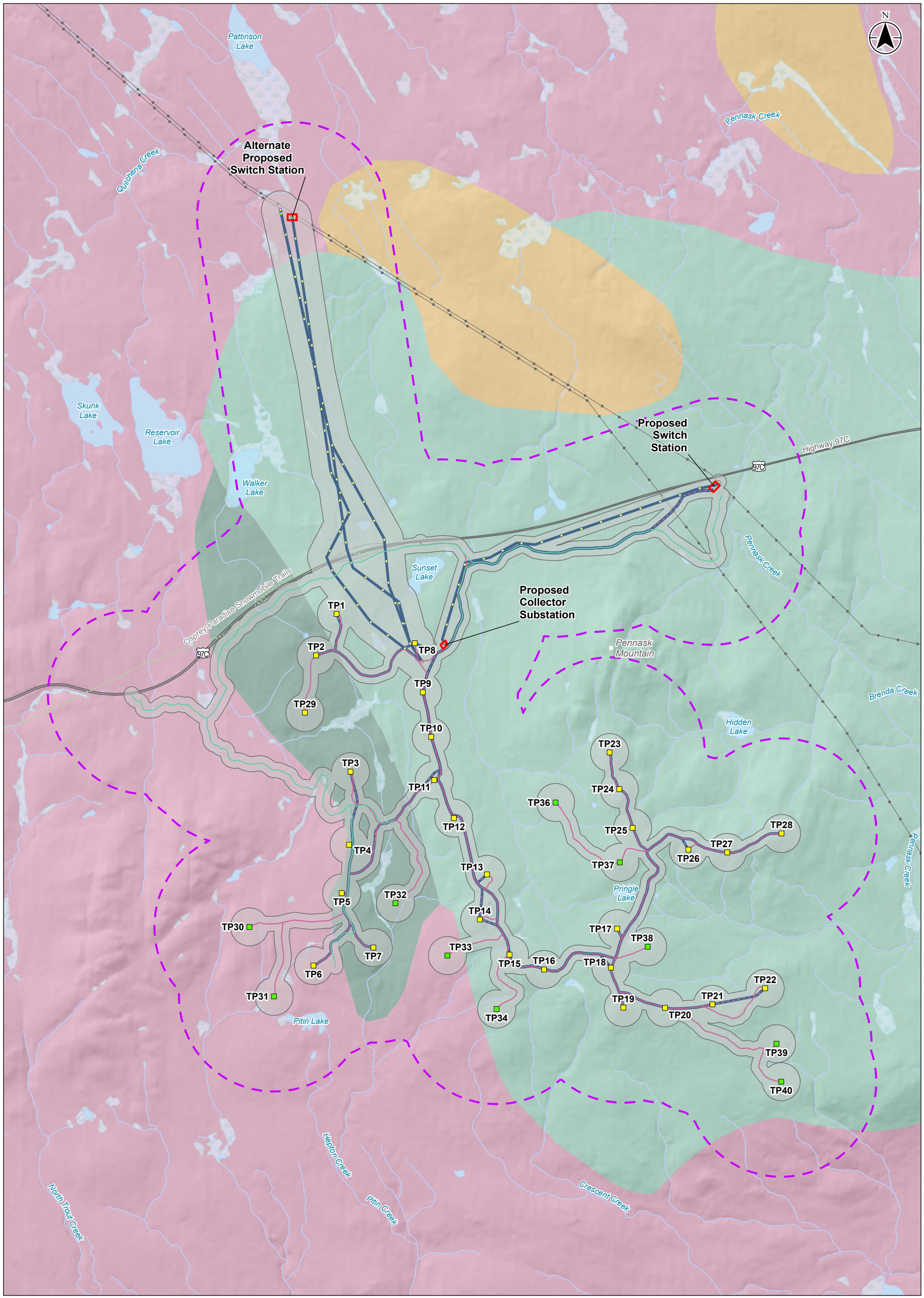
Igneous intrusive rocks of granite and granodiorite occur along the south, west, and north margins of the Study Area (Figure 3). The palaeontological potential of igneous intrusive rocks is nil and they are not considered further. The Eocene Princeton Group occurs along the northeast tip of the Study Area but does not overlap with the Project footprint. In this area, the Princeton Group consists of andesitic volcanic rocks of lava flows and volcaniclastic rocks (BC Geological Survey 2025). While in some areas, the Princeton Group volcanics are interbedded with fossiliferous sedimentary rocks of the Allenby Formation (Dillhoff et al. 2013; McMechan 1983), this facies has not been recorded in the Study Area. The palaeontological potential of the andesitic rocks of the Princeton Group is considered very low.

The Upper Triassic Nicola Group is the most palaeontologically interesting unit in the Study Area. It consists of two mapped facies: the Eastern Volcanic Facies and the Sedimentary Facies (Figure 3). The Eastern Volcanic Facies occurs in a band through the western portion of the Study Area. It consists of breccia and tuff and has low palaeontological potential. The Sedimentary Facies consists of shale, argillite, siltstone, sandstone phyllite, and tuff. Locally, conglomerate, limestone, and greenstone also occur. Macrofossils of corals, clams, brachiopods, snails, and ammonoids and microfossils of conodonts and ichthyoliths have been recorded in the Nicola Group Sedimentary Facies (Preto 1979).

There are eight fossil sites recorded within a 5-km radius of the Project footprint (Government of BC 2025b, restricted internet site). No macrofossils have been recorded. Site records indicate the occurrence of microfossils of conodonts (i.e., toothlike elements from an extinct group of jawless vertebrates that are used extensively in biostratigraphy), ichthyoliths (i.e., small pieces of fish remains, such as scales, denticles or teeth), and unidentified microfossils. Some of the site records consist of localities recorded as barren (i.e., they were sampled and processed for microfossils but did not yield any fossils). There is one fossil site within the Study Area near alternate turbine pad TP30. It is outside the potential Project footprint. This is Geological Survey of Canada Location C-143206, which produced Triassic conodonts from the Nicola Group. None of the fossil occurrences are considered significant as these microfossils are common and widespread.

Regionally, the Nicola Group has high palaeontological potential. However, none of the fossil sites within a 5-km radius of the Project footprint are significant. Therefore, the local palaeontological potential is considered low.



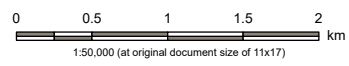


Notes
 1. Coordinate System: NAD 1983 UTM Zone 10N
 2. Data Sources: DataBC, Government of British Columbia; Natural Resources Canada
 Bedrock Geology - REST.

- Highway
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- Proposed Transmission Lines:
 - Proposed Feeder Line
 - Proposed Transmission Line

- BC Bedrock Geology:**
- Princeton Group (Volcanic)
 - Igneous Intrusive
 - Nicola Group (Eastern Volcanic Facies)
 - Nicola Group (Sedimentary Facies)



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 Checked by: LBOHACH 20250808

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Figure No.
3
 Title
Bedrock Geology

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3.2 Surficial Geology

The Project lies in mountainous terrain covered by till veneers and colluvium over bedrock. Fluvial sediments are mapped along only a small portion of the Project footprint where the proposed switching station and an existing road intersect the Pennack Creek valley (BC Geological Survey 2025).



4 Results – Fossil Resource Potential

The Important Fossil Areas Map provides a visual representation of general areas of BC that have important palaeontological resources (Government of BC 2025a). The Project does not overlap with a designated Important Fossil Area; however, there are some sedimentary rocks in the Study Area.

Sedimentary rocks in the Study Area belong to the Nicola Group (BC Geological Survey 2025). Fossil sites recorded within a 5-km radius of the Project footprint contain microfossils, which are common and widespread. Since these are not significant fossils, the local palaeontological potential is considered low. The likelihood of the Project encountering significant palaeontological resources during construction is also considered low. This potential impact is considered mitigated by the Project-specific chance find protocol (Appendix A).



5 Recommendations

As the likelihood of Project impacts to significant palaeontological resources is considered low, no further palaeontological studies are recommended. A Project-specific chance find protocol is provided in Appendix A.



6 Closing

This report has been prepared for the sole benefit of K2 Wind Power Inc. (K2) and may not be used by any other person or entity, other than for its intended purposes, without the express written consent of Stantec Consulting Ltd. (Stantec) and K2. Any use that a third party makes of this report is the responsibility of such third party.

The information and recommendations contained in this report are based upon guidelines issued by the Fossil Management Office, Ministry of Tourism, Arts, Culture, and Sport. Further, the information and recommendations contained in this report are in accordance with our understanding of the Project as it was presented at the time of our report. The information provided in this report was compiled from existing documents, geological and palaeontological databases, project information provided by K2, and others. If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, Stantec requests that we be notified immediately, and permitted to reassess the conclusions provided herein.

This report was prepared by Lisa Bohach, Ph.D. and reviewed by Jean-Paul Foster, MA., and Kate Peach, M.A. If you have any questions or comments on the contents of this report, please contact the undersigned.

Stantec Consulting Ltd.

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