California Institute of Technology
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Re: Reconstructing ancient sea level and seafloor conditions in the 1.9-billion-year-old Rocknest Formation

Dear Nunavut Impact Review Board,

Below is a non-technical description of my proposed research activity in Nunavut this summer. I have included the same document translated into Inuktitut and Inuinnaqtun. Please let me know if you have any feedback or questions. Thank you for your time and consideration.

Who: Emily Geyman, PhD student, California Institute of Technology.

What: The Rocknest Formation consists of carbonate rocks that formed at the seafloor 1.9 billion years ago. These rocks, superbly exposed in the Kitikmeot Region, provide a rare window into ancient climate and life on Earth. I am requesting permission to carry out a small-scale research project in which myself and two assistants (3 people total) will camp next to Eokuk Lake for approximately 6 weeks. We will be dropped-off and picked-up by floatplane out of Yellowknife. Each day, we will travel by foot 1-10 km from the camp to carry out our research, which involves documenting the properties (e.g., grain size) of every rock layer in the Rocknest Formation. We will sleep in tents and store all food and garbage in sealed, wildlife-proof containers. We will pack out all equipment and garbage and dispose of it in Yellowknife. We will honor the wildlife, landscape, and natural environment.

Why: Studying ancient climate and sea level change on Earth can help us make better predictions of future climate change. It is still poorly known when in Earth's 4.5-billion-year history was Earth covered in ice, and when was Earth warm and ice-free. Understanding when Earth had ice, and how it transitioned between cold and warm states, holds important information about Earth's climate system that can inform our mitigation strategies for future climate change.

Where: Our proposed camp at Eokuk Lake (67.410072, -112.984692) is located approximately 101 km southeast of Kugluktuk and 550 km north of Yellowknife.

When: Our proposed field work is from July-01-2022 to August-15-2022. The exact dates of the field work may change depending on floatplane availability and weather.

Sincerely,

Emily Geyman

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