NIRB Application for Screening #125885

Evaluation of the Deep Geothermal Potential of Baker Lake, Nunavut, Canada

Application Type:	New
Project Type:	Scientific Research
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Period of operation:	from 0001-01-01 to 0001-01-01
Proposed Authorization:	from 0001-01-01 to 0001-01-01
Project Proponent:	Ysaline Bacon Institut Nation de Recherche Scientifique 490 Rue de la Couronne Québec City Québec G1K 9A9 Canada Phone Number:: +33695051333, Fax Number::

DETAILS

Non-technical project proposal description

English: Non-technical Summary1.1 Project Title:Evaluation of the Deep Geothermal Potential of Baker Lake, Nunavut, Canada1.2 Lead Researchers and Affiliation:Pr. Jasmin Raymond, Dr. Mafalda Miranda, Ysaline Bacon1.3 Research Questions:We aim to assess the deep geothermal potential of Baker Lake at the request of the Qulliq Energy Corporation (QEC). Our goal is to complement Respec's geothermal exploration project for QEC by addressing the following questions:Can the geothermal resources beneath Baker Lake meet the community's heating and electricity needs? Are the deep geothermal resources in Baker Lake obtainable at a competitive cost?To answer these questions, we plan to conduct fieldwork, laboratory analyses, numerical modelling, and life-cycle cost analysis. These cost-effective tools will provide a preliminary assessment of Baker Lake's deep geothermal potential.1.4 Research Objectives:This project aims to assess Baker Lake's geothermal potential by identifying key parameters that need more information to mitigate future risks. Objectives include studying local geology, characterizing thermophysical properties of rocks, evaluating geothermal potential, developing numerical models, and analysing life-cycle costs. The results could support geothermal development in the north and contribute to a thermo-hydro-mechanical properties database. The goal is to promote sustainable energy independence while respecting the environmental and social values of the Baker Lake community.1.5 Where, When, and Duration of Field Research:Field research is scheduled for the summer of 2024 (between June 1, 2024, to September30, 2024) and will be conducted within a limited area (less than 10 km) surrounding theBaker Lake community. The fieldwork is expected to span over three weeks.1.6 Methods for Fieldwork:Research methods include fracture studies, geological mapping, and surface rock sample collection. Fracture data will be gathered through linear scanline and rectangular window sampling methods. Linear scanline involves measuring attributes of fractures intersecting a tape laid on an outcrop. Rectangular window sampling uses a rectangle placed on an outcrop to measure selected fracture attributes within the area. Surface rock samples will be collected using a geological hammer.1.7 Environmental, Wildlife, and Societal Impacts:With no drilling planned, we expect minimal environmental and societal impacts from our research. Our field activities will be conducted quietly and with utmost respect for the environment. Despite the research's proximity to the community, no impacts on wildlife are expected. Regarding social impact, Baker Lake has already experienced Respec's work in December 2022, which involved engaging in dialogue with residents. Based on this, we anticipate a positive community response. Additionally, we'll conduct follow-up activities with the Qulliq Energy Corporation (QEC). This collaboration is crucial, as QEC could potentially use our findings, in partnership with the community, to advance geothermal resource development if desired by the community. This proactive approach underscores our commitment to transparent communication, community engagement, and potential collaboration for the benefit of Baker Lake and its residents..1.8 Data Storage and Management:The results obtained from the 2024 fieldwork will remain within our institution until their public release in spring 2025, in the English language.1.9 Involvement of Nunavut Residents:The Baker Lake community will be actively engaged in the research by sharing their expectations and limits. Their preferences for heating and energy sources will contribute to building a realistic model for assessing the potential and feasibility of installing a geothermal heating system within the community.1.10 Communication of Research Results in Nunavut:Research findings will be shared with Baker Lake through a non-technical report. We maintain open communication with our team and invite future collaboration. This project aligns with environmentally responsible practices, meeting the community's specific needs for a sustainable energy solution while preserving local values.

French: Résumé non technique1.1 Titre du Projet :Évaluation du Potentiel Géothermique Profond du Lac Baker, Nunavut, Canada1.2 Chercheurs Principaux et Affiliation :Pr. Jasmin Raymond, Dr. Mafalda Miranda, Ysaline Bacon1.3 Questions de Recherche :Notre objectif est d'évaluer le potentiel géothermique profond du Lac Baker à la demande de la Qulliq Energy Corporation (QEC). Nous visons à compléter le projet d'exploration géothermique de Respec pour la QEC en abordant les questions suivantes :Les ressources géothermiques sous le Lac Baker peuvent-elles répondre aux besoins de chauffage et d'électricité de la communauté ?Les ressources géothermiques profondes du Lac Baker sont-elles accessibles à un coût compétitif ?Pour répondre à ces questions, nous prévoyons de mener des travaux sur le terrain, des analyses en laboratoire, une modélisation numérique et une analyse des coûts du cycle de vie. Ces outils économiques fourniront une évaluation préliminaire du potentiel géothermique profond du Lac Baker.1.4 Objectifs de Recherche :Ce projet vise à évaluer le potentiel géothermique du Lac Baker en identifiant les paramètres clés nécessitant plus d'informations pour atténuer les risques futurs.

Les objectifs incluent l'étude de la géologie locale, la caractérisation des propriétés thermophysiques des roches, l'évaluation du potentiel géothermique, le développement de modèles numériques et l'analyse des coûts du cycle de vie. Les résultats pourraient soutenir le développement géothermique dans le nord et contribuer à une base de données sur les propriétés thermo-hydro-mécaniques. L'objectif est de promouvoir l'indépendance énergétique durable tout en respectant les valeurs environnementales et sociales de la communauté du Lac Baker.1.5 Lieu, Date et Durée des Travaux sur le Terrain :Les travaux sur le terrain sont prévus pour l'été 2024 (entre le 1er juin 2024 et le 30 septembre 2024) et se dérouleront dans une zone limitée (moins de 10 km) entourant la communauté du Lac Baker. Les travaux sur le terrain devraient durer environ trois semaines.1.6 Méthodes pour les Travaux sur le Terrain :Les méthodes de recherche incluent des études de fractures, des cartographies géologiques et la collecte d'échantillons de roches en surface. Les données sur les fractures seront recueillies à l'aide de méthodes d'échantillonnage linéaire et rectangulaire. L'échantillonnage linéaire consiste à mesurer les attributs des fractures intersectant un ruban placé sur une paroi rocheuse. L'échantillonnage rectangulaire utilise un rectangle placé sur une paroi rocheuse pour mesurer les attributs sélectionnés des fractures dans la zone. Les échantillons de roches en surface seront collectés à l'aide d'un marteau géologique.1.7 Impacts Environnementaux, Fauniques et Sociaux :Sans forage prévu, nous prévoyons des impacts environnementaux et sociaux minimes de nos recherches. Nos activités sur le terrain seront menées en toute discrétion et avec le plus grand respect pour l'environnement. Malgré la proximité de la recherche avec la communauté, aucun impact sur la faune n'est prévu. En ce qui concerne l'impact social, le Lac Baker a déjà été exposé aux travaux de Respec en décembre 2022, impliquant un dialogue avec les résidents. Sur cette base, nous anticipons une réponse positive de la communauté. De plus, nous mènerons des activités de suivi avec la Qulliq Energy Corporation (QEC). Cette collaboration est essentielle, car la QEC pourrait potentiellement utiliser nos résultats, en partenariat avec la communauté, pour avancer dans le développement des ressources géothermiques si tel est le désir de la communauté. Cette approche proactive souligne notre engagement envers la communication transparente, l'engagement communautaire et la collaboration potentielle pour le bénéfice du Lac Baker et de ses résidents.1.8 Stockage et Gestion des Données :Les résultats obtenus des travaux sur le terrain de 2024 resteront au sein de notre institution jusqu'à leur publication au printemps 2025, en anglais.1.9 Implication des Résidents du Nunavut :La communauté du Lac Baker sera activement impliquée dans la recherche en partageant ses attentes et ses limites. Leurs préférences en matière de chauffage et de sources d'énergie contribueront à élaborer un modèle réaliste pour évaluer le potentiel et la faisabilité de l'installation d'un système de chauffage géothermique au sein de la communauté.1.10 Communication des Résultats de Recherche au Nunavut :Les résultats de la recherche seront partagés avec le Lac Baker par le biais d'un rapport non technique. Nous maintenons une communication ouverte avec notre équipe et invitons à une collaboration future. Ce projet s'inscrit dans des pratiques respectueuses de l'environnement, répondant aux besoins spécifiques de la communauté pour une solution énergétique durable tout en préservant les valeurs locales.

Inuktitut: ᑐᑭᓯᓇᖅᑐᑦ ᓇᐃᓈᖅᓯᒪᔪᑦ 1.1 ᐱᓕᕆᐊᖑᔪᖅ ᐊᑎᖓ: ᖃᐅᔨᓇᓱᒃᑕᐅᓗᓂ ᖃᓄᖅ ᐃᑎᓂᖃᖅᐸ ᓄᓇᐅᑉ ᓂᐱᑦᑕᐅᑖ ᖃᒪᓂᑦᑐᐊᕐᒥ, ᓄᓇᕗᑦ, ᑲᓇᑕ 1.2 ᐊᐅᓚᑦᑎᔪᑦ ᖃᐅᔨᓴᖅᑎ ᐊᒻᒪᓗ ᓴᓇᖃᑎᒋᔭᖕᒋᑦ: ᔪᓴᓖᓐ ᐸᐃᑲᓐ, ᓘᒃᑖᖅ ᒪᕗᓪᑕ ᒨᓛᓐᑕ, ᐃᓕᓴᐃᔨ ᐃᓕᓐᓂᐊᕐᕕᒃᔪᐊᒥ ᔮᓯᒥᓐ ᐅᓚᐃᒪᓐᑦ 1.3 ᖃᐅᔨᓴᕈᑎᑦ ᐊᐱᖅᓲᑎᖏᑦ: ᐱᓕᕆᖃᑎᒌᓗᒋᑦ ᕿᓪᓕᒃᑯᑦ ᐊᒻᒪᓗ RESPEC, ᑐᑭᓕᐅᕈᑕᐅᕙᓪᓕᐊᓂᐊᖅᑐᑦ ᑕᒪᑐᒫᖓ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᖃᐅᔨᓇᓱᒃᓗᒋᑦ ᖃᓄᖅ ᐃᑎᑎᒋᕙ ᓄᓇᐅᑉ ᓂᐱᑦᑕᐅᑖ ᖃᒪᓂᑦᑐᐊᕐᒥ ᑭᐅᓗᒋᑦ ᐅᑯᐊ ᐊᑖᓂ ᑎᑎᕋᖅᓯᒪᔪᑦ ᐊᐱᕐᑯᑎᑦ: ᐅᓇ ᓄᓇᐅᑉ ᓂᐱᑦᑕᐅᑖ ᐊᑖᓂ ᓄᓇᖕᒐᑕ ᖃᒪᓂᑦᑐᐊᖅ ᑎᑭᐅᑎᓯᒪᕙ ᐆᒻᒪᕐᑯᑎᖃᐅᑎᒋᓗᒍ ᐊᒻᒪᓗ ᖃᐅᒻᒪᕐᑯᑎᖃᐅᑎᒋᓗᒍ? ᐃᑎᔪᑦ ᓄᓇᐅᑉ ᓂᐱᑦᑕᐅᑖᑕ ᖃᒪᓂᑦᑐᐊᕐᒥ ᐱᔭᒃᓴᐅᕙᑦ ᐊᑭᓕᖅᑑᑎᖏᓐᓄᑦ ᓈᒻᒪᒃᓯᑎᑦᑎᓗᓂ? ᑭᐅᓂᐊᕐᓗᒋᑦ ᑖᒃᑯᐊ ᐊᐱᕐᑯᑎᑦ, ᐸᕐᓇᐅᓯᒪᔪᒍᑦ ᓄᓇᒥ ᓴᓇᓗᑕ, ᐊᖏᓐᓇᖅᑐᖃᖅᑐᓂ ᖃᐅᔨᓴᕈᑎᓂ ᖃᐅᔨᓴᕐᓗᑕ, ᓈᓴᐅᓯᕆᓗᑕ, ᐊᒻᒪᓗ ᖃᓄᖅ ᐊᑭᑐᑎᒋᓇᔭᖅᐸ ᖃᐅᔨᓴᕐᓗᒋᑦ. ᐅᑯᐊ ᐊᑭᖏᓐᓂᒃ-ᐊᑐᑎᖃᖅᑐᓂᒃ ᓴᓇᕐᕈᑎᑦ ᐱᓕᕆᐊᖑᓂᐊᖅᑐᑦ ᐱᒋᐊᓖᕐᓂᖓᓂ ᖃᐅᔨᓇᓱᒃᓗᒋᑦ ᖃᒪᓂᑦᑎᑐᐊᖅ ᐃᑎᓂᖓ ᓄᓇᖓᓂ ᐃᑭᐊᖓᓂ ᐆᓇᕐᓂᖃᕐᒪᖔᑦ. 1.4 ᖃᐅᔨᓴᖅᑕᐅᔪᖅ ᑐᑭᓕᐅᕈᑕᐅᕙᓪᓕᐊᓂᖓ: ᐅᓇ ᐱᓕᕆᐊᖑᔪᖅ ᑐᕌᖅᑐᖅ ᖃᐅᔨᓇᓱᑦᑎᐊᕐᓗᒋᑦ ᐆᓇᕐᓂᖓ ᓄᓇᒥ ᐆᒻᒪᕐᑯᑎᖃᐅᑕᐅᔪᓐᓇᖅᑐᑦ ᐃᑭᐊᖓᓂ ᖃᒪᓂᑎᐊᖅ ᐊᒻᒪᓗ ᖃᓄᖅ ᐅᓇ ᐆᒻᒪᕐᑯᑎᖃᐅᑎᖃᕐᑎᑦᑎᔪᓐᓇᖅᐸᑕ ᓄᓇᒥ. ᑐᑭᓕᐅᕈᑕᐅᕙᓪᓕᐊᔪᑦ ᐃᓚᖃᖅᑐᑦ ᐃᓂᑦᑎᓇᓱᒃᓗᑎᒃ ᓄᓇᓕᖕᓂ ᐅᔭᖃᖕᒋᓐᓂᒃ ᖃᐅᔨᓇᖅᓯᓂᐊᖅᑐᑦ ᐆᓇᕐᓂᖕᖓᓂᒃ ᐅᔭᖃᑦ, ᖃᐅᔨᓴᕐᓗᒋᑦ ᐅᔭᕋᖕᒋᑦ ᐆᓇᖅᑎᑦᑎᔾᔪᑎᖃᕐᒪᖔᑕ, ᓴᕿᑦᑎᓗᑕ ᓈᓴᐅᓯᕆᔾᔪᑎᑦᑎᒍᑦ, ᐊᒻᒪᓗ ᖃᐅᔨᓴᕐᓗᒋᑦ ᖃᓄᖅ ᐆᓇᑯᑖᖃᑦᑕᕐᒪᖔᑕ ᖃᓄᖅ ᐊᑭᖃᕋᔭᕐᒪᖔᑕ. ᐅᑯᐊ ᖃᐅᔨᓴᖅᓯᔪᑦ ᐃᑲᔫᑎᓂᐊᖅᑐᑦ ᐅᔭᖃᑎᒍᑦ ᐆᓇᕐᓂᖏᑦ ᓴᓇᔭᐅᓗᑎᒃ ᐅᑭᐅᖅᑕᖅᑐᒥ ᐊᒻᒪᓗ ᐆᓇᕐᓂᖓ-ᐆᒻᒪᕐᑯᑎᖃᕐᓇᕐᓂᖓ- ᐊᐅᓚᐅᓯᕆᔾᔪᓯᑦ ᐱᑕᖃᖅᑐᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᓄᑦ ᖃᐅᔨᒪᔾᔪᑕᐅᓂᐊᖅᑐᑦ. ᑐᕌᖅᑐᒍᑦ ᐊᑐᖅᑕᐅᓂᐊᕐᒪᑕ ᐆᒻᒪᕐᑯᑎᖃᕈᑕᐅᓗᑎᒃ ᐃᒻᒥᒍᑦ ᐃᒃᐱᒋᑦᑎᐊᕐᓗᒍ ᐊᕙᑎᑦᑎᓐᓂᑦᑐᑦ ᐊᑑᑎᖃᖅᑐᑦ ᖃᒪᓂᑦᑐᐊᕐᒧᑦ ᓄᓇᓕᖕᓄᑦ. 1.5 ᓇᒥ, ᖃᖓ, ᐊᒻᒪᓗ ᖃᓄᖅ ᐊᑯᓂᐅᑎᒋᔪᖅ ᓄᓇᒥ ᖃᐅᔨᓴᕐᓗᑎᒃ: ᓄᓇᒥ ᖃᐅᔨᓴᕐᓂᖅ ᐃᓂᖃᖅᑐᖅ ᐊᐅᔭᖓᓄᑦ 2024 (ᐊᕙᑖᓂᑦ ᔫᓐ 1, 2024, ᑎᑭᓪᓗᒍ ᓯᑎᐱᕆ 30, 2024) ᐊᒻᒪᓗ ᐱᓕᕆᓂᐊᖅᑐᑦ ᓄᓇᖓᓂ (ᐊᑖᒥ 10 ᑭᓚᒦᑕᔅ) ᐊᕙᓗᐊᓂ ᖃᒪᓂᑦᑎᐊᖅ ᓄᓇᓖᑦ. ᓄᓇᒥ ᐱᓕᕆᓂᖅ ᓂᕆᐅᓇᖅᑐᖅ ᑎᑭᐅᑎᓯᒪᓂᐊᕐᓂᖓ ᐅᖓᑖᓄᑦ ᐱᖓᓱᑦ ᐱᓇᓱᐊᕈᓯᑦ. 1.6 ᖃᐅᔨᓴᕈᓯᑦ ᓄᓇᒥ: ᖃᐅᔨᓴᕈᓯᑦ ᐃᓚᖃᖅᑐᑦ ᐋᖅᓯᓗᑕ ᐃᓕᑦᑎᐊᕋᓱᒃᓗᒋᑦ ᓱᓇᖃᕐᒪᖔᑕ, ᓄᓇᖓ ᓄᓇᙳᐊᓕᐊᕆᓗᒍ, ᐊᒻᒪᓗ

ᖃᓐᓇ ᐅᔨᖅᑕ ᖃᐅᔨᓴᕕᑎᒋᔭᐅᓪᓗᓂ ᓄᐊᕐᑎᐃᒪᔭᐅᓂ. ᑐᑭᓯᐊᕐᑎᐊᖅᑐᓂᒃ ᓄᓇᒥ ᐅᓄᑐᖏᓐᓂᖅ ᓇᔭᐃᐃᖅᓯᓇᖅᑐᖅ ᐊᑐᖅᓯᔭᑎᓄ ᓄᓇᓕᓂᒃ. ᑭᐸᒫᑐᑎᑎᔪᑦ ᖃᓚᐱᐅᔨᓯᑦ ᖃᐅᔨᓴᕕᑎᑐ ᐊᑐᖅᑕᐅᔭᑎᓄ ᐃᓕᓴᐅᔭᔪᓄ ᓄᓇᓕᓂᒃ ᐅᓄᖏᓐᖏᖅᖢᖅ ᖃᐅᔨᓴᕕᑎᓄ ᓄᓇᓕᓂ. ᐊᓚᑎᑐᑦ ᐊᖏᑎᑎᓴᑦ ᐅᔨᖃᑦ ᖃᐅᔨᓴᖅᑕᐅᔭᑎᓄ ᓄᐊᑕᐅᔭᑎᓄ ᐊᑐᖅᓴᔭᑎᓄ ᐅᔨᖏᑎᐊᖅᑎᓄ ᖃᐅᑕᐅᔨᖅᑎᑦ. 1.7 ᐊᐸᖓ, ᓂᕐᔪᑎᑦ, ᐊᓚᒪᓗ ᐃᓄᐃᑦ ᖃᓄᐃᖏᑦᑎᐊᖅᓯᔭᑎᓂ ᐊᓂᑐᖅᑕᐅᔪᑦ: ᓂᐅᖅᑐᖅᑐᖃᓲᖅᖏᑦᑐᖅ, ᒥᑉᔪᐳ ᓴᓪᒪᑦ ᐊᓚᒪᓗ ᓄᓇᓕᖓᓂᓄ ᐊᐳᑐᖅᑕᐅᔪᑦ ᐊᑐᖅᑕᐅᔪᑦ ᐃᓕᓴᐅᔭᑎᓄ ᐊᐸᖓᖓᑦ ᐊᓂᔪᓐᓇᖅᑐᑦ ᐃᓐᐱᓕᕐᓂᖅᑐᑦ ᐊᓚᒪᓗ ᓄᓇᓕᖓᓂᓄ ᐊᐳᑐᖅᑕᐅᔪᑦ ᐊᑐᖅᑕᐅᔪᑦ ᐊᐳᑐᖅᑕᐅᔪᑦ ᐊᑐᖅᑕᐅᔪᑦ ᐊᑐᖅᑕᐅᔪᑦ ᐊ

Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Field Work Boundary	Researching	Municipal	N/A	N/A	The exploration activity takes place in an area surrounding the community of Qamani'tuaq

Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Baker Lake	Don Grant	Qulliq Energy Corporation	2022-12-01

Authorizations

Indicate the areas in which the project is located:

Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Nunavut Research Institute	Permit describing our research and its contributions to Nunavut.	Applied, Decision Pending		

Project transportation types

Transportation Type	Proposed Use	Length of Use
Air	air travel between Quebec and Baker Lake	
Land	Vehicle rental to travel within the designated research area outlined on the map via accessible roads.	

Project accomodation types

Community

Material Use

Equipment to be used (including drills, pumps, aircraft, vehicles, etc)

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Geological Hammers	3	30 cm	For geological research, we will utilize a specialized geological hammer for surface sample collection, ensuring samples are hand-sized. This tool is designed to minimize environmental impact, allowing precise collection while preserving the delicate nature of the terrain.
vehicule	1	4200*1500*1700	Renting a small local vehicle is vital for efficient mapping in our designated area. Its compact size enables easy navigation through tight spaces. Choosing a local agency supports the community and provides insights into the terrain. This flexibility is crucial for adapting to our mapping needs, ensuring effective coverage.

Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Information is not available						

Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
0	Drinking water available in the hotel (for cooking, drinking, showering)	Baker Lake

Waste

Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Information is not available				

Environmental Impacts:

Given the absence of camps and our accommodation in a hotel, the waste production associated with our presence in Nunavut is minimal and has little impact on the natural environment. We will implement stringent practices to minimize our ecological footprint, in compliance with the regulations in place in Baker Lake, ensuring that all generated waste is properly disposed of. In the field, we employ non-invasive exploration methods such as the use of hammers and crack counting, thus avoiding the generation of unnecessary waste,and will be conducted on area free of vegetation. Furthermore, all the equipment we utilize is designed to be reusable, and it will be carefully transported back to the laboratory after our fieldwork. This approach ensures sustainable waste management, minimizing our environmental impact and preserving the integrity of local ecosystems within the framework of our geothermal exploration in Nunavut.

Additional Information

SECTION A1: Project Info

SECTION A2: Allweather Road

SECTION A3: Winter Road

SECTION B1: Project Info

SECTION B2: Exploration Activity

SECTION B3: Geosciences

SECTION B4: Drilling

SECTION B5: Stripping

SECTION B6: Underground Activity

SECTION B7: Waste Rock

SECTION B8: Stockpiles

SECTION B9: Mine Development

SECTION B10: Geology

SECTION B11: Mine

SECTION B12: Mill

SECTION C1: Pits

SECTION D1: Facility

SECTION D2: Facility Construction

SECTION D3: Facility Operation

SECTION D4: Vessel Use

SECTION E1: Offshore Survey

SECTION E2: Nearshore Survey

SECTION E3: Vessel Use

SECTION F1: Site Cleanup

SECTION G1: Well Authorization

SECTION G2: Onland Exploration

SECTION G3: Offshore Exploration

SECTION G4: Rig

SECTION H1: Vessel Use

SECTION H2: Disposal At Sea

SECTION I1: Municipal Development

Description of Existing Environment: Physical Environment

Our research area is situated in a tundra region characterized by long, extremely cold winters and short, cool summers. Winter temperatures average between -21 and -25°C, while summers are typically cool and rainy. The absence of trees contributes to its designation as having a polar climate. Transportation is facilitated by Baker Lake Airport and a 110 km (68 mi) gravel road called Mine Road, providing vital access to the region. The bedrock of the area mainly consists of Archean gneiss, shaping the physical landscape. Roads are accessible by car, which is crucial for the connectivity of the region. It's important to note that our research will have minimal impact on the physical environment, apart from the collection of small hand-sized samples with a geological hammer on the outcrops, which will not affect vegetation. We will strictly adhere to accessible roads during our fieldwork.

Description of Existing Environment: Biological Environment

The municipality of Baker Lake is home to a diverse range of wildlife species, including caribou, muskoxen, Arctic hares, wolves, wolverines, sik-siks, and geese. Our research will take place in the vicinity of the community, so we do not anticipate encountering these species, if such encounters do occur, leave and not disturb them.

Description of Existing Environment: Socio-economic Environment

The residents of Baker Lake primarily depend on local grids powered by diesel generators for electricity, while oil furnaces are used for space heating. Despite subsidies, this reliance leads to considerable expenses. The local economy is closely tied to the Meadowbank gold mine, operated by Agnico Eagle Mines Limited, serving as a key source of employment and economic activity in the area. During our research, we will engage local services such as hotels, food, and car rentals, contributing positively to the socio-economic environment of the community.

Miscellaneous Project Information

N/A

Identification of Impacts and Proposed Mitigation Measures

Given the absence of camps and our accommodation in a hotel, the waste production associated with our presence in Nunavut is minimal and has little impact on the natural environment. We will implement stringent practices to minimize our ecological footprint, in compliance with the regulations in place in Baker Lake, ensuring that all generated waste is properly disposed of.In the field, we employ non-invasive

exploration methods such as the use of hammers and crack counting, thus avoiding the generation of unnecessary waste. Furthermore, all the equipment we utilize is designed to be reusable, and it will be carefully transported back to the laboratory after our fieldwork. This approach ensures sustainable waste management, minimizing our environmental impact and preserving the integrity of local ecosystems within the framework of our geothermal exploration in Nunavut.

Cumulative Effects

N/A

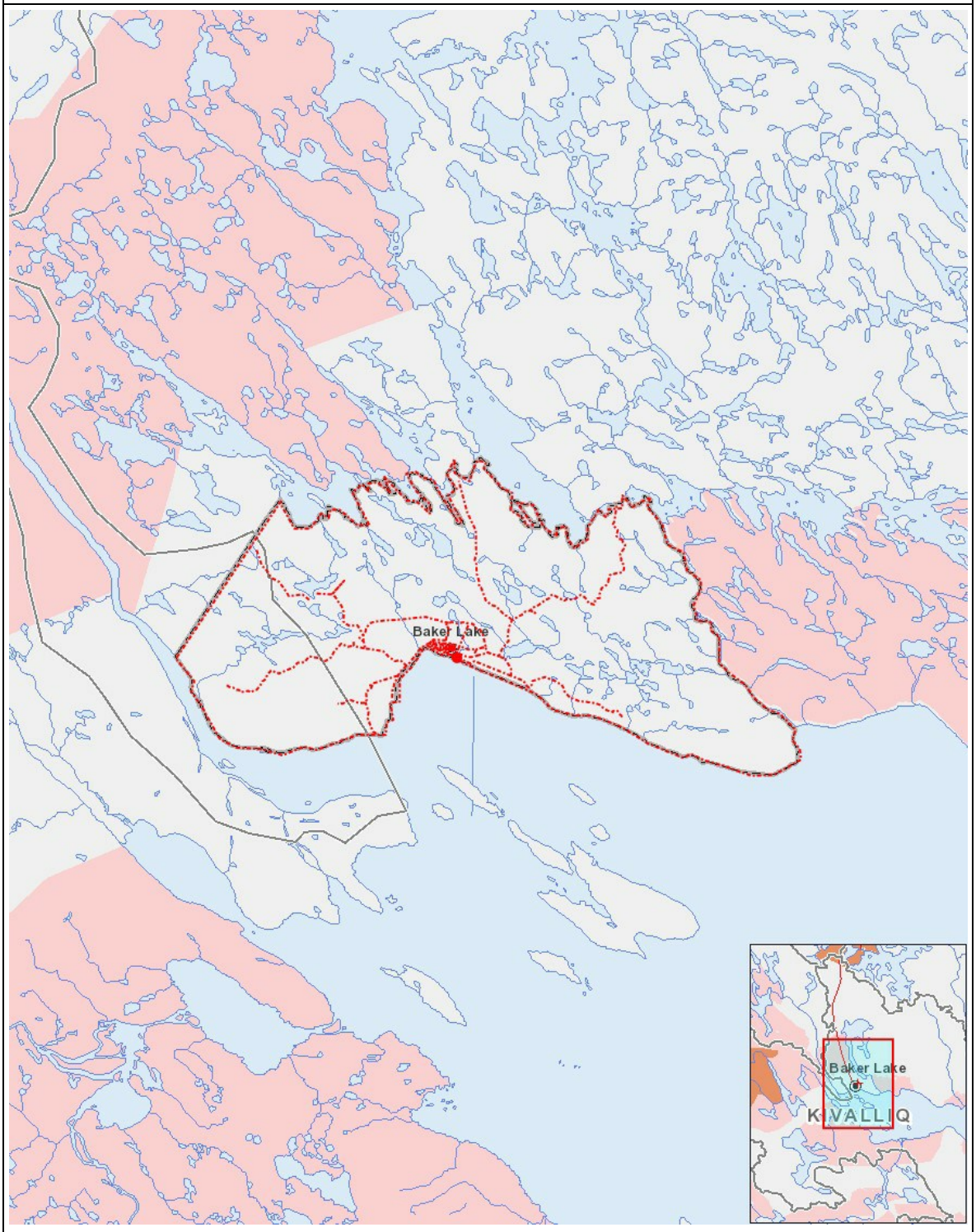
Impacts

Identification of Environmental Impacts

	PHYSICAL	Designated environmental areas	Ground stability	Permafrost	Hydrology / Limnology	Water quality	Climate conditions	Eskers and other unique or fragile landscapes	Surface and bedrock geology	Sediment and soil quality	Tidal processes and bathymetry	Air quality	Noise levels	BIOLOGICAL	Vegetation	Wildlife, including habitat and migration patterns	Birds, including habitat and migration patterns	Aquatic species, incl. habitat and migration/spawning	Wildlife protected areas	SOCIO-ECONOMIC	Archaeological and cultural historic sites	Employment	Community wellness	Community infrastructure	Human health
Construction																									
-		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-
Operation																									
Researching		-	-	-	-	-	-	-	M	-	-	-	-		-	-	-	-	-		-	P	-	-	-
Decommissioning																									
-		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-

(P = Positive, N = Negative and non-mitigatable, M = Negative and mitigatable, U = Unknown)

Project Location



List of Project Geometries

1	polygon	Field Work Boundary
2	polyline	road
3	polyline	road
4	polyline	road
5	polyline	road
6	polyline	road
7	polyline	road
8	polyline	road
9	polyline	road
10	polyline	road

11	polyline	road
12	point	our hotel - Nunamiut Lodge