



NIRB Application for Screening #125716
Baker Lake Geothermal Project

Application Type: New

Project Type: Scientific Research

Application Date: 6/14/2022 1:07:55 PM

Period of operation: from 0001-01-01 to 0001-01-01

Proposed Authorization: from 0001-01-01 to 0001-01-01

Project Proponent: Derek Allerton
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DETAILS

Non-technical project proposal description

English: The Baker Lake Geothermal Project (the Project) is located in the Kivalliq Region of Nunavut (NU), within the 1:50,000 scale National Topographic System (NTS) map sheets, 056D05 and 066A08. The Project will be completed within the municipal boundaries of the Hamlet of Baker Lake. Qulliq Energy Corporation (QEC), formerly the Nunavut Power Corporation, is a 100% Government of NU owned corporation that is the sole provider of electrical power in the Territory. The QEC currently provides power to the 25 communities in NU by operating (25) stand-alone diesel power plants in each, which means that it is dependent upon fossil fuels. However, the QEC is actively searching for new and renewable energy resources. QEC commissioned a Nunavut Geothermal Feasibility Study, completed by RESPEC, with guidelines set by the Canadian Geothermal Energy Association (CanGEA) for the Canadian National Geothermal Database (CNGD), published in June 2018. Baker Lake has been selected as a test site for investigating the geothermal potential in the Canadian Shield. The Project will consist of the completion of a small diameter, temperature gradient hole in which geothermal properties will be studied. Should this work yield positive results, further investigations, will be conducted that might ultimately lead to the construction of a geothermal heat and power facility that would help reduce, if not eliminate, the hamlet's dependence on fossil fuels. The Project is anticipated to commence in the late summer or fall and will comprise the drilling of a single, approximately 800-metre deep, vertical core hole at a target location within Lot 447 of the Hamlet of Baker Lake. A small volume of fuel (less than 4,000 L), will be required to power the drill during the program and will be appropriately permitted and managed. A camp will not be required for the exploration program, as the project is within the municipal boundaries of the hamlet of Baker Lake. A community consultation visit to Baker Lake to discuss the QEC Baker Lake Geothermal Project is planned prior to the commencement of the drilling program.

French: N/A

[illegible]

Inuinnaqtun: N/A

Personnel

Personnel on site: 10

Days on site: 21

Total Person days: 210

Operations Phase: from 2022-08-30 to 2022-09-01

Operations Phase: from 2022-09-01 to 2022-09-28

Post-Closure Phase: from to

Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
QEC_Baker_Lake_Proposed_Drillhole_n83z14_20220401	Drilling	Municipal	The hole will be drilled to test for the potential for Geothermal Energy on QEC's Baker Lake Power Plant Lot 447.	There is a low potential for archeological/paleontological artifacts/sites as the drillhole is located in a pre-disturbed lot within the Hamlet of Baker Lake. If an artifact/site is discovered all work in the area will halt and the Project Supervisor will immediately contact the GN Department of Culture and Heritage.	Within the municipal boundary of eth Hamlet of Baker Lake.

Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Baker Lake	Shawn Attungala	Mayor, Hamlet of Baker Lake - Letter of Support	2019-02-22
Baker Lake	Mayor & SAO	Hamlet of Baker Lake Phone call and review of emailed Powerpoint presentation	2020-07-30
Baker Lake	Sheldon Dorey	SAO Hamlet of Baker Lake provided forms for working in Municipality	2020-03-16
Baker Lake	Sheldon Dorey	SAO Hamlet of Baker Lake phone call regarding community consultation preparation	2020-04-03
Baker Lake	Sheldon Dorey	SAO Hamlet of Baker Lake community consultation protocols due to Covid-19 Pandemic	2020-06-10

Authorizations

Indicate the areas in which the project is located:

Kivalliq

Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Nunavut Research Institute	SCIENTIFIC RESEARCH LICENCE APPLICATION Physical / Natural Sciences RESEARCH	Not Yet Applied		
Hamlets and Municipalities	Business Licence	Not Yet Applied		

Project transportation types

Transportation Type	Proposed Use	Length of Use
Land	Flatbed truck to mob/demob drill & Pick up Truck for personnel. Only on existing roads and within Lot 447..	

Project accomodation types

Community

Material Use

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

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Truck	2	Pickup	Transport crew and equipment to and from drillsite.
Truck	1	Water	Supply drillhole with water if source to far to directly pump.
Diamond Drill	1	Zinex A5 or similar	Drill test hole for geothermal energy potential.
Pump	1	Water	Supply drill with water.
Tank	1	Water	Supply drill with water.
Tank	1	Mix	Mix additives for drilling fluids.
Generator	1	Diesel - 20 Kw	Supply power to drill.
Truck	1	Flatbed	Mobilize and demobilize drill and equipment to site.

Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Diesel	fuel	5	205	1025	Liters	Fuel for diamond drill.
Gasoline	fuel	1	205	205	Liters	Fuel for drilling equipment.
Propane	fuel	2	100	200	Lbs	Fuel for water heater.
CaCl2	hazardous	50	50	2500	Lbs	Antifreeze
Oil	hazardous	20	1	20	Liters	Hydraulic and motor oil for drilling equipment.
Cleaning Supplies	hazardous	5	1	5	Liters	Cleaning products such as degreasers, Javex and hand sanitizer

Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
100	Water will either be acquired directly from a source using a pump or will be brought to site via a water truck. The water intake for drilling will be screened as per DFO requirements to prevent fish.	Water source will be near the drillhole within the Municipal boundary of the Hamlet of Baker Lake. If a water source is not able to be found, water delivery may be contracted from the Hamlet.

Waste

Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Drilling	Combustible wastes	Minimal	The small amount of combustible waste such as meal and paper products produced during each shift can be disposed of at drilling personnel accommodations. Anything else such as cardboard will be disposed of at the Baker Lake waste facility.	QEC currently has timber for the rig matting located at their Bid Construction site to be transferred to the drillsite when needed. When the drillhole is completed the timber will be dismantled, bundles and stored for future use.
Drilling	Greywater	100m3/day	QEC currently has timber for the rig matting located at their Bid Construction site to be transferred to the drillsite when needed. When the drillhole is completed the timber will be dismantled, bundles and stored for future use.	If available, coarse gravel will be placed in the bottom of the sump to provide filtration, and supports will be built on the sides to prevent slumping. When full, sumps will be covered with enough material to allow for future ground settlement.
Drilling	Hazardous	Minimal	A hazardous waste storage area will be established adjacent to the main fuel cache at the drill site within secondary containment until they are backhauled to a registered hazardous waste receiver/ disposal facility.	All hazardous wastes will be sealed in appropriate containers, labeled, documented. A waste manifest will accompany hazardous waste in transit and all parties involved will be properly accredited.
Drilling	Non-Combustible wastes	Minimal	Non-combustible solid waste, bulky items and scrap metal such as glass bottles, tires, plastic packaging and broken equipment that cannot be recycled will be transported to the Baker Lake Waste Facility.	Any material that can be recycled or cannot be accepted at the Baker Lake Waste Facility will be transported to an approved recycling or disposal site.

Environmental Impacts:

Quilliq Energy Corporation is firmly committed to the protection and conservation of the natural environment and to ensuring the health and safety of all employees, contractors, and people in surrounding communities. Potential environmental impacts of the Baker Lake Geothermal Project are negligible and mitigatable with little impacts on the environment. A single drill site will be located at least 31 m from any waterbody. Recirculation and filtration equipment will be used to minimize the amount of water used during drilling activities. Any residual drill water will be contained in sumps at least 31 m from any waterbody. Secondary containment will be used for all fuel and chemicals and appropriate spill kits will be located at each fuel cache and drill site. The drill site will be photographed to comply with environmental due diligence. All waste materials will be recycled and/or disposed of within Baker Lake or transported south to an accredited facility. For further details please see the Spill and Fuel Management Plan, Waste Management Plan, Abandonment and Restoration Plan, and Environmental Management Plan.

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

The Project will be completed in a pre-disturbed area of the QEC Power Plant Lot 447, within the municipal boundaries of the Hamlet of Baker Lake.

Description of Existing Environment: Biological Environment

The Project will be completed in a pre-disturbed area of the QEC Power Plant Lot 447, within the municipal boundaries of the Hamlet of Baker Lake.

Description of Existing Environment: Socio-economic Environment

The Project will consist of the completion of a small diameter, temperature gradient hole in which geothermal properties will be studied. Should this work yield positive results, further investigations, will be conducted that might ultimately lead to the construction of a geothermal heat and power facility that would help reduce, if not eliminate, the hamlet's dependence on fossil fuels.

Miscellaneous Project Information

Identification of Impacts and Proposed Mitigation Measures

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Cumulative Effects

QEC will communicate and coordinate with the Hamlet of Baker Lake to ensure there are no negative cumulative effects that arise from the implementation of this project.

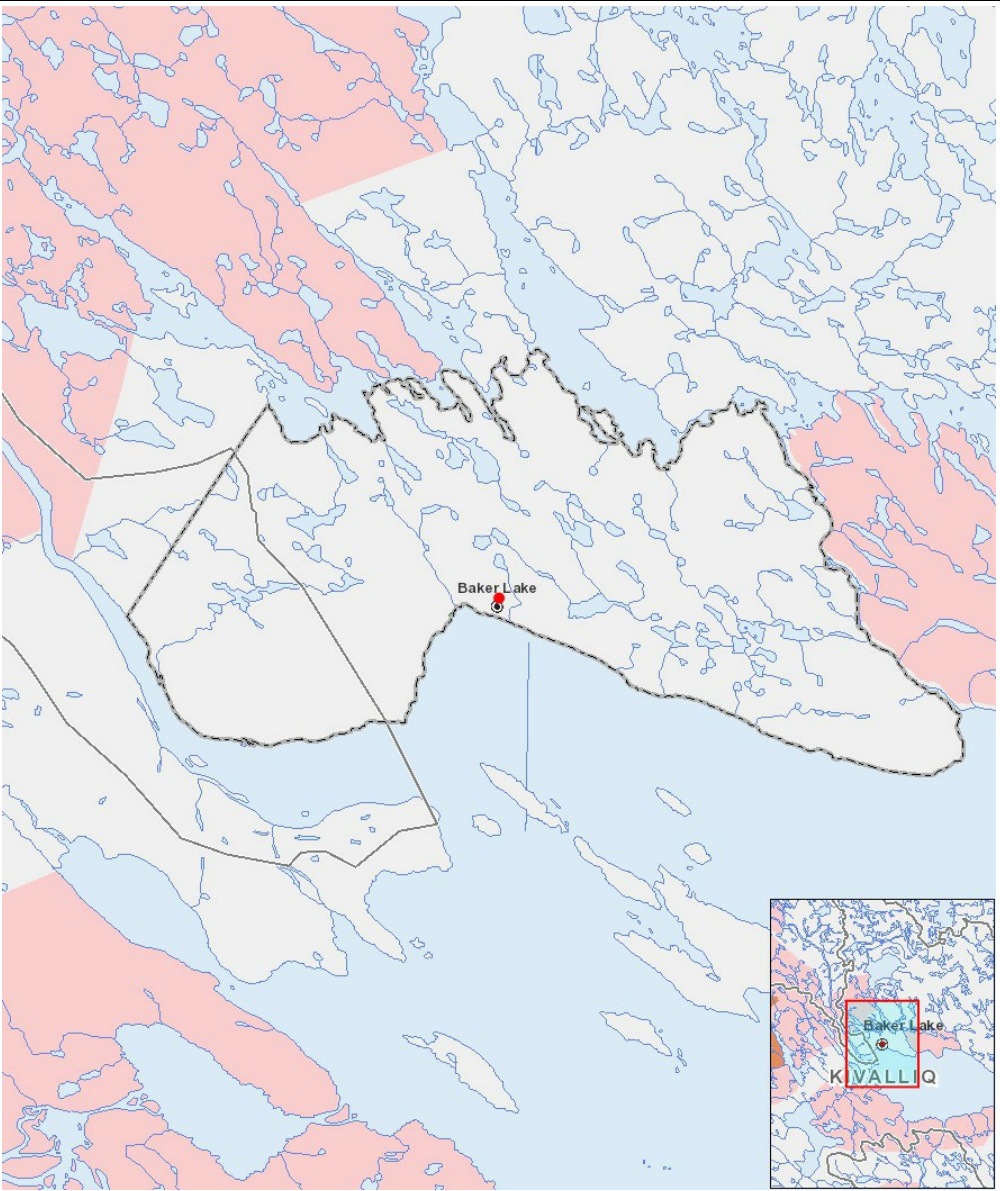
Impacts

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																									
Drilling		-	-	-	-	-	-	-	-	N	-	N	N		N	-	-	-	-		-	P	P	P	P
Operation																									
Drilling		-	-	-	-	-	-	-	P	N	-	M	N		N	-	-	-	-		-	P	P	P	P
Decommissioning																									
-		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-

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

Project Location



List of Project Geometries

1	point	QEC_Baker_Lake_Proposed_Drillhole_n83z14_20220401
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