

# CLEAN RESOURCES

## CLEAN TECHNOLOGY

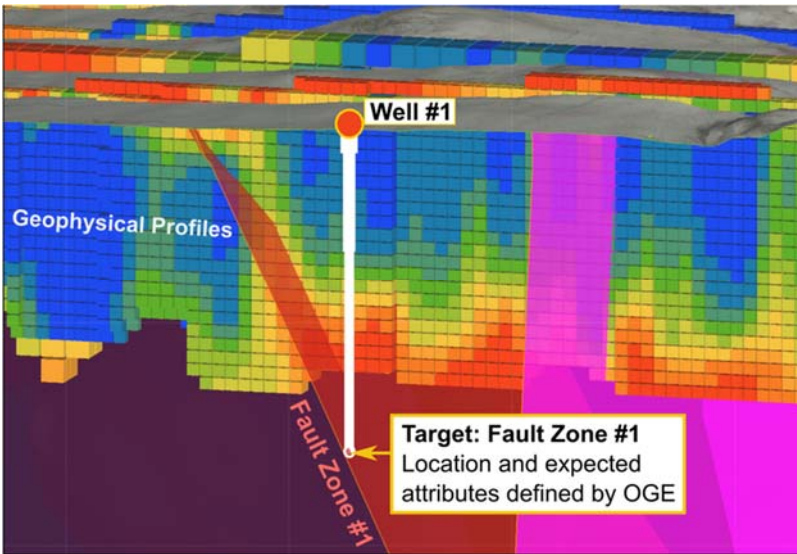
RENEWABLE AND ALTERNATIVE ENERGY - ELECTRICITY GENERATION

### FUNDING DETAILS

## Geothermal Heat – Reducing Emissions and Increasing Alberta’s Competitiveness

The high upfront costs of drilling and the risk of finding a dry well are substantial challenges for conventional geothermal development. Borealis GeoPower aims to overcome these challenges through the predictive capabilities of their Optimized Geothermal and Element (OGE) exploration technology. The exploration technology further enables Borealis’s development of a novel form of cooling, called Geothermal Absorption Chilling. Geothermal Absorption Chilling takes advantage of the efficiency of direct heat transfer to yield economically viable industrial cooling and simultaneously reduce the carbon footprint of geothermal operations.

The project focuses on confirming the updated exploration technology’s predictive capability. By confirming the predictive capability, a Geothermal Absorption Chilling (or industrial heating project) may operate successfully with defined cost certainty on the delivery of geothermal heat. The project scope includes the drilling of geothermal delineation wells to confirm or disprove OGE targeting hypotheses.



#### RECIPIENT:

**Borealis GeoPower**



#### PARTNERS:

**PrairiesCan**

**Kitselas Geothermal**



#### TOTAL BUDGET:

**\$1,500,000**



#### AI FUNDING:

**\$424,403**



#### PROJECT DATES:

**JAN 2021 –**

**JUL 2022**



#### PROJECT TRL:

**Start: 7**

**End: 9**

## APPLICATION

Successful demonstration of the Optimized Geothermal and Element exploration technology assists in the value proposition definition for Geothermal Absorption Chilling (or industrial heating projects) by providing upfront cost certainty. It is anticipated that the Geothermal Absorption Chilling technology may be applied to the industrial gas, agricultural, and food processing sectors. Within Alberta, these sectors can benefit from more stable cooling costs and cleaner energy supplies. Together, these Alberta sectors have a market value of approximately \$2 billion annually.

# ALBERTA INNOVATES CLEAN RESOURCES

## CLEAN TECHNOLOGY

### RENEWABLE AND ALTERNATIVE ENERGY - ELECTRICITY GENERATION

## PROJECT GOALS

Optimized Geothermal and Element exploration technology is a proprietary methodology that identifies blind geothermal targets with economic value. The technology accurately locates relevant geothermal targets, reasonably estimates the properties of the geothermal reservoir, and forecasts the amount of geothermal energy that can be harnessed from the reservoir.

- The project goal is to confirm the accuracy of the exploration technology. This consists of:
  - Deploying the exploration technology to identify target locations, and drilling holes at those locations.
  - Obtaining subsurface measurements from the target locations.
  - Confirming that flow, temperature, subsurface water quality, and location parameters meet initial predictions.

## BENEFITS TO ALBERTA

The project directly benefits Alberta by repurposing and developing Alberta's well-established subsurface and facilities skills.

When the Optimized Geothermal and Element exploration technology is commercialized, the following benefits are anticipated:

- Strategic cost reductions, based on preferential economics, for geothermally driven cooling customers.
- Profitable green energy infrastructure investments for energy companies seeking to diversify their portfolio, while also earning necessary economic returns.
- Job creation related to engineering, construction, operation, and maintenance of facilities requisite for the geothermal energy systems.
- Reductions to Alberta's GHG footprint, achieved by bringing onstream large quantities of renewable energy supply.



**3 Students  
Trained**



**12 Project Jobs**



**183 Future Jobs**



**1 New  
Product/Service**



**17 kt/year Future GHGs Reduced;  
850 kt Lifetime GHGs Reduced**

## CURRENT STATUS

### JUL 2022

The project targeted and designed four test holes, and ultimately completed three test holes. The well data contributed to the development of a process for more accurately imaging deep geothermal resources. The final report will be available in February 2023.

Borealis Geothermal, with their partner, Kitselas First Nation Development Corp., are moving forward with harnessing geothermal direct heat for industrial purposes via their development company, Kitselas Geothermal Inc. Kitselas Geothermal will be assisted with production well drilling and assessment by their Joint Development partner, Shell Canada Energy.