

LAKELSE LAKE GEOTHERMAL PROJECT IN TERRACE, BRITISH COLUMBIA, CANADA

Nunes, T.A.¹; Dunn, C.²; Derry, A.³

¹Universidade Federal da Bahia; ²University of Victoria

ABSTRACT: Nowadays the world is constantly seeking for new types of energies. Companies from across the globe have been searching for sustainable and durable sources that can be used to produce it. Geothermal energy comes to this scenario as a great potential and Borealis Geopower is one of the few Canadian companies trying to accomplish the dream of building the first geothermal power plant in Canada. One of its major projects lies in the city of Terrace, British Columbia, that has a vast potential for geothermal development due to its location at the Stikine volcanic belt, in the Pacific “Ring of Fire”, showing a favorable geological setting of deep faulting system in which heated groundwater flows. Furthermore, Terrace exhibits the hottest hot springs in Canada, with temperatures up to 89°C, encouraging Borealis to establish an exploration program in the area. This project is about the exploration work done in this city during the summer of 2014, in which a fieldwork of 4 months took place in order to locate strategic spots for further drilling. The fieldwork was mainly composed of analysis of: Biogeochemistry and soil sampling, used to correlate the movement of heavy metals along fault systems and flow regimes indicative of geothermal activity; Shallow ground probe measurements of temperature and CO₂, used to identify surface heat flow anomalies; Water well sampling to evaluate the temperature gradient, water chemistry and lithology; Surface lithological mapping with the aid of the spectrometer Terraspec Halo mineral identifier. In addition, software such as ArcGIS online, ESRI Collector and Google Earth were very useful when mapping the features found in the field. All data and information collected were put together and a 3D map of the area was produced, showing the places with highest anomalies of heavy metals along with elevated measures of CO₂ and temperature, hence potentially exhibiting drilling targets. At the end, the main objective of the project is to build a geothermal facility, but in order to do so, not only is necessary to have the geological pre-requisites, but also consider factors like the presence of power lines near the area in focus, acceptance of the local community and government policies. Therefore, it is not an easy task to establish such a complex project, and Borealis Geopower has been facing and overcoming barriers to achieve their goal. Geothermal energy is one of the cleanest and renewable source of both power and heat. It is proven technology that its production is based on an infinity loop, has near to zero emissions and one of the smallest environmental footprints of any power supply. Although it has been used worldwide throughout history, geothermal is still unknown by most of society. However, it can be a practical energy solution for an entire generation of not only Canadians, but people as a whole.

KEY-WORDS: GEOTHERMAL EXPLORATION; RENEWABLE ENERGY; BOREALIS GEOPOWER