

Brine Geochemical Data

The AGS analyzed the geo-chemical make-up of brine samples from about 300 producing oil and gas wells from across Alberta. Brine, which is highly salty water that may be produced with oil and gas, can host various minerals, including metallic elements. Minerals have important uses in everyday life and can be used for ingredients in daily use items such as batteries, TVs, and hospital equipment. The quantity and type of dissolved minerals in brines is linked to where they are found underground. The AGS's analysis of the brine samples provides valuable information about Alberta's brine-hosted mineral potential.

Samples were extracted from oil and gas wells where brines are currently produced during normal operations and sent to a lab for analysis. Wells were selected to ensure that the samples represented the subsurface conditions and were collected from geological formations spanning different

periods. Over half of the samples were collected from Devonian-aged formations because of the greater potential for minerals such as lithium. The samples were collected from depths between 400 m and 3200 m, and the average collection depth was about 1500 m.

The tests were intended to describe the geochemistry (integrated geology and chemistry) of each sample. The results provided information about the type and concentration of minerals and trace metals found in the brine samples. The lab also tested the brines for naturally occurring isotopes of elements like hydrogen and oxygen, which reveals information about the source and movement of brines within and between geological formations.

The AGS's analyses of properties like trace metals and isotopes are the largest such data set in Alberta and will continue to grow in the future. In addition to the raw data, the AGS will produce public reports about Alberta's brine-hosted mineral potential.

Highlights

Brine-hosted minerals are found in saline (salt) water and extracted through wells.



represents a period spanning between about 419 and 358 million years ago.

Trace metals are metallic elements that occur naturally in low concentrations.



Isotopes are different forms of an element (including metals) that have the same number of protons but different numbers of neutrons.



Visit the Mineral Mapping Program page

Brine samples were collected from about 300 producing oil and gas wells across Alberta. Here's what that looks like.



Sample locations of well sites across the province.



Collecting a produced brine sample at a separator.



A brine sample.



A wellsite that was sampled.