

## Fact Sheet: Ancient Water Sample

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One of the oldest museum artifacts in the world has been added to a world class collection of science and technology – at Ingenium – Canada's Museums of Science and Innovation.

### Background

Collected in the Kidd Creek Mine, at approximately 2.4 km below the earth's surface by University of Toronto geochemist, by Dr. Barbara Sherwood Lollar, this water is the oldest known flowing water on earth.

Sherwood Lollar and her lab traced several lines of evidence that both investigated the water's geochemical and radiogenic fingerprints, and analysed the sulfate-reducing, "rock-eating" microbes that live in the highly saline groundwaters.

The team concluded that the water's mean residence time was **more than a billion years**, many times more than what was then considered to be the oldest known water.

Some components of the water are older yet: this ancient water bears witness to the time before the great oxidation event, before the earth drew its first breath.

### The artifacts

In addition to the water sample, which is now one of the oldest museum artifacts in the world, Ingenium's collection also houses:

- A sample of the type of rock that the chemolithotrophic (literally "rock-eating") microbes in the water "eat"
- Several items that were used in the collection and analysis of the water sample

### Significance

This discovery gives us clues as to the potential for life that is buried within the deepest parts of other planets. Like ancient rocks, this water brings messages from the early days of the earth.

The collection and scientific analysis of the water sample deepens our understanding of the hydrosphere and the capacity for life to occur in extreme conditions (e.g. on other planets). The water itself is its own ecosystem and symbolizes a time before anthropogenic climate change.

### The Ingenium Centre

The artifact will be housed at the Ingenium Centre, a state-of-the-art conservation lab and additional facilities (e.g. Digital Innovation Lab, Research Institute) that will ensure it receives excellent care and remains accessible to Canadians.

### For more information, please contact:

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