EAR to the GROUND

AUGUST 2022 ISSUE

Dear South Bruce residents:

In the recently released Confidence in Safety reports, the NWMO indicated that both Ignace and South Bruce sites are suitable for a Deep Geological Repository (DGR) to contain and isolate used nuclear fuel to protect people and the environment.

Here, and in other countries around the world, a DGR is considered an environmental protection project. High level nuclear waste exists so there is also an ethical responsibility to deal with it.

I explored this topic in my Willing to Listen podcast with Roy Payne, Executive Director of GDFWatch, which is a non-profit citizen organization in the United Kingdom, "Founded to help individuals and communities understand the issues, offer trusted impartial advice and opinion, and keep all those responsible for delivering geological disposal on their toes and to their promises."

Roy suggests that dealing with nuclear waste is one of the most significant environmental projects in the world. We have two options for nuclear waste: above ground or underground. We can place the waste deep underground in unmoving, stable rock — far away from an ever-changing surface environment — or entrust the safe-keeping of that waste for the next 100,000 years to humans above ground and hope they never make a mistake!

Geological disposal is the best solution to reduce risk associated nuclear waste over the long term by moving it from the surface to deep underground. GDFWatch encourages communities to take their time exploring the potential socioeconomic and environmental benefits, while also assessing and evaluating both real and perceived risks. A DGR can provide long-term economic security and an intergenerational legacy.

If you're interested in hearing more of my interview with Roy Payne, you can find the podcasts (and many others!) on the Media page at willingtolisten.ca.

In closing, I'm excited to tell you about an event that we're working on with Canadians for Nuclear Energy. It will bring a panel of doctors to South Bruce to speak about radiation. Stay tuned for details! If you would like to contact me, feel free to email swhytockinsouthbruce@hotmail.com.

Sheila Whytock, Teeswater

NWMO's Confidence in Safety report

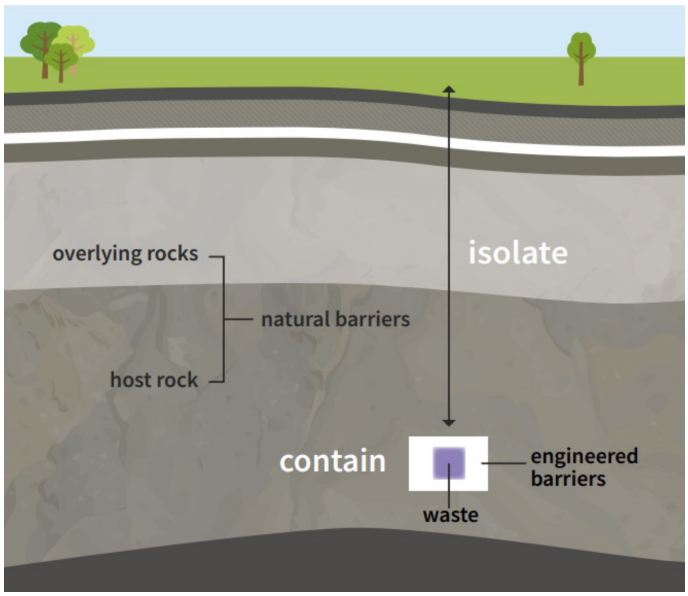
In order to safely contain and isolate used nuclear fuel, a DGR needs a rock structure that is stable and where any water movement through the rock would be extremely slow. The Cobourg formation in South Bruce meets those criteria and more.

The Cobourg rock formation is found at about 650 metres deep — deep enough that there is scientific evidence that the rock has been stable for hundreds of millions of years, and will remain so into the future. The Cobourg formation is thick enough to build the required tunnels and rooms for the repository.

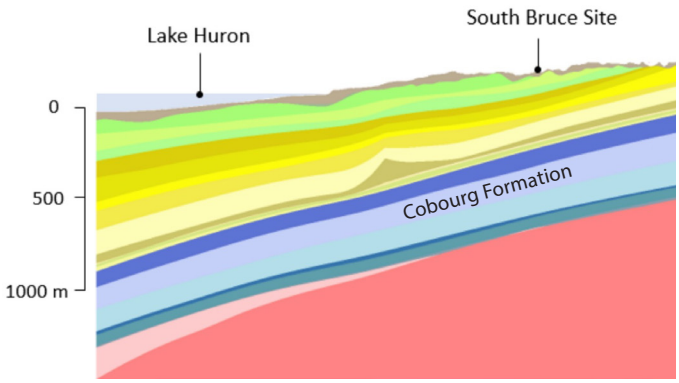
Analysis of the water molecules in the rock indicates that it had been there for hundreds of millions of years and was isolated from the shallow bedrock aquifers.

The mineral makeup of the rock, in combination with the chemical composition of any water at that dept,h is not expected to impair the performance of any of the barriers in the repository.

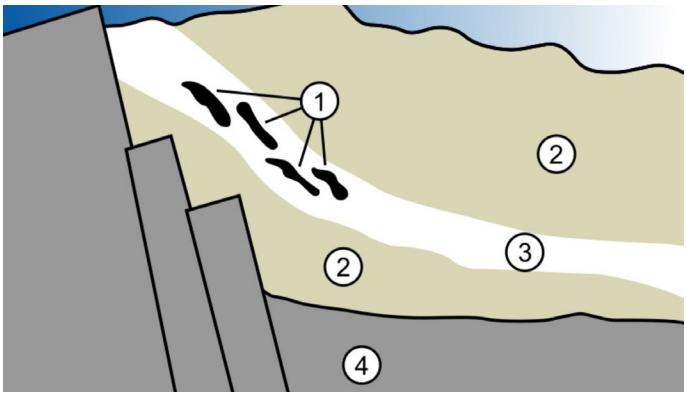
The Cobourg rock is strong enough handle construction of the repository and remove any heat from the used fuel.



How the barriers of a DGR provide protection from nuclear waste. (Source: Radioactive Waste Management, UK)



Vertical cross-section showing the main rock formation layers. (Source: Confidence in Safety – South Bruce Site report, NWMO)



Geological situation at Oklo leading to natural nuclear fission reactors – (1) nuclear reactor zones; (2) sandstone; (3) uranium ore layer; (4) granite. (Source: Wikipedia - originally from U.S. Department of Energy)

Lessons from a two-billion-year-old nuclear reactor

One of the reasons why the scientific community has identified geological repositories as the best solution to storing used nuclear fuel is because there is evidence that geology with low water flow can safely isolate and contain radioactivity for many millions of years!

In 1972, 16 ancient natural nuclear reactors were discovered in underground uranium deposits in the Oklo area of Gabon, Western Africa. Scientists believe the nuclear chain reactions developed spontaneously around two billion years ago and sustained a slow and stable nuclear fission for up to one million years due to the unique conditions of that time and location. These natural reactors — long before the age of dinosaurs — produced radioactive by-products just as our commercial reactors do today.

The remarkable thing, which emerged from the studies carried out on the territory, is that the waste produced by those nuclear reactions remained trapped in the original site, surrounded by layers of clay-like material, moving only a few centimeters over the course of two billion years — a proof indisputable in support of the thesis that burying nuclear waste is, among all possible storage methods, the best choice.

Bottle drive

Together we raised over $1,000 for the Teeswater Medical Centre. Thank you for your support (and your cans and bottles!!!)

Did you know?

Used nuclear fuel is a stable, solid material. It is not a liquid or a gas, and it is certainly not oozing green goo!

Canadian nuclear power plants are fueled by hard, high-density ceramic uranium pellets that are sealed inside zirconium tubes and arranged into fuel bundles.

The fuel pellet is the first barrier in the multi-barrier approach to managing used fuel because it has been designed to retain the fission products inside the pellet. Uranium dioxide is pressed into pellets which are baked at high temperature to change them to a hard, ceramic form. Ceramics are extremely durable; they do not readily dissolve in water, and their resistance to wear and high temperatures make them one of the most durable engineered materials. Think of the stuff that a sink or coffee cup is made of!

Photo: Uranium dioxide powder, pressed fuel pellet, ceramic fuel pellet and fuel bundle. (Source: Cameco)

If you have any questions or comments for us at Willing to Listen, please reach out via the Facebook page or email willingtolistensouthbruce@gmail.com

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