

PRELIMINARY ASSESSMENTS – PHASE 2

Borehole Drilling in Sedimentary Rocks



Safety is the first consideration in finding a site for a deep geological repository for Canada's used nuclear fuel.

Between 2012 and 2014, the NWMO used available geoscientific information to begin the process of learning about the geology of potential siting areas. These Phase 1 desktop studies were used to understand the regional geology and sedimentary sequence in the Bruce area and identify whether communities had the potential to satisfy the NWMO's geoscientific site evaluation factors. The results of these desktop studies are available online, at www.nwmo.ca and the websites of local community liaison committees, and in NWMO community offices.

For sedimentary rocks, the next phase of preliminary assessments include a series of geoscientific field studies such as observing general geological features, borehole drilling, and 2D-seismic surveys. Field studies will initially be conducted to advance understanding of the general geology in each community. These would be followed by more detailed studies, several years in the future, to understand the geology of potential repository sites identified through technical studies and discussions with the communities.

The scope, location, and timing of field studies will be developed in collaboration with communities.

Borehole Drilling and Testing

Borehole drilling and testing provides information about the underlying rock layers, including their geological, hydrogeological and hydrogeochemical characteristics.

Activities during drilling will initially include the collection of continuous rock core that will be logged and then transported to a core storage facility. Samples of core will undergo laboratory testing to examine characteristics such as the nature of the ground water trapped within the rock pores and the geomechanical strength of the rock.

Information will also be gathered during drilling that will aid in confirming the suitability and safety of the area being assessed.

Boreholes are drilled using a conventional truck mounted rotary drilling rig. They would typically be drilled through the entire sedimentary sequence to a depth of about 600 metres or more depending on the location.

Drilling, core logging, and borehole testing will likely be conducted in two shifts of 12 hours each. Depending on the depth of the borehole, the entire process can last for about 40 to 60 days.



Permitting and access

Borehole drilling in southern Ontario is strictly regulated through the Ontario Ministry of Natural Resources (MNR) Oil, Gas and Salt Resources of Ontario, Provincial Operating Standards, Version, 2.0 (MNR Standards). This document covers Well Drilling and Works regulated by the *Oil, Gas and Salt Resources Act (OGSRA)*.

Accessing the drill sites may involve access to municipal easement and/or private land. Potential locations for drilling will be identified through engagement activities with the municipality, affected private landowners, and others in the community with an interest.

What to expect

The footprint required for a drill site is about 50 x 50 metres. The area will likely be fenced, and a compacted pad will be established to host the rig and other equipment.

Drilling will be managed to minimize impact on the environment. For example, the drilling procedure will include management of drilling fluids and solids in accordance with provincial regulations.

Upon completion, drilled boreholes will be either plugged or instrumented for long-term monitoring. Instrumentation involves lowering instruments into the open borehole to measure and record bedrock properties such as permeability. Any need for long-term monitoring would require agreements with land owners.

Planning for future studies

Geoscience experts will need several months to review the data and share findings with the community. The findings, along with those from earlier desktop studies and other Phase 2 geoscientific assessments, will guide the NWMO in working with communities in planning any future study activities.

Site Selection

The NWMO is currently conducting studies to explore the potential suitability to host the project in a number of areas in Ontario, including both crystalline rock sites and sedimentary rock sites. Confirming a safe site will take several years of progressively more detailed technical, scientific, social, cultural and economic studies, as well as engagement with interested communities, First Nation and Métis communities in the area, and surrounding communities.

At this early stage, no specific sites are being considered – only broad areas have been identified for preliminary study. No communities involved in the siting process have made a decision about whether the project is a fit for their area.

Learn more. Be involved.

NWMO representatives are in the area nearly every month. You can also find us at a number of community events throughout the year.



For more information, please contact:

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