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June 23, 2017

Robyn-Lynne Virtue
Panel Manager
Canadian Environmental Assessment Agency

Sent via email: CEAA.DGR.Project-Projet.DGR.ACEE@ceaa-acee.gc.ca

Subject: Ontario Power Generation Proposed Deep Geologic Repository for Low- and Intermediate-Level Radioactive Waste: OPG Responses to Information Requests

Natural Resources Canada (NRCan) is providing specialist and expert knowledge to the Canadian Environmental Assessment Agency (the Agency) to assist in the technical review of Ontario Power Generation's (OPG) response to the Minister of Environment and Climate Change for additional information relating to the Deep Geologic Repository for Low and Intermediate Level Radioactive Waste.

NRCan has completed its technical review of the *Response to Information Request Package* submitted by OPG on May 26, 2017 (CEAR# 3784) as it relates to seismicity and seismic hazards and acid rock drainage / metal leaching. Our review did not consider OPG's assessment of the economic feasibility of alternate locations.

Within the scope of NRCan's review, NRCan agrees with OPG's analysis and conclusions related to the significance of environmental effects. NRCan has no further Information Requests for the Agency's consideration; however, technical comments pertaining to Information Requests IR-1.4, IR-1.6 and IR-3.1 are enclosed for your consideration.

If you have any questions or require clarification on our comments please feel free to contact me at <contact information removed>

Sincerely,

<Original signed by>

Jennifer Dorr
Senior Environmental Assessment Officer
Office of the Chief Scientist



Natural Resources Canada (NRCan) Comments on the Deep Geologic Repository for Low and Intermediate Level Radioactive Waste Project - Response to Information Request Package

June 23, 2017

Seismic Review

IR-1.4: Technical Feasibility Criteria

NRCan has reviewed this response within the context of its expertise in seismicity and seismic hazards, and are generally satisfied with the response.

IR-3.1: Clarification of commitment MIT-P-02

NRCan is satisfied that the commitment reflects the National Building Code of Canada (NBCC) 2015. However, we suggest the following minor revisions:

“All underground facilities will be designed and constructed to resist seismic ground motions ~~caused by a seismic event~~ specified for this area in the latest edition of the National Building Code of Canada (NBCC) at the time of construction. Under the current NBCC, these seismic ground motions ~~event~~ will have a return period of 1 in 2475 ~~2,500~~ years (or a probability of 2% per 50 years). The occurrence of such shaking ~~an event~~ shall not lead to failure of underground structures during the operational life of the facility.” [based on EA-142, IRC-LPSC-01.01, IRC-LPSC-01.02, IRC-LPSC-04.09].”

Acid Rock Drainage & Metal Leaching Review

IR-1.6: Surface Water

NRCan has reviewed the IR response relevant to acid generation and metal leaching from waste rock piles (IR-1.6). The OPG response to this IR is adequate; however, the response should have included “prevention” as another management option. The proponent listed the following mitigation measures: (1) collection, monitoring and treatment of water, (2) storage and management of waste rock, and (3) use of engineered and/or natural barriers under the waste rock pile. Acid rock drainage or acidic drainage and related metal(loid) leaching from waste rock piles can be prevented with the use of various low-permeability cover materials designed to prevent water infiltration and minimize air ingress into piles.

It should also be kept in mind that acidic generation can result from carbonate-deficient crystalline rocks with very small amounts of sulfide minerals such as pyrite or pyrrhotite; therefore, geochemical and mineralogical characterization of the crystalline rocks at the alternate locations such as those in the Ontario Shield ecozone would become a crucial task.