

OPG'S DEEP GEOLOGIC REPOSITORY PROJECT

For Low & Intermediate Level Waste

Safe and responsible long-term management

Safety Assessment

The safety of the DGR during the operational phase (preclosure) and over the long-term (postclosure), after operations have ceased and the facility has been decommissioned, was studied. These technical studies contribute to the Environmental Impact Statement and the Preliminary Safety Report submissions supporting the site preparation/construction licence application. Canadian and international guidelines were followed in the safety assessments.

These safety assessments were conducted in an iterative manner, as more detailed site characterization and facility design information became available and in turn providing feedback to the design. The safety studies will continue, incorporating information learned during construction, and would be presented as part of a future operating licence application before any wastes would actually be emplaced.

Conclusions from the preliminary safety assessment work include:

- The facility can be constructed and operated safely.
- The host rock is effective in providing long-term isolation and containment.
- The majority of radioactivity will decay in and around the repository.
- The potential dose to a person assumed to be living on top of the repository would likely be negligible, much less than 0.1 microSieverts per year.
- This is well below the public dose limit, and the natural background radiation dose rate. (The Sievert is a unit of measure used to describe the effective dose of ionizing radiation received by people. Dose is often expressed in millionths of a Sievert, or microSievert. The natural background dose rate is about 2,000 microSieverts).
- Future scenarios considered in the safety assessment include: earthquakes, glaciation, human intrusion into repository, failure of the shaft seal, failure of the borehole seals, and a vertical fault near the repository.
- Even under extreme assumptions about future scenarios, the impacts on people living around the repository site (i.e. around the current Bruce nuclear site) would be at or below the natural background radiation dose rate.

DGR Preclosure Safety Assessment

A preliminary preclosure safety assessment was completed, based on the DGR preliminary design. The assessment included:

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- The effect on public and workers from normal operation and accidents involving the waste packages
- Conventional safety assessment for workers
- Preliminary ALARA (As Low As Reasonably Acceptable) assessment for workers
- Flood risk assessment at DGR site
- Radon assessment

The operations at the DGR are generally similar to those at the existing Western Waste Management Facility (WWMF) on the Bruce nuclear site, where waste packages are already safely handled and stored.

The conclusion from the preclosure safety assessment is that the wastes can be safely handled and emplaced in the DGR.