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The Alternative Means Process for the Port Hope Area Initiative

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ABSTRACT

In March of 2001, the Government of Canada, the Town of Port Hope, Hope Township and the Municipality of Clarington agreed to the cleanup and long-term management of historic, low-level radioactive waste materials in these communities. The agreement identified conceptual designs for long-term management facilities for the wastes. Two environmental assessments (EAs) of the proposed long-term management facilities have been initiated as part of the Port Hope Area Initiative (PHAI); namely the Port Hope Long-Term Low-Level Radioactive Waste Management Project and the Port Granby Long-Term Low-Level Radioactive Waste Management Project.

A requirement set out in the Scope for the EAs is the consideration of technically and economically feasible Alternative Means of carrying out the PHAI projects. Alternative Means are the various ways that the projects could be implemented, such as alternative technologies, sites, transportation routes, etc.

Early in the overall EA processes the Low-Level Radioactive Waste Management Office (LLRWMO), which is responsible for undertaking the EAs, recognized that it was facing a significant challenge; namely, the successful completion of a clear, technically sound and defendable Alternative Means analysis, including consultation with and acceptance by the community. This would be a fundamental requirement for the success of the PHAI EAs. A further challenge was to develop consistent assessment methodologies for the Port Hope and Port Granby projects, which were both initiated under the PHAI at the same time. Although similar in many respects, the two projects have major differences. For example, the Port Hope Project, with more sources of contamination within a built-up urban area is more complex and has a broader range of potential solutions to be considered than the rural Port Granby Project.

This paper describes how the LLRWMO met that challenge, developed and implemented a successful Alternative Means process and presents the outcomes of the analyses for the Port Hope and Port Granby projects.

Methods

The evaluation of Alternative Means was undertaken in two phases. In the first phase, 'Feasible Concepts' based on those identified in the community agreements were developed and evaluated for each project. In the second phase, design descriptions were developed and a detailed comparative evaluation undertaken to identify 'Qualified Concepts'. An analysis of alternative transportation routes was also undertaken. Consultation with the community to determine preferences and input was a key part of the evaluation processes. A detailed comparative

evaluation of alternatives using a numerical matrix-based comparison was undertaken to identify preferred alternatives. The assessment was confirmed through subjective consideration of advantages and disadvantages, and issues and trade-offs. The preferred "Qualified Concepts" for each were the subjects of detailed assessments of environmental effects.

Results

The Port Hope Project consisted of two major parts: siting and constructing waste management facilities (WMFs) and remediating the existing contaminated sites. The analysis identified three Feasible Concepts for a new WMF as follows:

- Manage the marginally contaminated soils (MCS) in a new WMF located in an urban area, and manage all of the low-level radioactive wastes (LLRW) at a second new WMF located in a nearby rural area;
- Manage the MCS and LLRW from each of the contaminated sites at their own nearby WMFs; or,
- Manage all of the Port Hope area wastes at a single, local and new WMF.

The analysis determined that the third Feasible Concept was the most suitable and it was carried forward as the Qualified Concept for the WMF part of the project.

With respect to the site remediation portion of the Port Hope Project, the following Feasible Concepts were identified:

- Remediation of Port Hope Harbour by:
    - dredging, dewatering and transporting contaminated sediments to the WMF; or,
    - draining, excavating and transporting contaminated sediments to the WMF.
- Remediation of LLRW sites by excavating, dewatering and transporting the LLRW to the WMF.
- Remediation of sites without LLRW by:
    - excavating, dewatering and transporting contaminated materials to the WMF; or,
    - managing materials in-place with engineered controls.

Dredging was identified as the Qualified Concept for remediating the Port Hope Harbour. For sites without LLRW, the Qualified Concept was to excavate and transport wastes to the WMF.

For the Port Granby Project, four Feasible Concepts were identified and described as follows:

- On-Site management of wastes, with excavation of the East Gorge wastes;
- On-Site management of all wastes (no waste excavation);
- Relocation of all LLRW and MCS to a new WMF on a property just north of the existing WMF; and,
- Relocation of all LLRW and MCS to a new WMF located outside of the Municipality.
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The remaining three Feasible Concepts were evaluated using more detailed information. Relocation of all wastes to a new, local, WMF was identified as the Qualified Concept. One of

the primary advantages of this Feasible Concept over the others was the elimination of the need to stabilize the existing Lake Ontario shoreline and bluffs.