Peer Review of the Port Hope Project Environmental Assessment Study Report

March 2005

Prepared for:

The Municipality of Port Hope

Prepared by:

Hardy Stevenson and Associates Ltd.
364 Davenport Road
Toronto, Ontario M5R 1K6

p: 416-944-8444
f: 416-944-0900

HARDY STEVENSON AND ASSOCIATES

Executive Summary

In 2001, the Government of Canada, the Town of Port Hope and the Township of Hope (now amalgamated into the Municipality of Port Hope) and the Municipality of Clarington signed an agreement for the cleanup and long-term safe management of historic, low-level radioactive wastes situated in their communities (Legal Agreement, 2001). This agreement set in motion an Environmental Assessment (EA) process for the Port Hope Long-term Low-Level Radioactive Waste Management Project ("the Port Hope Project") within the Municipality of Port Hope.

The preferred option for the Port Hope Project consists of the following elements:

- A single long-term waste management facility (LTWMF) for all historic low-level radioactive waste (LLRW) and specified industrial waste in the Municipality of Port Hope to be developed on the property currently occupied by the Welcome WMF and an auto recycling operation. The LTWMF will consist of an above-ground engineered containment mound with a double composite base liner and a low-permeability final cover;

- On-land remediation sites, including those impacted by LLRW and the designated industrial waste-contaminated sites, to be remediated by excavating the contaminated material and transferring it by covered, highway-licensed trucks to the LTWMF. The remediated sites will be backfilled with imported clean fill;

- The Port Hope Harbour to be remediated by dredging the contaminated sediment and transferring it to the LTWMF. The dredging will occur in two stages; mechanical followed by hydraulic; and

- Transport of contaminated materials and construction materials to the LTWMF and of backfill to the remediation sites via prescribed transportation routes.

To evaluate the environmental effects of the preferred option, the Government of Canada determined that a screening level federal Environmental Assessment would be required. Should the project be approved by federal Authorities, the construction and development of the LTWMF would commence in 2007 and be completed in 2013. The proponent for the Port Hope Project is the Low Level Radioactive Waste Management Office (LLRWMO) of Atomic Energy of Canada Limited on behalf of the Government of Canada. The Municipality of Port Hope has an oversight role by virtue of having signed the Legal Agreement with the Government of Canada.

The Municipality of Port Hope retained Hardy Stevenson and Associates Limited to act on its behalf in reviewing the EA studies prepared by the LLRWMO. This is the second report that the peer review team has prepared on the remediation of historic LLRW and marginally contaminated soils (MCS) in Port Hope. The first report reviewed the LLRWMO's alternative means process and confirmed the acceptability of advancing the preferred option described above to the detailed environmental assessment stage.

This report summarizes the peer review comments on the Final Draft Environmental Assessment Study Report for the Port Hope Project (LLRWMO-03710-ENA-12003, Revision 0d3, January 2005) completed by Marshall Macklin Monaghan Ltd. A revised Final Draft Environmental Assessment Study Report is scheduled to be submitted to the federal Responsible Authorities on March 31, 2005.

The Environmental Assessment Study Report (EASR) was developed using the information and analysis presented in a number of technical study reports, including: six baseline characterization reports documenting existing conditions for the environmental components adopted for the EA and the corresponding six environmental effects assessment reports. These reports addressed the atmospheric, geology and groundwater, aquatic, terrestrial, and socio-economic environments, and human health and safety. Other reports included the earlier Feasible Concepts Report and Qualified Concept Report, a working draft of the Port Hope Project – Description of the Project for EA Purposes, and a Report on the Consultation and Communications Program.

Having reviewed the studies and analysis, the Municipal Peer Review Team has concluded that the EASR demonstrates that the preferred option can be designed to protect human health and the natural and social environments of Port Hope for the short and long term. Many of the components of the Environmental Assessment meet our expectations for a thorough and comprehensive analysis of potential effects. We generally agree with the Study's conclusions and we feel that the study, including addenda, is suitable for submission to Federal Authorities for further review.

Nonetheless, the Municipal Peer Review Team has identified a number of areas in the Environmental Assessment Study Report that should be strengthened. Work is required to fully characterize and determine the effects on the Aquatic and Terrestrial Environments. We generally expect to see more detail regarding mitigation measures and monitoring in all areas of the environment, especially related for socio-economic effects, prepared during the Detailed Design phase. Finally, in the next Phase, the EASR needs to be explicit about how the project has been designed to demonstrably minimize effects rather than to meet the regulatory requirements

It is important that the Municipality continue to have an oversight role to ensure that additional analysis requested by the MPRT be addressed. It should be noted that the Municipality of Port Hope and the LLRWMO are committed to continued discussions leading to an agreement on the clean-up criteria. Council should continue its efforts to provide to the LLRWMO a greater definition of the desired end use during Detailed Design.

Table of Contents

1. Introduction

An Environmental Assessment (EA) is required under the Canadian Environmental Assessment Act (CEAA) and licensing approvals are required from the Canadian Nuclear Safety Commission before decisions can be made for the implementation of the Port Hope Project. As required by the Legal Agreement, the Low-Level Radioactive Waste Management Office (LLRWMO) must obtain the written consent of the Municipality of Port Hope to the preferred option before the Environmental Assessment Study Report (EASR) can be submitted to the federal authorities for review. The Municipality's peer review team, led by Hardy Stevenson and Associates Limited (HSAL), has completed a detailed review of the EASR, including a description of the preferred option, prepared by the LLRWMO. This document summarizes the municipal peer review of the EASR and its support documents as outlined later in this report.

1.1 Background

In 2001, the Government of Canada, the Town of Port Hope and the Township of Hope (now amalgamated into the Municipality of Port Hope) and the Municipality of Clarington signed an agreement for the cleanup and long-term safe management of historic, low-level radioactive wastes situated in their communities (Legal Agreement, 2001). The agreement is founded on the municipalities' independent proposals to the Federal Government to host facilities for the long-term management of historic wastes located in their communities.

Subsequently, Natural Resources Canada launched the Port Hope Area Initiative (PHAI) in June 2001. Two projects have emerged as a result of this initiative: the Port Hope Long-term Low-Level Radioactive Waste Management Project ("the Port Hope Project") for the amalgamated Municipality of Port Hope, and the Port Granby Long-term Low-Level Radioactive Waste Management Project ("the Port Granby Project") for the Municipality of Clarington.

The Port Hope Project originally consisted of two principal components:

1. The remediation of sites containing low-level radioactive waste (LLRW), marginally contaminated soils (MCS) and specified industrial wastes located in the former Town of Port Hope (now Ward 1 of the Municipality of Port Hope), including the Port Hope Harbour and the management of the wastes in a local, long-term low-level radioactive waste management facility; and,

2. The remediation of sites containing LLRW and MCS located in the former Township of Hope (now Ward 2 of the Municipality of Port Hope) and the management of the wastes in a local, long-term low-level radioactive waste management facility (LTWMF).

In February 2004, the LLRWMO, the federally-appointed proponent for the Port Hope Area Initiative, completed its Alternative Means Process (i.e., the process for evaluating alternative means of carrying out the project that will be considered in the EA). The final draft report recommended a Qualified Concept (QC) for the Port Hope Project. The QC report describes in detail the evaluation and comparison of the three Feasible Concepts (FC), and the identification of a preferred method for the long-term management of low-level radioactive waste at a single site south of Highway 401 and west of Baulch Road (Concept D). The QC report also describes the process of cleanup and remediation of contaminated sites, and preferred transport routes for the haulage of construction materials, wastes, and contaminated soils.

Following completion of its QC report, the LLRWMO recommended to Port Hope Council that the following concept be endorsed by the Municipality as the preferred option for the Port Hope Project:

- A single LTWMF for all historic LLRW in the Municipality of Port Hope will be developed on the property currently occupied by the Welcome WMF and an auto recycling operation. The LTWMF will consist of an above-ground engineered containment mound with a double composite base liner and a low-permeability final cover;

- Remediation sites, including those impacted by LLRW and the designated industrial waste-contaminated sites, will be remediated by excavating the contaminated material and transferring it by highway-licensed trucks to the LTWMF. The remediated sites will be backfilled with imported clean fill;

- The Port Hope Harbour will be remediated by dredging the contaminated sediment and transferring it to the LTWMF. The dredging will occur in two stages; mechanical followed by hydraulic; and,

- Transportation of contaminated materials to the LTWMF and of backfill to the remediation sites via prescribed transportation routes.

The Municipal Peer Review Team (MPRT) concurred with this recommendation following a detailed and extensive review of the Feasible Concepts and Qualified Concept report. In its report, the MPRT concluded that the Concept for managing all of the waste south of Highway 401, west of Baulch Road is the most suitable approach for implementing the Port

Hope project and should be carried through to the detailed effects assessment. The MPRT presented their recommendations to area residents during two meetings in June 2004, followed by presentations to Council in August and September 2004. In September 2004, Port Hope Council resolved to concur with the recommendation of the LLRWMO that this concept should be advanced through the Environmental Assessment process as the Qualified Concept for the Port Hope Project.

Since the fall of 2004, the LLRWMO has further developed the Qualified Concept and has undertaken studies to assess the effects of the Qualified Concept on the biophysical environment (consisting of the atmospheric, geology and groundwater, aquatic, and terrestrial environments), and the human environment (consisting of the socio-economic environment and human health and safety considerations). The reports include: a Human Health and Safety Considerations Study; six environmental effects assessment reports; a working draft the Port Hope Project – Description of the Project for EA Purposes; and a Report on the Consultation and Communications Program. These studies build upon the baseline characterization studies, which describe the existing conditions of the biophysical and human environments. The results of these studies, and the other studies undertaken by the LLRWMO through the EA process, are summarized in the Environmental Assessment Study Report (EASR). The LLRWMO presented the findings of this report to Council on February 15, 2005.

The LLRWMO has also developed a Discussion Document on cleanup criteria development, which proposes criteria for radioactive and non-radioactive contaminants of potential concern in soil, sediment, air, groundwater, and surface water.

The MPRT has undertaken a comprehensive review of the project description, cleanup criteria, baseline characterization studies and the effects assessment reports, and has provided detailed comments at various stages to the LLRWMO. The Peer Review Team comments and the LLRWMO's responses are documented on Comment Disposition Forms. The form for the EASR is appended to this report.

1.2 Purpose of the Municipal Peer Review Team Report

The purpose of this report is to advise Council of the MPRT's review of the preferred option, in particular whether it can be implemented with no significant adverse effects on the human or natural environment in the short and long term. This report is intended to assist Council in deciding:

(a) whether the environmental assessment documentation reflects the concerns of the Municipality regarding, among other issues, alternate ways of carrying out the project, end use of the closed facility, and health, safety and disruption to residents and businesses during construction; and,

(b) whether to consent to the preferred option and to allow the LLRWMO to submit the EASR to the federal authorities for review as required by Section 4.1.3 of the Legal Agreement.

Subject to Municipal consent, the EASR will be forwarded for review by the Federal Agencies responsible for the project. The Responsible Authorities (RAs) for this project are Natural Resources Canada (NRCan), the Canadian Nuclear Safety Commission (CNSC) and Fisheries and Oceans Canada (DFO). Their concurrence that the project is not likely to cause significant adverse environmental effects is a requirement for proceeding with the project. Implementation of the project would also require appropriate regulatory approvals including a licence from the Canadian Nuclear Safety Commission to construct and operate the facility.

The Municipality of Port Hope Council will have an additional opportunity to decide whether to provide its final consent to the Project following the receipt of comments arising from the Federal Regulatory review, pursuant to Section 4.1.5 of the Legal Agreement. In the event that the Federal Authorities make decisions about the Project that are not what was previously consented to by the Municipality by way of this resolution, the Parties have 60 days to consult and a further 30 days to decide if they do not wish to proceed with the Project or an element of the Project.

1.3 Overview of the Municipal Peer Review Team Report

The remainder of this peer review report consists of the following sections: Section 2 describes the MPRT's methodology for reviewing the EA reports; Section 3 provides an overview of the preferred option within the context of the performance criteria set out in the Legal Agreement.

Section 4 summarizes the results of the baseline characterization studies and the findings of the effects assessment reports for the biophysical environments, and provides an overview of our comments on each study. Similarly, Section 5 summarizes the studies and reports on the human environments, along with our comments.

Section 6 describes our comments on the follow-up program proposed by the LLRWMO for ensuring that the operational and performance criteria of the Port Hope Project are achieved throughout the lifecycle of the facility. Section 7 describes the next steps in the EA process and Section 8 describes the Municipality's and the MPRT's role in the steps. Finally, Section 9 describes our conclusions and recommendations to Council regarding the preferred option and the Environmental Assessment Study Report for the Port Hope Project.

Appended to this report are the comments the MPRT provided to the LLRWMO on the EASR.

2. Methodology for Reviewing Environmental Assessment Reports

When reviewing the Baseline Characterization Studies, the Effects Assessment reports, and the Environmental Assessment Study Report, HSAL and its team of subconsultants used a methodology described below that involved detailed review of available supporting data and background reports and consideration of the following key questions:

Purpose	• Is the purpose of the EA work clearly stated and all issues and impacts encompassed through the stated purpose?
Methodology	• Is the methodology sound enough to permit our objective review of the issues, data and facts? Are certainties and uncertainties of the EA studies openly and objectively stated? Are there federal, provincial and local standards, regulations and guidelines that have been overlooked?
Data	• Are relevant data and facts clearly and consistently used in the reports/ study? Are there data gaps? Can we trust the data?
Issues	• Have significant issues been overlooked? Are there gaps arising from our examination of the issues? Are gaps addressed to the point where the EA can move forward? Has the public identified additional issues or questions?
Mitigation*	• Do these concepts allow for realistic and effective mitigation measures to be identified by the LLRWMO?
Conclusions	• Do the conclusions follow from the data? Are the conclusions supported by the research undertaken? Would the peer review team reach the same conclusions upon examining the data? • Are there areas where the peer review team and LLRWMO consultants completely disagree? • What are our conclusions as a peer review team? What is our recommendation to the Municipality of Port Hope?

* The review of mitigation measures applies only to the Effects Assessment reports.

Following the review of the LLRWMO's reports, the peer review team prepared detailed comments applying the methodology described above (our detailed comments on the EASR are included in Appendix A). The comments were submitted to the LLRWMO. The peer review team intends to discuss these comments with LLRWMO consultants and staff to finalize the EASR. Subsequently, a final EASR Report will be prepared by the LLRWMO.

3. Description of the Preferred Option

The Port Hope Project will involve the construction and development of a long-term waste management facility (LTWMF) during 2007-2013, the remediation of contaminated sites and transfer of the contaminated material to the Port Hope LTWMF by truck, the transfer of the existing waste at the Welcome WMF into the new facility, and the maintenance and monitoring of the Port Hope LTWMF for a period of several hundred years.

This section provides an overview of the key components of the preferred option, for construction and development of the facility and the subsequent Maintenance and Monitoring Phase. The MPRT's comments on the preferred option are discussed within the context of the performance criteria set out in the Legal Agreement.

3.1 Overview of the Preferred Option during the Construction and Development Phase (2007 – 2013)

3.1.1 Cleanup Criteria

During the spring and summer of 2004, the LLRWMO consulted the Municipality of Port Hope and the Municipality of Clarington to develop principles that would set the policy direction for developing cleanup criteria. These principles are as follows:

3.1.1.1 General Principles

- Properties contaminated with historic low-level radioactive waste shall be cleaned up to permit full enjoyment and use of these properties. Such uses include vegetable gardens, play areas, recreational uses and home construction;
- Cleaned up properties can be used for all current and foreseeable unrestricted uses; *Future land uses can be anticipated for most properties within the scope of the Port Hope Area Initiative. Examples are small-scale properties, municipal properties, the Centre Pier, Port Hope landfill and inner harbour.*
- The Legal Agreement shall be adhered to throughout the development and application of clean-up criteria for the Port Hope Area Initiative. *Performance criteria, approval process and methodologies are defined in the legal agreement (Article 3 and Schedule 2) between the municipalities and the federal government (March 2001);*

- Clean-up criteria shall meet or exceed the requirements of Canadian regulators; *Development of clean-up criteria will follow the direction provided by applicable international, national and provincial standards (International Atomic Energy Agency, International Commission on Radiological Protection, Health Canada, Canadian Council of Ministers of the Environment are examples).*
- Consultation with the public, the municipalities, and federal and provincial agencies shall be conducted during the development of clean-up criteria;
- Clean-up criteria shall consider all pathways to human health and the environment. *Contaminants in air, water, soil and other environmental media will be considered when developing clean-up criteria.*

3.1.1.2 Specific Circumstances related to the General Principles

- Specific cleanup criteria will be developed to reflect anticipated (foreseeable) future land uses for certain properties within the scope of the Port Hope Area Initiative. *Examples of these include the existing Port Granby site, Centre Pier, inner harbour and the Port Hope landfill and certain roadways*;
- Clean-up criteria for the inner basin of the Port Hope harbour will be developed so that future dredging activities will not be affected by historic low-level radioactive waste. *The harbour clean-up should alleviate any concern among the public about use of the harbour and during future dredging no special care shall be required to address historic low level radioactive waste in the dredged material*;
- Clean-up criteria shall reflect special groundwater circumstances. *The completion of the clean-up at some sites (for example, the existing Port Granby facility site and the Highland Drive landfill and Highland Drive South Ravine in Port Hope) could require continued environmental monitoring and treatment of groundwater for a period of time before conditions are such that the foreseeable unrestricted use for a particular site would come into effect*;
- The Port Hope Waste Management Facility shall continue to be monitored and will remain under the care and control of Canada for the long-term (i.e. hundreds of years). *Design and development of long term waste management facilit(y) will focus on community defined end-uses. Therefore, site-specific clean-up criteria should apply to (the site) in accordance with (its) end-use (e.g. passive/active recreational, no residential, etc.)*; and,
- Designated industrial waste in Port Hope will be cleaned up in accordance with Schedule 1 Part B of the legal agreement between Canada and the municipalities.

According to the EASR, the LLRWMO proposes criteria for two different land use conditions: residential/parkland and industrial/commercial. For sites contaminated with historic LLRW, the LLRWMO intends to remediate the sites to residential conditions so as to allow current and foreseeable unrestricted uses. The cleanup criteria for the Port Hope

Harbour sediments are the same as those recommended for residential soils containing LLRW. This measure will ensure that no special care will be required to address historic LLRW in the dredged material in the future, should harbour sediments be disposed of on land for maintenance or other purposes. However, the new LTWMF site will be remediated to meet or exceed regulatory requirements that apply when the work is undertaken and will focus on site-specific community-defined end uses (e.g. passive/active recreational uses).

For the industrial waste-contaminated sites and the areas within the boundaries of the Port Hope LTWMF site, the LLRWMO expects that institutional controls and / or development constraints will apply for managing risk. The criteria values for Organic Contaminants of Potential Concern (COPC) in surface soils at the industrial waste-contaminated sites correspond with provincial MOE generic criteria for commercial / industrial sites. Alternative criteria may be appropriate for soils at depth (i.e., 1.5 m) based on further assessment of contaminant and exposure conditions and risk management measures.

The radioactive COPCs have been identified as radium-226, thorium-230, and thorium-232. Criteria values for the radioactive COPC are incremental concentrations (i.e., exclusive of background) since they are intended to protect against incremental radiation dose. The non-radioactive COPC of greatest concern include arsenic, antimony, cobalt, copper, nickel, uranium, lead, and fluoride.

The LLRWMO's Discussion Document on Cleanup Criteria Development proposes specific criteria for radioactive and non-radioactive COPCs in soil, sediment, in surface and groundwater, and in air, based on relevant Canadian and international guidelines and the LLRWMO's experience with past cleanup projects. The MPRT has reviewed this document and has made a number of specific comments on how criteria should be developed. These comments include:

- clarification about contaminants that must be found at a site for it to qualify for cleanup;
- guidelines/criteria for applying ALARA (i.e., to reduce doses to as low as reasonably achievable levels);
- site-specific procedures and plans;
- further explanation of LLRWMO's interpretations of background concentrations that are at variance with MOE definitions and its implications;
- applicability of COPCs for air for short-term use during excavation/construction;
- guidelines for groundwater considering long-term constraints with respect to water use; and,
- protocols for monitoring and verification of cleanup.

Discussions are ongoing to resolve the comments made by the MPRT. These issues are further discussed in the report (Section 3.3.3).

The Agreement sets out the scope of the cleanup work and certain elements of the cleanup methodology would require regulatory approval before cleanup can be undertaken.

3.1.2 Characteristics and Quantities of Waste Materials

Waste material that will be placed into the Port Hope LTWMF will originate from the four sources described below. It will not include any LLRW from outside the municipality or non-historic LLRW waste.

- **Welcome WMF**: Wastes at the existing Welcome WMF consist of low-level radioactive waste (LLRW) and marginally contaminated soils (MCS) (i.e., soils contaminated due to mixing or contact with the LLRW due to leaching of the LLRW and movement of contaminated groundwater at the site). The total quantity of LLRW and MCS that will originate at the Welcome WMF is estimated to be 620,000 m^3;

- **Remediation sites**: Wastes at the remediation sites generally consist of LLRW and sand and silt soil or fill that have been contaminated due to mixing or contact with the LLRW or with contaminated groundwater. Several sites will also generate grubbing wastes (e.g., tree roots, subsurface vegetation) that cannot be effectively separated and will be directed to the Port Hope LTWMF. The LLRW at the Highland Drive Landfill is co-mingled with municipal refuse.

  At some sites, excavation will extend into groundwater and the material will be saturated. Contaminated soil would be dewatered if needed before being transferred to the LTWMF. The material dredged from the Harbour consists of very loose and soft fine sediment. The total quantity of LLRW including MCS that will originate from the remediation sites is estimated at approximately 735,000 m^3;

- **Industrial waste-contaminated sites**: These four sites are typified by their non-radiological contaminants that include metals, petroleum hydrocarbons and polycyclic aromatic hydrocarbons. For EA purposes, the quantity of waste material associated with industrial waste-contaminated sites has been maintained at 40,000 m^3; and

- **Cameco decommissioning waste materials**: Cameco is responsible for remediation activities associated with drummed waste in storage at the Centre Pier, historic LLRW generated during decommissioning of redundant facilities at Cameco, and historic LLRW

located on the Centre Pier[1]. The quantity of waste material excluding non-Cameco industrial wastes on the Centre Pier and the Lions Centre Park is 150,000 m^3.

3.1.3 Port Hope Long Term Waste Management Facility (LTWMF)

The LTWMF will be located on lands currently occupied by the existing licensed Welcome WMF and adjoining lands leased to an automobile recycling operation. The total area of the site is approximately 50 hectares. The facility will consist of an above-ground engineered containment mound with a double low-permeability base liner and final cover. It has been designed to contain approximately 1.9 million m^3 of waste materials. Additional materials (sand, clay, stone, general fill) are included in the design of the base and top cover to isolate the waste from the environment. Before construction of the facility begins, a 2 metre high security fence will be installed around the perimeter of the site. A controlled gateway will be installed at the entry into the site, and visual and sound buffering soil berms will be placed as required around the perimeter of the site to reduce effects on neighbouring properties.

The engineered mound will occupy an area of approximately 23 ha within the 50 ha site. When completed, the facility will form a vegetated earthen structure extending approximately 25 metres above the existing ground. Because the site presently has a 30 metre height difference from east to west across the site, the mound will be approximately 15 metres above the adjacent topography to the east and approximately 45 metres to the west of the site.

The facility will be developed as five separate cells: Cell 1, Cells 2A and 2B, Cell 3, and Cell 4. Cell 1 will accept LLRW from both onsite and offsite sources. The onsite waste will be excavated from within the footprint limits of Cell 2A and placed into Cell 1. Cell 2A will receive contaminated materials from offsite sources as well as from the footprint area of Cell 2B. Cell 2B will receive waste materials from offsite sources as well as from the western (treed) portion of the site. Cell 3 will be designated for containment of the co-mingled municipal refuse / contaminated soil from the Highland Drive Landfill (and other wastes that may contain organics). Cell 4 will be designated for containment of the Cameco-related drummed waste.

The base liner system comprises a double composite base liner consisting of a primary (upper) liner and an identical secondary (lower) liner with high-density polyethylene (HDPE)

[1] There is additional LLRW stored on the Centre Pier, not included in the Cameco waste allocation, that resulted from the cleanup of the site for the construction of the Municipality's new water treatment plant in 2003.

and associated drainage layers. The total liner thickness will be in the range of 2.5 metres. A network of perforated pipes will be installed to collect and remove leachate that will accumulate in the Port Hope LTWMF. The systems within each cell will drain to a collection sump where collected leachate and any sediment accumulation from the cleaning and maintenance activities can be removed.

The Port Hope LTWMF final cover will consist of layers of natural and synthetic materials designed to minimize infiltration of precipitation to the waste and to provide shielding for gamma radiation and radon emissions to the environment. In addition, a layer of rocks will be incorporated into the cover to act as an intrusion barrier. The total thickness of the cover will be in the range of 2 metres. Cell 3, containing the co-mingled LLRW and municipal waste, will include a collection system for the gases produced as the organic materials within the waste decompose. The collection pipes will connect to a treatment system, consisting of a flare to incinerate the methane and other gaseous contaminants associated with the landfill gas.

During construction and development of the LTWMF, uncontaminated surface water from work areas will be directed via temporary ditches to a storm water management pond located on the west side of the site. The pond will discharge to existing drainage courses, ultimately draining to Brand Creek. Contaminated surface water and ground water will be flow to separate collection ponds, pass through a treatment facility to remove contaminants and then flow through a pipeline to Lake Ontario.

3.1.4 Transportation of Construction Materials

To access the site, a dedicated access road will be constructed from Toronto Road to the Port Hope LTWMF site. Construction materials will be transported to the Port Hope LTWMF using highway-licensed trucks, the majority of which will access the site from Highway 401 to Toronto Road and the dedicated access road. The construction materials will consist mainly of bulk soil and granular materials and geosynthetic products for the base liner and final cover construction. An estimated 330,000 m^3 of soil and granular material and 950,000 m^2 of geosynthetic material will be required for the liner. Final cover construction will require an estimated 380,000 m^3 of soil and granular material and 630,000 m^2 of geosynthetic material. An additional 415,000 m^3 of structural backfill soil for refilling the excavation areas, perimeter berms, and other site preparation, is also required.

3.1.5 Placement of Contaminated Material

Onsite contaminated soil will be excavated using conventional excavation equipment (e.g., excavators, loaders) and loaded into off-road haulage vehicles. The trucks will travel via onsite roadways to the cell being developed, where the contaminated soil will be offloaded. Contaminated material from offsite sources will arrive at Port Hope LTWMF on highway-approved trucks. The off-loaded contaminated soil will be placed within the cell using dozers dedicated to this activity. Contaminated surfaces will be protected with a temporary covering to prevent wind erosion of the soil surface.

3.1.6 Remediation of Contaminated Sites

The sites to be remediated of LLRW / MCS include 18 major on-land sites, the Port Hope Harbour, as-yet undefined portions of roadways and street allowances, and an undetermined number of small scale sites (e.g., residential properties). The four industrial waste sites are the Lions Recreation Centre Park (the Lions Park), the Coal Gasification Plant Site, the Chemetron Lagoon Site, and the historical industrial wastes on the Centre Pier.

3.1.6.1 On-land Sites with LLRW

For on-land contaminated sites, the LLRW typically extends to a depth of 1 to 2 metres below grade, with the exception of the Highland Drive Landfill (refer to Section 3.1.6.2 below). The contaminated material will be excavated using conventional equipment (e.g., excavators, loaders) and loaded onto highway-licensed trucks. When excavations have been verified to meet the remediation objectives, they will be backfilled with clean fill imported from offsite sources. The final surface restoration will typically be topsoil and seed, or granular and asphalt.

3.1.6.2 Highland Drive Landfill

The Highland Drive Landfill includes a significant quantity of LLRW, much of which is co-mingled or overlain by municipal solid waste. LLRW extends to approximately 12 metres below grade and is overlain by as much as 5 metres of soil and/or municipal refuse unaffected by LLRW. Both the contaminated and unaffected waste will be removed using a medium size excavator and loader. To the extent possible, the LLRW within the landfill will be segregated from the municipal refuse and excavated and transferred to the LTWMF. As described previously, all waste resulting from remediation of the landfill will be placed in a dedicated cell at the LTWMF.

Restoration of the site will involve grading, placement of soil cover over areas where municipal refuse remains, top soiling and seeding the restored surface, and removal of all temporary works and structures. A passive groundwater collection system will be installed to divert the groundwater seepage from the Highland Drive South Ravine slope away from the excavation. Groundwater flushing may be required for many years after remediation of the Highland Drive area and other sites, possibly restricting use on some sites. Approximately 40,000 m^3 of earth fill materials of various types will be required for restoration grading and the low-permeability soil cover.

3.1.6.3 Port Hope Harbour

Contamination in the Harbour exists as the sediment layer overlying the till and bedrock surface throughout the Approach Channel and Turning Basin. The sediment thickness varies, extending to as much as 3 metres deep. Before dredging begins, a geotextile silt curtain will be installed at the entrance of the Harbour to prevent sediment movement into the outer harbour and Lake Ontario. A dike will be constructed at the south limit of the area to be dredged to physically isolate the area.

The dredging will be conducted in two stages: mechanical dredging and hydraulic dredging. The first stage will involve excavation by clamshell bucket operating from a barge and loading sediments onto a scow. This process is expected to remove approximately 85% of the contaminated sediment. At the conclusion of the mechanical dredging operation, remediation activities will cease for a minimum 3 to 4 months to allow the settlement of sediment suspended in the water column. The residual sediments that remain following the first stage will be removed by hydraulic (i.e., suction) dredging. During both stages, the sediment will be placed temporarily on the adjacent Centre Pier property to allow for de-watering. It will subsequently be loaded onto trucks and transported to the Port Hope LTWMF.

3.1.6.4 Industrial Waste-Contaminated Sites

These contaminated sites are former industrial sites that are included in the PHAI by agreement between the Municipality and the federal government. The depth of required excavation at these sites will typically be approximately 2 to 3 metres, although it will extend to about 7 metres in portions of the John Street Coal Gasification Plant Site. Contaminated soil will be removed using conventional construction equipment and loaded into highway-licensed trucks.

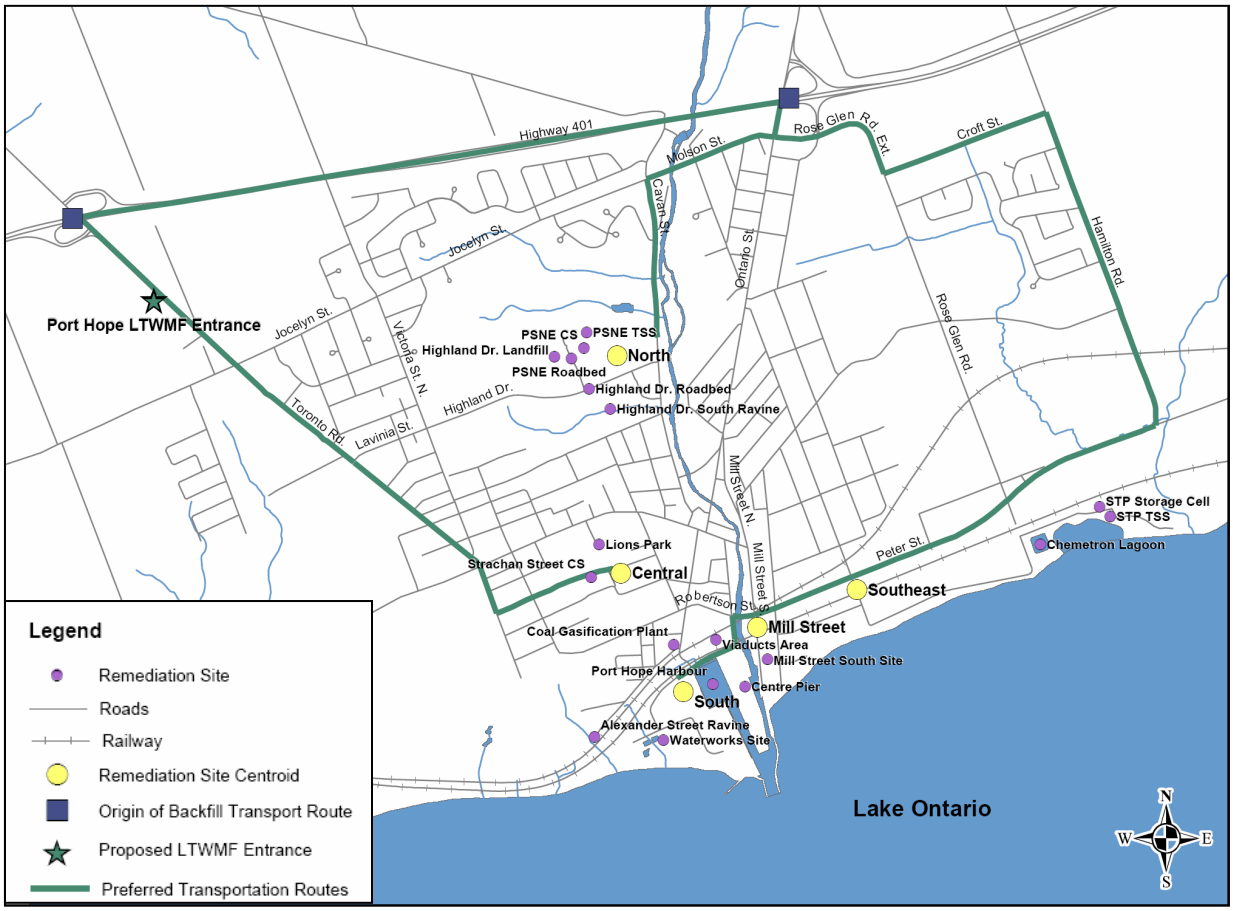
Backfill soils will be imported from offsite sources. The quantity of backfill placed at each remediation site will be similar to the volume of soil removed, except at the Chemetron Lagoon site, where an additional quantity will be required to regrade the area of the former lagoon.

3.1.6.5 Transport of Contaminated Materials

For transport planning purposes, the remediation sites have been grouped into regions within the Municipality. A "centroid" has been established for each region to represent the point of origin for the waste material transport routes. These centroids and the preferred transportation routes are shown on **Figure 1**. For the importation of backfill to the remediation sites, the point of origin of each transport route will be either the intersection of Toronto Road and Highway 401 or Ontario Street and Highway 401. The terminus of each backfill route is assumed to be one of the regional centroids. However, during remediation some trucks may be required to travel on local roads to reach the preferred transportation route, including trucks from small scale sites located in various areas of Ward 1.

All trucks will be cleaned of any loose material on the body, chassis, frame or tires and monitored before departing the controlled zones. The truck boxes will be completely covered with tie-down tarps to prevent release of material or dust from the cargo. All trucks will be signed to include a contact number.

Figure 1 - Transportation Routes for Contaminated Material



3.2 Overview of the Preferred Option during the Maintenance and Monitoring Phase (2014+)

A number of potential end uses have been considered for the completed Port Hope LTWMF (e.g., passive recreational/parkland, active recreational/tourism, restricted use). The Municipality wants the Port Hope LTWMF to enhance the community's image and be compatible with and blend in with the surrounding natural/cultural landscape. The general guidance for the end use of the aboveground mound would essentially be a grassed mound with limited low maintenance walking trails connecting to the remainder of the site and surrounding areas which could have compatible uses.

The main functional components of the Port Hope LTWMF, which include the base liners, leachate collection/monitoring system, gas collection and treatment system and final cover,

are anticipated to function well with some deterioration as the components age. Throughout the maintenance and monitoring phase, regular inspections, repairs and maintenance will be performed. Environmental and performance monitoring at the Port Hope LTWMF will occur to ensure that the facility is functioning as intended. The monitoring program will focus on groundwater, surface water and air quality, terrestrial and aquatic biota, leachate and methane gas generated in the facility and the performance of the cover and base liner systems.

The requirement for leachate treatment will continue through the maintenance and monitoring phase. However, the volume of leachate that will be generated in the Port Hope LTWMF will likely have declined and possibly stabilized within the first 10 to 15 years following completion of the facility. After that point, the volume of leachate to be treated is anticipated to be approximately 150 m^3 per year. The requirement for gas collection and treatment will continue through the early life phase of the Port Hope LTWMF, during which time generation rates are expected to peak and begin to decline. By 2025, gas collection and treatment is no longer expected to be required.

3.3 Does the preferred option achieve the performance criteria set out in the Legal Agreement?

The MPRT reviewed the Description of the Project presented in the EASR, in addition to the draft report entitled *Description of the Project for EA Purposes*. The MPRT made a number of detailed comments, requesting supplemental information to be included in the final EASR or, in some cases, during Detailed Design. During our review, we referred to the Legal Agreement to determine whether the project as described achieved the performance criteria.

This section presents each of the criteria set out in the Legal Agreement in the context of the preferred option. Overall, the MPRT believes that the preferred option can achieve the performance criteria set out in the Agreement.

3.3.1 Article 3.1.1: "*Any work … in regard to the establishment of the New Waste Management Facility shall be done so that the Facility will meet or exceed the regulatory requirements that apply at the time when the work is undertaken".*

It is the MPRT's opinion that the preferred option includes all the components necessary to achieve the appropriate regulations and licensing, including CNSC dose limits to the public and the workers, Ambient Air Quality Criteria (AAQC) and Ontario Drinking Water Standards (ODWS). The MPRT believes that there are additional opportunities in the current design to minimize the effects to as low as reasonably achievable. In this context, the MPRT believes that this project should be designed such that it exceeds regulations wherever possible to provide the best possible protection to current and future residents of Port Hope. We are confident that such optimization can be made to the project during Detailed Design in a financially responsible manner. These design changes are discussed in further detail in Sections 4 (Comments on the Proposed Effects on the Biophysical Environment) and 5 (Comments on the Proposed Effects on the Human Environment). A recommendation for continued Municipal oversight is contained in Section 8.

3.3.2 Article 3.2.1: "*Canada shall construct and operate the Facility so that, save for areas which may be required to be set aside for water management and monitoring activities and therefore access to which may have to be restricted, the surface area will be able to be used for active or passive recreational purposes as provided for in this Agreement".*

When the Municipalities proposed the concepts to the federal government, they required the facilities to be designed to be safe for public access. The designs would achieve background gamma radiation levels at the surface of the mound so that public health would not be affected.

The MPRT recognizes that access to certain areas within the Facility site will likely be restricted, such as the leachate collection and treatment system, gas collection flare, and storm water management ponds. Also, the CNSC may have a regulatory requirement with regard to fencing, which will have to be accommodated. Furthermore, discussions will continue between the Municipality and the LLRWMO regarding end uses for the mound and the remainder of the facility site. The Municipal Council's Long Term Waste Management Facility End Use Advisory Committee will assist Council in this regard.

We are, however, pleased that the EASR acknowledges that "some alternative fencing to demarcate the mound and deter potentially destructive access … would be acceptable".

Similarly, the EASR references ideas generated by the community, including a natural environmental preserve, an interpretive and educational centre or museum, sports fields and walking trails. We are confident that the Municipality and the LLRWMO can define the types of public access to and use of the site after closure of the mound that is compatible with CNSC license requirements and other facility management requirements.

3.3.3 Article 3.3.1 (a): "*Canada shall clean up properties contaminated with Historic Low-Level Radioactive Waste so that all such properties will be able to be used for all current and foreseeable unrestricted uses"*.

The Municipality of Port Hope and the LLRWMO are committed to continued discussions leading to an agreement on the clean-up criteria. General agreement has been reached on Clean-up Principles that will guide the development of criteria. Once agreement has been achieved, the revised recommended cleanup criteria will be forwarded to the relevant agencies for review. This will occur prior to submission of the criteria to the CNSC for approval. The MPRT is confident that the cleanup criteria can be developed so as to be appropriate for unrestricted uses provided that they are revised to be consistent with the cleanup principles as a first priority.

The MPRT's comments on the *Discussion Document for Cleanup Criteria Development for the Port Hope Area Initiative* are intended to ensure that the remediation of LLRW contaminated sites allows for all current and foreseeable unrestricted uses. We are pleased that the cleanup criteria will apply at depth (i.e., that the same criteria will apply no matter how deep the contamination goes), and that the remediated sites will be filled with clean fill. However, the description of cleanup criteria included in the EASR does not yet reflect the MPRT's comments on the cleanup criteria, nor does it adequately refer to principles developed cooperatively with the Municipalities.

As stated earlier, the MPRT has requested clarifications and made recommendations on a number of issues, particularly:

- guidelines on the level of contaminants that must be found at a site for it to qualify for cleanup;
- guidelines/criteria for applying ALARA (i.e. to reduce dose to as low as reasonably achievable levels);
- development of site-specific procedures and plans and assurances that the criteria are adequate for the long term;
- LLRWMO's interpretations of background concentrations that are at variance with MOE definitions and its implications;

- adequacy of criteria for COPCs for air for short-term use during excavation / construction;
- guidelines for groundwater that are sustainable for the long term with respect to water use; and,
- protocols for monitoring and verification of cleanup.

Discussions are ongoing to resolve the comments made by the MPRT.

3.3.4 Article 3.3.1 (b): "*Through the cleanup process, other contaminants may be found commingled with the Historic Low-Level Radioactive Waste, and in such cases, Canada shall clean up the commingled waste material*".

The major area in Port Hope where other contaminants are commingled with LLRW is the Highland Drive landfill, where the LLRW is commingled with municipal waste. The proposed works at the Highland Drive landfill, as described in the EASR, reflect this performance criterion.

We note that there may be some instances involving private property owners where soils testing and removal of historic LLRW for this project may identify other industrial contaminants. It is reasonable to expect that contaminants commingled with LLRW would be removed. However, situations may arise where the industrial contaminants co-exist but are not commingled. Such potential situations may require a protocol for cleanup such that cleanup of the properties is satisfactory and removes both LLRW and other contaminants.

We believe that the Municipality and the LLRWMO can deal with these questions during Detailed Design.

3.3.5 Article 3.3.1 (c): "…, Canada shall clean up the approximately 40,000 cubic metres of Industrial Waste on the properties identified in Schedule 1, Part B, Section 3 (non-radioactive) to this Agreement which cleanup will meet the applicable Ontario Ministry of Environment regulations and guidelines as determined by Canada."

This criterion refers to clean-up of non-radioactive industrial contamination at sites specified in the agreement. It is proposed by the LLRWMO that surficial soils at these sites be cleaned up to generic provincial land use criteria as a minimum, and that risk management methods be applied to limit risk from underlying soils on the premise that greater contamination may be acceptable at depth.

This approach needs to be reviewed and confirmed with the Ontario Ministry of the Environment. This review may also have some implications on the total volume of waste materials that will be generated from the clean-up. The volume of wastes may exceed the earlier estimates in these studies, or there may be other issues associated with the clean-up (i.e., groundwater quality), which may also have implications for the design and footprint of the LTWMF. Should the volumes increase significantly, the Municipality of Port Hope and NRCan will need to reach agreement on the volumes to be cleaned up and who pays for the cleanup of additional volumes.

4. Comments on the Proposed Effects on the Biophysical Environment

The Environmental Assessment Study Report for the Port Hope Project examines effects of the project on the biophysical environment, which includes the Atmospheric, Geology and Groundwater, Aquatic, and Terrestrial Environments. To predict what effects might result from the project, the LLRWMO first profiled the existing or baseline environmental conditions in the areas surrounding and encompassing the current and proposed waste management facility. These areas are as follows:

- The Regional Study Area (RSA), which extends generally from the Oak Ridges Moraine in the north to approximately 5 kilometres into Lake Ontario in the south, and from the western boundary of Municipality of Clarington to the eastern boundary of the Township of Hamilton;

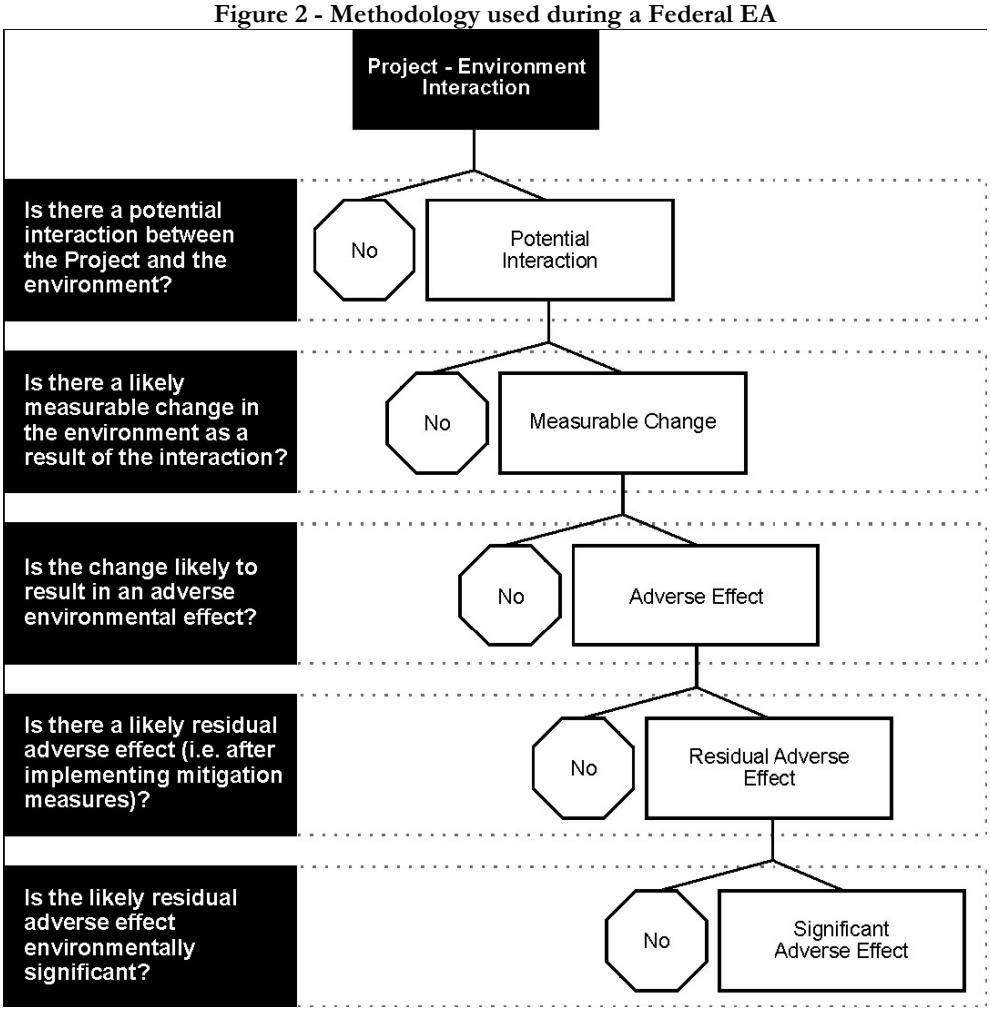
- The Local Study Area, which is bounded to the west by Willow Beach/Morrish Church Road, to the east by Theatre Road and to the north by former Hope Township 4th Line, and extends approximately 1 km into Lake Ontario to the south;

- The Site Study Area, which consists of several different sites for the Port Hope Project and encompasses all facilities, buildings, infrastructure, lands and waters, including areas in the Port Hope Harbour that are directly connected or associated with the Port Hope Project.

The general study areas were adjusted as necessary to consider the individual needs of the various environmental components.

The environmental data were reported in the Baseline Characterization Reports. Further data were collected in a follow-up phase specific to the site study areas, which were reported as Addendum to the Baseline Characterization Reports in the Effects Assessment Reports. The LLRMWO used this baseline information, the description of the project, and the proposed cleanup criteria, to predict what effects on the biophysical environment which might result from the project. **Figure 2** illustrates the methodology used during a Federal Environmental Assessment to determine whether the Project will result in any significant effects.

Figure 2 - Methodology used during a Federal EA



Based on the findings of the Effects Assessments, the EASR concludes that there are no significant adverse effects on the biophysical environment resulting from the Project. It also indicates that any residual effects will be minimized as a result of identified mitigation measures.

During our review, the MPRT considered the:

- Accuracy and comprehensiveness of baseline data;
- Accuracy and comprehensiveness of the assessment of likely environmental effects;
- Appropriateness of identified mitigation measures; and,
- Appropriateness of the follow-up program.

This section provides an overview of the Baseline Characterization Study (BCS) and the Effects Assessment (EA) report for each component of the biophysical environment, and the MPRT's comments on the BCS studies and the EA reports.

In general, the baseline characterization studies and the effects assessment reports are accurate and comprehensive, with the exception being the characterization and assessment of the effects of the project on the Aquatic and Terrestrial Environments. Additional studies are required to fully characterize and determine the effects on the Aquatic and Terrestrial Environments. We generally expect to see more detail regarding mitigation measures and monitoring in all areas of the environment prepared during the Detailed Design phase.

We also agree with the report's findings that there are no likely significant adverse effects on the project due to environmental factors (such as severe weather and extreme environmental events) which in turn could cause environmental effects. The various mitigation measures identified in the report will be effective in mitigating any natural environmental effects on the project.

Additional details on each component of the biophysical environment are provided below.

4.1 Atmospheric Environment

The effects areas in the atmospheric environment consist of non-radiological air quality, radiological air quality, and noise. As part of the assessment, the Environmental Assessment Study Report also discusses climate change and meteorological events and their effects on the project.

4.1.1 Baseline Characterization Study

The Atmospheric Environment characterization is based on both historical data and specific monitoring carried out during the baseline period. The Atmospheric Environment was characterized using air quality monitoring stations over a one-year monitoring period beginning in November 2002 and continuing until October 2003. Additional atmospheric monitoring, which focused on suspended particulate, landfill gas and noise along the transportation routes, was performed from June 2004 to August 2004. The LLRWMO anticipates that some aspects of the air monitoring program (i.e., meteorological data) will continue through the construction period.

In general terms, the levels monitored during the baseline program were unexceptional and within the range of typical historical data. Maximum 24-hour concentrations of Total Suspended Particulate (TSP) exceeded the MOE Ambient Air Quality Criteria (AAQC) at

the PHAI Mill Street South Office monitoring location on one occasion; however, this level was well within the range for historic Port Hope measurements. The MPRT has pointed out that historic measurements may not serve as a satisfactory baseline. Maximum dust fall rates also occasionally exceeded the AAQC.

Mean radon concentrations measured near the proposed LTWMF were at or near background. There was evidence of elevated radon levels within the Local/Site Study Areas, most notably at locations around Highland Drive landfill. These levels suggest that current radon emissions from LLRW in this area have affected local ambient radon levels, however, they remain below Federal Task Force criterion for radon.

Regarding noise, sound levels measured near the Highland Drive landfill are typical of urban locations near heavily travelled streets. The sound levels near the proposed LTWMF are heavily influenced by Highway 401 traffic. Sound levels near Port Hope Harbour are relatively high compared to levels elsewhere in the Local Study Area.

Summary of the Peer Review Team's Comments

In general, the MPRT was satisfied with the baseline data collected for the atmospheric environment. However, the team expects that measurements for nitrous oxides (NO_x) and carbon monoxide (CO) will be included as part of the data for non-radiological air quality, as people may be marginally affected during the remediation activities due to vehicle exhaust. Levels of these air contaminants are also predicted through the effects assessment, and therefore should be measured as part of the baseline.

Regarding odour, we are unconvinced that there will be no odour from the Highland Drive landfill due to the excavation and handling of municipal solid waste and commingled waste. The LLRWMO needs to sample waste from inside the perimeter of the landfill to determine actual measured concentrations of the typical constituents in landfill gas. Similarly, the odour assessment for the harbour is theoretical. Samples should be obtained and analyzed to re-assess the likelihood of effects and to develop appropriate mitigation.

4.1.2 Effects Assessment

To predict the effects of the project on the atmospheric environment, the Technical Study Authors made conservative estimations of baseline air quality for the year 2010 (i.e., the year considered to have the potential for maximum emissions). The potential effects of the

Project Works and Activities are modeled to determine the incremental effects that, together with the baseline data, provide an estimate of the combined environmental effect.

Regarding Total Suspended Particulate (TSP), the maximum 24-hour AAQC is predicted to be exceeded at nine locations adjacent to the Port Hope LTWMF, the Highland Drive landfill and the Lions Park locations. The greatest frequency of exceeding the 24-hour maximum AAQC is predicted for locations on the boundary of the proposed Port Hope LTWMF.

The maximum 24-hour levels of PM_{10} (particulates 10 microns or less) occasionally exceed the MOE AAQC. The highest levels of PM10 are predicted to occur at locations immediately adjacent to the proposed Port Hope LTWMF. Modelling also shows that the MOE AAQC for $PM_{2.5}$ (particulates 2.5 microns or less) is exceeded at several locations, again, all immediately proximate to remediation sites. No exceedances of the applicable criteria for TSP, PM_{10}, or $PM_{2.5}$ are predicted for residents.

Likely odours associated with exposed sediments during dredging operations at the Port Hope Harbour were also predicted. Modelling predicted that odours may occasionally slightly exceed the MOE 10-minute average odour criterion along the south end of Mill Street, on Madison Street and on the south end of King Street.

Summary of the Peer Review Team's Comments

In response to our comments on the Effects Assessment Report, the Technical Study Authors have already made revisions to the EASR, specifically concerning operational changes that will reduce or eliminate exceedances. These include incorporating better dust management practices to ensure that any effects associated with handling and transportation of materials are minimized.

However, we still have some concerns regarding the location of the receptors chosen to model potential effects. The report does not address exceedances for receptors at the fence line of the facility or for site users after the completion of the facility (i.e., members of the public) who are walking on the mound of the LTWMF or within the fence line. We would like to see special scenarios added for higher-risk users, such as pregnant women. As end use of the site and the mound is an important component of the facility, the EASR needs to address it explicitly.

In general, we are still concerned about detailed mitigation. The EASR needs to be explicit about how the project has been designed to demonstrably minimize effects rather than simply meet the requirements. For example, low emission off-road vehicles should be a requirement for construction equipment. Regarding odour, we would like to see a mitigation measure identified for the Highland Drive Landfill site due to the proximity of the landfill to the Jack Burger Sports Complex, residences and the high school. Mitigation measures should also be developed for any odour identified at the harbour.

Finally, as per the Scope of the Environmental Assessment document, the EASR must provide information on the greenhouse gases resulting from the project. This information has yet to be included. All of the forgoing information can be addressed during the Detailed Design stage.

4.2 Geology and Groundwater Environment

The Geology and Groundwater Environment for the Port Hope Project consists of the physical characteristics associated with the site and the surrounding study areas. These characteristics are geology, physiography, topography, stratigraphy, and seismicity. The baseline study also examined non-radiological qualities associated with groundwater flow, and the radiological and non-radiological qualities of groundwater quality, drainage water quality, and soil quality.

4.2.1 Baseline Characterization Study

The Geology and Groundwater Environment characterization is based on both historical data and specific sampling and monitoring carried out during the one-year baseline period. This period extended from October 2002 to September 2003. Baseline follow-up activities were carried out during spring/summer 2004.

For the purpose of this peer review report, we have not reported on the physical characteristics described in the baseline study, which are well documented in the reports. Regarding soil quality, historical samples collected from the Highland Drive South Ravine show numerous exceedances of the MOE guidelines for arsenic and occasional exceedances for barium. Similarly, historical soil samples from within the Site Study Area for the LTWMF indicated exceedances of the MOE guidelines for arsenic and cobalt in native soils (i.e., soils indirectly contaminated due to groundwater flow and leaching) and arsenic, cobalt,

copper, nickel and antimony in the wastes and mixed soils (i.e., soils directly contaminated due to mixing/contact).

A compilation and review of historical data concerning soil quality at the remediation sites confirmed the presence of contaminants at levels above the MOE Table 3 criteria, including exceedances of the criteria for:

- Silver, arsenic, mercury and lead at the Alexander Street Ravine;
- Arsenic and mercury at the Mill Street Site;
- Antimony, boron, copper, lead and zinc at the Lions Recreation Centre Park;
- Copper, lead and zinc and for petroleum hydrocarbons and polycyclic aromatic hydrocarbons (PAHs) at the former Coal Gasification Plant Property;
- Antimony, arsenic, boron, lead, zinc, and petroleum hydrocarbons at the Centre Pier; and,
- Lead and selenium at the Chemetron Lagoon.

The single analysed composite soil sample from the study area of the proposed LTMWF exhibited elevated concentrations of uranium, lead, polonium-210, and radium-226.

One well in the area of the Pine Street North Extension Consolidation Site exhibited uranium concentrations above the Ontario Drinking Water Standards (ODWS). The results of private well water quality in the vicinity of the Highland Drive site indicated a single exceedance of the health-related ODWS for sodium and two exceedances of the ODWS for nitrate. Monitoring wells located down gradient of the Welcome WMF mound exhibited arsenic concentrations commonly elevated above ODWS. Groundwater samples were collected from three monitoring wells in the Bedrock Aquifer. Two of the wells exhibited only occasional exceedances of the ODWS criteria for aluminium, chloride and Total Dissolved Solids. The third well, which extended to much lower groundwater elevations, also exhibited elevated concentrations of bromide, ammonia, boron, iron, barium, lead, manganese, potassium, sodium and strontium.

At the industrial sites, groundwater quality effects resulted from the same contaminants represented in the soils. These included metals, PAHs and petroleum compounds at the former Coal Gasification Plant Property and the Chemetron Lagoon site; metals and petroleum compounds at the Centre Pier; and nitrate and nitrite at the Lions Park.

Sampling results, coupled with the available historic uranium, indicate a large area of uranium effect to the south and east of the municipal landfill, with a concentrated plume extending from the vicinity of the Pine Street North Extension Consolidation Site into the

South Ravine. Arsenic and uranium are present at concentrations above their respective ODWS values in groundwater at Alexander Ravine, Mill Street South Site, the Strachan Street Consolidation Site and the Centre Pier, and uranium is present at concentrations above its ODWS value in groundwater at the Lions Park. Groundwater at the Former Coal Gasification Plant has historically contained radium and thorium.

Drainage water quality in the Site Study Area for the LTWMF exhibits impacts related to the presence of the Welcome WMF burial area. The concentrations of metals including aluminium, antimony, arsenic, cadmium, chromium, cobalt, copper, iron, lead, nickel, phosphorous, silver, thallium, uranium, vanadium and zinc commonly exceeded PWQO criteria. This surface water is collected and treated, prior to discharge via pipeline, to Lake Ontario

Samples collected and analyzed by Cameco from Brand Creek (west of the Welcome WMF) and from Highway 401 stream sampling location (immediately north of the Welcome WMF) indicated sporadic uranium concentrations in excess of the PWQO guideline.

Summary of the Peer Review Team's Comments

Regarding the Baseline Characterization Study, the report is comprehensive with a few exceptions. There are still uncertainties associated with the nature and volume of waste, which besides being important design data also reflect on the geology and groundwater-related effects. As a result, the contingency volumes described in the EASR will need to be further analyzed during Detailed Design to assess whether the waste data are reasonably firm and whether the reported environmental effects will be valid within the range of waste parameters. This assessment should be followed by ongoing examination during excavation of whether the volumes are being exceeded.

The MPRT and LLRWMO have discussed additional information that will be required regarding impacted groundwater at the existing Welcome WMF, and at the remediation sites. We expect this information to be provided during Detailed Design.

4.2.2 Effects Assessment

According to modeling results, there will likely be measurable changes in the concentrations of non-radiological and radiological contaminants of potential concern (COPC) in surface soils at the perimeter of the LTWMF. These changes result from the deposition of airborne

contaminants during the handling of waste material during construction. Levels of arsenic, for example, are expected to increase by 130% over baseline concentrations. However, these increases are well below the applicable MOE soil quality guidelines and as such, are not considered to represent an adverse effect. The largest predicted radiological soil parameter incremental increase is 63% over the baseline concentration for thorium-230. The LLRWMO does not consider this increase to be adverse because of the absence of applicable soil quality criteria.

Regarding groundwater flow, the volume of groundwater discharged to Brand Creek is estimated to be slightly lower (2%) than baseline conditions during the subsequent maintenance and monitoring phases. The storm water management system will augment the flow in Brand Creek by approximately 81,200 m^3/year.

Following construction of the LTWMF, the groundwater discharge will be reduced by 30% due to the reduced infiltration over the LTWMF. This change is considered to represent an overall beneficial effect since it is a net reduction in the volume of onsite drainage water that is collected, treated and discharged to Lake Ontario. Similarly, the COPC concentrations discharging from groundwater to the groundwater/surface drainage water collection and treatment system are expected to decline with time due to flushing of contaminants from the aquifer.

Summary of the Peer Review Team's Comments

Overall, the MPRT agrees that the project will result in an improvement to groundwater quality. However, the MPRT believes that information about the effects of the project on groundwater quality and quantity need to be strengthened in the EASR report. The MPRT suggests that the LLRWMO revisit the finding that there is no residual effect to groundwater flow as a result of the project. For example, 250 L/min of groundwater is to be extracted during de-watering for 1 to 2 weeks. In addition, a 2% reduction in discharge to Brand Creek is expected. To deal with potential effects to the quantity of groundwater flow, appropriate mitigation measures should be developed.

It is further noted that the storm water management system will augment the flow in Brand Creek. Augmentation with storm water discharge is typically not an acceptable method of replacing lost groundwater flow. We would like to see information demonstrating that net loading of contaminants from the storm water discharge in Brand Creek is not of concern.

The MPRT believes that the leachate volumes collected, treated, and discharged from the LTMWF may be higher than the 150 m^3/year predicted during the monitoring phase. The design should account for larger volumes and associated operational and maintenance costs.

Regarding the drummed waste in Cell 3 of the LTWMF, the MPRT would like to see the inventory of the drum contents and other options for handling the drums, such as crushing/compacting, removal of contents, addressed during Detailed Design to avoid settling of contents. Settling could potentially affect groundwater and surface water conditions at the site and leachate collection.

4.3 Aquatic Environment

The Aquatic Environment includes a number of components associated with watercourses and Lake Ontario, which are as follows:

- Hydrology and coastal processes
- Non-radiological and radiological surface water quality
- Non-radiological and radiological sediment quality
- Fish communities and habitat
- Benthic invertebrate communities
- Aquatic plant communities

4.3.1 Baseline Characterization Study

The BCS is based on historical data and specific sampling carried out during the baseline period. Sampling was conducted over a one-year baseline period, focusing on field sampling in fall 2002 and spring/summer 2003. Sampling stations were established at Little Creek, Brand Creek and its tributaries, Port Britain Creek, Gages Creek, Ganaraska River, Brewery Creek, and Highland Drive South Creek.

Regarding surface water quality, uranium and arsenic concentrations were found above guideline levels in tributaries of Brand Creek and in the Highland Drive South Creek, which are subject to influence from the Welcome WMF and Highland Drive Landfill, respectively. In Port Hope Harbour, copper, phosphorus and uranium concentrations were elevated above guideline levels and were elevated relative to the lake stations.

Sediment quality guidelines for iron, manganese, copper and zinc were exceeded in samples from one Brand Creek tributary while the arsenic guideline was exceeded in other Brand Creek tributaries, in Highland Drive South Creek, and in Alexander Creek. The arsenic results likely reflect the influence of the known contamination in the Welcome WMF, the Highland Drive Landfill and the Alexander Street Ravine. Sediment samples from the Chemetron Lagoon Area wetland exceeded sediment quality guidelines for arsenic, chromium, copper and lead, phosphorus, and total organic carbon. Levels of phosphorus and cadmium exceeded sediment quality guidelines in Lake Ontario. Sediment in the Port Hope Harbour exhibited clearly elevated concentrations of uranium and thorium 232.

In terms of aquatic habitat, the exposed lake near shore supports primarily cool and coldwater water forage species. Harbours in the region afford a protected environment and support a mainly warm water fish community. The majority of watercourses provide coldwater fish habitat. Most afford spawning and nursery habitat for migratory Lake Ontario species, including Port Britain Creek, Ganaraska River, lower Brewery Creek and Gages Creek. Brand Creek provides degraded coldwater fish habitat and does not appear to support resident trout. The Ganaraska River tributaries do not appear to support substantial fish communities despite the provision of apparently suitable habitat, particularly in their upper reaches. Alexander Creek provides marginal fish habitat despite unrestricted access to Lake Ontario.

Summary of the Peer Review Team's Comments

Overall, the MPRT will be looking for additional study and analysis during Detailed Design to reinforce the accuracy and comprehensiveness of the baseline characterization data. We will be seeking additional information, including a description of historical perturbations to the aquatic environment, a rationale for the selection of sampling locations, of reference or control stations, and a description of the sampling methodologies for the biological subcomponents selected for study.

The MPRT would like to see additional reference sites that reflect stream order within the Local Study Area, especially upstream of the remediation sites. We expect that the Proponent will conduct additional sampling at these sites to determine effects on habitat, changes to the channel morphology, water temperature, etc. We also expect to see spawning surveys in the near shore in the vicinity of predicted plumes.

4.3.2 Effects Assessment

Overall, the Effects Assessment results show that the Port Hope Project will result in beneficial effects for the Aquatic Environment. The removal of contaminated material at the remediation sites is expected to result in a long-term improvement to down-gradient surface water quality and to sediment quality. Reduced surface water infiltration into and subsequently out of the LTWMF is expected to result in a reduction in transport of contaminants via groundwater to Brand Creek and an associated increase in the water quality of the creek.

Similarly, contaminant loadings to Lake Ontario via treated leachate are expected to decrease with a corresponding improvement in lake water near the point of discharge. Finally, increased flow of uncontaminated surface water to Brand Creek from the LTWMF storm water management system is expected to improve water quality in the creek. However, as stated earlier, this is a net effect that requires further analysis.

Beneficial effects, including long-term improvement to sediment quality and habitat conditions, are also expected to result from the harbour remediation. Although the fish in the Harbour will be directed outside of the work area, the LLRWMO predicts that there may be more use of the Harbour by deepwater fish species, such as lake trout and alewife. Furthermore, contaminant levels in bottom dwelling species will be reduced.

The only predicted adverse effects on the Aquatic Environment are accidents such as a spill of fuel oil or contaminated soil into the Ganaraska River or a release of water from a sediment containment area on the Centre Pier. These malfunctions would likely result in increased mortality to sensitive aquatic organisms following the accident, although the effects would not be long-lasting and the mortality rate for mature and larger aquatic species is not expected to be affected.

Summary of the Peer Review Team's Comments

Overall, the MPRT agrees that the project will result in beneficial aquatic effects over the long term. However, we expect that there will be short-term effects from construction. There is no mention of harmful alteration, disruption, and destruction of fish habitat (HADD), even though the stream diversions proposed as part of the Project will likely result in HADD. Cutting off groundwater sources to the creek through dewatering and other project-related activities could be considered a HADD. Similarly, removal of riparian

vegetation in headwater streams may be considered a HADD, as benthic invertebrates are dependent on this vegetation as their primary food source.

In the Detailed Design stage we expect to see more detail on the effects associated with each remediation site and the LTWMF during the construction and development phase. A site-by-site effects assessment would allow an evaluation of site features and how they may interact with specific project phases to determine vulnerability. There should be an analysis of what creeks will change hydrologically as a result of the project. For example, increased surface water run-off volumes are assumed to be a benefit to Brand Creek, but there is no analysis to show why this is beneficial. In the MPRT's experience, elevated volumes of run-off could result in erosion of the streams and temperature differences, which in turn may affect fish habitat. Geomorphology measurements would help to understand how the streams would change (which could be included as additional baseline information).

We will also be looking for more details on how the fish will be removed from the Harbour prior to dredging. Given the size of the basin and the approach channel, it may be difficult to achieve a high percentage of live transfer.

Finally, the MPRT is looking for additional details on mitigation measures. For example, mitigation/off-setting benefit for HADD for Alexander Creek could include reinstalling the poorly installed culvert.

4.4 Terrestrial Environment

The Terrestrial Environment consists of the following environmental sub-components: vegetation communities, wildlife communities, wildlife habitats, and radioactivity in the Terrestrial Environment.

4.4.1 Baseline Characterization Study

Within the Regional Study Area, the information on the terrestrial environment was based on a literature review and an analysis of other existing data sources. For the characterization of the Terrestrial Environment within the Local and Site Study Areas, a detailed field program was conducted, including surveys and inventories of vegetation, amphibians, reptiles, birds, and mammals.

A total of 373 plant species were recorded within the Port Hope Project, with a total of 252 species in the Port Hope Ward 1 Local Study Area, 203 in the Port Hope Ward 2 (Welcome) Local Study Area, and 230 in the Remediation Sites. None of the species identified are considered Federally, Provincially or Municipally rare species.

The recorded vegetation communities within the Local Study Areas are typical of the cultural landscape within the Regional Study Area and include meadows, thickets and forest communities. The vegetation in and around the Highland Drive landfill is primarily old-field meadow community, while the vegetation in the vicinity of the proposed LTWMF Site Study Area is represented by a variety of forest types, non-classified lands, and old- field meadow vegetation.

A total of 85 animal species were identified within the Port Hope Project, although neither the Port Hope Ward 1 nor the Port Hope Ward 2 Site Study Area exhibited particularly important wildlife habitat or habitat features. Habitats located along the Ganaraska River Valley, the local ravines (e.g. Monkey Mountain, Pigeon Hill and Alexander Street Ravine) and the shoreline along Lake Ontario were generally the most highly rated habitats.

Summary of the Peer Review Team's Comments

Overall, the MPRT is satisfied with the accuracy of the data that the LLRWMO collected. However, the MPRT is concerned that the data and analysis do not fully address the Migratory Birds Convention Act or the new Species at Risk Act (2004) for the Port Hope Harbour. The harbour is well known by naturalists for the spring and fall migration concentrations of waterfowl. As well, the outfall of warm discharge water from Cameco keeps the harbour open most of the winter and attracts hundreds of waterfowl. There are records of endangered harlequin duck in the harbour in the winter of 2004. Thus, additional data collection is required (spring and fall and maybe winter) to identify migratory birds and raptors.

4.4.2 Effects Assessment

The results of the Effects Assessments for the Geology and Groundwater Environment and the Atmospheric Environment were used to determine potential effects of groundwater and atmospheric (including noise) changes on the Terrestrial Environment. Similarly, the effects assessment for the Aquatic Environment was used to determine effects on riparian habitat via surface water quality impairments. The footprint of the proposed LTWMF was used to

calculate the geographic extent of temporary and permanent effects on vegetation, habitat corridors, and habitat complexes. To determine the potential effects of the exposure of terrestrial biota to Contaminants of Potential Concern (COPCs), an Ecological Risk Assessment (ERA) was undertaken.

The Effects Assessment predicts that preparation of the LTWMF site will result in the permanent conversion of vegetation communities throughout 11% of the Local Study Area and 47% of the Site Study Area for the LTWMF. An additional 3% of the Local Study Area vegetation and 11% of the Site Study Area vegetation will be lost temporarily.

The remediation of sites in and around the Highland Drive Landfill and the Pine Street North Extension will result in the temporary loss of approximately 7.6% of the vegetation within the Local Study Area and 57.7% of the Site Study Area. The remediation of all other sites in Ward 1 will result in the temporary loss of vegetative cover, including two fens close to the Waterworks site, which are both of high ecological importance

The LTWMF and the rehabilitated remediation sites will develop over time into mature vegetation communities. At the LTWMF, these new communities will be of higher ecological importance than the existing vegetation, thereby resulting in an ecological net benefit.

Summary of the Peer Review Team's Comments

Regarding the Effects Assessment, the MPRT finds that the LLRWMO has accurately assessed the potential effects of construction at a general level (i.e., within the entire Site Study Area). However, the MPRT is looking for more detail on site-specific impacts regarding the woodlot at Alexander Creek, Pine Street North, Waterworks, and Lions Park Ravine. Similarly, the mitigation of effects should be site-specific. The assessment should relate back to the baseline data and should address the significance of effects on species that aren't rare.

Given our observation of the harbour as a migratory bird site, we are also looking for an assessment of the impact of closing and dredging the harbour and changing the bottom structure on migratory birds and over wintering waterfowl.

5. Comments on the Proposed Effects on the Human Environment

The Environmental Assessment Study Report for the Port Hope Project also examines effects of the project on the human environment, which includes the Socio-Economic Environment and Human Health and Safety Considerations. The methodology for determining effects was identical to the process used for the biophysical environment. It should be noted that the results of the effects assessment on the biophysical environment were used to determine the effects on the human environment.

Based on the findings of the Effects Assessments, the EASR concludes that there are no significant adverse effects on the human environment resulting from the Project. Although there are a number of minor adverse effects on the socio-economic environment, these effects can be minimized by implementing various mitigation measures. Similarly, the one minor adverse effect on human health (i.e., increased stress and adverse effects to health and the general well being of affected individuals) is expected to be minimized through appropriate mitigation measures.

In general, the baseline characterization studies and the effects assessment reports for the human environment were accurate and comprehensive. As with the biophysical environment, we expect to see more detail regarding mitigation measures and monitoring prepared during Detailed Design.

Additional details on the two components of the human environment are provided below.

5.1 Socio-economic Environment

The Socio-economic Environment is characterized in terms of population and economic base, land use and visual settings, community infrastructure, community services, traffic and transportation, municipal finance and administration, residents and communities, archaeology and cultural heritage resources, and aboriginal interests.

5.1.1 Baseline Characterization Study

The main data sources for the description of the existing Socio-economic Environment included: secondary source information (e.g., Statistics Canada data, Official Plans, etc.); telephone and/or personal interviews with people familiar with and knowledgeable about

their operations; neighbourhoods and communities; field surveys; public attitude research; visual analyses; traffic and transportation studies; meetings with First Nation Councils; traditional land use surveys; and, an archaeological assessment. The LLRWMO also conducted an extensive public consultation and communications program. The consultation and communications activities helped to collect information directly from local residents. The summary provided below focuses on the Local Study Area and the Site Study Area.

The tourism industry has been identified as one of the most important sectors of the Port Hope economy. Economic development in the Municipality of Port Hope is limited by the lack of available land for commercial and industrial development, particularly near Highway 401.

Agriculture is another important part of the economy and rural way of life in Port Hope. Based on the 2001 Census Report, approximately 56% of the lands in the Municipality of Port Hope were part of agricultural operations. In the Local Study Area, lands are primarily used for cash cropping, including soybeans, grain, corn and beef and dairy operations, although there are also a number of specialty operations such as berry, organic and horse farms.

According to the existing Official Plan for Ward 1, the primary use of land is Residential – Low Density with pockets of Medium and High Density Residential and Commercial and Industrial land use designations located throughout the urban area. The historic commercial centre of Port Hope is designated as Heritage Commercial. The Highland Drive Landfill is designated Parks and Open Space, as are the lands north and south of Highland Drive at Pine Street North and the lands located at the southeast corner of the unopened road allowance for Pine Street North and Jocelyn Street. The Ward 1 remediation sites exist within areas of various designations, including parks and Open Space, Residential, Commercial and Special Site Policy (e.g., Highland Drive landfill). Lands in the western part of the Local Study Area (Ward 2) are covered under the Official Plan of the former Township of Hope and are primarily designated for agricultural purposes.

The Port Hope West Secondary Plan is an area of new development located west of Toronto Road and residential construction is currently underway in this area. This area is anticipated to support 75% of the Town's new population growth.

A total of 93 residences, both farm and residential, are located within the potential view shed of the existing WMF and the Site Study Area. The existing Welcome WMF is designated Waste Management Industrial and Employment Area. Lands on the east side of Baulch Road are also designated Employment Area south of the Highway Commercial lands abutting Highway 401.

The draft Official Plan for the Municipality depicts a similar land use fabric to the existing Plan. Two proposed LTWMFs are anticipated in the draft Plan; the proposed Ward 1 LTWMF at Highland drive and the proposed Ward 2 LTWMF at the Welcome site. The policies of the draft Plan state that implementing by-laws will incorporate specific development controls on the selected sites once approved by the federal government.

Within the Local Study Area, the Ganaraska River and the Port Hope Harbour are frequented for recreational fishing. A number of community and recreational facilities are available in the built-up area of the Municipality of Port Hope, including Jack Burger Sports Complex, the Port Hope Marina, and the Lions Recreation Centre. Local and regional residents, organizations and groups make regular use of the Waterfront Trail, the Ganaraska Trail, natural areas, beaches and the Port Hope marina.

In terms of traffic and transportation, the Ward 1 area has a mix of roads with both rural (i.e., ditched) and urban (i.e.,curbed) cross-sections. No major pavement defects observed in 2004. All intersections and links are currently operating at excellent or good level of service. Almost all intersections are expected to operate at good levels of service in 2014, with the exception of Toronto Road and Jocelyn Street during the regular school season. Most bicycle route and existing and proposed trail routes are along the major roads in the Ward 1 area and coincide with the preferred transportation routes for the Port Hope Project to some extent.

With regard to the historic heritage resources of the Local Study Area, traces of aboriginal occupation have been found in the form of isolated native artefacts recovered in modern residential areas. No historically significant buildings or other historic heritage resources were identified at the proposed Ward 1 LTWMF or any of the remediation sites.

Summary of the Peer Review Team's Comments

Overall, the MPRT feels that the socio-economic baseline characterization was well done. The MPRT is satisfied, for the most part, with the data collected as part of the BCS. During Detailed Design, we expect to see a detailed inventory of existing traffic conditions, especially information related to the transportation routes, including:

- number of driveways;
- sensitive land uses;
- facilities at rail crossings;

- intersections along haul routes; and,
- on-street parking.

Finally, a more detailed visual sensitivity analysis, including an expanded view shed that encompasses nearby high points in the Local Study Area, should be conducted once the facility end uses are determined.

5.1.2 Effects Assessment

The Socio-economic Environment Effects Assessment identified the following residual adverse effects of the Port Hope Project, each of which was judged to be a minor adverse effect after taking into consideration mitigation measures:

- Displacement of one tenant residence and one tenant business operation;
- Voluntary out-migration of residents living in neighbourhoods nearest the LTWMF (less than 10%) and nearest major remediation sites or along transportation routes (1% to 3%) prior to and during the Construction and Development Phase;
- Disruption to business (including tourism related) activities at commercial operations with outdoor components and farm operations within the likely zone of influence for the Port Hope LTWMF and remediation sites;
- Changes in the quality of existing views from viewing locations within the LTWMF viewshed;
- Changes in the quality of existing views of the remediation sites from viewing locations adjacent to the remediation sites;
- Reduced property values, increased turnover and difficulties in marketing properties in the likely zone of influence for the LTWMF, remediation sites and transportation routes during the Construction and Development phase and into the Maintenance and Monitoring Phase;
- Disruption of user activities at community and recreational facilities with outdoor components located within the likely zone of influence for the Port Hope LTWMF and remediation sites, or along transportation routes during the Construction and Development Phase;

- Disruption of operations at the Port Hope Harbour, Port Hope Yacht Club, Lions Recreation Centre Park, Canadian Fire Fighters Museum during the Construction and Development Phase;

- Reduced attractiveness of areas used for fishing along the Ganaraska River and Lake Ontario within the likely zone of influence for the Port Hope remediation sites, or along transportation routes during the Construction and Development Phase;

- Temporary restricted public access to natural areas and trails in the immediate vicinity of remediation sites, the Port Hope Harbour and the east shore of the Ganaraska River during the Construction and Development Phase;

- Increased potential for disruption of operations at the Jack Burger Sports Complex during the Construction and Development Phase;

- Disruption of outdoor user activities at educational facilities located within the likely zone of influence for the Port Hope LTWMF and remediation sites, or along transportation routes during the Construction and Development Phase;

- Disruption to some road users, pedestrians and non-motorized traffic along the recommended transportation routes and local roads due to perceived hazards, detours and road closures;

- Changes in the use of property and reduced enjoyment of property among some residents living within the likely zone of influence for the Port Hope LTWMF and remediation sites or along transportation routes; and,

- Adverse changes to community character or image of neighbourhoods nearest the LTWMF and major remediation sites.

Given that there are a wide variety of measures that can be taken to manage the effects of a project on the Socio-economic Environment, the LLRWMO recommends that a Socio-economic Effects Management Program be established. This program would necessarily be project-specific and community-based. The establishment of a community / neighbourhood project implementation committee or liaison group is also recommended.

Summary of the Peer Review Team's Comments

The MPRT agrees with the assessment of effects on the socio-economic environment and believes, in general, that the analysis is well done. We also feel that the mitigation measures are, for the most part, appropriate. Mitigation measures that we feel are worthy of mention include:

- Addressing business losses (including farm business) related to verified acute or chronic nuisances, prolonged road, closures, direct property damage and property value losses attributable to the Project;
- Provision of a mitigation package including relocation assistance for displaced business;
- Implementation of a business activity enhancement program aimed at maximizing local business opportunities and benefits of the Project;
- Implementation of an onsite landscaping and lighting plan and an off-site tree planting program aimed at minimizing the visibility of onsite activities at the LTWMF;
- Continued implementation of the PVP program for the duration of the LTWMF Construction and Development phase with ongoing review to determine its duration and future needs;
- Improved facilities for fishers, and enhanced liaison with fishers and fishing clubs aimed at keeping them aware of Project works and activities, environmental monitoring results, peak traffic periods, potential road closures and access restrictions;
- Design and delivery of a follow-up program and contingency plan to address disruption of operations at the Jack Burger Sports Complex due to noise and dust;
- Implementation of a mitigation package for the Port Hope Yacht Club, yacht club members and Canadian Fire Fighters Museum for direct effects and financial losses incurred as a result of the Project;
- Implementation of a recreational trail access management plan for the Ganaraska Trail, Waterfront Trail and Highland Drive area trails (e.g., provision of temporary alternative trail routes, signage);
- Implementation of a recreational trail restoration and enhancement plan in the vicinity of Highland Drive;
- Avoidance of trucking during school bus pick-up/drop-off times along recommended transportation routes;
- Implementation of a proper construction management plan to ensure proper access to neighbourhoods where a remediation site is in close proximity;
- Implementation of an information program for affected neighbourhoods, including requirements for disclosure of monitoring information to designated neighbourhood

representatives, real-time monitoring of noise and dust levels and site inspection privileges; and,

- Conduct(ing) Stage 1 and 2 Assessments for the new access road to the LTWMF and any other acquired properties on which development shall occur;

Additional mitigation measures may be necessary during the Construction and Development Phase. Such measures should address the potential for a reduction in weekday tourism, including resident and tourist use of the east beach and the Ganaraska River during remediation near the downtown, as a result of construction noise, traffic, road closure, etc. Appropriate mitigation may involve scheduling of remediation activities by season.

Regarding traffic and transportation effects, a detailed safety review of the recommended haul routes should be conducted to identify safety/operational deficiencies and the methods/measures to remediate these deficiencies. More significant changes are likely required on Cavan Street, including widening and reconstruction of the Highland Drive to Jocelyn segment. Intersection improvements at Cavan and Jocelyn, including possible signalization, are also likely. We also expect to see mitigation measures developed to address possible disruption to residents and businesses along the transportation route.

During Detailed Design there will need to be additional information regarding institutional components. We agree that a set of guidelines or policies are required for institutional controls; they are required to address each Phase and stage of the Project. The Project needs to articulate those guidelines and include them in the EASR along with a process and timeframe for establishing the controls.

5.2 Human Health and Safety Considerations

Human health and safety is being examined as part of the EA because the activities that comprise site preparation, construction and operation of the Port Hope Project have the potential to interact with this component of the environment. The study has been categorized into four sub-components, including: radiological health of workers, radiological health of members of the public, conventional occupational health and safety, and conventional health and well being of members of the public.

5.2.1 Baseline Characterization Study

The Human Health and Safety Considerations baseline characterization incorporates information from the baseline studies carried out for the other environmental components. This information is used to model the exposures of hypothetical people living, working, and undertaking recreational activities in the Local Study Area to stressors such as radiation, air quality, noise, exposure to COPC, and traffic accidents.

Over the past two decades there have been a number of studies into the potential effects of low level radiation sources on the health of people living in Port Hope, Durham Region and Ontario municipalities that host nuclear facilities. None of the studies have found a significant adverse effect on the health of residents or workers as a result of the increased level of radioactivity or other hazardous contaminants in the communities.

Regarding exposure to radiation, the estimated total annual dose to both area residents (i.e., living within the Local Study Area) and adjacent residents (i.e., living next to the LTWMF) was comparable to the typical adult dose that Canadians receive from natural sources. Doses in infants and children also tended to be below the national average for these ages.

Background air concentrations of the reported COPC are not expected to pose a risk to human health based on current atmospheric measurements and toxicological information. Similarly, the concentrations of COPC measured in fishes in the Local Study Area in 2004 are not anticipated to pose a significant risk to human health.

Summary of the Peer Review Team's Comments

The MPRT believes that the baseline information provided is accurate and is comprehensive. We caution that interpreting a lack of statistical significance in previous health studies as meaning no effect is not necessarily accurate. We note that there are differences in expectations between some concerned residents in the community and the LLRWMO project team regarding the purpose of the human health and safety considerations study. The former is looking for information on the health of individuals, while the reports focus on environmental data. A statement as to the rationale for the approach would be helpful.

5.2.2 Effects Assessment

Regarding radiological health of members of the public, the assessment of incremental annual radiation dose to members of the public predicted to occur as a result of construction and development indicate the following:

- All of the predicted doses are within 10% of the dose received by the typical members of the public under existing conditions;
- All of the predicted total annual doses are within the range of annual dose received by most Canadians as a result of natural background;
- All doses are within 25% of the CNSC public dose limit of 1 mSv/year above background;
- The annual radiation doses are predicted to occur only for a relatively short duration for the infant and child.

Thus, the dose received by area residents is not considered to represent a measurable change from the radiation dose received by typical members of the public.

Regarding the conventional health and well being of the public, there is an unacceptable risk associated with increased concentrations of cobalt for an infant living adjacent to the LTWMF and spending 100 hours per year at its fenceline. However, mitigation measures aimed at reducing the quantity of particulate generated as a result of Port Hope Project works and activities would reduce the risk to an acceptable level. The Port Hope Project will result in incremental noise levels at a number of locations associated with LTWMF construction and development and site remediation phases. The increase could be annoying at some locations and cause an adverse response in some people.

Measurable changes may occur to people's feelings of health and sense of well-being, feelings of personal security, and feelings of satisfaction with living in the community. These changes could result in increased stress and adverse effects to health and the general well being of affected individuals. These effects could potentially be compounded due to cumulative effects of a similar nature due to other projects in the area.

Regarding the radiological health of workers, the predicted doses are well within acceptable limits. Conversely, there may be risks to the conventional health and safety of workers, as the likelihood for construction accidents involving injury and the health consequences on workers associated with increased noise in the workplace are considered adverse effects. However, the LLRWMO anticipates that these effects can be successfully mitigated.

Summary of the Peer Review Team's Comments

The analysis of human health effects, as presented in the EASR, is comprehensive. However, the MPRT would like mitigation measures developed to reduce public doses in

keeping with ALARA (as low as reasonably achievable). For example, while we agree that the risk from arsenic to adjacent residents that results from the project is not adverse, the overall levels of arsenic are above acceptable levels due to the high baseline values. As discussed in our comments on the Atmospheric Environment, we would like to see more consideration given to health effects on end users of the facility, including special cases such as pregnant women, etc.

We also note that the report appears to downplay the effect of stress. We expect that there could be additional stress on some members of the community as a result of the project and that stress could manifest in physical/medical conditions. Mitigation measures need to be provided to address this potential effect.

The MPRT believes that the radiological health of workers needs more attention during Detailed Design. Although the doses are shown to be below regulatory criteria, they need to be brought down as much as possible to reduce worker exposure. Critical worker receptors, including monitoring technician, haul truck operators, transport drivers, and harbour sediment workers, should particularly be targeted for dose reduction. Real time monitoring of atmospheric emissions is recommended.

6. Comments on the Follow-up Program

The EASR includes a description of a follow-up program of long-term environmental monitoring to ensure that the performance and operational requirements of the LTWMF are met and to verify the predictions of effects made in the EASR. In general, the MPRT feels that more detail on the follow-up program is required to more fully address the predicted effects. This detail is also necessary to fulfil the requirements of the EA Scope Document, which requires information on project specific and cumulative effects and enhanced programs for monitoring malfunctions and accidents.

The MPRT is looking for assurance that the monitoring of air, water, truck traffic, truck routing, noise, etc., will be undertaken in partnership with the Municipality. The MPRT would like a commitment from the LLRWMO that monitoring will occur in real-time where technically feasible, with clear protocols for operational changes if exceedances are measured or if effects are not as predicted.

The MPRT recommends that a site contamination survey take place at the LTWMF, and the remediation of sites as may be required, before construction begins and after construction is complete (but before the facility is closed), particularly in view of the higher-than-background values noted in the baseline soil concentrations in the site study areas. This survey would facilitate better follow-up monitoring of the site for any incremental effects from the project, any post-construction cleanup if required and reduction of any future risks to end-users of the site.

The MPRT would like a sensitivity analysis conducted during Detailed Design to determine changes to the effects assessment if the footprint of the facility changes as a result of greater volumes of waste being identified or as a result of end use requirements of the Municipality. We would like to know what flexibility the LLRWMO believes exists in the footprint shape and size. If the proposed LTWMF cannot be expanded to include additional volumes of waste without incurring residual effects, the assessment should identify how the LLRWMO will deal with such waste.

Additional comments on monitoring associated with each component of the environment are included in the following sections.

6.1 Monitoring of the Atmospheric Environment

With follow-up measures in place, the MPRT is generally satisfied with the monitoring described by the LLRWMO for the Atmospheric Environment for EA purposes.

6.2 Monitoring of the Geology and Groundwater Environment

The MPRT is generally satisfied with the monitoring described by the LLRWMO for the Geology and Groundwater Environment for EA purposes.

6.3 Monitoring of the Aquatic Environment

The MPRT feels that additional details on the Aquatic Environment monitoring program are required. Monitoring of surface water quality through conventional chemical analysis is often not an appropriate way to assess impacts on surface water and sediment. Water quality should be sampled frequently in the short-term to help quickly identify and mitigate unforeseen problems. Sampling should take place during storm events to measure the effectiveness of surface water collection and leachate treatment when the systems are under stress.

Aquatic monitoring should examine fish, benthos, and geomorphology, in addition to water quality sampling. An annual benthic monitoring program would allow for a measure of cumulative project effects that water sampling would miss. Erosion pins could be used as an inexpensive way to evaluate if any channel morphology changes are occurring in creeks.

6.4 Monitoring of the Terrestrial Environment

The MPRT is generally satisfied with the monitoring described for the Terrestrial Environment for EA purposes.

6.5 Monitoring of the Socio-economic Environment

In general, the MPRT is satisfied with the monitoring described for the socio-economic environment for EA purposes. We would like to see monitoring of tourism/tourists in Port Hope to ensure that effects are addressed as they arise. Also, we would like more detail on the monitoring of trucks during construction to ensure that they travel on the prescribed routes (e.g., who is to monitor; actions if protocols are not adhered to). The public consultation and communications activities should continue.

6.6 Monitoring of Human Health and Safety Considerations

Consideration should be given to monitoring other pathways/vectors for human health, including some nearby crops, livestock and garden vegetables. The LLRWMO should include some off-site final surface soil measurements in areas representative of the human health assessment and in airsheds where soil deposition of contaminants can be expected.

There should be real-time monitoring of dust levels on the site and at the fence line and for NO_2 for vehicle exhaust with set protocols for changes to operations at specified trigger levels. The MPRT also expects that radon monitoring will be initiated over Cell 3 to ensure that the radon emitted as part of the gas collection system is within acceptable levels.

7. Next Steps in the Process

The LLRWMO will submit documentation for the Environmental Assessment of the project, including the EASR and its support documents, for review by the Responsible Authorities (RAs) following Port Hope Council's consent to the preferred option.

The RAs determined in 2002 that, pursuant to Section 5 and 7 of the CEAA, an environmental assessment of the project was required. It was also determined pursuant to subsection 18(1) of the CEAA that a screening must be conducted for the project and that a screening report must be prepared. Natural Resources Canada (NRCan) assumed the lead for the conduct of this assessment in full cooperation of other RAs. The information provided in the EASR will be reviewed by the RAs and other Federal Expert Departments as may be needed, and once accepted, will form the basis for the preparation of the screening report by the RAs. Health Canada, Transport Canada, Environment Canada and the CEAA represent key expert departments for this project. The RAs maintain the responsibility of ensuring that the EASR is carried out in accordance with CEAA regulations and for determining whether the project will entail significant adverse environmental effects. No provincial environmental assessment requirements under the Ontario EA Act would apply since this is a federal project.

NRCan will need to make a decision whether to provide funds for the project as part of its oversight responsibilities for the PHAI. Authorizing the funds for project implementation is an EA trigger under paragraph 5(1)(b) of the CEAA.

The LLRWMO will require a Waste Nuclear Substance Licence (WNSL) for the project under the Nuclear Safety and Control Act (NSCA). The Canadian Nuclear Safety Commission is charged with this authority and as such is an RA for the Port Hope Project. The proponent will have to make an application to the CNSC for this license, which will be subject to a thorough evaluation. This licensing process will also provide further opportunities for the public to provide input to CNSC prior to its licensing decision.

Department of Fisheries and Oceans (DFO) is also an RA for the Project since any harmful alteration, disruption and destruction of fish habitat (HADD) would require approvals under the Fisheries Act (Subsection 35(2)).

As a part of the future Environmental Assessment and Licensing process, the development of the screening report and decision-making will involve the following steps:

- RAs review the EASR for completeness and technical soundness with the assistance of expert federal authorities and Ontario ministries;
- RAs provide comments of the reviewing agencies to the LLRMWO
- LLRWMO revises and resubmits EASR to RAs;
- RAs develop draft screening report;
- RAs distribute the draft screening report to the Municipality and the public for comment;
- RAs consult the public on the draft screening report
- RAs revise and finalize screening report as needed;
- RAs submit the screening report to respective departmental decision-makers for a decision;
- LLRWMO provides written notification to the Municipality of the decision by the RAs; and,
- RAs provide public notice of the course of action on the project.

It is expected that the above steps will take approximately 1 year. Based on a favourable decision on the Environmental Assessment by the RAs, the LLRWMO would complete its application to the Canadian Nuclear Safety Commission for a Waste Nuclear Substance Licence to construct and operate the facility. If a WNSL is granted, the proponent will then commence construction and development phase (2007-2013).

8. Continued Involvement of the Municipality and the Peer Review Team

The Peer Review Team is expected to provide necessary support to the Municipality throughout the EA process. During the peer review process to date, the MPRT has identified a number of issues for resolution either during the current review or during the Detailed Design stage. In addition, the MPRT will:

- review the EASR revisions as may be needed;
- participate in cleanup criteria discussions;
- review the Federal screening report;
- review the licensing documents to be prepared for the CNSC licensing approvals; and,
- support the Municipality's consideration of optional closed facility end uses.

The MPRT will continue to reports to Council on its progress.

Municipal Council is required to provide its consent to the preferred option before it can proceed to federal review. After that consent is given, the next major milestone is the decision of the RAs on the EA.

Section 4.1.5 of the Legal Agreement requires that the LLRWMO, as proponent, provide to the Municipality written notice of the decision of the relevant authorities with regard to the environmental assessment. In the event that the decision made by the relevant authorities is different from what Port Hope Council previously consented to, then the Parties shall have 60 days to consult and a further 30 days to decide if they do not wish to proceed with the Project or an Element of the Project.

9. Conclusions and Recommendations

Based on our review of the Environmental Assessment Study Report and the supporting documentation, the MPRT believes that the preferred option can be constructed, operated, and maintained in a way that results in minimal adverse effects on the environment during construction and a beneficial effect in the long term. The MPRT is confident that mitigation measures can be developed to further minimize any adverse effects. We will be looking for additional information from the LLRWMO during Detailed Design to confirm that they have developed appropriate mitigation measures and monitoring protocols. We expect our comments to be addressed in the forthcoming Environmental Assessment Study Report submission to the RAs.

It should be noted that the Municipality of Port Hope and the LLRWMO are committed to continued discussions leading to an agreement on the clean-up criteria. The MPRT is confident that the cleanup criteria are appropriate for unrestricted uses provided that they are revised to be consistent with the cleanup principles.

The remainder of this section describes whether:

- The various elements of the EA, including the Alternative Means process, the Baseline Characterization Studies, and the Effects Assessments, have been appropriately addressed and undertaken; and,

- The EASR and supporting documents reflect the comments and concerns of the Municipality.

All of the details of the project have not been finalized, and will occur through detailed engineering that will take place over the next year. The MPRT expects to continue its involvement to ensure that the issues raised in this report will be addressed by the LLRWMO before the project proceeds to licensing.

9.1 Adequacy of the Environmental Assessment Study Report

Following a detailed review of the EASR and the supporting documentation, it is the MPRT's opinion that these reports demonstrate that the preferred option includes all the components necessary to achieve the appropriate environmental regulations. We expect outstanding comments to be addressed in the Final EASR.

The MPRT is now looking for additional baseline data and analysis that will help strengthen the design of the preferred option and further minimize any potential effects. We recommend that the work described in **Table A** be undertaken either before the EASR is submitted for federal review, or once Detailed Design has begun. In the case of the latter, we expect that the Municipality will continue its oversight role to ensure that the work focuses on efforts to achieve a superior design.

Table A – Summary of Additional Work Requested of the LLRWMO

Discipline	Work to be completed	Timeframe
General	Continually monitor waste volumes during excavation to determine whether design volumes are being exceeded. Prepare a contingency plan for greater volumes of waste	Detailed Design / Construction
Atmospheric	Optimize and further reduce effects from dust and other particulate matter, including preparing mitigation measures for dust control	Detailed Design
	Conduct sampling from the Highland Drive landfill and the Port Hope Harbour to reassess the potential for odour, and develop appropriate mitigation measures, as required	Pre-construction follow-up
	Measure levels of nitrous oxides (NO_x) and carbon monoxide (CO) within the LSA and SSA	Pre-construction follow-up
	Further examine exceedances for receptors at the fence line of the facility and for end-users	Detailed Design
	Provide information on, and evaluate, the greenhouse gases resulting from the project	Effects Assessment
Geology / Groundwater	Determine the extent of groundwater contamination at the existing Welcome WMF and the remediation sites	Detailed Design
	Develop mitigation measures to minimize effects from the Project on the quantity of groundwater base flow	Detailed Design
	Provide analysis to show that discharging storm water to Brand Creek will not result in a net loading of contaminants to Brand Creek	Detailed Design
	Conduct an inventory of the number of drums and their contents associated with Cell 3 of the LTWMF and assess other options for handling and placement of the drums	Detailed Design
	Confirm that the existing pipe carrying treated water from the site to Lake Ontario does not need replacement	Detailed Design

Discipline	Work to be completed	Timeframe
Aquatic	Conduct additional sampling on watercourses within the LSA to complete the baseline data and determine effects on habitat, changes to the channel morphology, water temperature, etc.	Pre-construction follow-up
	Conduct spawning surveys in the near shore in the vicinity of treated leachate plumes to predict the effects on fish communities	Pre-construction follow-up
	Conduct a site-by-site assessment to determine the potential for harmful alteration, disruption, and destruction of fish habitat (HADD) as a result of the project	Pre-construction follow-up
	Provide analysis to support the prediction that increased surface water run-off volumes will benefit Brand Creek	Effects Assessment
	Take geomorphology measurements to help understand how the streams may change as a result of the project	Detailed Design
	Provide a detailed explanation of how the fish will be removed from the Port Hope Harbour prior to dredging	Detailed Design
Terrestrial	Collect data to identify migratory birds and raptors for the Port Hope Harbour as consistent with the Migratory Birds Convention Act	Pre-construction follow-up
	Assess the impact on migratory birds and over wintering waterfowl from closing and dredging the harbour and changing the bottom structure	Detailed Design
	Conduct site-specific assessments regarding effects on the woodlots at Alexander Creek, Pine Street North, Waterworks, and Lions Park Ravine	Detailed Design
Socio-economic	Prepare a plan for the short term and long term institutional controls of the Project	Detailed Design
	Prepare more explicit descriptions of the mitigation measures for addressing adverse effects	Detailed Design
	Conduct a detailed visual sensitivity analysis, that includes an expanded viewshed	Detailed Design
	Complete the inventory of existing traffic conditions, especially regarding information related to the transportation routes	Pre-construction follow-up

Discipline	Work to be completed	Timeframe
	Conduct a detailed safety review of the recommended haul routes to identify safety/operational deficiencies and the methods/measures to remediate these deficiencies.	Pre-construction follow-up
Human Health and Safety	Prepare mitigation measures to address the effects of stress	Detailed Design
	Assess the effects of air quality emissions on the future users of facility, including people using the mound (e.g., pregnant women)	Detailed Design
	Optimize and demonstrably reduce effects from radiation doses to the public and the workers to as low as reasonably achievable (ALARA) levels	Detailed Design

The LLRWMO has agreed to continue to discuss the outstanding issues and concerns of the peer review team after submission of the EASR. The MPRT looks forward to resolving those outstanding items and reporting the results to Council and the federal authorities.

9.2 Reflection of MPRT and public comments in EASR

During our review of the EASR, the MPRT also looked at whether comments that we had submitted on earlier reports had been incorporated.

Our review showed that the majority of comments on the Feasible Concepts report, the Qualified Concept report, and the baseline characterization studies that the LLRWMO had agreed to include were integrated. The MPRT continues to work with the LLRMWO to ensure that any residual comments are addressed. The exchange of comments within the Comment / Disposition Forms should be seen as an integral part of the EA documentation.

As noted earlier, the Municipality and the LLRMWO will continue to discuss the cleanup criteria to ensure that the criteria that move forward for approval reflect the Principles for developing cleanup criteria agreed to by the two parties. Similarly, the impacts on the aquatic and terrestrial environment from remediating the Harbour still need to be examined in detail.

Our comments on the Cleanup Criteria document and the majority of the Effects Assessment documents were not fully addressed in the EASR, presumably due to the tight timelines established for reviewing and providing comments. Outstanding comments are

outlined in **Table A** of the previous section. We expect that the Final EASR that is submitted to the Regulatory Authorities for review will address our comments. The Comment Disposition Forms on the EASR and the baseline studies will form part of the LLRWMO submission to the federal authorities and will therefore be available to federal review agencies.

9.3 Recommendation to Port Hope Council

The MPRT recommends that Council provide to the LLRWMO its concurrence that the preferred option be advanced to the next step in the Environmental Assessment process – submission of the EASR to the RAs. We further recommend that Council request that the preferred option be refined based on continued discussions between the Municipalities and the LLRWMO on cleanup criteria, such that the criteria are consistent with the cleanup principles.

Council should ensure that the Municipality continue to have an oversight role to ensure that the additional work requested by the MPRT is addressed. It is expected that the Peer Review Team and the LLRWMO will continue discussions to resolve outstanding Peer Review Team comments on the Environmental Assessment Study Report and to refine the details of the Project to further minimize the adverse effects on the environment and the community.

Consistent with the original concept, the preferred option as described in the EASR includes public access to the facility site and the mound for active or passive recreational uses subject to CNSC approval. During the Detailed Design of the facility, we recommend that Council continue its efforts to provide to the LLRWMO a greater definition of the desired end use. Low Level Radioactive Waste Management Office has assured Council that it will continue to meet with residents to hear their comments and to keep them informed of the progress of the federal regulatory review.

10. References

AMEC Earth and Environmental. 2004. Terrestrial Environment Baseline Characterization Study for the Port Hope Project. LLRWMO-03780-ENA-12001

AMEC Earth and Environmental. 2004. Terrestrial Environment Environmental Effects Assessment Report for the Port Hope Project. LLRWMO-03780-ENA-12002, Rev 0d2, December 2004. Final Draft.

Canadian Environmental Assessment Agency. 1995. The Canadian Environmental Assessment Process, A Citizen's Guide. http://www.ceaa-acee.gc.ca/013/0001/0002/guide_e.htm (Viewed online in August 2004).

Canadian Environmental Assessment Agency. December 2003. Canadian Environmental Assessment Act – An Overview.

Conestoga Rovers & Associates (CRA). 2004. Geology and Groundwater Environment Environmental Effects Assessment Report. Final Draft. Port Hope Project. LLRWMO-03770-ENA-13002, Revision 0d2.

Conestoga Rovers & Associates (CRA). 2004. Geology and Groundwater Baseline Characterization Study for the Port Hope Project. Final Working Draft. LLRWMO-03770-ENA-12001.

EcoMetrix. 2004. Aquatic Environment Environmental Effects Assessment Report for the Port Hope Project. LLRWMO-03720-ENA-12002, Revision 0d2.

Gartner Lee Limited. 2004. Socio-economic Environment Baseline Characterization Study, Port Hope Project, LLRWM-03740-ENA-12001, Revision 0d1, (Final Draft), October 2004.

Gartner Lee Limited. 2004. Socio-economic Environment Effects Assessment Study Report for the Port Hope Project, Revision 0d2, Final Draft, December 2004.

Golder Associates Ltd. 2005. Port Hope Project Human Health and Safety Considerations Environmental Effects Assessment Report. LLRWMO-03710-ENA-12009, Revision 0d2, January 2005. Second Working Draft.

Golder Associates. 2004. Human Heath and Safety Considerations Study Report for the Port Hope Project. Final Working Draft. LLRWMO-03710-ENA-12006.

Hardy Stevenson and Associates Limited. June 2003. Peer Review of Initial Studies Undertaken to Evaluate Port Granby Long-Term Low-Level Radioactive Waste Management Project.

Legal Agreement, 2001: An Agreement for the Cleanup and the Long-term Safe Management of Low-level Radioactive Waste Situate in the Town of Port Hope, The Township of Hope and the Municipality of Clarington.

Marshall Macklin Monaghan Ltd. Final Draft Port Hope Project Environmental Assessment Study Report. LLRWMO-03710-ENA-12003. Revision 0d3. January 2005

Marshall Macklin Monaghan Limited and Conestoga-Rovers & Associates. 2003. Port Hope Project Environmental Assessment Feasible Concepts Report (Final Draft).

Marshall Macklin Monaghan Limited and Conestoga-Rovers & Associates. 2004. Port Hope Project Environmental Assessment Qualified Concept Report (Final Draft)

Marshall Macklin Monaghan Limited and Conestoga-Rovers & Associates. 2004. Port Hope Project Description of the Project for Environmental Assessment Purposes. LLRWMO-03710-ENA-12008, Revision 0. November 2004.

Natural Resources Canada (in cooperation with The Canadian Nuclear Safety Commission and the Department of Fisheries and Oceans Canada). 2002. Scope of the Environmental Assessment for the Port Granby Long-term Low-level Radioactive Waste Management Project.

SENES Consultants Limited. 2004. Atmospheric Environment Baseline Characterization Study for the Port Hope Project. Final Draft (0d3).

SENES Consultants Limited. 2004. Atmospheric Environment Environmental Effects Assessment Report. Second Working Draft. Port Hope Project. LLRWMO-03760-ENA-12002, Revision 0d2.

Stantec Consulting Ltd. (Stantec). 2004. Aquatic Environment Baseline Characterization Study for the Port Hope Project.

Stantec Consulting Ltd. 2004. Discussion Document on Clean-up Criteria Development for the Port Hope Area Initiative, LLRWMO-01611-TE-11004, Revision 0, Final Draft 28 May 2004.

Appendix A - Comment / Disposition Form for the Environmental Assessment Study Report for the Port Hope Project

The attached form includes the Municipal Peer Review Team's detailed comments on the Environmental Assessment Study Report for the Port Hope Project. Please note that the LLRWMO had not provided us with responses to our comments as of the date of this report.

Comment & Disposition Sheet

Document Number	Rev. No.	Document Title
LLRWMO-03710-ENA-12003	0d3	Environmental Assessment Study Report for the Port Hope Project

Author:	Reviewed by:	Date:
Marshall Macklin Monaghan Limited	Hardy Stevenson and Associates Limited	February 28, 2005

Comment & Disposition Sheet

Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
1.	E-iv	Executive summary	2	☐ Resolution Accepted by Reviewer.
The Peer Review Team has not confirmed the waste volumes, particularly for the remediation sites and the industrial waste contaminated sites. In addition, there is still little information available regarding the nature of the Cameco decommissioning wastes. The waste volumes are a fundamental issue for landfill design.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
2.	E-iv	Executive summary	5	☐ Resolution Accepted by Reviewer.
Cameco Decommissioning waste materials – add to the end of the last sentence ", including Crane Foundry waste located on Centre Pier and at the Lion's Centre park". The report needs to be clear that the 150,000 cubic metres is not entirely historic LLRW.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
3.	E-iv	Executive summary	Last	☐ Resolution Accepted by Reviewer.
Port Hope: LTWMF: 1st sentence – please provide a complete description of the site (e.g.,. auto recycler …)				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
4.	E-v	Executive summary	Bullet 3	☐ Resolution Accepted by Reviewer.
The text gives the impression that the entire approach channel is contaminated and will be excavated. Is this correct?				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
5.	E-v	Executive summary	5	☐ Resolution Accepted by Reviewer.
It is indicated that the industrial sites will be "remediated". It should be made clear at this time that "remediation" may include a Risk Assessment, which is different than the remediation level that will be conducted at the low-level radioactive sites. Risk assessment may not permit unrestricted land use as is the case for the remediation of the low-level sites.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
6.	E-vii	Executive summary	5	☐ Resolution Accepted by Reviewer.
Last line: change to "low to moderate 'natural environment' importance"				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
7.	E-ix	Executive summary	n/a	☐ Resolution Accepted by Reviewer.
The final effects tables/summary should be split into two: one for construction, one for Maintenance and Monitoring Phase.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
8.	E-ix	Executive summary	2	☐ Resolution Accepted by Reviewer.
To the first sentence, please add: "With some exception" the use of wells and ….". There are some well users in Ward 1 and Ward 2.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
9.	E-x	Executive summary	Table	☐ Resolution Accepted by Reviewer.
Why are only "final' mitigation levels listed, instead of all mitigation?				

Comment & Disposition Sheet

Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
10.	E-xiii	Executive summary	Table	☐ Resolution Accepted by Reviewer.
The second paragraph starting with "address business losses" – please specify here or in the appropriate section of the report what this might look like.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
11.	E-xiv	Executive summary	Table	☐ Resolution Accepted by Reviewer.
Will the lighting disrupt the rural character? Please define "zone of influence". Is the LLRWMO office committed to an on-going review of the PVP program?				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
12.	E-xv	Executive summary	Table	☐ Resolution Accepted by Reviewer.
Please describe what would be involved in a contingency plan to address disruption of outdoor activities at the Port Hope High School, here or in the appropriate section of the report. The final mitigation measure regarding transportation routes should be reversed such that the LLRWMO / Government of Canada adjusts their routings or schedule to avoid conflicts with school and transit buses.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
13.	E-xvii	Executive summary	Table	☐ Resolution Accepted by Reviewer.
The Mitigation Scenario will not affect NO_2 exceedances. Adverse effects might still occur.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
14.	E-xviii	Executive summary	Table	☐ Resolution Accepted by Reviewer.
Cobalt is not a recognized human carcinogen.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
15.	E-xviii	Executive summary	Table	☐ Resolution Accepted by Reviewer.
Please elaborate on what is involved with "continued and consistent protocols for delivering information" here or in the appropriate section of the report. This measure alone will likely be insufficient to address issues of security and safety. Please describe additional mitigation measures to reduce this residual effect.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
16.	E-xx	Executive summary	3	☐ Resolution Accepted by Reviewer.
A one year interval for reporting of follow-up monitoring is too long. Monthly reporting may be a better interval.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
17.	E-xxi	Executive Summary	2	☐ Resolution Accepted by Reviewer.
The discussion of abandonment is much better than in the Port Granby EASR.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or**

18.	n/a	Executive Summary	n/a	☐ Resolved as: ☐ Resolution Accepted by Reviewer.

Very little attention is paid to the "do nothing" scenario. More focus should be given to the future "baseline" if the project is not done. This is fairly well discussed in Section 3.2 and should be summarized in the Executive Summary.

Comment #	Page No.	Section No.	Paragraph No.	
19.	1-3	1.1.2	1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

State why the present conditions are not considered appropriate.

Comment #	Page No.	Section No.	Paragraph No.	
20.	1-3	1.1.3	1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

Add a bullet before the last bullet stating "development of a closed facility end use plan as agreed to by the Municipality and as approved by the CNSC".

Comment #	Page No.	Section No.	Paragraph No.	
21.	1-4	1.1.4	1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

There is no discussion on what might happen if timelines shift. This is probably not a big issue, but if construction shifted by a number of years, is there anything that changes in the EA? This should at least be discussed in a general sense.

The same comment applies to Page 2-1, Section 2.2.

Comment #	Page No.	Section No.	Paragraph No.	
22.	1-8	1.3.7	n/a	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

A full list of all supporting documents would better demonstrate the depth of studies.

Comment #	Page No.	Section No.	Paragraph No.	
23.	1-8	1.3.7	1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

3rd bullet: add to the end "and the socio-economic environment".

Comment #	Page No.	Section No.	Figure No.	
24.	n/a	1.3.8	1.3-1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

This Figure implies that the BCS and EEA studies are done in parallel and feed into the EASR. The linkages between these areas should also be shown. For example, did consultation only go into the EASR, and not into the QC and other reports?

This figure should include a reference to the Description of Project for Environmental Assessment Purposes report.

Comment #	Page No.	Section No.	Paragraph No.	
25.	2-2	2.2	n/a	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

There should be further explanation regarding the rationale for developing short, intermediate, and long-term time frames. While we do not disagree with the approach, it could be better defined.

Comment #	Page No.	Section No.	Paragraph No.	
26.	3-6	3.1.5	3	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

The switch from the search for a "disposal" facility to a long term waste management facility should be explained

Comment #	Page No.	Section No.	Paragraph No.	
				☐ Comment Accepted & Incorporated; **or**

Comment & Disposition Sheet

27.	5-1	5.0	n/a	☐ Resolved as: ☐ Resolution Accepted by Reviewer.
It appears that there has been consultation with the WMF owners/regulators in other countries (such as the US) based on the description of facilities in US and Europe in previous documents (QC Report etc.). If there has been, it would strengthen the EASR to record these consultations.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
28.	5-3	5.2.1	2	
It is unclear how "Traditional Ecological Knowledge", as required in the Scope document, has been integrated into the EA process, particularly the baseline data.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
29.	5-15	5.4.7	1	
Second bullet: "The Municipal/LLRWMO *AMG* Working Group …". These meetings were a part of the AMG.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
30.	5-21	5.5.2	1	
There should be a summary in the issue tracking report regarding all of the issues that were raised in the process and how they were addressed or resolved.				
Comment #	Page No.	Section No.	Table No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
31.	5-25	5.5.3	5.5-1	
Please revise the second sentence in the 1st row, second column as follows: "However, as set out in the Legal Agreement, the federal government has funded the Port Hope Municipal Peer Review Team and the public has had access …."				
Comment #	Page No.	Section No.	Table No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
32.	5-26	5.5.3	5.5-1	
Regarding previous studies, it is not true that previous studies by Health Canada found no elevated levels of morbidity or mortality.				
Comment #	Page No.	Section No.	Table No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
33.	5-27	5.5.3	5.5-1	
The process of how further details will be developed and reviewed in response to stakeholder issues is provided in a number of places in this report, including **Section 13**. The details provide some structure, but at this point all input is simply "review". How can we deal with getting better mitigation? The philosophy still is "it's good enough" instead of "It can be better". How do we ensure that in the future, after approval, that "it's good enough" mindset is not the dominant approach? How would "issues" be resolved?				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
34.	5-27	5.5.3	4	
It is not true that no one will be at risk of adverse health effects arising from the Project. Project-related anxiety may well result in diminished health status. Furthermore, the response provided does not address disruptions in lifestyle.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
35.	6-4	6.2.1	2	
Please describe the fundamental objectives of the Port Hope Project.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or**
36.	6-11	6.2.3	n/a	

The choice of truck over rail and barge should be mentioned.	☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 37. Page No. 7-1 Section No. 7.2.4 Paragraph No. 3 The LTWMF capacity is quoted as 1.8 million m3. On Page No. 7-1, it was stated as 1.9 million m3.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 38. Page No. 7-2 Section No. 7.2 Paragraph No. n/a This section of the report provides a description of the nature and volume of wastes. We remain concerned that the volume of wastes may exceed the estimates in these studies, or that there may be other issues associated with the clean-up (i.e., intrusion onto private property, residual ground water contamination, and the like).	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 39. Page No. 7-2 Section No. 7.2 Paragraph No. n/a A description of how Cameco wastes are to be moved would be useful.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 40. Page No. 7-6 Section No. 7.2.3 Table No. 7.2-2 3rd row – Cameco Decommissioning Waste, 3rd column: add to the end of the first sentence "and Crane Foundry wastes located on Centre Pier and Lions Centre park"	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 41. Page No. 7-7 Section No. 7.2.4 Paragraph No. 1 Last bullet: Please clarify Cameco volumes here and in the Executive Summary.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 42. Page No. 7-7 Section No. 7.3 Paragraph No. 4 What is the reason for categorization of primary and secondary COPCs?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 43. Page No. 7-7 Section No. 7.3.1 Paragraph No. n/a This section needs to acknowledge: that the Municipality of Port Hope has not agreed to the proposed cleanup criteria and that the Municipality and the LLRWMO will continue to discuss the criteria; that once agreement has been achieved, the revised recommended cleanup criteria will be forwarded to agencies for review; and that the implications for the environmental assessment of any changes to the proposed cleanup criteria will be evaluated at that time.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 44. Page No. 7-8 Section No. 7.3.1 Paragraph No. n/a It is noted that the clean-up criteria for the industrial sites generally corresponds with the MOE generic criteria for surface soils (i.e., at depths of surface up to 1.5 m below grade). It is recognized that a risk assessment may be utilized to develop different criteria for depths below 1.5 m. For LLRW remediation sites, we are concerned that the background has been affected by industrial emissions. The report should use MOE Table A values as proposed for Port Granby. It must be recognized that the assumptions used in the clean-up criteria will also greatly affect the volume of waste materials generated. The acceptability of using risk assessment	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

and leaving impacted soils in place to the Municipality and local landowners has not been established. Therefore, it is difficult to confirm or establish the volume of waste materials that will be generated from the clean-up. As noted previously, we have not been provided any detailed information regarding site investigations that were used to determine the volume of waste. There needs to be a reference to Clean up Principles as an overriding determinant of how cleanup criteria will be applied. The clean-up criteria also apply only to soil. How will ground water contamination be dealt with? What about the non-radioactive COPCs? Won't they require specific management measures? What are the alternative criteria that may apply to soils at depth?	
Comment # 45. Page No. 7-11 Section No. 7.4 Paragraph No. 1 The rationale for developing the time frames for the life cycle of the project should be provided. Also, the significance of these time frames with respect to maintenance, monitoring, institutional care, and the like, should also be discussed. A reference to the double liner should also be included here.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 46. Page No. 7-12 Section No. 7.6 Paragraph No. n/a In Footnote 1, please clarify whether Cameco will be required to use the same routes as the LLWRMO in transferring the waste to the LTWMF. Similarly, how will the Municipality be assured that Cameco will be following the same operational procedures to minimize dust emissions as proposed by the LLRWMO? In Footnote 2, how will the waste details such as radioactivity, other COPCs, associated with the Cameco wastes, affect this EASR analyses?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 47. Page No. 7-14, 15 Section No. 7.6.1 Tables No. 7.6-1, 7.6-2 How were numbers estimated? Are these workers per day, or over the whole year?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 48. Page No. 7-16 Section No. 7.6.1 Paragraph No. n/a For future discussions regarding end use of the site, provide a viewshed map that keys the standpoint and sightlines of each viewpoint used. Indicate whether the views are foreground, middleground, or background in the viewshed.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 49. Page No. 7-16, 7-17 Section No. 7.6.1 Paragraph No. n/a For the purpose of end-use discussions, future simulations should: • Show the existing landscape view. • Show the project with and without landscaping mitigation options at several future times, e.g. 2 years; 10 years. • Show when leaves are off the trees. • Show a person or automobile in the foreground for scale reasons. • Include ground-level simulations from County Road 2 and west. Also, include views from both directions along the 401, and from several topographical high points. • Include oblique, bird's eye view simulation images.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 50. Page No. 7-16 Section No. 7.6.1 Paragraph No. 1	☐ Comment Accepted & Incorporated; **or**

For completeness, add the following text to the last sentence: "on the east and x metres on the west of the site".	☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 51. Page No. 7-18 Section No. 7.6.1 Paragraph No. 4 The preparation should include a pre-construction site contamination survey and cleanups as may be required.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 52. Page No. 7-19 Section No. 7.6.1 Paragraph No. 1 Ancillary facilities should include a visitor information centre / observation area.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 53. Page No. 7-22 Section No. 7.6.1 Paragraph No. 1 Please clarify whether the geomembrane liner in the primary liner is made of high density polyethylene (HDPE). The report should clearly state that a double liner is required because underlying soils do not provide sufficient backup to prevent off-site contamination.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 54. Page No. 7-24 Section No. 7.6.1 Paragraph No. Bullet 3 As noted in the project description comments, more details are required regarding placement of wastes in the new facility. In particular, the putrescible wastes will produce methane gas and may settle. We are not clear about the current method of placement and are concerned that it may lead to significant settlement in the cell. The wastes should be placed in an area such that the landfill design and operation is not affected by this settlement and gas production. The placement of the drummed wastes should accommodate the eventual deterioration of the drums. To determine the most appropriate placement, the stability of drummed waste and its impact on the mound integrity over the facility life should be studied during the detailed design stage.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 55. Page No. 7-25 Section No. 7.6.1 Paragraph No. 3 Please add an additional sentence regarding gamma radiation levels being at background at the surface of the mound.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 56. Page No. 7-26 Section No. 7.6.1 Paragraph No. 1 Will the treatment system be located away from the mound to reduce radon levels at the mound location? For the public reader it would be useful to explain that there are various 'flaring' technologies and a visible flame is not required.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 57. Page No. 7-26 Section No. 7.6.1 Paragraph No. 4 End-use needs should be factored into demobilization.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 58. Page No. 7-28 Section No. 7.6.2.1 Paragraph No. 2 During detailed design, please describe how trucks will be cleaned of loose	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:

material – particularly at the sites in the neighbourhoods.	☐ Resolution Accepted by Reviewer.
Comment # 59. Page No. 7-28 Section No. 7.6.2.1 Paragraph No. 2 During detailed design, please describe whether tie-down tarps provide full containment to the radioactivity and other COPCs. We recommend that the TSAs consider sealed systems (using liners).	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 60. Page No. 7-29 Section No. 7.6.2.2 Paragraph No. 1 How will testing be done to ascertain whether it meets clean-up criteria?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 61. Page No. 7-30 Section No. 7.6.2.2 Paragraph No. 4 During detailed design, please describe how you will control the spread of contamination during the pumping and reinfiltration of the groundwater.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 62. Page No. 7-31 Section No. 7.6.2.3 Paragraph No. n/a The section does not include any details regarding the existing harbour perimeter structures and the potential problems that could be encountered when dealing with dredging along the structures. It was our opinion, expressed previously, that the details regarding the conditions of the existing structures could be better defined. Costs may increase to deal with the actual encountered conditions. This information will be needed in the detailed design phase.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 63. Page No. 7-34 Section No. 7.6.2.3 Paragraph No. 1 The lagoons containing geotubes should be located sufficiently below grade to prevent water overflow to the river in case of the accidental rupture or leakage from a geotube.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 64. Page No. 7-36 Section No. 7.6.2.3 Paragraph No. 1 We suggest plastic liners for all LLRW to reduce potential for spills.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 65. Page No. 7-36 Section No. 7.6.2.4 Paragraph No. 5 To where will treated water in Chemetron Lagoon be discharged?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 66. Page No. 7-37 Section No. 7.6.2.4 Paragraph No. 2 To the end of the second sentence, please add “if the groundwater meets the Municipal sewer use by-law and is acceptable to the Municipality”. For here and elsewhere in the document, the discharge of contaminated groundwater to the sanitary sewer system may not be permitted by the Municipality for a number of reasons, including: the additional volumes of water arriving at the WPCP could disrupt the treatment process and the additional contaminants could put the practice of land spreading the sludge at risk. Efforts should focus on other solutions to the treatment and discharge of groundwater.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 67. Page No. 7-37 Section No. 7.6.2.4 Paragraph No. 2 Please clarify whether water treatment is not required at the Coal Gasification Plant and the Lions Park. If not, please explain why.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

Comment & Disposition Sheet

Comment #	Page No.	Section No.	Paragraph No.	
68.	7-37	7.6.3	6	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Please indicate where the off-site infrastructure improvements are expected to take place.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
69.	7-39	7.6.3	n/a	
During the detailed design stage, please provide calculations for the estimate of trucks, and how this estimate is derived from the estimated tonnages. Are these volumes based on the entire remediation period or an annual basis? Clarify why the truck activities are expected to be constant during the 10 hours of operations of the day. The 9-10 hours of truck operation per day assumption used to calculate daily truck traffic would appear to overlap with school bus pick-up and drop-off times along the recommended transportation routes.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
70.	7-40	7.6.3	1	
Please discuss cleaning of leachate ponds and dismantling of current leachate piping.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
71.	7-41	7.6.4	1	
The last sentence should be omitted or change “would” to “could”. The consultation was not intended to confirm any particular type or level of use of the mound but suggestions for further consideration. There were a number of suggestions for use of the mound and the remaining site area and some suggestions regarding the adjacent lands. Suggestions such as an amphitheatre were re-affirmed which is a more active use of the mound. For the project description purposes the first sentence of this paragraph is the operative description.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
72.	7-41	7.6.4	3	
The words “quite likely” are used to refer to whether Government of Canada will continue to own the entire property. Would there be a circumstance where the Government doesn’t own it?				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
73.	7-42	7.6.4	4	
Won’t the drummed waste also result in settling of the final cover at some time? Please describe the active maintenance required to ensure the performance of the cover. Could cap replacement be required; will additional gamma monitoring be initiated over Cell 3?				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
74.	7-44	7.6.5	6	
Why would the passive vent system be kept after the gas collection/treatment stops? Should it not be closed to reduce radon emissions?				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
75.	7-49	7.8.1	n/a	
This section mentions design features of the project but describes and relies solely on the H&S Program to be developed. The section would benefit from a table similar to Table 7.8-1 Design Features …. Or fully incorporate and highlight the Project design features that protect HH&S. For example, Table 7.8-1 Engineered Port Hope LTWMF final cover management benefit is also protective of Human Health by ensuring background gamma levels at the surface.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or**

Comment & Disposition Sheet

76. 7-49 7.8.1 4 Please explain how the design features for health, safety, and environmental control will be revised and updated to reflect changing regulations. See also Page No. 7-66, Section 7.10	☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # Page No. Section No. Paragraph No. 77. 7-50 7.8.1 bullets We are really pleased to see that H&S plans will be developed and the elements of these plans. We would like this similar type of description for institutional requirements, environmental protection plans, etc. Will the Health and Safety Plan apply to Cameco's handling of the waste?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # Page No. Section No. Table No. 78. 7-55 7.8.2 7.8-2 Please describe the criteria used to determine what's necessary in terms of health, safety, environmental and emergency plans.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # Page No. Section No. Table No. 79. 7-57 7.8.2 7.8-2 "to the extent possible, conduct operations …". This needs clarification. Under what conditions is this not possible?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # Page No. Section No. Paragraph No. 80. 7-58 7.8.3 n/a There is not enough detail in this section. Additional information should be prepared during detailed design. Below are the types of variables to consider in how the Government of Canada will oversee and fund the management and repair (if required) of this facility during its life span. • Organizational structure • Health and safety requirements (environmental compliance might fit here also) • Evaluation and monitoring • Communications • Legal support • Program and strategic plans • Staffing • Training (on-going and one-time) • Compensation • Administrative systems • Funding	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # Page No. Section No. Table No. 81. 7-61 7.9.2 7.9-1 The table of Review of Credible Malfunction and Accident Events is difficult to understand. It appears that all of the credible events will require some review decision or action. In most cases the document indicates no further consideration is required. This is likely a matter of semantics, but further consideration would be required and it may be more appropriate to simply state that an appropriate operation or management program is available or in place to deal with the credible event, and then describe the program. The current table seems to dismiss most of the credible events as requiring no action.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # Page No. Section No. Table No. 82. 7-61 7.9.2 7.9-1	☐ Comment Accepted & Incorporated; **or**

Was the likely event of a major traffic accident occurring on Highway 401, resulting in the closure of the highway for a number of hours, addressed? Were contingency plans for the remediation activities and trucks already on the roads developed?	☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 83. Page No. 7-61 Section No. 7.9.2 Table No. 7.9-1 / 7.9-2 With respect to on-site spills, what is the potential for localized fire and combustion of a certain quantity of waste? With respect to failure of dewatering area containment system, are there no design measures to prevent this from happening (such as locating the lagoons sufficiently below grade so that geotubes rupturing will not release water to the river)?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 84. Page No. 7-61 Section No. 7.9.2 Table No. 7.9-1 Row 4: Damage to gas utility. Is there not a human health and safety issue associated with the rupture of a gas main or electrical cable that should be addressed?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 85. Page No. 7-61 Section No. 7.9.2 Table No. 7.9-1 Failure of stream diversion structure. Review Decision column implies that this will be explicitly addressed in Section 10 but it is not and should be. Similarly we could not find in Section 10 reference to Failure of Harbour Dike.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 86. Page No. n/a Figure No. 7.5-1 Paragraph No. n/a This figure is useful in indicating the project schedule. However, the figure is overly precise (i.e., assigning 1,523 days to construction of the facility). This may give the mistaken impression that the project schedule can be controlled to this level. Most of the activities should be rounded off to the nearest month or two, and a liberal contingency should be applied for unforeseen circumstances. With regard to the number of days shown, are these elapsed days or actual days? How were they estimated? Are these “one-worker day”, or the numbers of days a crew will be on site? If it refers to a crew, what is the size? We suggest indicating on the diagram which wastes go to which cells with connecting lines.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 87. Page No. n/a Figure No. 7.6-2 Paragraph No. n/a The outline of the existing burial mound should be shown.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 88. Page No. n/a Figure No. 7.6-3 Paragraph No. n/a As a general question, what will be done if the excavation for this site and the industrial sites becomes considerably larger and must extend onto adjacent property (i.e., residential)? How will any additional volumes be accommodated? What impact will this have on the timing of the project?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 89. Page No. n/a Figure No. 7.6-4 Paragraph No. n/a The legend indicates that section A is “unexcavated” but that area will need to be excavated to retrieve the LLRW. Please redefine.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

Comment & Disposition Sheet

Comment #	Page No.	Section No.	Paragraph No.	
90.	8-12	8.2.1.3	3	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Though it is mentioned that the samples are from the perimeter wells, the rest of the section deals with them as if they are good data. This is a major "non-conservative" assessment and recommendations should be made to obtain in-waste samples and re-assess impacts and mitigation (see comment in the HHSC EEA CD form).				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
91.	8-12 and 8-13	8.2.1.4	n/a	
Why is there no discussion of NO_x in this section? It's discussed in later sections but this is where background is established.				
Comment #	Page No.	Section No.	Table No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
92.	8-15	8.2.1.4	8.2.1-8	
Why are values for TSP lower than PM10? PM10 is a component of TSP, so values in TSP should always be higher than PM10.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
93.	8-22	8.2.2.2	4	
Please indicate that the Ward 1 LTWMF is no longer being considered as an option in the EA.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
94.	8-22	8.2.2.2	Last	
A reference to the character of the soils underlying the existing WMF would be useful.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
95.	8-23	8.2.2.2	6	
Regarding the statement, "The presence of iron and/or iron bacteria, sulphur and methane gas are thought to be from natural sources", please clarify whether this will be confirmed.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
96.	8-26	8.2.2.4	2	
We presume the soil sample was from the surficial soil above the mound and not within the mound.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
97.	8-31	8.2.2.7	n/a	
The discussion of ground water quality could be more useful, particularly for the remediation sites. It is important to know if there are ground water impacts at the site, and beyond the site. It is also important to know if these impacts will be dealt with during the remediation process. We have not been provided the information necessary to determine if the ground water impacts have been delineated, nor is there any program for dealing with impacted ground water.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
98.	8-38 to 8-41	8.2.2.9 and 8.2.2.10	n/a	
Runoff from remediation sites were not considered as potential project-environment interactions, except at Alexander Street Ravine. Please explain.				
Comment #	Page No.	Section No.	Table No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:
99.	8-42	8.2.2.10	8.2.2-7	
Ra-226 range of results appears too high (156Bq/L). Is it a typographical				

error? If not, what are the consequences?	☐ Resolution Accepted by Reviewer.
Comment # 100. Page No. 8-49 Section No. 8.2.3.4 Paragraph No. n/a Lake whitefish reportedly spawn in the study area. Where are these spawning locations in relation to plumes? Are there any special precautions to protect sensitive lifestages of these fish during the project? Spawning surveys for all species should focus on the vicinity of predicted plumes.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 101. Page No. 8-50 Section No. 8.2.3.4 Paragraph No. n/a Was there only a single reference site on Port Britain Creek? What reference sites were used for stations that had different stream orders than that of the Port Britain Creek site?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 102. Page No. 8-50 Section No. 8.2.3.4 Paragraph No. n/a Were any fish sampled above the perched culvert identified on Alexander Creek? How much fish habitat would be available if the perched culvert were to be replaced? The section of stream within the area of the remediation site appears to provide fish habitat. The channel is well-defined with plenty of cover and a variety of water depths and adequate flow. The BCS report showed a wetland downstream of this area that may prevent upstream passage of fishes to the remediation site. Does this natural feature (the downstream wetland shown in a photo in the BCS report) prevent fish access to habitat close to the remediation site? Are there fish in Alexander Creek at the remediation site?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 103. Page No. 8-50 Section No. 8.2.3.4 Paragraph No. 6 It was noted that expected values for several IBI metrics are based on watershed area. Were the metrics used to calculate IBI scores applicable to all stations sampled?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 104. Page No. 8-53 Section No. 8.2.3.6 Paragraph No. 8 What are the benchmark values for Po-210?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 105. Page No. 8-71 Section No. 8.2.4.2 Paragraph No. 4 *373 species were found in the study areas.* Were there any other species listed or regulated under the new federal SARA? Butternut is listed in the appendix to the BCS but is not mentioned in the text. The same comment applies to Page No. 8-73, Paragraph No. 3.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 106. Page No. 8-74 Section No. 8.2.4.3 Paragraph No. n/a The reference to the "proposed Port Hope Ward 1 LTWMF" is misleading. The same comment applies to Page No. 8-76, Section No. 8.2.4.4.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 107. Page No. 8-74 Section No. 8.2.4.3 Paragraph No. 2 *This includes waterfowl that overwinter at Port Hope harbour, that overwinter at inland sites or are migrants or vagrants….*These comments	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as:

include birds that are significant in Ontario but may also be listed under federal legislation including SARA and the Migratory Birds Convention Act. Which of these species are regulated under the new federal SARA? Which are listed under the federal migratory birds convention? Please comment on their occurrence.

The harbour is well known by naturalists for the spring and fall migration concentrations of waterfowl. As well the outfall of warm discharge water from Cameco keeps the harbour open most of the winter and attracts hundreds of waterfowl (geese, mergansers, goldeneye for example). There are records of endangered harlequin duck in the harbour in the winter of 2004. Were inventories of the harbour made during these key periods to determine the use by migratory birds as listed under the federal Migratory Birds Convention Act? What are the peak periods of waterfowl concentration in the harbour and how many birds? Is there survey data available from Environment Canada on the waterfowl use in the area and was this examined as part of the EA? Are any of the species that use the harbour listed under SARA? What is the impact of closing and dredging the harbour for an extended period and changing the bottom structure for the dredging operation on migratory birds and overwintering waterfowl? Is there other habitat that provides overwintering refuge in the Port Hope Study Area that provides protection from waves, winds and provides open water during cold snaps? Will the construction phase impact on the use of the harbour and Port Hope coastal area by migratory waterfowl?

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
108.	8-88	8.3.1.1	2

Please explain why there is no specific SSA for the Harbour and the land based remediation sites.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
109.	8-94	8.3.1.3	4 and 5

The Official Plan will be adopted in 2005, not 2004.

Existing built out industrial lands are located in the east end. However, large vacant lands designated as industrial are located at Toronto/Jocelyn.

Please modify the references from “Town” to “Municipality”.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
110.	8-94	8.3.1.3	5

Please describe where the area that is slated to support 75% of new housing is located relative to the LTWMF, and document the number of units expected to be developed.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
111.	8-95	8.3.1.3	4 and 5

There are two different references to the Highland Drive landfill designation: the first is Parks and Open Space and the second is Special Site Policy.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
112.	8-95	8.3.1.3	6

Marginal land pockets are located throughout the municipality, not just the southwest corner.

What does “minor growth” mean in the last sentence?

The Official Plan indicates a wetland in the “environmental schedule” on the proposed LTWMF site. All OP schedules should be reviewed and referenced where appropriate.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.

Comment & Disposition Sheet

113.	8-96	8.3.1.3	2 and 3	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Please correct the text to indicate that lands along Walton Street in the central core are designated as Central Commercial, part of which includes lands designated as the Heritage District.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
114.	8-96	8.3.1.3	4	
Please specify where the development along Marsh Rd. is in relation to the proposed facility. The commercial land use designation at Toronto Road and Highway 401 in the OP should be referenced.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
115.	8-96	8.3.1.3	4	
The rural employment lands around the Wesleyville Generating Station are commonly referred to as the Wesleyville Employment Area.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
116.	8-97	8.3.1.3	2	
3,500 units is a little misleading as this would include lands designated but not a part of any specific proposal. In addition, the 1,700 units to the north and south (of Lakeshore Road) have been redesignated as low density residential. Please update Page No. 11-17, which references 2,000 units in the AON development.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
117.	8-97	8.3.1.3	4	
The commercial lands in Ward 2 north of Highway 401 are located on the east side (not the west side) of Highway 2. There appears to be a missing reference for the Marsh Road North proposed residential development, which has been approved in principle.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
118.	8-97	8.3.1.3	6	
Please define what “vicinity” means regarding development of proposed Ward 1 or Ward 2 LTWMFs.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
119.	8-100	8.3.1.3	2	
Are there any “u-pick” produce places that might be considered part of a tourism experience in the LSA?				
Comment #	Page No.	Section No.	Table No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
120.	8-100	8.3.1.3	8.3.1-6	
For Cobourg, are data not available on farms, or are there no farms within the town?				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
121.	8-100	8.3.1.3	4	
During detailed design, specify the assumptions and methods used in generating the viewshed. Identify the standard visual impact assessment technique it follows. A visual sensitivity analysis should be conducted and visual quality objectives identified for differing areas depending on their sensitivity so as to manage by objectives. In the viewshed, include nearby high points, County Road 2 north of the 401 to 4th Line, and roads west of County Road 2 also north of the 401.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or**
122.	8-104	8.3.1.5	1st	

This information on fishing seems to differ from Page No. 8-98, which states that fishing is concentrated during the first 2 weeks of trout season. Please clarify.	☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 123. Page No. 8-104 Section No. 8.3.1.5 Paragraph No. 4 There is no mention of the emergency plan or of Community Awareness and Emergency Response for Port Hope. Please include a description of the Municipality's plan.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 124. Page No. 8-111 Section No. 8.3.1.6 Paragraph No. 2 During detailed design, please consider how many cyclists use the bicycle routes. We are not convinced that sidewalks (where bicycles are prohibited) or wide shoulders would minimize the potential for conflict with construction vehicles. The same comment applies to Page No. 8-157, Section 8.3.2.6.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 125. Page No. 8-116 Section No. 8.3.1.8 Paragraph No. n/a Please include the number of survey respondents at the beginning of this section. Without this information, the percentages of respondents who responded to each question has little context. The same comment applies to Page 8-122, Section 8.3.1.10 for the traditional land use survey.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 126. Page No. 8-118 Section No. 8.3.1.9 Paragraph No. n/a At small urban remediation sites in areas of high heritage character, mature trees should be considered heritage resources. If removed for remediation purposes, they should be replaced with mature species of the same kind.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 127. Page No. 8-122 Section No. 8.3.1.10 Paragraph No. 3 Please elaborate on the extent to which members of the First Nation practise traditional uses and outdoor recreational activities in the LSA.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 128. Page No. 8-124, 8-125 Section No. 8.3.1.11 Table No. 8.3.1-15 The VECs include three indicators related to Aboriginal Peoples, yet there is no source-pathway-receptor relationship for cleanup activities. Please explain why.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 129. Page No. 8-129 Section No. 8.3.2.2 Table No. 8.3.2-2 Inhalation of Exhaust gases from trucks and construction equipment has been omitted from the Table.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 130. Page No. 8-131 Section No. 8.3.2.3 Paragraph No. 2 Please add leachate and sludge management as radiation exposure risks.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 131. Page No. 8-133 Section No. 8.3.2.4 Paragraph No. 1 Please correct the error in stating de minimis. It should be 0.01 mSv/a.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 132. Page No. 8-133 Section No. 8.3.2.4 Paragraph No. 5	☐ Comment Accepted & Incorporated; **or**

The average annual medical exposures are stated to be 0.6 mSv/a. In the preceding paragraph, the typical doses from human-made sources are quoted to be 1.2 mSv/a. Are the two figures consistent, given that the medical exposures are the largest dose of human-made sources?	☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 133. Page No. 8-134 Section No. 8.3.2.4 Paragraph No. 2 Key references should be provided for the studies on the health effects of Port Hope people. How similar or different is the health of Port Hope residents than the rest of Canada?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 134. Page No. 8-134 Section No. 8.3.2.4 Paragraph No. 3 In our memorandum on health and safety considerations EEA, we commented on the need to review radiation exposure scenarios for hypothetical residents (such as including end-users, pregnant women etc). Those comments should be reviewed with a view to enhancing this section.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 135. Page No. 8-138 Section No. 8.3.2.5 Paragraph No. 1 It may not be practicable to enforce the use of PPE for dust exposure during the heat of the summer months. There may need to be reliance upon dust suppression techniques.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 136. Page No. 8-138 Section No. 8.3.2.5 Paragraph No. 2 How representative are the gas well samples to characterization of landfill gases?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 137. Page No. 8-141 Section No. 8.3.2.6 Paragraph No. 3 PM2.5 is 98%-ile over three years. This is used later, and should be clarified here. Are the 25 and 15 ug/m3 used in this report? Are they needed?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 138. Page No. 8-142 Section No. 8.3.2.6 Table No. 8.3.2-7 It is noted that the criteria for soil quality are referred to as Table A and Table F, which are part of the old Ministry of Environment Guideline for Use at Contaminated Sites. These have now been replaced by Tables 2 and 1 respectively under the new Ontario Regulation 153.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 139. Page No. 8-143 Section No. 8.3.2.6 Paragraph No. 1 The Region of Durham no longer uses a collision rate of 1.5 as a threshold to indicate a potential safety problem. The recommended haul routes should be re-examined during detailed design with the revised figures in mind. The same comment applies to Page No. 8-157.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 140. Page No. 8-144 Section No. 8.3.2.6 Table No. 8.3.2-8 Footnote “c” is not correct and doesn’t reflect the text. The Canada Wide Standard is not draft. It should reflect the 98%ile in 3 years. It is also unclear why PM2.5 is “expected”. PM2.5 – this range is not developed in the referenced report. The measured range is greater than this.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

Comment & Disposition Sheet

Comment #	Page No.	Section No.	Table No.
141.	8-145	8.3.2.6	8.3.2-9

This is a new table that was not presented in the BCS. It references the Addendum baseline report, but it is not there.

The standards for NO are inappropriately noted. MOE has a standard for total NOx reported as NO2, so applying these standards to NO and NO2 is not appropriate.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
142.	8-147	8.3.2.6	1 and 2

The rationale for assessing background quality in soil and ground water is not known. It appears that some samples were taken to assess background soil quality. Where were these samples taken? Do they include the potential impacts of previous industrial activity in the Port Hope area?

No ground water samples were taken. The rationale for this must be explained.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
143.	8-148	8.3.2.6	2

Please clarify whether any non-motorized modes of transportation were involved in the collision statistics listed.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Table No.
144.	8-155	8.3.2.6	8.3.2.-15

Please explain the anomaly in zinc data for high measured concentrations.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
145.	8-157	8.3.2.6	6

The following sentence should be rephrased: *"The presence of school and municipal buses, trail and bike routes, and vehicles carrying dangerous goods are not considered to pose any major safety concerns on the transportation system under existing conditions."* The justification for this statement is not clear.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Figure No.
146.	n/a	n/a	8.3.2-1

As noted in comments on previous documents the Ward 2 adjacent Resident is located in Ward 1. The text referring to this Figure needs to be clear on why that resident is located there and what that resident represents.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
147.	n/a	9	n/a

Although we're pleased that some of our comments on optimisation have been addressed, we're still not comfortable with the levels predicted. Further optimisation should be undertaken during detail design.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Table No.
148.	9-2	9.1	9.1-1

Why is the radiological health of members of the public not indicated to be impacted by remediation sites (no diamond, squares or bullets are shown)?

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
149.	9-7	9.2.2.1	2

The potential for combustion of waste due to fuel spills should be reviewed.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

	☐ Resolution Accepted by Reviewer.
Comment # 150. Page No. 9-8 Section No. 9.2.2.3 Paragraph No. 3 We feel there may be effects during sludge and leachate management	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 151. Page No. 9-10 Section No. 9.2.3.1 Paragraph No. 4 Why are different waste characteristics applied to different activities?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 152. Page No. 9-15 Section No. 9.2.3.3 Paragraph No. 1 Was any verification done on the meteorological data from the Welcome station to verify its applicability to the lower lying areas of Ward 1 near the Lake?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 153. Page No. 9-17 Section No. 9.2.4.1 Paragraph No. 3 Since work is seasonal, 24 hour AAQC is more important than annual averages with respect to control.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 154. Page No. 9-20 Section No. 9.2.4.1 Paragraph No. 2 Predicted concentrations are based on modelling. The predictions will need to be verified by the monitoring program. The same comment applies to Page 9-26.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 155. Page No. 9-23 Section No. 9.2.4.1 Paragraph No. 2 “no further evaluation … associated with particulate-bound metals” – can we presume this does NOT preclude further optimisation and reductions during detailed design?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 156. Page No. 9-25 Section No. 9.2.4.1 Paragraph No. 3 Low emission off-road vehicles should be a requirement for construction equipment. The same comment applies to Page 9-29, Paragraph 5.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 157. Page No. 9-26 Section No. 9.2.4.1 Paragraph No. 2 and 3 “Conservative assumptions” in this case is not true and should not be stated. The data for the Highland Drive landfill was from perimeter wells and not in the waste itself. Similarly for the harbour, the odour assessment is theoretical. As a result, the uncertainty around the odour emissions from the landfill and the sludge provide an uncertain assessment. Samples should be obtained and analyzed to re-assess impacts and mitigation.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 158. Page No. 9-27 Section No. 9.2.4.1 Paragraph No. Last The design and operational features could include controlled loading/unloading of wastes (with the use of plastic enclosures). Close control of waste moisture levels would also help.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 159. Page No. 9-28 Section No. 9.2.4.1 Paragraph No. 2nd bullet 2nd bullet: How are “high wind conditions” defined?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

Comment & Disposition Sheet

Comment #	Page No.	Section No.	Paragraph No.	
160.	9-29	9.2.4.1	4	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

"mitigation against offsite emissions". The purpose is to minimize emissions from getting offsite. Please reword this bullet appropriately.

Comment #	Page No.	Section No.	Paragraph No.	
161.	9-31	9.2.4.2	2	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

In the early monitoring phase, the leachate generation could be significantly higher than 150 m3/year since the transition from the high leachate generation rate during construction phase would take some time. How much would this affect the radon flux from the leachate in the early monitoring phase?

Comment #	Page No.	Section No.	Paragraph No.	
162.	9-38	9.3.1	1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

The first bullet acknowledges that overall hydrological changes will take place during the LTWMF Construction and Development phase. This may be a harmful alteration disruption and destruction (HADD) of fish habitat, depending on the degree of change. Please provide more details on the extent of the change expected.

Comment #	Page No.	Section No.	Paragraph No.	
163.	9-41	9.3.2.1	1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

Please clarify whether the mitigation scenario results imply that Th-230 incremental increases will not be measurable.

Comment #	Page No.	Section No.	Table No.	
164.	9-42	9.3.2.1	9.3.2-1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

A ground water flow model was used to predict the effects of the waste management facility on ground water discharge to the creek. No detailed technical information or support has been provided for review. The summary in Table 9.3.2-1 shows no effect whatsoever as the result of the landfill. This seems unlikely.

Comment #	Page No.	Section No.	Paragraph No.	
165.	9-44	9.3.2.2	5	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

250 L/min of groundwater is to be extracted during de-watering for 1 to 2 weeks. This is 360,000 L/day. What criteria were used to make the assessment that this will result in no expected change on the volume of groundwater flow discharging from the aquifer to N and S Ravine Creeks? What is the projected recovery rate of this aquifer?

Comment #	Page No.	Section No.	Paragraph No.	
166.	9-46	9.3.2.3	4	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

A 2% reduction in the discharge of groundwater to Brand Creek is expected. However 30% reductions were noted in the early life of the project. Do these reductions represent percentage changes on a water-shed or site basis?

If the reductions reflect changes for a specific location close to the site, groundwater inputs may be significant in this creek, as a coldwater fish species (mottled sculpin) were sampled from Brand Creek indicating coldwater habitat. Depending on the actual reduction in discharge, the effects could be measurable.

Comment #	Page No.	Section No.	Figure No.	
167.	n/a	9.3.3	9.3.3-1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

No linkages were noted between aquatic resources and the aquatic environment during the construction and development phases.

Comment #	Page No.	Section No.	Paragraph No.	
				☐ Comment Accepted & Incorporated; **or**

168.	9-51	9.3.3.2	2

Bullet 1. 0n page 9-41 it was stated that the mitigation scenario will bring down the Th-230 concentration by 65%. This should be mentioned here.

☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
169.	9-52	9.3.3.3	3

The text on this page is not consistent with Table 9.3.2-1. The text indicates a decrease in ground water discharge, while the table indicates constant ground water discharge.

As noted previously, the results of the model need to be provided to the MPRT. A 2% reduction in baseflow may be quite significant depending on its location. Also, it appears that the reduction has been averaged over the entire watershed. This is not appropriate. There may be a complete loss of baseflow in those areas adjacent to the site, for example, which could have a significant impact. Even if the net flow remains the same, the hydrology of the stream may change.

It is further noted the storm water management system will augment the flow to the site. Augmentation with storm water discharge is not an acceptable method of replacing lost ground water baseflow. Without further information, we do not agree that the changes to ground water flow are acceptable.

Monitoring of the stream channel with erosion pins could be used, in part, to verify that no impacts are occurring. Baseline geomorphology data should be gathered for all potentially impacted streams and applicable references sites.

☐ Comment Accepted & Incorporated; **or**

☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
170.	9-57	9.4.2	n/a

It is unclear from the information provided which sites may result in a HADD of fish habitat. Changes to hydrology including groundwater conditions are reported for some sites but there are no anticipated changes predicted. Predicted water quantity changes need to be reviewed by a hydrologist or geomorphologist to determine if channel morphology changes and thermal regimes will occur, that may result in a HADD.

Local conservation authorities likely have numerous potential restoration sites that may be used as compensation if a HADD does occur.

☐ Comment Accepted & Incorporated; **or**

☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
171.	9-57	9.4.2	n/a

From an Aquatic Environment perspective, it would be beneficial to see more detail on the effects assessments completed for each remediation and long-term storage site, for conservative case scenarios during the construction and development phase. This assumes that this project stage is the most vulnerable to impacting the environment, as contaminant sources are disturbed and exposed to the elements. A site by site effects assessment would allow an evaluation of site features and how they may interact with specific project phases to determine vulnerability.

Which creeks will be affected by changes in hydrology via changes in ground and surface water flows? A table listing these creeks, their flow characteristics, expected changes, and some threshold values (for channel morphology changes in response to hydrology changes) would help in the evaluation of potential HADDs.

☐ Comment Accepted & Incorporated; **or**

☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
172.	9-57	9.4.2	n/a

Removal of riparian vegetation in headwater streams may be considered a HADD, as the benthic invertebrates are dependent on this vegetation as

☐ Comment Accepted & Incorporated; **or**

☐ Resolved as:

their primary food source. Please list all sites where extensive riparian vegetation removal will take place.	☐ Resolution Accepted by Reviewer.
Comment # 173. Page No. 9-57 Section No. 9.4.2 Paragraph No. n/a What are the sensitivities of embryo, and fry stages of fishes in the study areas to applicable contaminants with respect to this project? In other words, how likely is it that the project may impact the most sensitive lifestages of fishes within study area streams and in Lake Ontario?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 174. Page No. 9-60 Section No. 9.4.2.2 Paragraph No. 3 and 4 No changes are expected at Alexander Street Ravine and other creeks during de-watering. Alexander Creek is a small system and presumably could be affected by relatively small changes caused by de-watering. Have the effects on flow as a result of de-watering been quantified for Alexander and other Creeks? Similarly, are there any potential detrimental effects to the Ganaraska River other than accidental spills?	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 175. Page No. 9-62 Section No. 9.4.2.2 Paragraph No. 4 Accidental release of contaminated water into the Ganaraska River could be prevented by constructing a temporary cofferdam around the area (double containment), thereby reducing the likelihood of accidental release.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 176. Page No. 9-74 Section No. 9.5 Paragraph No. n/a Overall, the terrestrial portion of the report gives a generalized overview level assessment of the impact of removal of waste at the existing Ward 1, Ward 2 and remediation sites. Site-specific impacts at each location are not addressed in terms of loss of vegetation, loss of wildlife habitat, impact on significant species or habitats, local wildlife corridors and habitat complexes. Instead a general statistical analysis of loss of vegetation community area is given based on the entire study area or local study area. The impacts of the removal of waste and development of the LTWMF are divided into temporary and permanent effects. While this is one level of impact assessment, the direct and indirect impacts on the features and functions at each location are not provided in terms of loss of vegetation on the localized area and individual polygons. The description of the project for the Environmental Assessment Purposes prepared by MMM and Conestoga Rovers provided a detailed site by site assessment of clearing operations, mitigation measures and the extent of works. While the information in this report was focussed on engineering and construction operations, the details of each site included the extent of clearing, site photos and preliminary ideas on final grades, end use and mitigation measures. This information does not appear to have been used in the EEA report as the basis for determining environmental effects on the features and functions of the vegetation and wildlife communities at each site (e.g., clearing treed areas of Lions Centre Park).	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 177. Page No. 9-90 Section No. 9.5.3.1 Paragraph No. n/a The mitigation measures for the construction, post-construction and short-term are described in general terms for the Ward 1, Ward 2 and remediation sites but specific recommendations are not made. The extent of the excavation footprint and general construction steps and timing are presented in the MMM report and could be used to do site by site mitigation measures.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # Page No. Figure No. Paragraph No.	☐ Comment Accepted & Incorporated; **or**

178.	n/a	9.6.3-1a	n/a	☐ Resolved as: ☐ Resolution Accepted by Reviewer.
This figure indicates a source-pathway and receptor relation between all "construction related works and activities", "change in biophysical environment", and "receptor effects on aboriginal interests". Please explain how dust, noise, odour, and traffic will affect aboriginal interests.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
179.	9-107	9.6.3.2	5	
Please explain the basis for the percentages of people who might decide to move. The same comment applies to Page 9-30, Paragraph 4.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
180.	9-108	9.6.3.2	1st bullet	
Shouldn't "is likely to result in the displacement" be changed to "will result in the displacement"? Won't the tenant definitely be displaced?				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
181.	9-108	9.6.3.2	2	
Are these numbers per year (e.g., 45.5) over the 7 years, or total?				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
182.	9-109	9.6.3.2	2, 3	
Please quantify the numbers of businesses with outdoor components. Is attracting and retaining businesses in Port Hope a current problem (i.e., even without the project)? If so, this statement belongs in the baseline as it is part of the current situation.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
183.	9-110	9.6.3.2	4	
Is the income related spending of $33.7 million over the 7 years, or for each year? How was this figure estimated?				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
184.	9-111	9.6.3.2	1	
What are the predicted trends in tourist numbers without the project?				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
185.	9-111	9.6.3.2	2	
Please address what effects might result should the anticipated outcomes not be realized (e.g., accidents/spills and associated media coverage, environmental damage, etc.)				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
186.	9-112	9.6.3.2	5	
Please define the "zone of influence" and describe how it was determined.				
Comment #	Page No.	Section No.	Paragraph No.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
187.	9-113	9.6.3.2	4	
We believe that the proponent can undertake measures that will improve the opportunities for local and regional businesses and workers to become involved in the Project. Communications and procedures to proactively encourage local business and employee opportunities should include timely advance notice to businesses and prospective workers of contractor and employee requirements (e.g., skills, certification, equipment requirements, and procurement procedures). As well, emphasizing to general contractors the benefits of using local sub-contractors will better				

enable local workers and contractors to compete for work on the Project.

Comment #	Page No.	Section No.	Paragraph No.
188.	9-113	9.6.3.2	List of bullets

Please explain further how the LLRWMO will "address business losses". Please also suggest how these measures are unique (e.g., bullets 4 and 1 seem similar; 3 and 7 seem similar). Similarly, please explain what a "business activity enhancement program" (last bullet) consists of and how effects on tourism would be monitored.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
189.	9-115	9.6.3.3	4

For the residential development within the 500 m zone, what effects might occur if the development is approved (i.e., effects on new residents from construction and truck traffic along the dedicated access route)? Is the provision of the berm along the dedicated access road intended to address the effects?

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
190.	9-117	9.6.3.3	3

At small urban remediation sites in core neighbourhoods, it may be appropriate to use small-scale machinery for remediation activities. In these neighbourhoods, mature trees and shrubs should be considered heritage resources. If removed for remediation purposes, they should be replaced with mature species of the same kind.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
191.	9-125	9.6.3.6	3 and 4

More significant changes are likely required on Cavan Street, including widening and well as reconstruction of the Highland Drive to Jocelyn segment. Intersection improvements at Cavan and Jocelyn, including possible signalization, are also likely.

The Municipality is expecting that full inspections of the three concrete bridges will occur prior to construction, and any required modification made prior to use by trucks.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
192.	9-127	9.6.3.6	3

Regarding traffic, we are concerned about possible disruption to residents and businesses along the transportation route, particularly on Peter Street with access to the grocery store and retail plazas and delays to workers and others during shift change of the industries in the area. The timing of the traffic lights at Hope Street may be lengthened to permit older pedestrians additional crossing time.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
193.	9-127	9.6.3.6	Last

Change MUTCD reference to Ontario Traffic Manual.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
194.	9-128	9.6.3.7	2

When remediating streets, it is likely that the contaminated soils extend to a depth to or below the sanitary/storm sewer pipes and/or the water mains. In some areas those pipes are old and will likely break during soil removal. Protocols will need to be developed to ensure that service disruption is minimized and appropriate replacement of services (including appropriate certificates acquired from provincial agencies and required engineering plans) is provided.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
195.	9-134	9.6.3.8	n/a

☐ Comment Accepted & Incorporated; **or**

Mature trees and shrubs within the likely zone of influence for the Port Hope LTWMF and remediation sites or along transportation routes should be identified prior to earthmoving and mitigation measures taken to protect them.	☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 196. Page No. 9-136 Section No. 9.6.3.10 Paragraph No. 2 Change 2nd sentence to read, "Thus a licensed archaeologist will be on-site during site preparation to ensure that …"	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 197. Page No. 9-137 Section No. 9.7 Table No. 9.7-1 ALARA should be included as a criteria/parameter.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 198. Page No. 9-141 Section No. 9.7.2.1 Paragraph No. 2 We commented on a number of receptor and other issues in our review of the Human Health and Safety Considerations EA. These should be reviewed with a view to enhancing this Section. **Please refer to the associated Comment-Disposition Form on the Health and Safety EEA.**	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 199. Page No. 9-144 Section No. 9.7.2.1 Paragraph No. 6 The radiological health of workers needs more attention during detailed design. Although the doses are shown to be below regulatory criteria, they need to be brought down as much as possible to reduce worker exposure. Critical worker receptors (monitoring technician, haul truck operators, transport drivers, and harbour sediment workers) should particularly be targeted for dose reduction.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 200. Page No. 9-146 Section No. 9.7.2.1 Table No. 9.7.2-1 It is important to check whether assumed shielding of 2.5 cm of steel is available for the backhoe worker all the time (make sure it is not machine dependent). A reduction in this shield could significantly increase backhoe worker dose. In Assumption 2, the time percents appear very sensitive to dose. How will they be enforced? How much truck shielding is available for the haul truck driver? There need to be administrative goals in occupational dose management and the targets set should be comfortably below the regulatory limits (a factor of 10 at least).	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 201. Page No. 9-151 Section No. 9.7.2.2 Paragraph No. 2 The worker doses at the harbour appear too high. Attention is required for radiation dose reduction to the worker in the dewatering area.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 202. Page No. 9-152 Section No. 9.7.2.3 Paragraph No. n/a Further assessment should be done of onsite landfill gas emissions, including radon, on early life use. Using nearby receptors, applicable during the construction phase, is not appropriate.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Comment # 203. Page No. 9-154 Section No. 9.7.3.1 Paragraph No. 3 It appears that the radiological effects are based on the maximum emission scenarios. The resulting doses appear high, particularly the infant dose (0.25 mSv/a). It would be useful to repeat the analysis for mitigation scenarios and see whether the doses get significantly reduced.	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

Comment & Disposition Sheet

Comment #	Page No.	Section No.	Paragraph No.	
204.	9-155	9.7.3.1	2	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Further mitigation measures should be identified to reduce public doses in keeping with ALARA.				
Comment #	Page No.	Section No.	Table No.	
205.	9-160	9.7.3.2	9.7.3-1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
The incremental risk being greater than acceptable is a concern. Arguing that it is only 4% of the existing does not change the incremental. IF the existing were lower, would the 6.43 x 10-6 be acceptable, especially since the argument can't be made that "existing" goes down? Therefore we increase the risk, for no benefit. It is controversial to state that increased risk (although a small percentage) is not considered an adverse effect when the total risk exceeds acceptable risk due to a high level of existing risk.				
Comment #	Page No.	Section No.	Table No.	
206.	9-161	9.7.3.2	9.7.3-2	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
The incremental risk being greater than acceptable is a concern. Arguing that it is only 4% of the existing does not change the incremental. IF the existing were lower, would the 0.2 be acceptable?. Especially since the argument can't be made that "existing" goes down. Therefore we increase the risk, for no benefit. It is controversial to state that increased risk (although a small percentage) is not considered an adverse effect when the total risk exceeds acceptable risk due to high level of existing risk.				
Comment #	Page No.	Section No.	Paragraph No.	
207.	9-163	9.7.3.2	3	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Cobalt is not a recognized human carcinogen. How was cancer risk calculated?				
Comment #	Page No.	Section No.	Paragraph No.	
208.	9-164	9.7.3.2	4	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Bullet 2. Would the 2 m high impaction fences be effective in mitigating finer particulates (PM2.5)?				
Comment #	Page No.	Section No.	Paragraph No.	
209.	9-166	9.7.3.2	1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
What are the mitigation measures to reduce the predicted health effects from cobalt exposure for an infant?				
Comment #	Page No.	Section No.	Paragraph No.	
210.	9-166	9.7.3.2	2	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
During detailed design, mitigation measures for traffic accidents should also focus on workplace hazards (slopes, loading/unloading operations, and other procedures that may entail potential traffic problems).				
Comment #	Page No.	Section No.	Paragraph No.	
211.	9-166	9.7.3.2	last	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
This appears to be the first time Environment Canada NOx (or any EC criteria) is mentioned. This should be discussed earlier in report.				
Comment #	Page No.	Section No.	Paragraph No.	
212.	9-167	9.7.3.2	1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Evidence gathered in the past decade suggests that short-term exposure increases in particulate and gaseous pollutants are associated with increased risk of circulatory disease events. Most recently, linear non-threshold models have been used.				
Comment #	Page No.	Section No.	Paragraph No.	

213.	9-167	9.7.3.2	3

Quoting a hazard quotient to 3 significant digits is unjustified. The margin of error would undoubtedly include a hazard quotient in excess of 0.2

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
214.	9-168	9.7.3.3	2

The worker doses appear too high. Doses should be reassessed using mitigation scenarios.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
215.	9-168	9.7.3.3	4

The expectation that commitment to BMPs would reduce the radiation dose to below 10% of the CNSC limit should be demonstrated by assessments.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Figure No.	Paragraph No.
216.	n/a	9.7.2-1	n/a

Should the figure also include the fenceline receptor?

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.
217.	9-174	9.8.3	1

For spills and emissions in the harbour or Ganaraska River, please ensure that Municipal water intake is addressed. The localized currents have been observed to carry sand and silt materials from the mouth of the River toward the water intake. For the malfunction/accident of materials falling into the River ensure that the response is timely and that the materials are contained. Establish protocols for notifying the Municipality of spills or releases into the River or Harbour area.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Table No.
218.	9-178	9.9	9.9-1

This table is a good format for representing the effects. However, the table is incomplete and all of the potential environmental effects and consequences should be summarized in such a table.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Table No.
219.	9-179	9.9	9.9-1

During remediation near the downtown, ensure that the potential for a reduction in weekday tourism (including resident and tourist use of the east beach and the Ganaraska River) as a result of construction noise, traffic, road closure, etc., is addressed. Appropriate mitigation may involve scheduling of remediation activities by season. As well, we would like to see monitoring of tourism/tourists in Port Hope to ensure that effects are addressed as they arise.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Table No.
220.	9-181	9.9	9.9.1

The statement that project-related truck traffic MAY disrupt seems too weak – LIKELY disrupt seems more probable given that 12 trucks per hour are expected.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Table No.
221.	9-182	9.9	9.9.1

Regarding the last row, add " ….information to residents and 'listening to residents' concerns' …" to the second column to ensure two-way communication to address stress.

☐ Comment Accepted & Incorporated; **or**
☐ Resolved as:

☐ Resolution Accepted by Reviewer.

Comment #	Page No.	Section No.	Paragraph No.

☐ Comment Accepted & Incorporated; **or**

Comment & Disposition Sheet

222.	10-8	10.1.2	3	☐ Resolved as: ☐ Resolution Accepted by Reviewer.

Flooding could also be caused by the failure of drainage systems concomitant with heavy rains. During detailed design, please ensure that project design features are adequate to respond to flash flooding situations.

Comment #	Page No.	Section No.	Paragraph No.	
223.	11-10	11.1.6	6	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

The first sentence needs to be changed to reflect the Legal Agreement. We suggest referring to “specified waste materials”.

Comment #	Page No.	Section No.	Paragraph No.	
224.	11-17	11.1.6	3 to 6	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

The AON development has an inconsistent reference to a number of units. Infrastructure construction is expected to begin in 2005. The Ottery development on the south side of Marsh Road is nearing completion with approximately 70 units left. As the Draft OP does not suggest modifying Ward boundaries, reconfiguration of Ward boundaries would not be minor.

Development on lands to the west of the Ward 1 boundary will not commence in 2004. Regarding Tucker Creek, the proposed OPA was denied. While there is existing approval for 250 units (no golf course), in the current draft prepared by PAC, the designation has been removed.

Comment #	Page No.	Section No.	Paragraph No.	
225.	11-19	11.1.6	2	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

We could not find mention of the Waterfront Plan Implementation Strategy. This project has been in the planning stages for a number of years with implementation to occur upon completion of remediation in the Mill Street area.

Comment #	Page No.	Section No.	Paragraph No.	
226.	12-1	12	1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

There will likely be residual adverse environmental effects to ground water baseflow and surface water drainage as a result of the project as planned (i.e., appropriate mitigation measures will need to be specified during detailed design).

Comment #	Page No.	Section No.	Table No.	
227.	12-5	12.2.1	12.2.1-2	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

We are not convinced that the effects management program will truly mitigate "increased difficulties in marketing properties". In terms of residual reduced property values, while property values do tend to rebound to their original levels at some point, it's hard to predict when the rebound will actually occur. The recommendation about the PVP should be to evaluate the program after the 2 years post-construction, and a commitment that the program will continue if necessary.

Comment #	Page No.	Section No.	Table No.	
228.	12-7	12.2.1	12.2.1-2	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

As noted previously, splitting the construction and long term effects would provide a much clearer picture of the residual effects.

Comment #	Page No.	Section No.	Table No.	
229.	12-7	12.2.1	12.2.1-2	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

Regarding “Disruption along the recommended transportation routes and local roads due to perceived hazards, detours and road closures”, Table 12.2.1.2 suggests that the permanence is low because the effects are manageable. How will these effects be managed?

Comment #	Page No.	Section No.	Paragraph No.	
				☐ Comment Accepted & Incorporated; **or**

Comment & Disposition Sheet

230.	13-2 -13-4	13.2 -13.4	n/a	☐ Resolved as: ☐ Resolution Accepted by Reviewer.

This chapter needs to make more explicit the differences and similarities between the performance monitoring program and the follow-up program. At times it is unclear.

Comment #	Page No.	Section No.	Paragraph No.	
231.	13-3	13.3	n/a	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

This section does not capture the philosophy of a consultative approach that we would like to see with reporting. The public and the Municipalities will need to receive, review and comment on the monitoring programs and policies and the data produced through the programs, both follow up and performance monitoring. This would not necessarily be left to the annual monitoring report but the Construction and early monitoring phases should include regular review and comment as well as participation in the monitoring.

The first paragraph omits mention of the Municipality and the public. The last paragraph notes that the Legacy Committee and groups would be expected to receive monitoring reports and that they would be expected to distribute information and data to the public or other stakeholders.

Comment #	Page No.	Section No.	Paragraph No.	
232.	13-4	13.4	2	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

2nd bullet: and “human health” after environmental in last line.

Comment #	Page No.	Section No.	Paragraph No.	
233.	13-4	13.4	n/a	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

This section does not fully address S. 6.12 Follow-up Program of the EA Scope Document, including project specific and cumulative effects and enhanced programs for monitoring malfunctions and accidents. More precision process and timing for establishing the details of the follow-up program could also be provided.

Comment #	Page No.	Section No.	Table No.	
234.	13-6	13	13-1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

Monitoring of surface water quality through conventional chemical analysis is often not an appropriate way to assess impacts on surface water and sediment. Water quality sampling frequency should be intensified during the construction phase so that problems can be identified and mitigated as they are occurring. Real-time water quality sampling during vulnerable project stages would be ideal. Sampling during storm events would allow an evaluation of the effectiveness of stormwater management.

Erosion pins and benthic monitoring would provide an assessment of the state of physical fish habitat and the health of the associated biota. This additional monitoring will help capture episodic events that may affect the aquatic environment that may be missed by water quality sampling alone.

Comment #	Page No.	Section No.	Table No.	
235.	13-6	13	13-1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

Why are streams being diverted? Please provide a list of streams to be diverted, the reason for the diversion and other applicable details of this project stage that relate to the aquatic environment.

Have baseline data been gathered specifically at the diversion sites?

Comment #	Page No.	Section No.	Table No.	
236.	13-8	13.3	13-1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.

In the Traffic and Transportation, please change the first sentence so that the pre-Project quality assessment includes both roads and bridges.

Comment & Disposition Sheet

LLRWMO-C&D-531.4.1

Ref. Procedure LLRWMO-531.4.1

Comment #	Page No.	Section No.	Table No.	
237.	13-8	13.1	13-1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Regarding Traffic and Transportation, Table 13-1 suggests monitoring and inspecting the conditions. The detailed design will need to recommend any mitigations or improvements if a problem or deficiency is encountered.				
Comment #	Page No.	Section No.	Table No.	
238.	13-8	13	13-1	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
Consideration should be given to monitoring in other pathways/vectors for human health, including some nearby crops, livestock and garden vegetables. We should include some off-site final surface soil measurements in areas representative of the human health assessment.				
Comment #	Page No.	Section No.	Paragraph No.	
239.	14-1	14.1	3	☐ Comment Accepted & Incorporated; **or** ☐ Resolved as: ☐ Resolution Accepted by Reviewer.
The possible future context for decisions regarding decommissioning could include urbanization, future cleanup constraints, and major upheavals (earthquakes).				

*Note: Approver(s) will review this completed form before approving document for use.	Reviewer's Signature	Date
	Author's Signature	Date