Waste Management of Canada Corporation

Environmental Assessment for a New Landfill Footprint at the Beechwood Road Environmental Centre

DISCIPLINE WORK PLANS

DRAFT FOR DISCUSSION AND COMMENT

Prepared by:
AECOM

Project Number:
60263757

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1. Introduction

The purpose of this document is to present the proposed work plan for the environmental assessment (EA) of Waste Management of Canada Corporation's (WM) new landfill footprint at the Beechwood Road Environmental Centre (BREC). Comments were invited from the Government Review Team (GRT) during the preparation of the Terms of Reference (TOR).

This proposed work plan, which is part of the TOR, presents the scope of work required to complete the EA, including the scope of technical studies for each of the environmental components, public consultation, effects prediction/assessment, mitigation, EA documentation and submission. Work plans for the individual technical disciplines are included in Sections 4.0 to 13.0 of this document. The work plan for design and operation is provided in Section 14.0.

The Work Plan for Stakeholder Consultation is provided in Section 15.0.

2. EA Approach

2.1 Phased Approach

It is proposed that the EA work will be undertaken in three phases as follows:

- Phase 1 – Characterize Existing Environment and Predict Effects of the Proposed Alternatives;
- Phase 2 – Identify Preferred Alternative; and,
- Phase 3 – Prepare and Submit EA Documentation.

Consultation with the public, agencies and other stakeholders will be ongoing throughout the EA process.

2.2 Environmental Components

The environmental components that will be evaluated in the EA, sub-components, rationale, indicators and data sources for the comparative evaluation criteria are provided in Appendix B of the TOR.

Environmental Components

- Atmosphere (Section 4.0);
- Geology and Hydrogeology (Section 5.0);

- Surface Water (Section 6.0);
- Biology (Section 7.0);
- Cultural Heritage Resources (Section 8.0);
- Transportation (Section 9.0);
- Land Use (Section 10.0);
- Agriculture (Section 11.0)
- Socio-economic (Section 12.0); and,
- Aboriginal (Section 13.0).

Technical Criteria

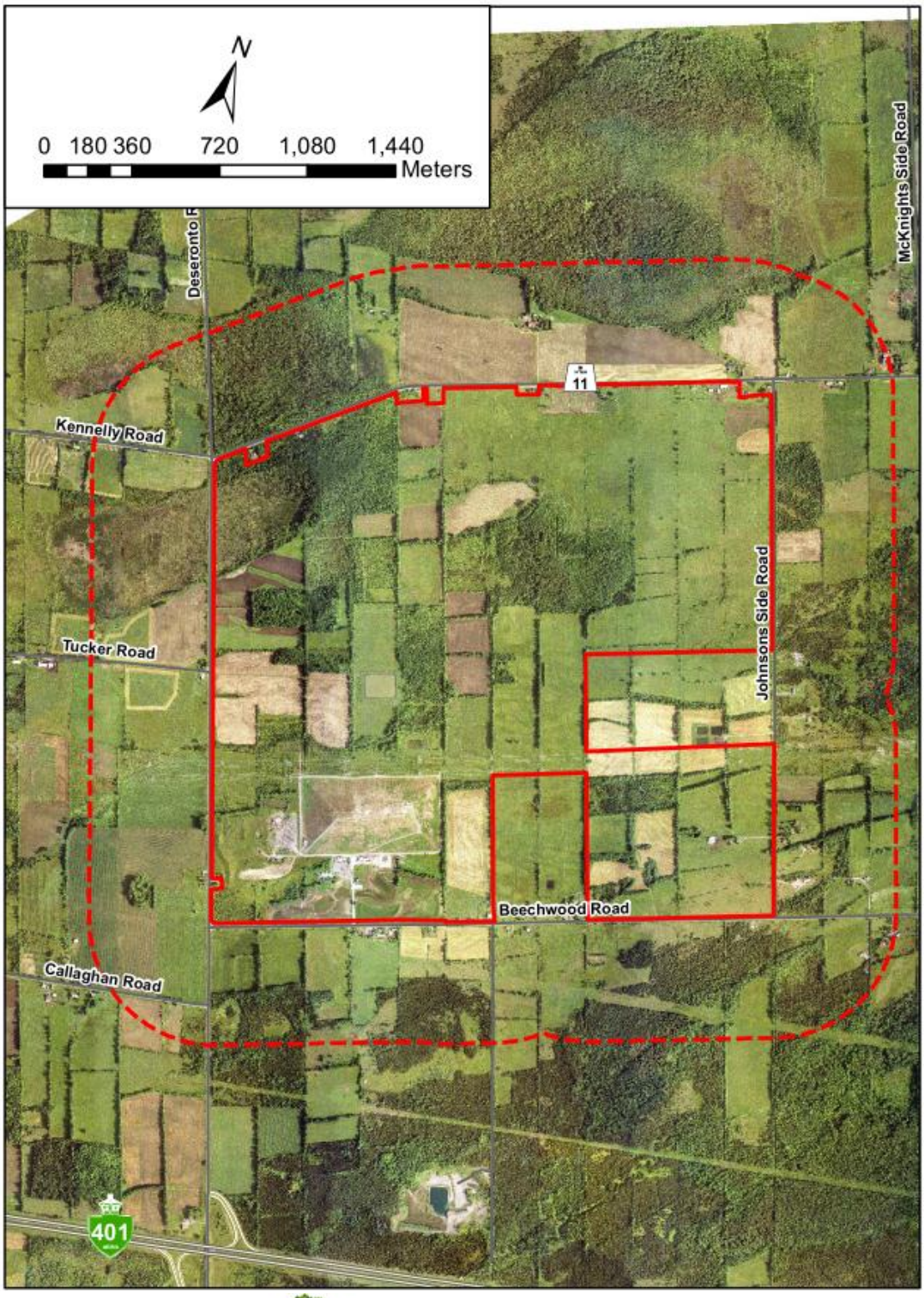
- Site Design and Operations (Section 14.0).

2.3 Study Areas

Data for the EA will be collected and analyzed for three generic study areas that will be presented in the TOR, as follows:

- On-Site – the lands owned and/or optioned by WM for the proposed new landfill footprint and ancillary facilities;
- Site Vicinity – the lands in the vicinity of the Site (within 500 m of the On-Site, study area and modified as appropriate for specific technical disciplines as will be determined during the EA); and
- Regional – the lands within about 25 km of the On-Site, study area for socio-economic environment.

In the period between submitting the TOR to the Ministry and receiving approval, WM acquired additional lands. As such, the study area has been amended as shown below:


N
0 180 360 720 1,080 1,440
Meters
McKnights Side Road
Deseronto R
11
Kennelly Road
Johnsons Side Road
Tucker Road
Beechwood Road
Callaghan Road
401

2.4 Time Frame

The EA will consider potential effects on the environment associated within three timeframes as follows:

- Construction;
- Operations (20 years); and
- Post-closure.

3. Work Scope

3.1 Phase 1 – Characterize Existing Environment and Predict Effects of Proposed Alternatives

This initial phase of the EA comprises four tasks, which involve identifying alternative methods, characterizing existing environmental conditions, determining mitigation measures that will be incorporated into the design of alternatives, and predicting the effects of the alternatives on the environment.

WM will undertake EA studies to adequately describe baseline conditions and demonstrate that they can clearly understand the proposed site and potential environmental impacts of the proposed undertaking.

The project team will consult with the Ministry of the Environment (the Ministry), other appropriate government reviewers, members of the public, and Aboriginal communities during Phase 1 of the EA regarding the nature and scope of the proposed EA studies, including early consultation on the development of the Geology and Hydrogeology Work Plan, summarized in a separate memo. This early consultation will provide an opportunity for WM to receive input from regulators and interested parties on how potential impacts may be identified, which will inform the development of measures to mitigate potential environmental impacts.

3.1.1 Task 1 – Identifying Alternative Methods for New Landfill Footprint

Preliminary land envelopes or areas where new landfill footprints could be constructed have been identified during the preparation of the TOR. Early in the EA the land envelopes will be refined and confirmed and an appropriate number of reasonable landfill footprints will be proposed by the project team in consultation with the public and GRT. The new landfill footprints will provide approximately 13 million m^3 of air space and will be required to meet all

applicable requirements of the Ministry. The proposed alternatives will include development options on both the western and eastern portions of the lands owned or optioned by WM (see Figure 3 in the TOR). WM is proposing that the height of the new landfill footprint alternatives will be no greater than the current landfill height but this could be changed through the consultation process.

The alternative new landfill footprints that will be developed will comprise a range of features and variables, including for example, footprint configuration, location of entrance, and access roads; the position of the landfill footprint will determine the location of the non-landfill BREC components such as materials recycling facility, construction and demolition facility, organics facility, landfill gas to energy facility, greenhouses, community features, etc.

During the EA, the project team will describe the proposed alternative landfill footprints and associated facilities in sufficient level of detail (i.e., conceptual designs) for assessment by individual environmental component leads. A draft Conceptual Design Report (CDR) will be prepared and distributed to each of the environmental component leads for further analysis. The characteristics of the existing and proposed site design and engineering system requirements, including in-design mitigation measures, can affect the environment and site activities such as operational and maintenance requirements. These potential effects will be assessed in the EA.

3.1.2 Task 2 – Describing Environment Potentially Affected

The project team will collect information and conduct studies (desktop and field) to describe components and sub-components of the environment identified in the TOR that may be affected by the undertaking and BREC facility components. This will be done for each of the alternative methods identified in the previous task. The environmental components, sub-components, rationale, indicators and data sources that will be used in the analysis of each component are presented in Appendix B and methodology is provided in Sections 4.0 to 14.0 of this document.

3.1.3 Task 3 – Identifying Mitigation Measures to be Incorporated in the Design of Each Alternative

Following identification of a reasonable number of alternatives (Task 1) and the characterization of existing environmental conditions (Task 2), the project team will conduct a preliminary assessment of potential effects of the landfill and BREC facility components. Potential mitigation measures to be incorporated into the conceptual design of the alternatives will also be developed. The project team will then finalize the CDR, updating the conceptual designs, including in-design mitigation measures. The CDR will serve as the common basis for conducting the assessment of alternatives.

3.1.4 Task 4 – Predict Environmental Effects for Each Alternative

In this final task for Phase 1 of the EA, the project team will predict the effects of each alternative (i.e., including in-design mitigation measures) on the environment. The potential effects of BREC facility components will also be predicted. The assessment will be done for each component of the environment based on the existing environmental conditions (determined in Task 2) and the conceptual designs for each alternative including mitigation (determined in Task 3).

3.2 Phase 2 – Assess Effects and Identify Preferred Alternative

3.2.1 Task 5 – Refine Mitigation Measures and Determine Net Effects

The EA project team will identify linkages (i.e., direct or indirect effects of the undertaking on an environmental component via another component, such as groundwater discharge to surface water). Linkage diagrams will be prepared by the environmental component leads. These diagrams will serve as the basis for conducting an integrated assessment of effects.

Prediction of future environmental conditions associated with each alternative landfill footprint and BREC facility components will be provided by each discipline lead using modelling and other methods. Assessment of potential effects will be done using appropriate objectives, standards, policies and legislation. The Ministry and the GRT members will be consulted on methodologies that will be used. Further mitigation measures, if required, will be identified and refined as necessary. The project team will update and revise the conceptual design plans for the alternative footprints. The final conceptual designs will be documented in the Final EA Report.

Finally, the EA project team will repeat prediction of future environmental effects, assuming all mitigation measures are in place. The remaining effects or “net effects”, if any, will be documented.

3.2.2 Task 6 – Compare Alternatives

At this point, the project team may also consider additional alternative landfill footprints that may have been identified by the public or other parties during the EA process. Should an additional alternative(s) be developed, it would also be subjected to the analysis described in Task 3.

Following the completion of Task 5, the net effects of each Alternative Method, or landfill footprints, will be comparatively evaluated using a Reasoned Argument (or Trade-off) Method as a means of selecting the recommended Alternative Method. Application of this assessment method will be based on identifying the advantages or disadvantages of each Alternative Method, and then using them to establish preferences among the alternatives. Each alternative will be compared using the criteria, indicators, criteria weighting and data sources presented in the TOR. This analysis will be undertaken by the EA project team. The information generated through the comparison of the short-listed Alternative Methods will be summarized in a series of tables and documented in the EA Report.

3.2.3 Task 7 – Identify Preferred Alternative and Detailed Assessment

In this task, the advantages and disadvantages of the alternative landfill footprints will be described based on the comparative evaluation. Preliminary feedback on the relative importance of the criteria was received during preparation of the TOR and further input will be obtained during the initial stages of the EA. The outcome of this ranking exercise will be the identification of a preferred alternative landfill footprint.

A detailed impact assessment of the preferred alternative(s) will be completed to determine the net effects that will be caused, or that might reasonably be caused, on the environment (i.e., the advantages and disadvantages to the environment). This includes consideration of any mitigation that might be necessary to reduce or eliminate impacts, and the appropriate monitoring, contingency and impact management plans.

3.2.4 Task 8 – Conduct Cumulative Effects Assessment

WM is proposing to conduct assessments that are not normally part of the Ontario EA Act process. The assessment of cumulative effects, effects of the environment on the project and consideration of valued ecosystem components (VECs) are components of the federal *Canadian Environmental Assessment Act* process. WM is proposing to conduct these additional analyses in order to provide a more fulsome assessment of the project and the environment. The cumulative effects assessment will consider the combined or cumulative effects on the environment of "net effects" of the new landfill footprint identified previously, with the effects of other BREC facility components and other projects that occur during the same timeframe and geographic area. For example, the cumulative effects assessment will consider the combined effects of the new landfill footprint with other BREC components such as the materials recycling facility, construction and demolition facility, etc.

In addition, the EA will consider the potential effects of the environment on the project, such as severe weather. VECs will also be considered as part of the EA. VECs are specific

components of the environment that are identified by the public and other stakeholders as being important for them. VECs will be determined early in the EA process in consultation with the public, GRT and aboriginal communities; and the Canadian Environmental Assessment Agency.

3.3 Phase 3 – Prepare and Submit EA Documentation

The third and final phase of the EA will be the preparation and submission of the EA documentation. The EA Report will be based on the results of the individual technical studies and the consultation program, which will be documented in Technical Support Documents (TSDs) and a series of consultation reports, respectively.

3.3.1 Task 9 – Prepare EASR/TSDs

Key information and findings from the TSDs and consultation reports will be compiled into the EA Report by the project team.

During the preparation of the TSDs and EA Report, the project team will conduct meetings or telephone calls with the Ministry, Ministry of Natural Resources (MNR), Environment Canada, Conservation Authorities and other government staff to discuss the EA studies and findings. Input and comments received from the public, aboriginal groups, government agencies and other stakeholders will be considered in the preparation of the final reports.

3.3.2 Task 10 – Submit Draft EA Report to Ministry

This task is the submission of the EA Report in draft form to the Ministry and includes tracking and follow-up to ensure all reports are received by the GRT.

3.3.3 Task 11 – Submit Final EASR to Ministry

This task is the formal submission of the revised EA Report, based on comments received from the GRT and the Ministry in Task 10.

3.3.4 Task 12 – Technical Support During Review Period

The project team, including WM, AECOM and sub-consultant staff, will be available for technical support during the review period. This will include answering questions/comments received and documenting responses. It is anticipated that comments and responses will be presented in a separate report.

3.4 Consultation

Consultation will be ongoing throughout the EA. The proposed EA Consultation Plan is provided in Section 6.3 of the TOR.

The project team will ensure that agency contacts are coordinated and documented fully. It is anticipated that meetings will be required between members of the project team and various regulatory agencies during the preparation of the EA.

3.5 Schedule

The original schedule was as follows:

The TOR will be submitted to the Ministry in late spring 2010 and it is expected that it will be posted on the EBR website for public comment during the month of June 2010. A decision by the Minister on the TOR is expected in the fall of 2010. Assuming that the Minister approves the TOR, the EA is expected to begin in the fall of 2010.

The amended TOR was subsequently approved in February 2012.

As noted previously, the EA will be undertaken in three phases. Phase 1 is initiation of the EA process, Phase 2 is assessment of effects and identification of a preferred alternative and Phase 3 is preparation and submission of the EA documentation.

At the completion of Phase 1 of the EA studies, existing environmental conditions will be characterized and conceptual designs for the alternative landfill footprint options will be completed, including mitigation measures, as required. The bulk of the work in this phase will be the development of predictions for the various environmental components.

At the completion of Phase 2 of the EA, a preferred alternative will be identified. The analysis methods and tools for undertaking the comparative evaluation have been developed, and the detailed comparative evaluation task will be completed after the effects prediction analysis is completed during the EA.

In the third and final phase of the EA, the necessary EA documentation will be prepared, reviewed by the WM team and formally submitted to the Ministry.

4. Atmospheric Work Plan

The atmosphere environmental component is comprised of three sub-components for the purposes of the EA: air quality, noise and odour.

The following tasks will be undertaken to characterize existing environmental conditions, predict and assess potential environmental effects, determine mitigation measures (if required) and compare alternative methods of carrying out the undertaking:

- Compile and interpret information from existing data sources, including information available from the following resources:
  - Atmospheric studies from the previous EA;
  - Ongoing monitoring assessments for the current landfill;
  - Environment Canada and Ministry air quality monitoring data from local stations; and,
  - Review site records related to air emission (odour) and noise complaints;
- Conduct site reconnaissance to confirm site information compiled from existing documentation and finalize location and nature of potential off-site receptors.
- Determine "linkages" with other components and data generation/transfer requirements (e.g., link with natural environment, link with transportation component).
- Consult with the Ministry and other members of the GRT to decide on air dispersion/noise modelling approach and protocols to be used in the assessment.
- Based on consultation with the Ministry, the review of existing information and the project description, identify information gaps and data needs.
- Conduct on-site air quality/odour sampling (if required) to characterize sources of odour and provide data for input to the air quality and odour assessments.
- Conduct a noise assessment of baseline conditions at sensitive receptors using noise measurements and numerical CADNA modelling.
- Define baseline conditions for the project, based on available monitoring data and numerical modelling.

- The baseline assessment of the odour conditions will include the development of a document tracking the historical odour issues on-site with the improvements made to the site and the corresponding improvements in odour impacts to the present and into the future.
- Upon collection of data required for the assessment of air quality and odour emissions, embark on the following studies:
  - Assessment of Alternatives: This study will focus on the subject of the EA (i.e., the landfill) and assess emissions from the various alternatives. Emissions from each alternative (including landfill gas [LFG] collection system, haul roads, excavation operations etc.) will be estimated. This will be followed by the execution of an atmospheric dispersion model for each alternative. The results of this study will be predicted maximum air quality and odour effects associated with each of the alternatives. This study will focus on property line and sensitive receptors. Results will be used to assist in ranking of project alternatives.
  - Ontario Regulatory Permitting Assessment: This study will focus on the final selected alternative based on input from the various technical components, and specifically on the sources at the larger integrated waste management site that require regulatory permitting in Ontario under O.Reg.419/05. These sources include the proposed landfill gas collection system, the material recycling facility, and the organics composting operation. Emission estimates will be generated for each of the sources that will require regulatory permitting. These estimates will be input to an atmospheric dispersion model for the site to predict the maximum off-property effects of operations, and to determine the ability of the site to comply with the Ministry's air quality criteria and odour guidelines. This study will be based on the Ontario regulatory receptor grid, and discrete sensitive receptors.
  - Cumulative Assessment: This study will assess the combined impact of the larger integrated waste management site and other sources of air emissions within the local area. One option for achieving this will be combining model predictions of the proposed waste management site with baseline values as applicable. This study will focus on receptors that represent the locations of monitoring stations, or areas of interest identified by the study team.

- In support of the air quality and odour studies listed above the following will be completed:
  - The development of an AERMOD atmospheric dispersion model for the site, which will be used to predict effects of the proposed operations. Based on the complexity (or simplicity) of local conditions, changes to the selected atmospheric dispersion model may be made. Changes to the dispersion model will be done in consultation with the Ministry.
  - The atmospheric dispersion modelling will likely employ the Ministry's regional meteorological data set. Local data will be examined to determine if site specific data is available to develop a data set. The local data will be evaluated against the Ministry data to see if the site is sufficiently different from the standard data set to warrant the development of a site specific data set.
  - Assessment of mitigation measures inherent in the project design and those that may be necessary to improve operations.
- Upon collection of data required for the assessment of noise emissions, embark on the following studies:
  - Assessment of Alternatives: This study will focus on the subject of the EA (i.e., the landfill) and assess emissions from the various alternatives. Emissions from equipment operating within each alternative (including LFG collection system, haul roads, excavation operations etc.) will be based on measurements from the existing landfill or emissions data from a database of similar noise sources. This will be followed by the execution of a noise prediction model for each alternative. The results of this study will be predicted worst-case hour operation associated with each of the alternatives. This study will focus on off-site sensitive points of reception. Results will be used to assist in ranking of project alternatives.
  - Ontario Regulatory Permitting Assessment: This study will focus on the final selected alternative based on input from the various technical components, and specifically on the sources at the larger integrated waste management site that require regulatory permitting in Ontario in accordance with Ministry noise guidelines. These sources include the proposed landfill gas collection system, the material recycling facility and the organics composting operation. Source noise emissions will be based on data from a database of similar noise sources and/or manufacturer's specifications. This data will be input to a noise prediction model for the site to predict the off-site noise emissions associated with

the worst-case hour operations, and to determine the ability of the site to comply with the Ministry's noise guidelines.

- In support of the noise study listed above, the following will be completed:
  - The development of the predictive CADNA model or other approved model for the site, which will be used to predict effects of the proposed operations.
  - Haul route noise assessment, using STAMSON or other approved prediction models, to predict the effects of the proposed haul route on sensitive points of reception.
  - Provide acoustic specifications for mitigation measures inherent in the project design and those that may be necessary to improve operations and ensure compliance with Ministry noise guidelines.
- Generate predictions (air quality, odour and noise) for use in non-atmospheric EA components (e.g., terrestrial component).
- Compile and document climate normals for the project site, and document the existing climatic conditions;
- Prepare a monitoring program appropriate for the preferred alternative, and conceptual contingency plan approaches;
- Document the assessments listed above, data sources and assessment results in an Atmosphere TSD that will form an appendix to the EA;
- Participate in meetings with the government review agencies including upfront consultations with the Ministry during the EA to obtain pre-approval of tasks in the work plan as required; and,
- Provide technical support during the review of the draft EA by the regulatory agencies and public.

5. Geology and Hydrogeology Work Plan

A separate memo accompanying this document has been prepared to include the Geology and Hydrogeology Work Plan.

6. Surface Water Work Plan

The surface water quality work plan has the sub-components of water quality and water quantity. This work plan undertakes to characterize existing environmental conditions with respect to chemical water quality and flow (quantity) and subsequently to predict and assess potential environmental effects on water quality quantity and determine mitigation measures in the context of alternative methods of carrying out the undertaking. As a result of the expanded footprint of the proposed site, the water quality program needs to address the fact that the site is located in the headwaters with flow although primarily to the west, also to the east and south. The surface water work plan needs to be considered in the context of the aquatic ecology component of the Biology work plan.

- Compile and synthesize water quality information from defined background sources including:
  - Surface water reports from previous EA and annual monitoring reports;
  - Topographic mapping and aerial photography to define the existing drainage network and drainage watersheds/sub-watersheds, discharge locations; and
  - Published sources (annual reports, Ministry, Environment Canada, Conservation Authority) to characterize water quality and stream flow.
- Conduct site reconnaissance to confirm the information from available sources;
- Establish surface water flow and water quality monitoring station locations (including continuous temperature loggers) at relevant locations on the property including:
  - Marysville Creek at the west boundary of the site (County Road 10);
  - The tributary flowing into the wetland on the north side of the property at Selby Road (County Road 11);
  - The outflow from the wetland on the north side of the property that flows west across County Road 10;
  - One or both of the small watercourses that drain the eastern extremity of the site where they cross Johnson's Side Road;
  - Beechwood Road Ditch at the outfall from the stormwater ponds; and
  - Marysville Creek downstream of County Road 10 at an accessible location.
- Establish shallow groundwater mini-peizometers at the above referenced sites to evaluate shallow ground water / surface water interaction in the site (i.e. is the surface water recharging the groundwater or is groundwater upwelling to the surface?);

- Summarize existing surface water flow and quality representative of conditions upstream and downstream of proposed new landfill footprint alternatives;
- Undertake a topographical survey of the site to provide control for the water quantity modeling and to help understand the surface water flow paths on the site;
- Using a hydrological model, characterize existing conditions of surface water runoff and peak flows in the area of the proposed new landfill footprint under existing conditions, using designs storms as set out in O. Reg. 232/98;
- Based on the design options for the proposed landfill, predict and assess future surface water runoff, peak flows and quality conditions and water levels in the wetland associated with the preferred new landfill footprint alternatives;
- Compare these predictions to the existing conditions to;
  - Determine changes and potential adverse effects on downstream water courses;
  - Determine if mitigation measures are required, and if so develop and evaluate conceptual options (i.e., engineered stormwater management measures/facilities);
  - Based on the proposed conceptual design alternatives, in-design mitigation measures and the results of predictive modelling, complete an evaluation of potential effects of each alternative on the surface water environment;
- Compare the degree of potential effects using the criteria and indicators for the surface water component, rank the alternatives, and identify the preferred alternative from a surface water perspective;
- Prepare a stormwater quality and quantity monitoring program appropriate for the preferred alternative, and conceptual contingency plan approaches;
- Document the factual information, analysis and comparative assessment in a Surface Water technical memoranda that will form an appendix to the EA;
- Participate in meetings with the government review agencies as required; and,
- Provide technical support during the review of the draft EA by the regulatory agencies and public.

7. Biology Work Plan

The Biology environmental component has the sub-components terrestrial ecosystems and aquatic ecosystems. The following tasks will be undertaken to characterize existing environmental conditions, predict and assess potential environmental effects, determine mitigation measures and compare alternative methods of carrying out the undertaking. The aquatic ecosystems sub-component of the Biology work plan must also be viewed in context with the Surface Water work plan.

- Compile and interpret information from defined background sources including:
  - Biology reports from previous EA and ongoing terrestrial and aquatic surveys;
  - Published information from MNR, Canadian Wildlife Service, Fisheries and Oceans Canada and Conservation Authority, including potential Species at Risk (SAR); and
  - Aerial photos and topographic and drainage mapping.
- Characterize terrestrial environment baseline conditions in the area of the proposed new landfill footprint and site vicinity including occurrence and distribution of wetlands, vegetation communities and wildlife (e.g., birds, mammals, reptiles, amphibians by means of breeding bird surveys, amphibian surveys, rare plant and insect assessment, snake/turtle surveys, mammal surveys, specific surveys for any identified SAR); natural areas such as significant wetlands, woodlands, valley lands and wildlife habitat, and habitat for endangered and threatened species;
- Characterize existing aquatic ecosystems, including drainage ditches and natural watercourses by fish community surveys, aquatic habitat assessment, benthic invertebrate sampling programs, water quality and flow information;
- Based on the proposed new landfill alternatives and considering in-design mitigation measures, assess potential impacts of the proposed new landfill alternatives on the natural environment including the ability to sustain water levels in key areas of aquatic and terrestrial habitat;
- Determine if mitigation and/or habitat compensation measures are required to avoid or reduce potential adverse impacts to any sensitive components of the ecosystem and, if so, develop and evaluate conceptual mitigation options;

- Prepare a natural environment monitoring program for the preferred alternative that is integrated with the proposed surface water monitoring program, and develop conceptual contingency measure approaches;
- Document the factual information, analysis and comparative assessment in a Biology technical memoranda that will form an appendix to the EA;
- Participate in meetings with the government review agencies as required; and,
- Provide technical support to the regulatory agencies and public during the review of the draft EA.

8. Cultural Heritage Resources Work Plan

The Cultural Heritage Resources environmental component has the sub-components of archaeological resources, built heritage, and cultural landscape. The following tasks will be undertaken to characterize existing environmental conditions, predict and assess potential environmental effects, determine mitigation measures and compare alternative methods of carrying out the undertaking. The cultural heritage assessment will be conducted for both the study area and areas within 500m of the study area.

- Compile and interpret information from defined background sources including:
  - Archaeology reports from the previous EA and available from the Ministry of Culture;
  - Ministry of Tourism, Culture and Sport has indicated that site area has high archaeological potential;
  - Built heritage will be identified through existing heritage lists and designated lists for structures and cultural landscapes.
  - Site reconnaissance to confirm the information from available sources, identify other buildings or cultural landscapes with heritage value or interest, and plan field work programs; and
  - Consultation with appropriate agencies/institutions to identify heritage concerns (this may include, but not be limited to, local municipalities, heritage organizations, provincial and/or federal agencies, First Nations).
- Complete Built Heritage Resources and Cultural Heritage Landscapes Checklist and submit to the Ministry of Tourism, Culture and Sport to determine if a qualified heritage consultant needs to be retained to carry out a Heritage Impact Assessment;

- Complete Stage 1 and Stage 2 archaeological and cultural heritage assessments in areas that may be disturbed by the proposed new landfill alternatives and associated facilities. A Stage 1 archaeological assessment has been conducted for the study area and haul routes, while a Stage 2 archaeological assessment has also been conducted for the study area. The haul route still requires the completion of a Stage 2 assessment. If areas are considered beyond the scope of the existing archaeological assessment, an additional Stage 1 assessment should be conducted. Archaeological potential will be field verified to account for details not presented in topographic or other resources. A Stage 2 assessment will be the outcome if archaeological potential is identified;
- If necessary due to the presence and significance of resources identified, complete Stage 3 and 4 assessments;
- Provide mitigation measures, as required, to manage potential impacts and/or preserve/protect significant features;
- Based on the CDR, predict and assess potential impacts on archaeological and cultural heritage resources associated with each of the proposed new landfill footprint alternatives;
- Compare the degree of potential effects using the criteria and indicators for the archaeological and cultural heritage components, rank the alternatives, and identify the preferred alternative from a cultural heritage perspective;
- Document the factual information, analysis and comparative assessment in a Cultural Heritage Resources TSD that will form an appendix to the EA;
- Complete submissions to the Ministry of Tourism, Culture and Sport to obtain the required approvals and clearances;
- Participate in meetings with the government review agencies as required; and,
- Provide technical support during the review of the draft EA by the regulatory agencies and public.

9. Transportation Work Plan

The transportation environmental component has the sub-components of airport and access roads. The following tasks will be undertaken to characterize existing environmental conditions, predict and assess potential environmental effects, determine mitigation measures and compare alternative methods of carrying out the undertaking.

- Compile information from background sources including:
  - Traffic volumes and mix;
  - Vehicular operating speeds;
  - Roadway and intersection geometrics (including horizontal and vertical curves; passing zones; turning radii, etc.);
  - Regulatory signage and pavement markings;
  - Historical collision records;
  - Trip generation information from other comparable landfill sites operated by WM;
  - Active and passive methods successfully used by WM and other landfill operators for bird control at sites within close proximity to airports; and
  - Collect current traffic data at ramp terminals and at Beechwood Road / County Road 10 intersection.
- Refine the study area for each sub-component based on the expected influence area. In the case of the road network, impacts on the road geometrics and operations will be assessed for an area that includes roads (independent of classification or jurisdiction) that directly link the site to the nearest interchange on the provincial highway system. In the case of airport operations, the study area will extend eight kilometres from the Site.
- Undertake necessary liaison with members of the GRT to achieve early consensus on study area; extent of impact (e.g., trip generation rate, collision frequency/severity); and expected effectiveness of potential mitigation measures (e.g., bird control strategies).
- Provide input to the assessment of alternative landfill footprints, site accesses and haul routes, placement of weight stations or control gates; as well as site development sequencing/phasing.
- Compare the alternatives using the criteria and indicators for the Transportation environmental component, rank the alternatives, and identify the preferred alternative from a Transportation perspective;
- Predict the expected change in traffic volumes; traffic mix; and collision frequency/severity.
- Identify road improvements such as addition of auxiliary lanes or extension in the length of existing auxiliary lanes; intersection improvements; modification to lane configuration and turning radius; introduction/upgrading of traffic controls; and changes to passing zones.

- Document the analysis assumptions, findings and mitigation measures in a Transportation TSD will form an appendix to the EA.
- Participate in meetings with the government review agencies as required; and,
- Provide technical support during the review of the draft EA by the regulatory agencies and public.

10. Land Use Work Plan

The land use environmental component has the sub-component of effects on current and planned future land uses. The following tasks will be undertaken to characterize existing environmental conditions, predict and assess potential environmental effects, determine mitigation measures and compare alternative methods of carrying out the undertaking.

- Compile and interpret information from defined background sources including:
  - Provincial Policy Statement 2005;
  - Official Plans for Town of Greater Napanee and Hastings County;
  - Zoning By-laws for Town of Greater Napanee and Township of Tyendinaga;
  - Aerial photographic mapping and field reconnaissance;
  - Published information on public recreational facilities and activities;
  - Reconnaissance to confirm data from information sources;
  - Former proposed landfill footprint EA for the site
- Meet with municipal officials to determine planned development and land use, including any applications for approval currently submitted;
- Based on the CDR, and considering in-design mitigation measures, identify potential adverse effects on current and planned future land use;
- Compare these predictions to the existing conditions. Determine if mitigation measures are required, and if so develop conceptual mitigation;
- Compare the degree of potential effects using the criteria and indicators for the land use component, rank the alternatives, and identify the preferred alternative from a land use perspective;
- Document the factual information, analysis and comparative assessment in a Land Use TSD that will form an appendix to the EA;
- Participate in meetings with the government review agencies as required; and,
- Provide technical support during the review of the draft EA by the regulatory agencies and public.

11. Agriculture Work Plan

The agriculture environmental component has the sub-component of effects on agricultural land and agricultural operations. The following tasks will be undertaken to characterize existing environmental conditions, predict and assess potential environmental effects, determine mitigation measures and compare alternative methods of carrying out the undertaking.

- Compile and interpret information from defined background sources including:
  - Provincial Policy Statement 2005;
  - Official Plans for Town of Greater Napanee and Hastings County;
  - Zoning By-laws for Town of Greater Napanee and Township of Tyendinaga;
  - Recent and historical aerial photographic mapping and field reconnaissance;
  - Published information on public recreational facilities and activities;
  - Published information on agricultural land classification (Canada Land Inventory (CLI)) and agricultural or agricultural-related land and facility uses in the area;
  - Published information on land tenure, land fragmentation from Municipal Assessment data;
  - Published information on artificial tile drainage from OMAFRA;
  - Detailed on-site soil survey to verify previous Agricultural work completed and to document the unmapped portions of the new footprint;
  - Reconnaissance to confirm data from information sources; and,
  - Former proposed landfill footprint EA for the site.
- Meet with municipal officials and government agency (OMAFRA) representatives to determine planned agricultural operations, including any applications for approval currently submitted;
- Based on the CDR, and considering in-design mitigation measures, identify potential adverse effects on agricultural land and agricultural operations;
- Compare these predictions to the existing conditions. Determine if mitigation measures are required, and if so develop conceptual mitigation;
- Compare the degree of potential effects using the criteria and indicators for the agriculture component, rank the alternatives, and identify the preferred alternative from an agricultural perspective;
- Document the factual information, analysis and comparative assessment in a Agriculture TSD that will form an appendix to the EA;

- Participate in meetings with the government review agencies as required; and,
- Provide technical support during the review of the draft EA by the regulatory agencies and public.

12. Socio-Economic Work Plan

The socio-economic environmental component has the sub-components of effects on the cost of services to customers, continued service to customers, economic effects on the local municipality, effects on recreational resources and visual impact. The following tasks will be undertaken to characterize existing environmental conditions, predict and assess potential environmental effects, determine mitigation measures and compare alternative methods of carrying out the undertaking.

The indicators associated with the first three sub-components listed above utilize information that comes directly from or is determined from the CDR.

Cost of Services to Customers

- Review and revise existing and planned operational costs.

Continued Service to Customers

- Review of existing customer base and potential local and regional opportunities.

Economic Effects on the Local Municipality

- Description of existing project related revenues relevant to the local municipality.

Recreational Resources

- Define existing recreational resources in the study areas, including parks, trails, playing fields and other facilities;
- Define opportunities to provide new recreational resources as part of the project; and
- Assess the effects and develop strategies to mitigate adverse effects and maximize benefits to recreational resources.

Visual Impact Assessment

- Define the existing visual conditions of the site from off-site viewpoints, and document through written and photographic record;
- Determine the viewpoints (directions, distances) from which the proposed landfill footprint alternatives will be visible and take photographs from those viewpoints;
- Using Visual Software integrated with photographs, a digital terrain model of the site and surrounding area, and site grading plans from the CDR, superimpose each of the landforms associated with each of the proposed new landfill footprint alternatives to establish the appearance of the site from off-site viewpoints, both during operations and post-closure;
- Using the Visual Software, assess the effects of vegetation growth over time, during both operational and post-closure periods; and,
- Develop strategies to mitigate visual impacts and improve the appearance of the site, as required.

Comparison of Alternatives

- Compare the degree of potential effects using the criteria and indicators for the socio-economic component (including assessment of visual impact for off-site receptors), rank the alternatives, and identify the preferred alternative from a socio-economic perspective;
- Document the analysis and comparative assessment in a Socio-economic TSD that will form an appendix to the EA;
- Participate in meetings with the government review agencies as required;
- Provide technical support during the review of the draft EA by the regulatory agencies and public; and
- Integrate results from other disciplines' assessments with reference to socio-economic environment (e.g. noise, odour, traffic, etc.).

13. Aboriginal Work Plan

The Aboriginal environmental component has the sub-component of potential effects on Aboriginal communities. The following tasks are proposed to be undertaken to characterize the existing environmental conditions, predict and assess potential environmental effects, determine mitigation measures and compare alternative methods of carrying out the undertaking. The work plan will be finalized in discussion with Aboriginal communities.

- Compile and interpret information from defined background sources including but not limited to:
  - Potentially affected First Nations communities;
  - Ontario Ministry of Aboriginal Affairs (OMAA);
  - Assembly of First Nations;
  - Chiefs of Ontario;
  - Métis Nation of Ontario; and,
  - Indian and Northern Affairs Canada (INAC).
- Existing conditions with respect to treaty rights, land claims and litigation involving the Site and Site-vicinity will be examined. The traditional use of lands and resources, as well as the existing culture, way-of-life and socio-economics of the MBQ, and other Aboriginal communities that may be affected by the undertaking, will be described.
- Provide mitigation measures, as required, to manage potential impacts and/or preserve/protect significant features;
- Predict and assess potential impacts on the Aboriginal environmental component associated with each of the proposed new landfill footprint alternatives;
- Compare degree of potential effects using the criteria and indicators for the Aboriginal communities sub-component;
- Document the factual information, analysis and comparative assessment in an Aboriginal TSD that will form an appendix of the EA;
- Participate in meetings with the government review agencies and First Nations as required; and,
- Provide technical support during the review of the draft EA by the regulatory agencies and Aboriginal communities.

14. Site Design and Operations Work Plan

The site Design & Operations (D&O) environmental component has the sub-component of site design & operations characteristics. The following tasks will be undertaken to characterize existing environmental conditions, compare alternative methods of carrying out the undertaking, predict and assess potential environmental effects, and determine mitigation measures.

The specific activities required include the following:

- Compile and review information from background sources including:
  - Digital topographic mapping;
  - Aerial photography;
  - Drainage features, ground cover;
  - Subsurface conditions including depth to bedrock and to the shallow water table;
  - Existing site infrastructure and facilities; and,
  - Requirements for site design specified in Ont. Reg. 232/98 Landfill Standards.
- Review additional data that will be collected by other EA component disciplines, as required, to develop footprint alternatives (i.e. additional subsurface data that will be collected for the hydrogeology component).
- Collect additional data specific to landfill D&O discipline, if required.
- Develop alternative landfill footprints and grading plans to reasonably represent the characteristics of the possible range of alternatives within the land envelope identified for the new landfill footprint. This includes:
  - Landfill base elevations;
  - Height;
  - Side slope geometry;
  - Final contours;
  - Alignment of main access roads to the footprint;
  - Potential location of key landfill features such as storm water management ponds and leachate pumping stations.
- Calculate total footprint area, total airspace, corresponding estimated waste tonnage capacity and site operational period for each alternative.
- Estimate excavation and fill quantities and construction and operations materials requirements, and prepare overall soil balance for each alternative.

- Prepare conceptual design of key environmental controls including base liner, leachate collection system, gas collection system, and final cover system following the requirements on Ont. Reg. 232/98.
- Prepare a Conceptual Design Report (CDR) that summarizes the key characteristics of each of the footprint alternatives.
- In parallel with other EA component disciplines, compare the alternatives using the criteria and indicators for the D&O component, rank the alternatives, and identify the preferred alternative from a D&O perspective. Input ranking into overall comparative analysis.
- Undertake further refinement of the design of the preferred alternative. This is anticipated to include:
  - Undertake a static and seismic stability and settlement analysis;
  - Prepare estimate of landfill gas generation;
  - Prepare estimates of surface water management requirements;
  - Prepare estimate of landfill leachate generation;
  - Model anticipated contaminant flux through base liner system;
  - Further refine site soil balance;
  - Develop landfill site sequencing/phasing plans; and,
  - Integrate the preferred alternative into an overall site development concept (i.e., BREC waste diversion components, site roads, screening berms, buffer zones, etc.).
- Prepare Draft Facility Characteristics Report (FCR) documenting the preferred design and circulate to other EA component disciplines to serve as common basis for their individual impact assessments.
- Based on the findings and requirements as a result of the EA component disciplines, make necessary modifications and update the Draft Facility Characteristics Report to Final status, which will form a Technical Support Document (TSD) to the EA;
- Participate in meetings with the government review agencies as required; and,
- Provide technical support during the review of the draft EA by the regulatory agencies and public.