February 1, 2018 Reference No. 086822

Mr. David Parks
Director of Planning, Development & Tourism
County of Simcoe
1110 Highway 26
Midhurst, ON L0L 1X0

Mr. Brent Spagnol, MCIP, RPP
Director of Planning Services and By-Law Enforcement
Township of Springwater
2231 Nursery Road
Minesing, ON L9X 1A8

Mr. Chris Hibberd
Director, Planning Services
Nottawasaga Valley Conservation Authority
8195 8th Line
Utopia, ON L0M 1T0

Dear Sirs:

Re: County of Simcoe Environmental Resource Recovery Centre
Amended Facility Characteristics Report
Ministry of Municipal Affairs File #: 43-OP-169096

The County of Simcoe (County) continues to pursue the development of the proposed Environmental Resource Recovery Centre (ERRC) located at 2976 Horseshoe Valley Road West (Site) in the Township of Springwater (Township). In support of the ERRC, applications for Amendments to the Official Plan and Zoning By-Law were submitted to Township Planning staff on November 18, 2016. In addition to these Amendments, a number of supporting studies were also submitted, including a Facility Characteristics Report (FCR).

As part of the One Window Provincial Planning Service, a copy of the draft FCR was circulated to the Ministry of Municipal Affairs and partner ministries including: Ministry of Natural Resources and Forestry, Ministry of the Environment and Climate Change (MOECC), Ministry of Tourism, Culture and Sport, Ministry of Transportation and Ministry of Agriculture, Food and Rural Affairs. The draft FCR was also circulated to Ainley & Associates Limited for review on behalf of the Township.

GHD are pleased to provide the enclosed Amended FCR, which has been revised to address review comments as well as document additional work that has been carried out in support of the ERRC. The review comments and responses have also been summarized in the attached table, providing an overview of the revisions made to the FCR. Of particular note, the FCR has been revised to include additional details on the proposed approach to fire protection, as well as an Air Quality Impact Assessment carried out in consultation with the MOECC.

Should you require any additional information or clarification please do not hesitate to contact the undersigned.

Sincerely,

GHD

Brian Dermody, P. Eng.

BD/jlm/

Encl.

Comment No.	Submitted By	Date Submitted	Document	Comment	Response	Action
1	Ainley Group	January 24, 2017	Facility Characteristics Report	In general, the report outlines all applicable site servicing requirements and provides the broad range of site development concepts for initial approval, to set the stage for the eventual detail design of Site Servicing and Grading plans required to secure the Township's Site Plan development approval. The conceptual site plan identifies a 4.5 Ha development site within the centre of an 85 Ha forested area known as the Freele County Forest Tract, with an entrance to be constructed approximately 500 m east of the Gill Road intersection on the north side of Horseshoe Valley Road West, following a portion of the existing multi-use trail.	Details related to site servicing (e.g., electricity, gas, communications, lighting, security), grading, and water management (e.g., surface water, process water, fire protection water, potable water, wastewater) will be determined during the detailed design of the MMF and OPF. These details will be included in the Site Plan application submitted to the Township for approval.	Complete the detailed design for the of MMF, including site servicing and grading plans, and submit the Site Plan application for approval. Complete the detailed design for the OPF and submit an amended Site Plan for approval.
2	Ainley Group	January 24, 2017	Facility Characteristics Report	The proponent's intent is to initially develop the Material Management Facility (MMF) for consolidation and handling of waste including garbage, recyclables and organics, also known as a Transfer Station. This would include the construction of site access, water, sanitary, stormwater management and utility servicing along with the administration building. A site plan amendment will eventually be required for the future Organic Processing Facility (OPF) to process green bin, yard & leaf waste, etc. within the confines of the same site development.	The MMF will be developed in advance of the OPF, and will include the construction of common elements such as the site access road, scale area, stormwater management facility, water management systems (i.e., fire water, potable water, wastewater), administrative facility, and utilities. The initial design of these components will be undertaken with the design of the MMF in support of the Site Plan Approval and Environmental Compliance Approval. Amendments to the Site Plan and Environmental Compliance Approval will be submitted as required following completion of the detailed design for the OPF.	Complete the detailed design for the of MMF, including site servicing and grading plans, and submit the Site Plan application for approval. Complete the detailed design for the OPF and submit an amended Site Plan for approval.
3	Ainley Group	January 24, 2017	Facility Characteristics Report	Supply of domestic potable water will be provided from a new well to be drilled on site, with realistic demands anticipated to be in the order of up to 10 m^3 per day. Pending detail design of the administration facilities, this may require an underground or above grade water storage facility.	The supply of domestic potable water is proposed to be provided from a new groundwater well installed on-site. The location and supply demands for the groundwater well and any associated storage facility will be determined as part of the detailed design.	Complete the detailed design for the Administrative Facility, including the location, demand, and storage requirements for the supply of potable water.
4	Ainley Group	January 24, 2017	Facility Characteristics Report	Fire protection of the proposed facilities will require on-site water storage amenities to the Building Department and Fire Department's satisfaction. The report suggests a variety of methods for these provisions, however specific servicing details are vague at this stage. We note that materials to be processed on site are considered at a higher risk of combustible energy, and minimum fire protection measures will be established by the Ontario Building Code. This may entail an active (pressurized) sprinkler system, or a passive (cistern) water storage facility. We specifically note the consultant's suggestion to utilize the stormwater management facility for drawing water through a dry hydrant system during fire fighting activities. This may be problematic if the detail design of the facility is unable to demonstrate the reliability of maintaining a constant water level in the wet pond, due to evapo-transpiration and infiltration into underlying sandy soils. A significant level of detail will be required to justify the chosen fire protection facility design.	For the proposed facility, the materials being processed are generally considered to be "higher risk" due to the potential combustible energy content in the materials (paper/fibre, wood/organics, plastics, etc.). As such, most facilities of this nature are classified as a medium hazard industrial occupancy (Group F, Division 2) under the Ontario Building Code. The Facility Characteristics Report noted that the most common type of fire protection system for these types of facilities is an active system (e.g., pressurized sprinklers), but notes that a passive protection system (e.g., standpipe) may also be feasible. Additional details have been provided in the Amended Facility Characteristics Report. The supply rate, volume, and provision of fire protection water will be developed as part of the detailed design, in accordance with the requirements of the Ontario Building Code.	Complete the detailed design for the MMF and OPF, including the fire protection system.
5	Ainley Group	January 24, 2017	Facility Characteristics Report	Details of the proposed potable water storage facility and domestic wastewater disposal systems have not been provided and are anticipated to be described in sufficient detail on the site servicing design drawings. We look forward to the submission of these details.	Details of the proposed domestic potable water supply and wastewater disposal systems will be developed as part of the detailed design in support of the Site Plan Approval and Environmental Compliance Approval.	Complete the detailed design for the Administrative Facility, including the potable water and wastewater systems.
6	Ainley Group	January 24, 2017	Facility Characteristics Report	Details of the proposed method of disposal of process wastewater from the site must be clearly detailed. The consultant suggests this aspect would be determined as part of the chosen processing technology, in order to determine the most suitable provisions for managing this waste by-product. A significant level of detail is required to evaluate the proposed management and disposal methods, as the preferred processing technology is selected by the owner.	Details of the proposed process wastewater disposal system will be developed as part of the detailed design for the OPF, and will depend on the selected technology.	Complete the detailed design of the OPF, including the management of process wastewater.
7	Ainley Group	January 24, 2017	Facility Characteristics Report	This report generally outlines the intended stormwater management aspects of proposed surface water Quantity controls, Quality controls, Low Impact Development features (LID), Sediment & Erosion control measures. Given the available land mass and native infiltrative soils, we anticipate that the consultant will be able to successfully design suitable stormwater management and low impact techniques for this site, promoting infiltration and reducing or eliminating peak discharge flows. We look forward to the submission of a detailed Stormwater Management Report and detail drawings for review and comment. We note the consultant's suggestion to possibly utilize the surface water captured in the stormwater management facility for use as supplemental process water in the plant operation. A significant level of detail will be required from the consultant to verify if this approach would even be feasible, in light of the stormwater management objectives and fire protection schemes noted above.	Details of the proposed stormwater management system, including quality and quantity controls, low impact development features, and sediment & erosion control measures will be developed as part of the detailed design for the MMF in support of the Site Plan Approval and Environmental Compliance Approval. This will also include consideration for using this water to support the proposed fire protection systems. Further consideration will be given to using this water to supplement process water requirements during the development of the detailed design for the OPF. Amendments to the Site Plan and Environmental Compliance Approval will be submitted as required following completion of the detailed design for the OPF.	Complete the detailed design for the of MMF, including the stormwater management system. Complete the detailed design for the OPF, including potential modifications to the stormwater management system to allow for the use of water for processing operations.
8	Ainley Group	January 24, 2017	Facility Characteristics Report	Section 5.7 - Operations & Maintenance; describes that the stormwater management facility would not incorporate a sediment forebay. This is contradictory to the proposed treatment train approach noted in Section 5 of this report and should be clarified.	The proposed stormwater management facility will incorporate a sediment forebay. The text in Section 5.7 of the Amended Facility Characteristics Report has been updated to reflect this. The Nottawasaga Valley Conservation Authority is an agreement with the proposed approach to stormwater management. Further details of the stormwater management system for the ERRC will be determined during the detailed design for the MMF and OPF.	Complete the detailed design for the of MMF, including the stormwater management system. Complete the detailed design for the OPF, including potential modifications to the stormwater management system.
9	Ainley Group	January 24, 2017	Facility Characteristics Report	Section 6 - Noise; identifies the need for a comprehensive Noise Assessment to be undertaken once the owner has selected the desired processing technology and a detail design has been advanced. It is noted that the primary noise contributor is anticipated to be inbound and outbound traffic. Further site servicing details will be required in order to advance the required Noise Assessment.	A comprehensive Noise Assessment will be undertaken following the completion of the detailed design for the MMF and the identification of all potential noise sources. A subsequent Noise Assessment will also need to be carried out following the completion of the detailed design for the OPF. Notwithstanding this, it is expected that the results of the assessment will not differ significantly from the current Noise Assessment since the primary noise contributor is still anticipated to be the inbound and outbound vehicle traffic.	Complete the detailed design for the of MMF, including a Noise Assessment. Complete the detailed design for the OPF, including an updated Noise Assessment.
10	Ainley Group	January 24, 2017	Facility Characteristics Report	Section 7 - Odour; identifies the need for an Odour and Air Emissions Assessment to be undertaken once the owner has selected the desired processing technology and a detail design has been advanced. It is noted that the primary odour contributor is anticipated to be from receiving, handling and processing of organic materials. Further site servicing details will be required in order to advance the required Odour and Air Emissions impact assessment.	In consultation with the MOECC, a preliminary Air Quality Impact Assessment Report has been completed for the ERRC and included as part of the Amended Facility Characteristics Report. A comprehensive Odour and Air Emissions Assessment will be undertaken following the completion of the detailed design for the MMF and the identification of all potential odour sources. Since the primary odour contributor is anticipated to be from the receiving, handling, and processing of organic materials, a subsequent Odour and Air Emissions Assessment will be carried out following the selection of the organics technology and the completion of the detailed design for the OPF.	Complete the detailed design for the of MMF, including an Odour and Air Emissions Assessment. Complete the detailed design for the OPF, including an updated Odour and Air Emissions Assessment.

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11	Ministry of Municipal Affairs and Partner Ministries (MNRF, MOECC, MTCS, MTO, OMAFRA)	April 7, 2017	Facility Characteristics Report	Stormwater Management - The "Facility Characteristics Report" prepared by GHD (dated November 2016) notes that the proposed impervious surfaces within the ERRC footprint will produce peak runoff volumes higher than those produced before the pre-development conditions. The proposed stormwater management facility will mitigate the increase of surface runoff from the impervious areas, manage peak flow and maintain existing water quality and quantity conditions. MOECC staff are satisfied with the proposed stormwater management strategy provided the County identifies a commitment to achieving enhanced level of quality of treatment for the site. An Environmental Compliance Approval (ECA) is needed for stormwater works for the proposed project. MOECC staff advise that site specific water controls be proposed at detailed design and ECA application stage to demonstrate the discharge water from the site will not degrade downstream creek health. MOECC approval of the ECA will need to be in place prior to construction of any components of the stormwater management facility.	Site specific water controls will be determined during the detailed design and will demonstrate that water discharged from the Site will not degrade downstream creek health. Construction of any components of the stormwater management facility will not be undertaken prior to MOECC approval of the ECA being in place.	Complete the detailed design for the of MMF, including the stormwater management system, and submit an ECA to the MOECC for approval. Complete the detailed design for the OPF, including potential modifications to the stormwater management system, and submit an amended ECA to the MOECC for approval.
12	Ministry of Municipal Affairs and Partner Ministries (MNRF, MOECC, MTCS, MTO, OMAFRA)	April 7, 2017	Facility Characteristics Report	Policy 1.2.6.1 of the PPS directs planning authorities to ensure land use compatibility issues and impacts between major facilities, such as waste management systems, and sensitive land uses be avoided and mitigated to the fullest extent possible. MOECC staff recommend a separation between sensitive incompatible land uses as a preventative means of achieving environmental objectives. Areas of influence around certain facilities or land uses, where exposure to residents and other sensitive uses may be harmful, should be minimized. Necessary environmental control measures, such as buffers between emissions sources and residential or sensitive land uses, should be applied in addition to practical emission controls.	Maximizing the separation distances between the facility and sensitive receptors and incompatible land uses was considered during the siting of the overall Site as well as when determining the location of the ERRC footprint. Supplementary environmental controls, if required, will be identified during the detailed design of the facility.	Complete the detailed design for the of MMF, including buffer distances from potential emission sources and controls. Complete the detailed design for the of OPF, including buffer distances from potential emission sources and controls
13	Ministry of Municipal Affairs and Partner Ministries (MNRF, MOECC, MTCS, MTO, OMAFRA)	April 7, 2017	Facility Characteristics Report	In order to determine if a proposed undertaking will have a negative impact on air quality, an air quality impact assessment is typically conducted.' This assessment would determine if an undertaking will meet 0. Reg. 419/05 standards including 10-minute odour standards and odour mitigation measures to minimize off-site impacts. Based on Section 7 of the "Facility Characteristics Report" prepared by GHD (dated November 2016), it appears the report only reviewed general odour impacts and did not in fact assess individual contaminants (such as total reduced sulphur compounds) and how these will comply with 0. Reg. 419/05 standards. Further, the Facility Characteristics Report stated that the proposed ERRC facility will meet the MOECC's screening level of 1 odour unit at the sensitive receptors. However, without supporting documentation, such as AERMOD modelling input and output files, MOECC staff are cannot confirm if the conclusion is valid. MOECC staff recommend the air quality impact assessment be updated to assess all contaminants prior to the ECA stage so that the public, particularly any concerned residents are aware of the impacts. Appendix 'A' outlines MOECC's technical comments and concerns that should be addressed in the air quality impact assessment report.	In consultation with the MOECC, a preliminary Air Quality Impact Assessment Report has been completed for the ERRC and included as part of the Amended Facility Characteristics Report. Electronic modelling files were provided to MOECC. A comprehensive Odour and Air Emissions Assessment will be undertaken following the completion of the detailed design for the MMF and the identification of all potential odour sources. Since the primary odour contributor is anticipated to be from the receiving, handling, and processing of organic materials, a subsequent Odour and Air Emissions Assessment will be carried out following the selection of the organics technology and the completion of the detailed design for the OPF. An assessment of applicable compounds of concern, including those with limiting effects other than odour, will be prepared as part of a future ECA application for the facility.	Complete the detailed design for the of MMF, including an Odour and Air Emissions Assessment. Complete the detailed design for the OPF, including an updated Odour and Air Emissions Assessment.
14	Ministry of Municipal Affairs and Partner Ministries (MNRF, MOECC, MTCS, MTO, OMAFRA)	April 7, 2017	Facility Characteristics Report	The odour impact assessment should stipulate which meteorological data set was used for the- analysis. A 5-year meteorological data set is recommended and should be representative of the site, which needs to be clarified in the report. Please note that the odour frequency assessment at the sensitive receptors should have used site specific meteorological data, which includes local and land use characteristics. This is not discussed in the odour assessment. The site specific meteorological data should have been reviewed and approved by the MOECC's Environmental Monitoring and Reporting Branch (EMRB).	In consultation with the MOECC, a preliminary Air Quality Impact Assessment Report using site-specific meteorological data has been completed for the ERRC and included as part of the Amended Facility Characteristics Report. A comprehensive Odour and Air Emissions Assessment will be undertaken following the completion of the detailed design for the MMF and the identification of all potential odour sources. Since the primary odour contributor is anticipated to be from the receiving, handling, and processing of organic materials, a subsequent Odour and Air Emissions Assessment will be carried out following the selection of the organics technology and the completion of the detailed design for the OPF. An odour assessment using site-specific meteorological data in accordance with s. 13(1) of O. Reg. 419/05 will be prepared as part of a future ECA application for the facility.	Complete the detailed design for the of MMF, including an Odour and Air Emissions Assessment. Complete the detailed design for the OPF, including an updated Odour and Air Emissions Assessment.
15	Ministry of Municipal Affairs and Partner Ministries (MNRF, MOECC, MTCS, MTO, OMAFRA)	April 7, 2017	Facility Characteristics Report	The basis of the odour estimates and supplier's supporting documentation was not included in the odour assessment. Therefore, MOECC cannot comments on the quality of emission data used in the model assessment.	In consultation with the MOECC, a preliminary Air Quality Impact Assessment Report, including additional information for the emission rates, has been completed for the ERRC and included as part of the Amended Facility Characteristics Report. A comprehensive Odour and Air Emissions Assessment will be undertaken following the completion of the detailed design for the MMF and the identification of all potential odour sources. Since the primary odour contributor is anticipated to be from the receiving, handling, and processing of organic materials, a subsequent Odour and Air Emissions Assessment will be carried out following the selection of the organics technology and the completion of the detailed design for the OPF. Odour emissions were estimated based on similar facilities with similar technology in Ontario. Once a technology is selected and the detailed design is available, supporting information for odour estimates will be included in a future ESDM report.	Complete the detailed design for the of MMF, including an ESDM report. Complete the detailed design for the OPF, including an updated ESDM report.
16	Ministry of Municipal Affairs and Partner Ministries (MNRF, MOECC, MTCS, MTO, OMAFRA)	April 7, 2017	Facility Characteristics Report	The odour assessment did not discuss which sensitive receptors were assessed. There is a building which is situated approximately 500 meters south east of the proposed facility that does not appear to have been included in the odour assessment.	In consultation with the MOECC, a preliminary Air Quality Impact Assessment Report has been completed for the ERRC and included as part of the Amended Facility Characteristics Report. A comprehensive Odour and Air Emissions Assessment will be undertaken following the completion of the detailed design for the MMF and the identification of all potential odour sources. Since the primary odour contributor is anticipated to be from the receiving, handling, and processing of organic materials, a subsequent Odour and Air Emissions Assessment will be carried out following the selection of the organics technology and the completion of the detailed design for the OPF. A full grid model was run as part of each modelling scenario. Based on this full grid, the most-impacted sensitive receptors were assessed in subsequent analysis. The most-impacted sensitive receptors were considered in the odour assessment. The modelling results presented in the report reflect worst-case sensitive receptor impacts.	Complete the detailed design for the of MMF, including an ESDM report. Complete the detailed design for the OPF, including an updated ESDM report.

Comment No.	Submitted By	Date Submitted	Document	Comment	Response	Action
17	Ministry of Municipal Affairs and Partner Ministries (MNRF, MOECC, MTCS, MTO, OMAFRA)	April 7, 2017	Facility Characteristics Report	The odour assessment does not discuss background odour sources in the area. The additional odours from the proposed facility may potentially result in higher odour impacts at the nearest sensitive receptors when considering background.	In consultation with the MOECC, a preliminary Air Quality Impact Assessment Report has been completed for the ERRC and included as part of the Amended Facility Characteristics Report. A comprehensive Odour and Air Emissions Assessment will be undertaken following the completion of the detailed design for the MMF and the identification of all potential odour sources. Since the primary odour contributor is anticipated to be from the receiving, handling, and processing of organic materials, a subsequent Odour and Air Emissions Assessment will be carried out following the selection of the organics technology and the completion of the detailed design for the OPF. The site has no industrial operations within one kilometer, with agricultural land to the west and forested areas to the east. It should be noted that agricultural operations, which can have odour far higher than 1 OU, may be exempted from odour-based standards. The perceived odour threshold of a mixture of two compounds may, in theory, be as strong as the sum of the two compounds, may be more intense, or may be less intense. Typically, the perceived odour level is not directly correlated to the concentration of individual odorous compounds. Odour is generally accepted to be a logarithmic function of the concentration of the chemical species. Since the modelled ground level odour concentration at the sensitive receptors will be less than 1 OU (99.5% of the time), any significant background odour concentration would likely be the dominant perceived odour. Therefore, background odour concentrations were not taken into account in the preliminary odour impact assessment An odour assessment using site-specific meteorological data in accordance with s. 13(1) of O. Reg. 419/05 will be prepared as part of a future ECA application for the facility.	Complete the detailed design for the of MMF, including an ESDM report. Complete the detailed design for the OPF, including an updated ESDM report.
18	Ministry of Municipal Affairs and Partner Ministries (MNRF, MOECC, MTCS, MTO, OMAFRA)	April 7, 2017	Facility Characteristics Report	Total reduced sulphur compounds (H2S, etc.) and ammonia are contaminants of concern from organics processing operations (anaerobic digestion) which should have been addressed in this project. MOECC typically recommends doing this assessment prior to the ECA stage to ensure the contaminants released meet 0. Reg. 419/05 standards.	In consultation with the MOECC, a preliminary Air Quality Impact Assessment Report has been completed for the ERRC and included as part of the Amended Facility Characteristics Report. A comprehensive Odour and Air Emissions Assessment will be undertaken following the completion of the detailed design for the MMF and the identification of all potential odour sources. Since the primary odour contributor is anticipated to be from the receiving, handling, and processing of organic materials, a subsequent Odour and Air Emissions Assessment will be carried out following the selection of the organics technology and the completion of the detailed design for the OPF. An assessment of applicable compounds of concern, including those with limiting effects other than odour, will be prepared as part of a future ECA application for the facility. The facility will be designed to ensure that TRS and ammonia concentrations meet both health and odour limits.	Complete the detailed design for the of MMF, including an ESDM report. Complete the detailed design for the OPF, including an updated ESDM report.
19	Ministry of Municipal Affairs and Partner Ministries (MNRF, MOECC, MTCS, MTO, OMAFRA)	April 7, 2017	Facility Characteristics Report	A minor typo was noted in Section 7.3 of the Facility Characteristics Report which should be corrected. The reports notes that a series of models were performed to determine the odour compliance as per the April 2008 technical bulletin. This would be corrected that a series of modelling scenarios and not models were performed.	Section 7.3 of the Amended Facility Characteristics Report has been updated to reflect that a series of modelling scenarios were performed.	No further action required.
22	Terraprobe Inc. (Ainley Group)	January 24, 2017	Hydrogeological Assessment Facility Characteristics Report	Terraprobe agrees with the GHD conclusion that the deep water table and sandy soils have the potential to facilitate the infiltration of all collected storm water post development. Implementation of infiltration measures for the post development condition will be required.	Details of the proposed stormwater management system, including potential infiltration measures will be developed as part of the detailed design for the MMF in support of the Site Plan Approval and Environmental Compliance Approval. This will also include consideration for using stormwater to support the proposed fire protection systems. Further consideration will be given to using this water to supplement process water requirements during the development of the detailed design for the OPF. Amendments to the Site Plan and Environmental Compliance Approval will be submitted as required following completion of the detailed design for the OPF.	Complete the detailed design for the of MMF, including the stormwater management system. Complete the detailed design for the OPF, including potential modifications to the stormwater management system to allow for the use of water for processing operations or fire protection.
23	Terraprobe Inc. (Ainley Group)	January 24, 2017	Hydrogeological Assessment Facility Characteristics Report	The water demand of ERRC facility, and therefore the water taking of the proposed supply well, should be further evaluated to demine an estimated daily flow volume. If the water requirement does exceed 50,000 L/day, then a Category 3 PTTW for long term water takings will be required for the facility.	Details of the required water demand of the ERRC will be developed as part of the detailed design for the MMF and the OPF in support of the Site Plan Approval and Environmental Compliance Approval. If it is determined that more than 50,000 litres of water will be required per day, then a Permit to Take Water (PTTW) application will be submitted to the Ministry of the Environment and Climate Change.	Complete the detailed design for the Administrative Facility, MMF, and OPF, including the potable water requirements. Apply for a PTTW if required.
25	Terraprobe Inc. (Ainley Group)	January 24, 2017	Hydrogeological Assessment Facility Characteristics Report	The unevaluated wetland near the northeast portion of the Site will constrain storm water management options in that vicinity. Additional evaluation of the wetland area should be undertaken to ensure that drainage patterns are maintained to provide similar hydrologic contributions to this feature.	Additional evaluation of the wetland will be undertaken during the stormwater management design to ensure drainage patterns are maintained to provide similar hydrologic contributions to this feature.	Complete the detailed design for the of MMF, including the stormwater management system. Complete the detailed design for the OPF, including potential modifications to the stormwater management system.

County of Simcoe
Environmental Resource Recovery Centre
(Amended) Facility Characteristics Report

- Conceptual Site Plan
- Functional Servicing Study
- Stormwater Management Study
- Noise Assessment
- Odour Assessment

County of Simcoe
Solid Waste Management Department
1110 Highway 26
Midhurst, ON L0L 1X0

County of Simcoe

GHD | 184 Front Street East Suite 302 Toronto Ontario M5A 4N3

086822 | Report No 18 | February 1, 2018

Executive Summary

The County of Simcoe (County) is proposing the development of a co-located Materials Management Facility (MMF) and Organics Processing Facility (OPF) to address needs for the consolidation, transfer, and processing of waste materials. The OPF, MMF, and ancillary facilities (e.g., truck servicing facility, materials recovery facility, administrative facility and public education space, access roads, stormwater management pond) will collectively be referred to as the Environmental Resource Recovery Centre (ERRC).

Through a detailed site evaluation and selection process, the preferred site for the development of the ERRC was identified as 2976 Horseshoe Valley Road West (Site) in the Township of Springwater (Springwater).

The current County Official Plan (OP) designation for the Site is Greenlands (Schedule 5.1), while Springwater's OP designates the majority of the Site as Rural, with the southwest portion of the Site designated as Agricultural. The Site is currently zoned Agricultural under Springwater's Zoning By-Law (ZBL).

Following a pre-consultation meeting with Springwater Planning staff in December 2015, a number of studies were identified that would be required in support of amending the Springwater OP and ZBL. This report includes and summarizes the findings of the following studies:

- Conceptual Site Plan
- Functional Servicing Study
- Stormwater Management Study
- Noise Assessment
- Odour Assessment

A description of the Site based on the findings from these and other additional studies is provided, as are details surrounding the siting and sizing of the ERRC footprint, components, proposed layout, and the provision of Site servicing. An overall development strategy is also presented, outlining the anticipated approach and staging/timing of procurement, Site Plan approval, building permits, construction, and operations.

Preliminary details have also been provided on how the ERRC will obtain environmental compliance approval (ECA) from the Ministry of the Environment and Climate Change (MOECC), and how regulations surrounding the management of stormwater, noise, and odour will be met.

This report demonstrates how the development of the proposed ERRC at 2976 Horseshoe Valley Road West is a suitable use for the Site, and how the proposed facilities will be able to satisfy applicable guidelines and regulations through careful design, operation, and the implementation of best management practices.

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1. Introduction

The County of Simcoe (County) Solid Waste Management Strategy sets a framework for collection, diversion and disposal of waste materials from across the County, which in turn defines facility needs for consolidation, transfer, and processing of the waste materials. The County is proposing a co-located development to provide a Materials Management Facility (MMF), an Organics Processing Facility (OPF), and ancillary facilities (e.g., truck servicing facility, materials recovery facility, administrative facility and public education space, access roads, stormwater management pond), which will collectively be referred to as the Environmental Resource Recovery Centre (ERRC).

Through a detailed site evaluation and selection process, the preferred site for the development of the ERRC was identified as 2976 Horseshoe Valley Road West (Site) in the Township of Springwater (Springwater). The Site is located approximately 15 kilometres (km) north of Barrie, roughly 3 km west of Highway 400, on the north side of Horseshoe Valley Road West. A Site Location Plan is provided as Figure 1.1.

The current County Official Plan (OP) designation for the Site is Greenlands (Schedule 5.1), while Springwater's OP designates the majority of the Site as Rural, with the southwest portion of the Site designated as Agricultural. The Site is currently zoned Agricultural under Springwater's Zoning By-Law (ZBL).

Following a pre-consultation meeting with Springwater Planning staff in December 2015, a number of studies were identified that would be required in support of amending the Springwater OP and ZBL. This report includes and summarizes the findings of the following studies:

- Conceptual Site Plan.
- Functional Servicing Study.
- Stormwater Management Study.
- Noise Assessment.
- Odour Assessment.

The remaining studies are presented under separate cover, and will be referenced herein as required.

2. Site Description

The Site at 2976 Horseshoe Valley Road West is described as Lot 2, Concession 1 in the Township of Springwater (Springwater), County of Simcoe. The Site is identified as the Freele County Forest Tract and is covered by a forest with the exception of an access road/trail extending from Horseshoe Valley Road West at the frontage (south/southeast boundary) to Rainbow Valley Road East at the rear-flankage (north/northwest boundary). The overall Site is roughly 84 hectares

(207 acres) in area, rectangular in shape, with approximate dimensions of 625 metres wide and 1,370 metres deep (2,050 feet by 4,500 feet).

Key features of the Site and surrounding area are presented in Figure 2.1. Select details of the various planning and engineering studies that have been undertaken are summarized in the sections that follow.

2.1 Hydrogeology

The Site is located in the Simcoe Uplands physiographic region, which is characterized by a drumlinized till plain and sand plain. The topography on the Site ranges from an elevation of 265 metres above mean sea level (mAMSL) near the west side of the Site to 245 mAMSL on the east boundary. At the north end of the Site, the topography is relatively flat at an elevation of approximately 240 (mAMSL), which is coincident with a wetland area.

The Site topography slopes from west to east toward Matheson Creek, which is steeply incised into the sand plain at an elevation of 220 mAMSL. Two tributaries of Matheson Creek are mapped on the Site, as identified by the Natural Heritage Information Center (NHIC) and NVCA mapping resources. One watercourse originates at the wetland area near the northeast corner of the Site. A minor water course flows west to east, originating at the east-boundary of this area, and another similar watercourse just north of the Site is situated on the opposite side of Rainbow Valley Road East. The second watercourse crosses the south portion of the Site. This south watercourse could not be located during site visits and investigations completed at the Site.

Overburden underlying the Site is approximately 120 metres (m) thick, and is generally described as a thick sequence of Pleistocene glacial deposits overlying limestone and shale bedrock of the Middle Ordovician, Simcoe Group Formations.

The Site and surrounding lands are underlain by sandy deposits and foreshore basinal deposits (sand and silt) encountered to a depth of up to 30 metres below ground surface. The water table within the ERRC footprint area and surrounding area is present within the sand deposit at depths ranging from 9 to 26 metres below ground surface. In general, the sandy overburden forms a thick unconfined aquifer overlying bedrock.

Additional details are provided in the updated Hydrogeological Assessment Report (GHD, February 2018).

2.2 Ecology

The Site is comprised of the Freele County Forest tract, an approximately 65 year old mixed species plantation managed by County foresters. It represents approximately 84 hectares (ha) of a greater than 475 ha contiguous woodland area. Wetlands are present in both the northeast and southeast corners of the Site. There are no Areas of Natural or Scientific Interest or Significant Ecological Areas identified on-Site.

Field investigations conducted in 2016 included wetland boundary delineation, verification of watercourse presence, vegetation inventory, calling amphibian surveys, breeding bird surveys, and incidental wildlife observations. Field investigations in 2017 included additional vegetation

community mapping, snag survey, and acoustic bat surveys. Nottawasaga Valley Conservation Authority (NVCA) verified wetland boundaries were field delineated and mapped. The field data was used to assign Ecological Land Classification (ELC) units to the vegetation units present, and describe the available habitats and natural features of the Site for a total of seven upland and four wetland ELC units. Unique within the Site is an older-growth hemlock stand present in the southeast corner.

Based on the determination of Site habitats, targeted surveys for Species at Risk (SAR) were conducted for forked three-awned grass (*Aristida basiramea*), little brown myotis (*Myotis lucifugus*), northern long-eared myotis (*Myotis septentrionalis*), and small footed myotis (*Myotis leibeii*). Suitable habitat was not present within the Site for whippoorwill or Hine's emerald dragonfly SAR that secondary source information indicated may be present in the area. Therefore targeted surveys for the presence of these species were not conducted. Two bird species with provincial Special Concern status, two bird species with federal Special Concern and one with Threatened status, and low densities of three bat SAR species were documented within the Site.

The development of the ERRC will not result in a negative impact, which is defined under the PPS as "degradation that threatens the health and integrity of the natural features or ecological functions for which an area is identified due to single, multiple or successive development or site alteration activities". This is based on the proposed location of the ERRC, the plantation history of the Site, the actively managed nature of the Site, and the implementation of the recommended mitigation measures, which adequately avoid, compensate and/or replace natural features (i.e., vegetation/ plantings) within the wider woodlot feature. Environmental impacts on the larger woodlot feature are not anticipated from the development of the proposed ERRC.

Additional details are provided in the Amended Scoped Environmental Impact Study (GHD, February 2018).

2.3 Archaeology

Archaeological Services Inc. (ASI) conducted a Stage 1 & 2 Archaeological Assessment of the proposed footprint and access road for the ERRC.

The Stage 1 background research and property inspection determined that one previously registered archaeological site is located within one kilometre of the study area, and there is a historical cemetery in the southwest corner of the Stage 1 study area, however the proposed project will not impact the cemetery lands. A review of the historical and archaeological contexts of the study area suggests that it has potential for the identification of archaeological resources, depending on the conditions of soils and the extent of previous disturbance.

The Stage 2 property assessment was conducted on the proposed project limits, which consists of a 4.5 hectare area for the ERRC footprint and a 1.0 hectare area for the proposed access road. Approximately 0.6 hectares were found to have no potential due to deep and pervasive disturbance while the remainder of the project study corridor (10.7 ha) was assessed by test pit survey at five metre intervals.

During the course of the Stage 2 survey, one Euro-Canadian archaeological site was identified that met criteria for sufficient cultural heritage value or interest. A Stage 3 assessment was subsequently carried out in order to clarify the nature and extent of the cultural deposits.

The Stage 3 assessment included the excavation of one metre square test units over the locations of positive Stage 2 test pits. Euro-Canadian historical artifacts were recovered and one potential feature was documented within an area of approximately 40 m x 40 m.

Given the relatively compact size and location of the archaeological site, and the fact that the County already owns the property, the archaeological site is an excellent candidate to be subject to a Stage 4 Avoidance and Protection strategy. A minimum setback distance of 10 m was applied surrounding this area. Protection of this area in-situ and relocation of the footprint was considered to be preferred over excavation.

Additional details are provided in the Stage 1 & 2 Archaeological Assessment Report (ASI, November 2016), and the Stage 3 Site Specific Assessment Report (ASI, November 2016).

2.4 Surrounding Area

There are a limited number of residential units within 200 metres of the overall Site boundary: adjacent to the south/southwest corner of the Site is a farm-residential property; to the south across the road from the Site is a rural-residential property; and to the east of the Site is another rural-residential property (all three of these units front onto Horseshoe Valley Road West).

Within 500 metres of the overall Site boundary, there are three additional rural/farm-residential units to the northwest (fronting along Rainbow Valley Road East), two more residential units to the south (fronting along Gill Road), one rural-residential unit south/southeast of the Site at the end of Ohara Lane, and two more rural-residential homes situated southeast of the Site fronting on Pine Hill Drive.

Within one kilometre of the overall Site boundary there are roughly 30 to 40 additional residential units, located primarily to the southeast. Adjacent to the south/southwest corner of the Site is a small cemetery (Apto Cemetery).

3. Conceptual Site Plan

A conceptual site plan for the ERRC is provided in Figure 3.1. Details surrounding the various components of the ERRC, sizing and siting of the overall ERRC footprint, and the rationale behind the proposed ERRC layout are provided in the sections that follow.

In order to build and operate the waste management facilities proposed for the ERRC, the County will require approvals from the Ministry of the Environment and Climate Change (MOECC) that describe design and operations, air and noise controls, and surface water and groundwater controls.

The conceptual site plan has been developed based on the information that is currently known about the ERRC, including:

- The current and projected material tonnages that will be transferred through the MMF.
- The current tonnage of organic material along with growth projections for the County and an understanding of other areas within the County that also generate organic materials that are managed separately (for example, Barrie and Orillia).
- The typical types of technologies that are utilized for organics processing facilities, taking into account technologies that are currently being successfully utilized in Ontario.
- The associated regulatory motivators for waste management projects in the province, such as the newly implemented Climate Change and Low-Carbon Economy Act and the Waste-Free Ontario Act.

A conceptual site plan identifies space allocations and ancillary facilities that form the initial steps of a design and procurement process. A conceptual site plan is intended to define the extent and limits of the individual facilities, while taking into account the different technologies and approaches that could be proposed during the detailed design and procurement stages.

For the MMF, the design and technology range is very limited as this is a conventional waste management facility that is mostly reliant on space for consolidation of waste from smaller vehicles into larger vehicles with limited or no processing of the waste.

For the OPF, the technology range encompasses two main variants: anaerobic digestion and composting (as described in Section 3.2.2). The conceptual site plan thus allocates space that would be suitable for either type of OPF technology based on a range of facilities that are currently in operation in Ontario.

As noted above, the conceptual site plan is based on preliminary information and will be further refined and built upon during the design and approvals process.

3.1 Development Strategy

While both the MMF and OPF will be situated within the same ERRC footprint, they will differ in terms of technology, procurement method, approvals, and development timelines. However, there are also many synergies that can be realized during the development of these facilities in terms of aligning the overall development schedule. It is important to understand the various dimensions of permitting and approvals, procurement, design and construction, and how they inter-relate between the two facilities and the overall schedule.

GHD met with County staff on April 1, 2016 to discuss the scope of work and to lay out a potential framework for the development of these facilities, with the following key aspects being identified:

- Planning studies required in support of Official Plan Amendments (OPAs) at the County and municipal (Township of Springwater) level, and a Zoning By-Law Amendment (ZBA) at the municipal level.
- Engineering studies required in support of facility design.

- Different procurement delivery methods for the MMF and OPF.
- Permits and approvals, including supporting information and application process.
- Development of a business case for the OPF and providing updated, site-specific costing analysis for the MMF.
- Development timeline including detailed design, construction and commissioning.

A memorandum to the County dated May 11, 2016 summarized all of these aspects and presented an overall strategy for the development of both the MMF and the OPF. The timeline was later revised on October 24, 2016 to account for a change in the submission date for the planning application package.

In general, the strategy contemplates initially developing the MMF to transfer the County's materials from local collection vehicles to transfer vehicles. This would include waste, recyclables and organics. The OPF would be developed subsequently to specifically accommodate the organic materials, eliminating the need for a transfer activity for this waste stream.

3.1.1 Procurement Method

GHD has recommended that the MMF proceed under a conventional design-bid-spec process wherein an engineer undertakes the design of the facility and develops construction specifications that are then used in a competitive procurement process to retain a contractor for construction.

The OPF will follow a design-build-operate (DBO) approach, as recommended by GHD. This is a standard procurement approach for OPFs, and is largely predicated on the fact that the technologies utilized to treat organic materials aerobically (composting) or anaerobically (digestion) are largely proprietary and require detailed involvement of technology providers. As a result, a DBO mechanism allows for single-point contracting between the County and an entity that will include both the technology component and the operating component of the facility.

3.1.2 Permits and Approvals

3.1.2.1 Site Plan Approval & Building Permits

Given the complexity of the overall ERRC, the Site Plan approval process will follow a staged approach. The site plan presented herein has been developed to a conceptual level of detail, and is submitted in support of the planning approvals process.

Following the initial approval of the conceptual site plan and the receipt of appropriate zoning designation, formal Site Plan approval will be sought on two separate occasions once the detailed designs for the MMF and subsequently the OPF have been completed. The formal Site Plan will also include the other ancillary facilities (e.g., weigh scale, administrative building, etc.) noted in this report, and will be developed based on any zoning-related items pertinent to the facilities.

The formal Site Plan will also underpin the building permits required for the individual facilities. Building permits for the MMF and OPF will be submitted and approved separately prior to the construction of each facility.

3.1.2.2 Environmental Compliance Approvals

The MMF and the OPF are both regulated under the Environmental Protection Act and will require an Environmental Compliance Approval (ECA) issued by the Ministry of the Environment and Climate Change (MOECC). An ECA is overseen and enforced by the province and will cover waste operations, air and noise, and surface water and groundwater monitoring and control for the entire Site. It will govern how each of the facilities are operated and monitored with respect to preventing off-Site impacts.

Given the anticipated development timelines for both facilities, the ECA process will be undertaken using a staged approach. The initial ECA application will cover the MMF, and will subsequently be amended at a later date to incorporate the OPF. Pre-consultation with the MOECC and other stakeholders will be key to ensuring a seamless ECA process that will allow for the uninterrupted operation of the overall ERRC.

It is not possible to operate either the MMF or the OPF until the MOECC issues the required approvals, which generally involves the stipulation of terms and conditions that specify operating parameters and required environmental performance. The ECA is a legal document that will be held in the County's name and that will create performance obligations on the County and, through the County, to the operations of the MMF and OPF. The MOECC will have the right at any time to inspect the facilities, and the County will be required to report on ECA terms and conditions on a regular basis. Contravention of the ECA constitutes a contravention of the Environmental Protection Act.

3.1.3 Construction Timing

The design and construction of the ERRC will also follow a staged approach. The MMF will be constructed in advance of the OPF, and will include the construction of common elements such as the Site access road, scale area, stormwater management facility, administrative facility, as well as servicing (i.e., fire water, potable water, wastewater) and utilities. Other Site works such as grading, fencing, gates, trails, signage, lighting, and landscaping are also expected to be completed at that time. The MMF will be commissioned first in 2019, and the OPF will follow in 2021.

3.2 ERRC Components

3.2.1 Materials Management Facility

A Materials Management Facility (MMF), also known as a transfer station, is a location for the consolidation of waste (garbage, recyclables, and organics) from multiple collection vehicles into larger, higher-volume transfer vehicles for more economical shipment to disposal or processing locations. This is a conventional waste management activity that is common to all municipalities.

An MMF is a very conventional type of waste management facility employed by most municipalities. In the context of the County, curbside collection vehicles collect waste from residents, but the ultimate processing or disposal of wastes generally occur outside of the County. For example, residual waste/garbage is currently exported to the Emerald Energy-from-Waste facility in Brampton for processing and to produce an energy stream; recyclable containers (e.g., plastics, bottles, etc.) are currently exported to the City of Guelph's material recovery facility (MRF) for sorting and

segregation so that the recyclables can enter the re-use market; recyclable fibres (e.g., paper) are exported to a private facility in Toronto for processing into re-use products; and source-separated organics (SSO; residential food waste primarily composed of kitchen wastes) are transported currently to a composting facility in Hamilton. Given the travel distances between the point-of-origin and these processing facilities, it is not feasible to send curbside collection vehicles carrying between 1 to 10 tonnes per load over these long distances, as this would involve excessive logistics and significant diesel fuel consumption. To mitigate this necessity, a transfer function is generally used to consolidate materials from the smaller curbside trucks into large transfer trailers that can carry between 30 and 40 tonnes per load to the final processing destinations. This is a very normal and efficient component of any waste management system. Currently, the County is reliant on private sector transfer capacity and does not manage a significant transfer component of its own.

It is noted that the proposed MMF will need to transfer SSO for a period of time. This transfer activity will cease upon development of the OPF, which would then allow export of SSO outside of the County to be discontinued, and would further allow the County to benefit from energy and/or fertilizers/compost that can be generated from organic materials.

The MMF will likely consist of a pre-engineered steel frame structure with exterior walls constructed of concrete and steel sheeting. The use of internal support columns will be minimized in order to provide clear spans that allow for the unrestricted movement of materials and vehicles inside the building. The overall construction of an MMF is typically concrete, thus avoiding the use of combustible materials.

In terms of specific construction, multiple bays with roll-up doors will provide vehicle access inside the building where materials will be unloaded. A concrete tipping floor and push walls will allow for materials to be moved around using a wheeled loader. While there will be no long-term storage of materials within the MMF, the tipping floor will be sized to accommodate the temporary storage of materials as a contingency for temporary service disruption at downstream facilities.

The MMF will likely be a multi-storey building approximately 10 to 15 metres high depending on the expected truck flow and final design. The unloading area/tipping floor will be on the upper level, while the lower level will allow for the passage and loading of transfer vehicles from above. All unloading/loading operations will occur inside of the building.

The MMF will also incorporate a truck servicing facility for the County's fleet of Solid Waste Management vehicles. The truck servicing facility will consist of a workshop, storage area, and at least one service bay.

The conceptual layout and estimated costing for the MMF is presented in Appendix A.

3.2.2 Organics Processing Facility

An OPF is a location where source-separated organics (i.e., green bin material) and potentially materials such as leaf and yard waste, pet waste, and diapers are processed under controlled conditions and converted into other valuable products, such as compost, fertilizer and/or biogas for energy production.

The County's procurement process for the OPF will be open to all types of aerobic composting and anaerobic digestion technologies, as these are common in the industry and there are many examples of both technologies in-place across Ontario. Both are engineered biochemical conversion processes involving the decay of organic materials using biological processes, but involve different conditions and produce different outputs, and have differing cost factors. Composting is the controlled decomposition of organic material by introducing oxygen, to produce a value-added compost product; anaerobic digestion is an oxygen-free process that also decomposes organic material using natural biological processes but that further produces biogas and fertilizer products.

In terms of selection of technology, given that both are established in Ontario, it is generally left to a competitive procurement process with stipulated performance conditions to establish the optimal solution. In either case, overall performance would be stipulated by the County and the successful vendor would need to comply with the performance envelope created therefrom. This performance envelope would be stipulated by contract.

Either type of facility will generally include the following components:

- Receiving area for incoming materials.
- Handling area.
- Processing area.
- Storage area.
- Loading area for outgoing materials.
- Environmental control facilities (e.g., odour abatement and water control features)

Conventional OPFs in Ontario generally include the following main features:

- Waste tipping activities indoors, with doors closed and fully protective surfaces with coatings to accommodate the movement of heavy traffic and the liquids that emanate from SSO. Tip floors are sloped to capture any liquids and prevent their egress through doors when they are open.
- Overall indoor facility ventilation controls such that negative air pressure is maintained. In this context, the facility is maintained under constant suction, such that when doors do open to admit trucks, airflow is in an inwards direction to the facility (i.e., fugitive emissions from door openings are minimized).
- Odour control of collected air. In this configuration, negative air pressure systems will collect outside fresh air and draw it into the facility as a matter of course for ventilation, further supplemented by door openings which provide additional air volume. This airflow will then have been drawn over organic materials in storage or processing, thus generating a potentially odorous air stream. This air stream is then treated through a complex set of odour abatement systems that could be comprised of biological filters (biofilters), chemical scrubbers, activated carbon systems, air cooling systems, or ionization systems. These systems are specifically developed to allow OPFs to comply with MOECC guidelines for odour and air quality. Odour control systems are generally paired with a release point such as a stack that allows for dispersion of the treated air. The design and requirement of a stack is predicated on dispersion

modelling as would be required by the MOECC to demonstrate compliance with odour regulations.

- Main equipment is lodged indoors or in noise-attenuated enclosures in order to mitigate noise emissions. The MOECC provides specific direction on noise control, which will be provided at the OPF by housing the main processing equipment indoors, in addition to blowers, pumps, and other noise sources.
- Processing of organic materials in contained environments. This could include housing the main processing equipment indoors, such that odour and noise control can be fully established. Outdoor composting technologies are only envisioned if controlled covers with inherent odour control (such as Gore composting systems) are utilized; these systems are common in Ontario. Anaerobic digestion may include outdoor enclosed tanks that process organics in an oxygen-free environment; any outdoor tanks are further coupled, per MOECC requirements, with secondary containment to impound and control spills should a tank rupture occur.
- For anaerobic digestion systems, biogas (an energy-rich gas product mostly comprised of methane) is created from the organic materials. This biogas has typically been used to produce electricity using reciprocating engines at a level that is generally more than sufficient to address the electrical demands of an OPF, MMF, and ancillary facilities, with additional electricity for export. This would require having reciprocating engines on-Site, generally in enclosed containers or buildings to facilitate noise control and maintenance functions. Biogas may also be used to produce renewable natural gas, which can then be injected into the natural gas distribution grid to offset fossil fuel use.
- Final product storage, if a liquid fertilizer is created, is generally in enclosed and covered tanks. If a compost material is produced, it is generally stored indoors until trucks are able to transport this material to its final use in land application programs.
- Rainwater capture systems, particularly roof water capture systems, to provide a source of water for cleaning and processing activities.
- Fire control systems generally comprised of standpipe and/or sprinkler systems depending on building classification to ensure that fires, should they occur, do not propagate. It is noted that SSO is largely comprised of water (between 70 and 75% water by weight) and is itself not normally combustible under usual operating conditions. Coupled with the non-combustible nature of this style of building construction, there is limited opportunity for significant damage from fire. Notwithstanding this, the Ontario Building Code prescribes fire suppression requirements based on building footprint area and occupancy. Regardless of code requirements, it is recommended that a monitored sprinkler system be installed to provide early detection in the event of a fire as well as to protect life and minimize property damage.
- OPFs normally have sophisticated computerized control systems, up to and including SCADA (supervisory control and data acquisition) systems. This allows operators to modulate each aspect of the OPF based on feedback from a number of sensors and other instrumentation, and to track historic trending data. Typically, these systems can be remotely controlled from off-site terminals, where operators can monitor and control systems even after hours. Alarm systems are built into the controls to generate immediate call-out in emergency conditions. OPFs also have data storage servers that allow for tracking of SCADA data over time, coupled with

uninterrupted power supplies to ensure that data is not lost due to power outages, as well as to make sure that control and alarm systems continue to operate in the event of power outage.

- Control room where operators monitor the system, admit trucks to the facility, schedule maintenance and monitor alarms. This is generally the area where data is retained. Additionally, an OPF will contain a separate electrical room and generally a pump room.

There are many different technologies available that can differ significantly in design, construction, and operations. The sections that follow present a range aerobic and anaerobic processing technologies that may be implemented for the County's OPF.

3.2.2.1 Aerobic Digestion Technologies

There are three main techniques used in aerobic composting: static piles, aerated static piles, and in-vessel systems. In its simplest form, composting is achieved using static piles called windrows, which are turned periodically using mobile equipment to aerate the material. These are simple piles that are often exposed to outdoor weather elements, and the level of overall process control is quite low.

Aerated static piles incorporate vented floors or perforated pipes into the windrows. Ambient air is introduced to the piles using pressure to push, or a vacuum to pull, air through the piles. There is a greater potential for odours using these techniques compared to in-vessel or anaerobic digestion techniques, so they are usually conducted indoors, or under a specially designed cover system. Introduction of controlled airflow accelerates the composting process and allows for more even and consistent distribution of oxygen within the organic mass, which is a prime consideration for composting.

More sophisticated systems include in-vessel composting plants which use mechanical means to introduce air and aerate the material in enclosed, controlled environments. The most common systems include: beds or bays with mechanical agitation, horizontal basin reactors, modular tunnels/biocells with or without aeration, and vertical reactors. At this level of technology, process control is advanced, reducing composting times, environmental emissions, and producing high quality compost.

One of the key features of composting systems is the presence of so-called process air. In any composting regime, oxygenation of the material, either through mechanical turning or active aeration, is required. The air that has passed through and contacted the composting material thus contains odorous compounds that are then treated or filtered.

3.2.2.2 Anaerobic Digestion Technologies

Anaerobic digestion occurs in the absence of oxygen, and uses naturally occurring microorganisms to break down complex organics with the addition of heat. The outputs from this process include significant amounts of methane and carbon dioxide, other gases such as ammonia and hydrogen sulfide, and digestate which can be further composted using aerobic processes or potentially marketed as a fertilizer. A key advantage with anaerobic digestion is that a significant amount of energy can be recovered with the capture and utilization of the methane.

Anaerobic digestion processes are described as either wet or dry, depending on the ratio of solids to moisture in the feedstock. Anaerobic digestion technologies are also distinguished by the number of stages (single or two-stage), operating temperature (mesophilic or thermophilic), process flow (continuous or batch), and the mixing regime (completely mixed, plug flow, or static).

As opposed to composting, anaerobic digestion does not generate specific process air streams, as the odorous compounds are captured in the biogas produced in the unaerated environment. One key difference between composting and anaerobic digestion is the presence of a utilization facility to uptake the biogas. This could take the form, for instance, of reciprocating engines to generate electricity, or an upgrading system to produce renewable natural gas (RNG).

3.2.3 Administrative Facility

The administrative facility will serve as a centralized location for the administration staff and resources required to operate the ERRC. The administrative building can be established as either a standalone structure, or incorporated as part of another facility such as the MMF or OPF. The administrative facility will include offices, meeting spaces, washroom and change room facilities, a lunchroom/kitchen, and potentially a public education area. To best isolate the administrative and support functions from the processing operations, it is recommended that the Administrative Facility be constructed in a manner that is equivalent to a fully-exposed exterior structure, complete with air barriers, vapour barriers, exterior moisture protection systems (all walls/roof), and provided with air-lock passageways between odourous and lesser-odourous areas.

It is expected that the administrative facility may need to accommodate approximately 20 administration and operations staff on a regular basis, and could see up to 50 additional people on a short-term basis for meetings or educational tours.

3.2.4 Materials Recovery Facility

The ERRC will include an area which is reserved for the potential establishment of a Materials Recovery Facility (MRF) in the future. The County's current material tonnages do not make this a viable alternative at this time; however, secured funding for the overall MMF is contingent on allotting space for this component.

A MRF is a location for the processing and separating of commingled recyclable material into its core components (e.g., paper, glass, metals, plastic) for marketing and shipping to end-users. A typical MRF operates using a wide range of processing and sorting equipment including, but not limited to:

- Conveyors.
- Compactors.
- Screens.
- Magnetic separators.
- Eddy current separators.
- Air sorters.

- Optical sorters.

The MRF may also share common elements with the MMF such as loading and unloading areas, ventilation control systems, and weigh scales.

Processing activities are undertaken indoors and overall sizing of the facility will accommodate the peak volume of incoming curbside vehicles to prevent queueing, while also allowing for outbound transfer vehicles to be stored indoors while they are being loaded.

3.2.5 Stormwater Management Facility

The ERRC will include a stormwater management facility for the capture and treatment of surface runoff from impervious areas such as rooftops and paved roadways. Some of the surface water can be used as process water or cleaning water in the OPF or the MMF, enhancing the sustainability features of these facilities.

Surface water quality and quantity will be managed through the implementation of the following potential controls:

- Vegetated filter strip.
- Rock check dams.
- Stormwater management pond.
- Infiltration basin.
- Catchbasins, manholes, and piping.
- Overflow weir.
- Drainage ditch.

Additional details on the proposed design and operations of the stormwater management facility are presented in Section 5.

3.2.6 Scale Area

The scale area is a location where inbound and outbound vehicles can be weighed on scales to determine material tonnages arriving at or leaving the facility. Weigh scales serve to monitor and record all materials for health, safety, environmental compliance, and also for data management purposes (tracking inbound and outbound tonnages).

The scale area will likely consist of a number of decks resting on a series of load cells and mounted on a concrete foundation. Scales will be monitored remotely using a keycard system and software capable of printing tickets and providing reporting features.

3.2.7 Parking Areas

Parking areas will need to be provided for staff and visitor vehicles, as well as for trucks from the County's solid waste management fleet (noting that curbside collection vehicles will not be housed at this facility but will return to the collection contractor's facility for fueling). These areas may

incorporate additional features such as charging stations, and may also serve secondary functions such as providing areas for snow storage.

3.3 ERRC Footprint Sizing

The overall footprint of the ERRC must be large enough to accommodate each of the components noted in Section 3.1. Minimum size requirements for the overall Site as well as the ERRC footprint were determined by GHD during the siting phase of the project.

Based on previous experience and a review of similar facilities, the footprint required for the ERRC was determined to be 4.5 hectares (ha). Further details on how this area is distributed amongst the various components of the ERRC are presented in Section 3.4. For context, a footprint of 4.5 ha would represent a square measuring approximately 212 m on each side, and would cover approximately 5.5% of the overall 84 ha Site area. Maintaining a regularly shaped footprint (i.e., rectangular or square) for the overall ERRC will also allow for maximum flexibility during the design of each facility.

3.4 ERRC Footprint Siting

The evaluation criteria identified during the siting process were used to create a preliminary map of the Site identifying potential constraints such as source water protection areas, wetlands, and distance to sensitive receptors. Based on this mapping, an elevated area of the Site to the northwest of the mid-point was identified as having relatively few constraints, representing the best potential location for the development of the ERRC.

A number of field investigations were carried out at the Site starting in April 2016 in order to confirm Site conditions and to provide guidance on the siting of the ERRC footprint. Key studies included: a scoped environmental impact study, a hazard land assessment, a hydrogeological study, an agricultural impact assessment, and archaeological investigations. Based on these studies and a review of additional information, the following constraints were used to determine the optimal location for the ERRC footprint:

- Wetlands were identified in the northeast area of the Site. The Ontario Wetland Evaluation System (OWES) identifies the significance of wetlands (regionally significant or provincially significant) as well as minimum setback distances. In determining the location of the footprint, the wetlands on-Site have been considered as if they were provincially significant (although they remain *unevaluated* according to the Ministry of Natural Resources and Forestry), and a minimum setback distance of 120 m was applied to the ERRC footprint. This is the standard setback distance considered protective of provincially significant wetlands.
- Previously disturbed areas of the Site (i.e., access road, trail) were encompassed within the ERRC footprint to minimize potential impacts.
- An archaeologically significant area was identified on the Site. Investigations were carried out to map its extents, and a minimum setback distance of 10 m was applied surrounding the area. Protection of this area in-situ and relocation of the footprint was considered to be preferred over excavation.

- A minimum separation distance of 100 m was maintained between the ERRC footprint and all property lines, and the maximum separation distance possible was maintained from sensitive receptors. Maintaining a buffer to separate the facility from sensitive receptors is used in combination with good design and operational practices to mitigate impacts such as odour and noise.
- Topography was sought that would minimize the amount of grading required and maximize the usage of existing slopes for drainage and operations.

The setbacks noted above were used as minimum guidelines only. Setbacks were increased between the ERRC footprint and identified constraints wherever possible.

Based on the application of these setbacks to the originally proposed area, the footprint for the ERRC was shifted approximately 100 m towards the southeast, remaining just to the northwest of the Site mid-point.

3.5 Proposed ERRC Layout

A conceptual layout of how the various facilities will be situated within the ERRC footprint is presented in Figure 3.1. The rationale behind the layout of each component is discussed below.

These details are provided for context at the overall Site level; it is important to note that the design of each facility will be refined in the future following additional Site investigations and further stakeholder consultation.

3.5.1 Site Access

The main access to the ERRC will be from Horseshoe Valley Road West in the south. The access road will have two lanes approximately 3.5 m wide with 1 m shoulders. An additional turning lane approximately 3.2 m wide will be provided for trucks leaving the Site and turning onto Horseshoe Valley Road.

The access road will follow the general alignment of the existing trail through the Site to minimize additional disturbance. A total clearing width of approximately 15-20 m will be established from the facility footprint to Horseshoe Valley Road to accommodate the access road, drainage ditch, and utility corridor that will run along the west side of the road. Approximately 1.5 ha will be required for these components, which includes approximately 0.5 ha occupied by the existing trail. Trees will be maintained on both sides of the access road.

The entrance to the Site jogs toward the east immediately north of Horseshoe Valley Road West in order to improve sightlines for turning vehicles and increase visibility of the entrance. This jog will also prevent a direct line of sight into the Site for passing motorists on Horseshoe Valley Road West. Additional recommendations surrounding the Site entrance are provided in the Traffic Impact Study prepared by MMM Group.

An emergency access route will also be established along the alignment of the existing trail to Rainbow Valley Road East in the north.

The ERRC footprint will be fully enclosed with a chain link fence, with gates allowing entry from both the south and north access points. Additional gates will also be established closer to the Site boundary with Horseshoe Valley Road West in the south and Rainbow Valley Road East in the north.

3.5.2 Traffic Flow

The flow of traffic within the ERRC footprint is a key design consideration as it will determine, in part, how the facilities operate. Traffic flow will generally be one-way in a counter-clockwise direction. This is considered to be the safest approach for large trucks since it maximizes visibility for the drivers and eliminates oncoming traffic.

The backing-up of trucks will also be eliminated wherever possible. Drive through operations where vehicles are always traveling in a forward direction will be incorporated wherever feasible. Traffic flow for staff and visitor vehicles will be kept separate from truck traffic wherever possible.

Traffic flow has been determined at the overall Site level, and will be refined at the facility level during the detailed design stage.

3.5.3 Scale Area

The scale area will be situated along the eastern edge of the ERRC footprint, in line with the proposed access road. An area of approximately 0.1 ha has been reserved for the scale area, which will include parallel scale decks and by-pass lanes. The scales will be monitored remotely so there is no need for a building to house an attendant.

3.5.4 Stormwater Management Facility

The stormwater management facility will be located along the east side of the ERRC footprint in an existing low area. The current topography generally slopes from west to east, which will minimize the amount of changes required to the existing grading to maintain surface flow to the stormwater management facility.

An area of approximately 0.6 ha has been reserved for the stormwater management facility, which will include a vegetated filter strip, enhanced vegetated swale, and stormwater management pond. An overflow drainage ditch approximately 5 m in width will run along the west side of the access road, discharging to the existing ditch on the north side of Horseshoe Valley Road West.

3.5.5 MMF

The MMF will be situated in the southwest corner of the ERRC footprint. The existing topography in this area supports a multi-level facility, with the grade dropping at least 3 m form west to east. A multi-level facility will have the receiving area on the top floor with the transfer area below. This will improve facility operations as it permits the top-loading materials into transfer vehicles and separates the different traffic streams. A series of bays with roll-up doors will be situated along the west side of the facility, allowing curbside vehicles to drop off their materials on the tipping floor inside the building.

An area of approximately 0.4 ha has been reserved for the MMF, which will include the transfer station as well as the truck servicing facility, and will accommodate projected material tonnages at the 30 year design capacity. An additional area of approximately 0.4 ha has been reserved for the potential future MRF, adjacent to the MMF in the northwest corner of the ERRC footprint. The MRF may share common elements with the MMF such as the tipping floor, so the layout of the MRF should be developed in conjunction with the MMF.

3.5.6 OPF

The OPF will be situated in the middle of the ERRC footprint. An area of approximately 1.0 ha has been reserved for the OPF, although the actual footprint requirements may vary depending on technology selection. The land within the OPF footprint will be graded flat, creating a large open area that provides design flexibility to accommodate a wide range of different technologies. A 1.0 ha parcel, based on other OPFs in Ontario operating at the scale envisioned for the County, should accommodate a range of aerobic and anaerobic digestion technologies.

3.5.7 Administrative Facility

The administrative facility will occupy an area of approximately 0.1 ha over several storeys. The administrative facility will serve as a hub for MMF and OPF operations, so the proposed footprint has been shown adjacent to both. This will provide easy access to common elements such as change rooms and lunchrooms, and will permit the integration of other design elements such as viewing areas into both facilities.

3.5.8 Parking Areas

An area of approximately 0.2 ha has been reserved for parking along the south side of the ERRC footprint. Parking for both staff vehicles and facility vehicles may be provided within this area. Additional parking areas will also be established during the design of each facility once a more detailed layout of the ERRC footprint has been established.

4. Functional Servicing

4.1 Purpose

A Functional Servicing Study identifies the services required to support development (i.e., water, sewer, electric power, natural gas, communications, etc.), and compares that against available public or other available services at or near to the proposed development. Where there is unavailability of a required service, the Functional Servicing Study identifies how the provision of that service will be made.

4.2 Required Services

The highest priorities for a facility of this nature are health & safety for workers and visitors, property protection (fire risk), and ongoing/general operations. To fulfill these priorities, fire protection water supply, domestic potable water supply, domestic wastewater disposal, electric power, and off-site

communication are required services that need to be provided. To support efficient facility operations, process water supply, process wastewater disposal and stormwater management are beneficial services that should be provided.

4.3 Adjacent / Nearby Services

Adjacent to the site, along Horseshoe Valley Road, there is overhead 3-phase electric power service; there is also overhead and buried telephone cable servicing, and buried natural gas service. East of the site there are a series of three overhead high voltage transmission lines, part of the Provincial Grid system; it is likely not an available resource for connectivity, as these lines typically provide city/township/community level service, not lot/site/local level service. Being fairly remote from municipally serviced communities, there is no public water or public sewer services adjacent to or nearby the proposed site (nearby residential homes and businesses are reported to be on well water and septic sewage systems).

4.4 Provision of Services

4.4.1 Fire Protection

4.4.1.1 Approach

There are two basic approaches to be addressed with fire protection: protect life and minimize property losses. Both of these metrics are addressed by how a facility is constructed (e.g., layout planning, selection of construction materials, provision of protective measures such as sprinklers and/or standpipe hoses and smoke monitoring) and by day-to-day operations which establish a culture of operations and maintenance that is protective of the workers, visitors, equipment, facilities, and the site surroundings as a whole.

4.4.1.2 Planning

Key to the effectiveness of any fire protection measures for the ERRC is comprehensive planning during the early stages of the project. This will include development of various fire protection plans for the facility, careful consideration of how the facility is designed, and the implementation of operational and maintenance procedures.

In order to discuss the proposed ERRC and gain insight on fire related concerns associated with these types of facilities, the County held a preliminary meeting with the Director of Fire & Emergency Services/Fire Chief and Deputy Fire Chief from the Township of Springwater Fire and Emergency Services (SFES) on June 22, 2017. The County will continue to engage SFES during the planning, design, and operational stages of the project to provide opportunities for input and ensure that feedback is adequately addressed. This will ensure that SFES is familiar with the site layout, facility operations, and emergency response procedures.

A Fire Prevention Plan (FPP) will be prepared for the ERRC, outlining guidelines and procedures for items such as material management, staff responsibilities, fire safety training requirements, and maintenance of fire equipment and systems. The FPP will be prepared with input from SFES, and

will be developed in consideration of a site hazard assessment and relevant documents such as the Ontario FireSmart Manual.

In addition, an Emergency Response Plan (ERP) for the ERRC will be developed in consideration of applicable municipal and provincial standards such as the Fire Protection and Prevention Act, the Township of Springwater Master Fire Plan, the Township of Springwater Emergency Response Plan, and the Occupational Health and Safety Act (OHSA). At a minimum, the ERP will address the following situations:

- Fire.
- Power failure.
- Chemical spill.
- Weather conditions.

4.4.1.3 Layout and Construction

The layout and construction of the ERRC will be developed in accordance with the requirements of the Ontario Building Code (OBC) and the Ontario Fire Code (OFC). Wherever possible, the facility will be constructed using non-combustible building materials and will incorporate a fire protection system.

The layout of the facility will also be developed in consideration of the following:

- Segregation of materials that represent a higher fire risk.
- Maximum dimensions of material piles.
- Separation between material piles.
- Separation between buildings and forested lands.
- Maintaining clear access around the Site.
- Security including fencing and access gates.
- Emergency access and escape route planning, including providing keys/access codes to SFES.
- Provision of fire flow water.
- Contingency plans for fire flow runoff to the on-Site stormwater management system.

Complete design requirements related to the fire protection system will be outlined in the ECA for the ERRC.

4.4.1.4 Operations

With respect to facility operations, the County will implement best management practices for fire control and suppression, which will include the following:

- Operating procedures for material management.
- Operation of fire protection equipment such as fire extinguishers and hoses.
- Staff training and certification programs, including annual coordinated training with SFES.

- Rehearsal of emergency response and fire control procedures.
- Communication protocols between facility operating staff, management, and SFES.
- Routine fire inspections to be carried out by facility staff and SFES.
- Regular cleaning of filters and equipment which accumulate dust (overheated dust or overheated equipment normally cooled through dust filters is a significant source of equipment-origin fires).
- Maintenance of access roads (including emergency access road) especially in winter.
- Maintenance of forested lands around the facility in order to minimize slash (i.e., debris resulting from such natural events as wind or snow breakage; or such human activities as logging, pruning, thinning, or brush cutting. Slash includes logs, chunks, bark, branches, stumps, and broken understory trees or brush). Management of the Site beyond the ERRC footprint will continue to be carried out by the County Forestry Department.

The County will also be prepared to include additional mitigating measures such as heat/smoke detection systems, 24 hour automated monitoring systems, and remote alarms should they be required following a detailed risk assessment during the development of the detailed design.

Complete operating requirements related to the fire protection system will be outlined in the ECA for the ERRC.

4.4.1.5 Fire Protection System

The design of the fire protection system is directly tied to the type of operations being conducted, how those operations are or could be carried out, and the style of construction implemented for the facility. As this facility will not have a municipally sourced water distribution system, additional assessment is required to make provisions for onsite storage and supply of the required water quantity.

An active protection system provides the best means of defense; a fire protection water system is pressurized and the water is ready to be delivered to point of need when required, automatically and without user intervention – this is the most common form of protection for larger multi-unit residential, institutional, commercial and industrial (ICI) facilities, typically offered by sprinklers. A passive protection system requires confirmation and/or active intervention by one or more persons, such as standpipe fire hose systems, or pumper-truck fire hose systems – this is the form of protection most common in un-sprinklered facilities, such as most single family residential homes, lower-risk ICI facilities, and many rural structures (farm buildings, etc.).

For the proposed facility, the materials being collected, segregated, and stored, are generally deemed to be a “higher risk”, due to the potential combustible energy content in the materials being processed (paper/fibre, organics, plastics, etc.). The OBC establishes minimum requirements based on the industrial occupancy categorization, combustible content, and process activity, and will be adhered to in terms of building code classification and the required fire protection measure. This could range from a standpipe system through to a full sprinkler system for the facility.

Most facilities of this nature are classified as a medium hazard industrial occupancy (OBC Group F, Division 2), having a combustible content of more than 50 kg/m² or 1,200 MJ/m² floor area; some facilities may have operations that elevate classification to a high hazard industrial occupancy (Group F, Division 1), if containing sufficient quantities of highly combustible and flammable or explosive materials to constitute a special fire hazard (indoor storage of large quantities of paper/wood fibre and/or plastics). This determination will be made through the design process and in full accordance with the OBC.

An active sprinkler system with monitoring is recommended for the MMF, OPF, and potential MRF due to the stockpiling of potentially combustible materials and the risk of fire from both internal self-ignition and external ignition sources. An active sprinkler system is also recommended for the Administrative Facility in order to protect ERRC staff.

4.4.1.6 Fire Protection Water Supply Rate & Volume

As noted above, the specific determination of fire protection water quantity required is directly tied to the type of operations being conducted, how those operations are or could be carried-out, and the style of construction implemented for the facility. Most facilities comparable to that proposed for this site have an active water sprinkler system, sized and zoned by type of area being protected, supplied under pressure from a source containing a sufficient volume of water to provide a design target flow rate for a specified duration, resulting in a determinable supply volume.

The specific design criteria to be applied will vary based on material types and quantities stored, and how high they are piled; however, most facilities will be adequately protected with a zoned system that can provide up to 3,785 litres per minute or 1,000 US gallons per minute (gpm) for 3 hours, or roughly 700 m^3 available water volume. This is a typical maximum value used for facilities of this nature, and may be decreased if risk can be reduced through design and operations. However, some facilities may also require larger flow rates and storage volumes based on assessed risks. Specific analysis and planning for fire protection needs to be carefully considered during detailed design.

Some organics processing technologies may require higher sprinkler coverage rates, while others could require minimal fire protection (wet-processing or digestion in tanks or other enclosed vessels). Fire suppression systems are commonly provided for both OPFs and MMFs and determination of the specific requirements will be made depending on the selected technology in order to fully comply with the OBC.

4.4.1.7 Provision of Fire Protection Water

For the proposed development, onsite storage of water and onsite pumping-pressurization of water from the storage location is recommended. The storage location could be a specifically constructed storage tank (steel or concrete, elevated or buried), or it could be in the form of a dedicated pond, or combined with a stormwater management facility (extra permanent pool depth). As a stormwater management pond is already contemplated for the design, this is a likely source of water.

Supply of water to fill the storage reservoir can be from collected rainwater runoff, from an externally supplied source (pumped/trucked from a pond, lake, or municipal system), or from an onsite well if developed supply volume (rate) is sufficient.

It is further recommended that the determined volume of water is stored and ready to use (24 hrs/ 365 days), and that the pumping facility to deliver the water is automated and provided with back-up emergency power (i.e., reservoir with directly-connected pump suction intake connected to a sprinkler header). As discussed in Section 5.5.3, the provision of fire protection water has been accounted for in the proposed stormwater management pond, although this may also be accomplished through a dedicated reservoir below grade following detailed design. Either system would need to demonstrate reliability in maintaining a minimum supply volume. A supplemental or backup provision for fire protection such as a dry-hydrant connection to the on-Site storage system should also be incorporated into the detailed design.

Reference to Fire Underwriters Survey (FUS) guidelines and to their publication “Alternative Water Supplies for Public Fire Protection” is recommended for detailed design, together with reference to National Fire Protection Association (NFPA) document-1142 “Standard on Water Supplies for Suburban and Rural Fire Fighting”, current edition 2017 (previous edition 2012, and previously NFPA-1231/’93), and to the most current version of the OBC and the OFC.

4.4.2 Domestic Potable Water Supply

For hygiene purposes and general washing up (toilets, hands, showers, dishes, floors, etc.), it is recommended that a source of potable water be provided. This could be from an onsite well, or via trucked-in options into a purpose-dedicated storage tank.

It is expected that the proposed facility will employ between 10 to 20 staff on a regular basis, and depending on the extent of the proposed facility and/or school or other educational tours, could see up to 50 additional people for short-term domestic water demands. Utilizing a design flowrate of 125 litres per employee per day and 30 litres per tour-visitor per day (both from OBC, Table 8.2.1.3.B – ranges typically considered can vary from a low of 20 up to 300 litres per person per day, and in some cases could be as high as 450 depending on a variety of factors), a load of 20 staff yields an estimated demand of 2.5 m^3/day, with potential for an additional 1.5 to 3.0 m^3/day for short-term tour groups.

For facilities utilizing bulk stored chemicals (e.g., for odour treatment), the provision of emergency eyewash fountains, facewash stations, or full-body showers is recommended (and in some cases required); the best systems provide tempered potable water for irritant flushing. The requirements for these provisions vary between jurisdictions, and in many cases do not exist, so the common go-to reference in the absence of local guidance is American National Standards Institute (ANSI) Standard Z358.1 "Emergency Eyewash and Shower Equipment", or reference can also be made to Canadian Centre for Occupational Health and Safety guidance documents. Eyewash fountain demands typically begin at about 1.5 litres per minute (0.4 US gpm), and full-body showers can range up to 76 litres per minute (20 US gpm), for durations of typically 15 minutes, and in some cases up to 60 minutes may be recommended (i.e., certain corrosive or penetrating chemicals). This can add an emergency demand from 1.2 to 3.5 m^3 per event for potable water.

From a supply perspective, the provision for minimum 3.0 and possibly up to 10 m^3 per day is an average demand on a supply source of up to 6.9 litres per minute (1.8 US gpm), but peaked into an 8 hour work period can translate into a delivery rate of around three times this flow rate (i.e., “max-day” rate), and peaked again into a smaller demand period of say 2 hours, can further

peak the delivery rate to as much as twelve times the daily average demand rate (i.e., “peak-hour” rate).

The design of a potable water supply and distribution system should consider realistic “max-day” and “peak-hour” conditions, and provide a certain amount of stored water in addition to the refill/supply rate. The expected daily demand volumes are not excessive and should be easy to provide. The provision of water from a drilled well is a fairly common system (this is what is done on the adjacent residential and farm properties), and can be readily implemented for the ERRC. Alternatively, potable water can also be provided from an on-Site storage tank.

While not expected from a potable water consumption perspective, it should also be noted that if the water requirement exceeds 50,000 litres per day (greater than 50 m^3 per day), then a Category 3 Permit to Take Water for long-term water takings will be required for the facility.

4.4.3 Domestic Wastewater Disposal

The volume that gets supplied by the domestic potable water supply side is usually directed to domestic sanitary service, so a system capable of managing at least 3.0 m^3 per day, and possibly up to 10 m^3 per day (varies with services provided for) should be considered – a more precise sizing is warranted once final facility details are determined (i.e., confirmed staff numbers, provision of tour-group services, etc.).

Collection and disposal of domestic wastewater could be done by pump-and-haul methods, but is generally not preferred due to a number of reasons, and may be limited or restricted in some jurisdictions.

Disposal of domestic wastewater is commonly done with septic tanks, distribution tiles, and shallow buried trenches or dispersal beds. Where soil conditions are suitable, buried systems can be implemented, and where soil conditions may be marginal (tight silts/clays, or where elevated groundwater conditions exist), then raised-bed systems can be considered.

The disposal of domestic wastewater with a septic system is a fairly common practice (this is what is done on the adjacent residential and farm properties), and could likely be implemented for the ERRC once proper sizing is determined and additional geotechnical investigations are undertaken.

4.4.4 Electric Power Supply

There are a few circuits of 3-phase power already in place along Horseshoe Valley Road West that service adjacent properties. The demand load required by the ERRC is not expected to be in excess of 1,500 kVA, and should be readily serviced from existing power lines adjacent to the site.

If it is determined that power demand in excess of available capacity is required, then additional capacity may need to be extended from an available source; there are additional power circuits located along County Road 27 to the west, and also along County Road 93 to the east (Penetanguishene Road).

4.4.5 Off-Site Communications

Telephone communication cables are already in place along Horseshoe Valley Road West, although it is unclear if these are local service lines or regional feeder lines. Given that adjacent properties appear to be serviced by these lines, it is assumed that the ERRC can also be serviced by these lines provided that there is adequate capacity adjacent to the Site. If limitations are identified during the detailed design stage, alternate arrangements can be made through the establishment of cellular services.

With respect to internet service (i.e., for remote system monitoring), provisions through existing telephone lines or service via cellular connection or broadband can be established. Given the typical demands for facilities of this nature, it is not expected that high-capacity fibre-optic services will be required. However, if available, it is recommended that broadband connection through high-speed fibre optic be established in order to account for potential advancements in technology requirements. If connection to a nearby fibre optic network is not available, then direct microwave connectivity to a remote base/tower may be required.

4.4.6 Process Water Supply

Most organic waste processing facilities do not require excess amounts of supplemental water to be added to the process, especially those focused on bulking and re-shipping. For the processing of organic materials, some processes may require the addition of supplemental process water, while others extract water from the incoming feedstock that can be recycled back into the process.

For those processes that do require supplemental water (i.e., no specific processing technology has been pre-selected at this stage), the required volume of added water can typically be provided from internal wash water processes, fed from storm runoff capture or from liquids extracted from the incoming feedstock. Where excess water requirements do exist (to be determined by process-technology provider), these needs will be met through the provision of internal process water recycling, supplemental rainwater collection and use, through supplemental well-water supply, or other means (i.e., trucked-in clear water).

It is not expected that the supply of supplemental process water will be required, and if so, that the volumes required will be manageable from onsite or imported resources.

4.4.7 Process Wastewater Disposal

Each organics processing technology has different output waste streams, and one of these is usually process wastewater. Incoming feedstock characteristics (i.e., source, condition, and makeup) and how it is processed are very large determinants on how much liquid comes out from the process – at times there might be none, and at other times there can be excess volumes.

Most facilities processing organics have a waste liquid residue that needs to be disposed of, that can range from being a “weak-wastewater” through to a “strong-wastewater” (in excess of typical sewage discharge bylaw limits); and there are some instances where the wastewater stream can be directly utilized, or processed, to become a beneficial use product, such as a liquid fertilizer.

The selected processing technology will need to assess (the lack of) municipal sewage disposal, and make provisions for management of any excess volumes. Subsurface (septic-style) disposal of process wastewater is not an acceptable option and will not be permitted; surface disposal direct to the environment is also not a viable option as it would need to meet MOECC disposal requirements, which will likely involve advanced treatment processes – since there is no nearby receiving water body to assimilate the discharge, it is likely that this option will not be considered. Use of liquid discharges as part of the final fertilizer product or on an export basis (trucking to a pump station) are the main possible outlets for these liquids, if they are generated by the technology.

4.4.8 Other Servicing

In support of the proposed development, there will be a number of other “services” required, such as construction erosion controls, pole lines, parking spaces, on-Site walkways, lighting, snow storage, landscaping, etc. Each of these is typically addressed at the design stage, being incorporated into Site Plan drawings and detailed facility construction drawings, and are not further elaborated on herein.

4.5 Summary

There are no site services required for the proposed development that cannot be provided for through traditional means; the proposed ERRC can be suitably serviced in all respects, provided that appropriate design parameters are implemented, and that utilization demands fall within the design criteria.

5. Stormwater

5.1 ECA Application Process

An Environmental Compliance Approval (ECA) for Sewage Works will be required by the Ministry of Environment and Climate Change (MOECC) for stormwater discharge from the Site under Section 53 of the Ontario Water Resources Act (OWRA), R.S.O. 1990. Section 53 covers industrial sewage works "for the collection, transmission, treatment or disposal of wastewater generated from industrial activities, including works to handle stormwater runoff”.

The proposed impervious surfaces within the ERRC footprint will produce peak flow discharge rates and runoff volumes higher than those produced by the pre-development conditions. It is assumed that additional water quality treatment will be required to address possible increases in total suspended solids (TSS) and oil/grease in the surface runoff. The design and operation of these measures will be detailed in the ECA.

The ECA permit application package for Sewage Works will be prepared during the detailed design of the stormwater management system, and will consist of a signed, stamped copy of a Stormwater Management Plan report, with any applicable drawings and supporting calculations. The design will need to achieve an enhanced level of water quality treatment and demonstrate that water discharged from the Site will not degrade downstream creek health. The design will also need to demonstrate that drainage patterns are maintained for the wetland area in the northeast portion of

the Site in order to provide similar hydrologic contributions to this feature. MOECC approval of the ECA will need to be in place prior to construction of any components of the stormwater management facility.

5.2 Regulatory Overview

Guidelines and requirements of the local municipality (Springwater Township), regional/county government (County of Simcoe), and those of the local conservation authority (NVCA), and any provincial or federal requirements will be implemented. In short, post-development conditions will not exceed pre-development conditions for peak discharge flow rate, and provisions for erosion control and discharge water quality management will be implemented to ensure that any impacts to the environment as a result of the proposed development will be mitigated (reduced or eliminated). It is noted that parts of the Site are classified as NVCA regulated areas, and may necessitate NVCA permitting approval for the proposed stormwater management facility.

5.3 Drainage Conditions

Existing drainage conditions at the Site involve surface runoff generally flowing from west to east. Within the proposed ERRC footprint, the northern portion currently flows towards a wetland area in the northeast, while the southern portion flows towards the southeast. Two tributaries of Matheson Creek are mapped on the Site, as identified by the Natural Heritage Information Center (NHIC) and NVCA mapping resources. One watercourse originates at the wetland area near the northeast corner of the Site, and the second watercourse crosses the southern portion of the Site.

The southern watercourse was found not to exist following multiple Site visits by GHD ecologists and NVCA staff. This was also confirmed by County staff who visited the Site during the 2016 spring freshet. There were also no signs of surface runoff from within the proposed ERRC footprint discharging off-Site as overland flow. Based on these observations, it is assumed that surface runoff generally infiltrates into the ground surface shortly after a rainfall event.

During post-development conditions, all runoff from within the footprint of the proposed ERRC will be contained within its limits and will need to meet quality and quantity objectives before being discharged via infiltration. It is expected that TSS and oil/grease will be the main concerns with respect to water quality.

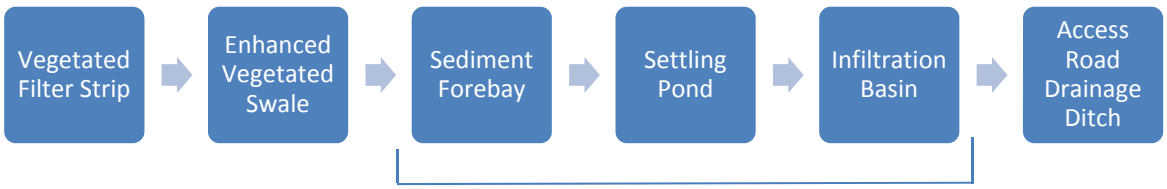
No runoff from within the ERRC footprint will discharge overland towards the wetland in the northeast portion of the Site. Existing drainage conditions beyond the ERRC footprint will be maintained, with the majority of rainfall absorbed by the land cover and infiltrating into the underlying soils. Additional consideration will be given to the wetland to ensure that surface drainage patterns beyond the ERRC footprint provide similar hydrologic contributions to this feature.

5.4 Proposed Stormwater Management Approach

The proposed stormwater management facility will mitigate the increase of surface runoff from the impervious areas, maintain existing water quality and quantity conditions, and address the water balance deficit. Given the presence of a wetland on the Site, hydrological conditions of the

downstream surface water features will be maintained and impacts to local habitat will be minimized.

To accommodate the proposed ERRC and address these requirements, GHD proposes the following 'treatment train' approach:



5.5 Proposed Stormwater Management Controls

5.5.1 Vegetated Filter Strips

Surface runoff will drain overland from impervious areas within the ERRC footprint towards the east and into vegetated filter strips. Vegetated filter strips are designed to capture sediment and hydrocarbons in the runoff. In general, they will remain unmaintained with shallow slopes approximately 3 to 5 metres in width.

5.5.2 Enhanced Vegetated Swale

Once through the vegetated filter strip, surface runoff will discharge into an enhanced vegetated swale to convey the runoff to the downstream stormwater management pond (SWMP). The enhanced vegetated swale will have a slope of 0.5%, and a minimum depth of 0.5 m with 3H:1V side slopes. Rock check dams will be spaced as required to further dissipate sediment within the surface runoff and encourage infiltration.

5.5.3 Stormwater Management Pond

The SWMP will be sized to capture, store, and infiltrate all rainfall events, up-to and including the 100-year storm event (excluding events greater than the 100-year storm event and large concurrent storm events). In addition, the SWMP will provide sufficient storage for fire protection water, as outlined in Section 4.4.1.

Since the underlying soil conditions consist of highly infiltrative soils (sand to sandy silt) and existing land conditions consist of a forested area, pre-development peak surface flows are assumed to be minimal. As such, it is recommended that all treated surface runoff from within the ERRC footprint also be infiltrated.

The SWMP will consist of the following three components:

- Sediment Forebay.
- Settling Pond.

- Infiltration Basin.

The stormwater management pond will be designed in accordance with MOECC guidelines. The runoff volume for the 100-year storm event was calculated based on the ERRC footprint and the interpolated rainfall depth from the Ministry of Transportation (MTO) Intensity/Duration/Frequency Curve Lookup website. Preliminary storage volume calculations for the SWMP in accordance with MOECC guidelines and requirements for fire protection water are provided in Appendix B.

5.5.3.1 Sediment Forebay

The sediment forebay will be designed to dissipate sediment and improve water quality. The sediment forebay will facilitate maintenance and improve pollutant removal by trapping larger particles near the inlet of the pond. The forebay will be designed to minimize the potential for re-suspension and to prevent the conveyance of re-suspended material to the pond outlet.

5.5.3.2 Settling Pond

The settling pond will provide storage for surface runoff from storms up-to and including the 100-year event. The settling pond will be able to provide 24 hours of detention for a 25 mm storm event.

The permanent pool within the settling pond and the sediment forebay will provide storage for fire protection water. As such, the bottom of the SWMP will be lined with a clay-based or geosynthetic liner to prevent infiltration and maintain adequate storage volume. The sizing of the permanent pool is such that the required storage volume for fire protection water accounts for sediment build-up and ice formation in the winter.

5.5.3.3 Infiltration Basin

An infiltration basin will be incorporated into the SWMP to allow for the slow discharge of runoff to replicate the slow contribution of groundwater to the adjacent watercourses. The infiltration basin will be designed and maintained per TRCA/CVC Guidelines for Low Impact development (TRCA, 2010). The infiltration basin will likely consist of clear stone bedding and underground storage/infiltration chambers.

It is assumed that sediment will be filtered through the treatment train prior to discharging to the infiltration basin, therefore it is expected that the storage/infiltration chambers will not be clogged by sediment and will require minimal maintenance until at least 10-20 years in operation. Given the sandy underlying soils, the infiltration basin is expected to provide sufficient dissipation time in the SWMP to accommodate storage for subsequent large rainfall events.

5.5.4 Access Road Drainage Ditch

Any overflow from the SWMP will discharge via a weir into a proposed drainage ditch along the west side of the access road, flowing towards the south and discharging into the existing drainage ditch along the north side of Horseshoe Valley Road West and ultimately to Matheson Creek.

The drainage ditch will convey overflow from the SWMP as well as any drainage from the access road. The proposed ditch will have a shallow slope (maximum 0.5% slope), and a minimum depth of

0.5 m with 3H:1V side slopes. The proposed ditch will also be heavily vegetated and fitted with rock check dams to further dissipate sediment in the surface runoff and encourage infiltration.

5.5.5 Other Potential Measures

Additional water quality measures may be required to address increased sediment from vehicular traffic or other contaminants from the materials on-Site. The need for additional measures will be assessed during the detailed design stage, and may vary based on the technology selection for the OPF. Additional measures may include the following:

- An oil/grit separator (OGS) upstream of the SWMP to provide additional sediment and oil removal.
- A membrane filtration system upstream of the SWMP to provide the removal of additional contaminants (e.g., phosphorus, metals, nitrogen) from the surface runoff.
- Aerators may be required within the settling pond section of the proposed SWMP for the treatment of additional contaminants (e.g., organic compounds, ammonia) in the surface runoff.

Additional measures may also be implemented as required in order to meet the water quality requirements developed as part of the ECA.

5.6 Erosion and Sediment Controls

The purpose of erosion and sediment controls (E&SC) is to minimize the potential release of pollutants, primarily sediments, directly or indirectly into downstream receiving waters during construction. Typical ESC measures include the following:

- Silt fencing around disturbed areas.
- Construction mud mat entrance.
- Rock check dams.
- Vegetated exposed areas.

ESC measures will be inspected, modified, and maintained as required during the construction period. Inspection logs will be utilized to document the condition of the installed measures and any requirements for modification or maintenance on a bi-weekly basis, and within 24 hours of any rainfall event of 25 mm or more. In the event that sediments migrate off-Site, additional ESC measures should be implemented as required and any sediment that has migrated off-Site shall be removed.

The ESC measures should be maintained until all construction is complete and vegetation has been established. The ESC measures may be removed once stabilized conditions have been reached and the Site is assessed by a qualified person.

5.7 Operations and Maintenance

GHD recommends that the following proposed measures should be performed to monitor and maintain the stormwater management system:

- The vegetated filter strip, check dams, and enhanced vegetated swales should be inspected to ensure no areas have signs of sediment accumulation or erosion. Any affected areas will be re-graded and re-vegetated as required.
- The SWMP should be checked regularly to ensure that excessive sediment build-up does not occur. The SWMP should be cleaned on an as-required basis or when sediment accumulation is on average over 100 mm in depth, to ensure that sediment accumulation does not decrease the available storage volume.
- An inspection pipe should be installed within the infiltration basin to monitor standing water in the chamber and the current infiltration rate. The infiltration basin should be maintained in accordance with MOECC requirements to ensure sufficient infiltration is achieved.
- The pond overflow weir should be inspected on a regular basis to assess its stability.
- The membrane filtration system or OGS unit if and when implemented should be operated and maintained per the manufacturer's specifications.
- The access road drainage ditch should be inspected to ensure no areas have signs of sediment accumulation or erosion. Any affected areas should be re-graded and re-vegetated as required.

6. Noise

6.1 ECA Application Process

In accordance with Section 9 of the Environmental Protection Act (EPA), all sources of emissions of air & noise contaminants to the atmosphere must be regulated through an ECA issued by the MOECC. The emissions from all sources must meet their applicable air & noise quality criteria under the EPA, R.S.O. 1990.

Based on the preparation of the conceptual Site plan, GHD has determined that the proposed ERRC will have the sources of noise detailed in Section 6.4 and will therefore require that an ECA application be submitted demonstrating compliance with the applicable noise criteria before the ERRC is constructed. Given that this is a preliminary evaluation of compliance with the applicable MOECC noise criteria, a subsequent noise assessment will need to be undertaken once the finalized design for the MMF has been prepared, and again when the finalized design for the OPF has been determined.

6.2 Regulatory Overview

The MOECC regulates noise emissions in Ontario and has issued Guideline NPC-300, "Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning", which sets out limits for sound levels due to stationary sources (including on-site movement of trucks and trailers). Limits are assessed at points-of-reception (PORs), which include

noise-sensitive land uses such as dwellings, educational facilities, day nurseries, hospitals, health care facilities, community centres, certain places of worship, and detention centres. These limits vary depending on the character of the area that surrounds the POR. All facilities applying for an ECA must demonstrate that they will meet the limits set out in NPC-300. Noise emissions will also comply with all municipal noise by-laws including Springwater by-law 2012-015.

The Site and surrounding PORs are located in a Class 3 area, which is defined in NPC-300 as a rural area with an acoustical environment that is dominated by natural sounds, having little or no road traffic.

Table 6.1 identifies the minimum sound level limits associated with Class 3 Areas, expressed as a 1-hour Leq (equivalent sound level) that can be applied to assess the sound levels emitted by the on-Site noise sources.

The applicable noise criteria at the PORs are based on the higher of the background sound level and the MOECC's minimum sound level limits. The MOECC Class 3 minimum limits were used for this assessment to be conservative. Given the volume of road traffic on Horseshoe Valley Road West to the south, completion of a background noise assessment in the future could justify higher ERRC-specific limits.

6.3 Methodology

The worst case assessment of steady state noise sources at the selected PORs was based on equipment manufacturer specifications and data from GHD’s extensive sound level library. GHD identified comparable and representative noise sources typically found at ERRC facilities based on previous noise impact studies conducted at similar facilities in order to conservatively evaluate the potential noise impact from significant sources of noise (i.e., large fans, blowers, traffic). All significant sources of noise at typical MMF and OPF facilities identified in Table 6.2 were considered for this evaluation.

Cadna A Acoustical Modelling Software (Cadna A), version 4.6, was used to model the potential impacts of the significant noise sources. Cadna A calculates sound level emissions based on the ISO 9613 2 standard "Acoustics – Attenuation of Sound during Propagation Outdoors".

6.4 Assumptions

GHD has prepared a conceptual site plan based on a preliminary concept and experience with other ERRC facilities. The layout, noise source identification and building tier heights are presented in Figure 6.1.

Noise sources included in the model were representative of all on-site equipment expected to produce a significant noise impact. Noise from trucks is expected to be the most significant contributor to noise emissions from the ERRC.

While specific operating hours will be outlined in the ECA, it is anticipated that the ERRC will generally operate six days per week (Monday through Saturday) from 6:00 a.m. to 7:00 p.m. Collection vehicles will utilize the MMF Monday through Friday and offload when routes are completed (currently averaging between 2:00 p.m. and 6:00 p.m.). County-owned trucks, managing

divertible material collected at drop-off facilities, will leave the facility around 6:30 a.m. and generally return by 4:30 p.m. Garbage and recycling will be sent outbound for processing during working hours Monday through Saturday.

A worst-case scenario reflecting truck volumes projected to the year 2049 was modeled for noise emissions. Peak hourly inbound and outbound truck volumes were based on information provided by the County and verified by GHD. Peak daytime (7:00 a.m. to 7:00 p.m.) hour volumes in the year 2049 reflect 61 inbound trucks and 62 outbound trucks, for a total of 123 trucks.

The peak AM outbound volume of 41 trucks in the year 2049 was also considered to account for trucks leaving the Site between 6:30 a.m. and 7:00 a.m. This is considered to be a conservative approach as it is very unlikely that the peak outbound traffic volume would occur during this time.

It is assumed that there will be no truck movements between 7:00 p.m. and 6:30 a.m.

Additional noise sources included in the model were as follows:

- Biofilter fan.
- Exhaust stack.
- Biogas combustion engines, intakes, and radiators.
- Comfort heating equipment.
- Backup flare.
- General ventilation exhausts.

A comprehensive list of sources and associated Sound Power Levels (SPL) is provided in Table 6.2.

The worst-case cumulative ERRC-wide un-attenuated sound levels estimated at the PORs included attenuation effects due to geometric divergence, atmospheric attenuation, barriers/berms, ground absorption and directivity.

Assumptions used in the Cadna A modelling included:

- ***Noise Sources***: All sources were modelled using the 1/1 octave band data from GHD's standard reference library.
- ***Reflection Order***: A maximum reflection order of 1.0 was used to evaluate indirect noise impact from one reflecting surface.
- ***Ground Absorption***: The model was set up with a ground absorption factor of 1.0 because the ERRC is surrounded predominately by forest. A ground absorption factor of 0.25 was used for the hard surfaces within the ERRC footprint.
- ***Foliage***: Forested areas were modelled with an average height of 8.5 meters. This value is considered to be conservative as most on-Site tree species are expected to reach heights of 20-25 m.
- ***Receptor Elevation***: POR receptor heights were modelled to represent the worst-case elevation.

- ***Time-Weighted Adjustment***: Time-weighted adjustments for the proposed truck route were included in the model.
- ***Building Surfaces***: The buildings were modelled as reflective surfaces.

6.5 Results

The ERRC noise levels at the most-impacted existing POR, a residence located approximately 370 m southeast of the ERRC footprint, are 44.7 dBA during the day and 38.6 dBA during the night. A daytime noise contour plot for the worst-case hourly scenario projected to 2049 is presented in Figure 6.2. As expected, the primary contributor to noise impacts at the PORs is inbound and outbound truck traffic.

It should be noted that this is a preliminary noise assessment to determine if the impact at existing PORs surrounding the proposed ERRC would meet NPC-300 noise limits. The noise assessment will be revisited in more detail once the ERRC design has been finalized. GHD recommends that the equipment selected during the final design phase does not exceed the SPLs presented in Table 6.2, and that any additional equipment contributes less than 35 dBA at the worst-case POR in order to meet the MOECC noise limits.

6.6 Conclusions

The un-attenuated steady state sound levels estimated at the existing PORs are below the MOECC's minimum exclusionary sound level limits as applicable and as summarized in Section 6.2 and Table 6.3. This analysis demonstrates that the facilities, using typical noise levels, can comply with MOECC limits.

7. Odour

7.1 ECA Application Process

In accordance with Section 9 of the Environmental Protection Act, sources of air emission releases to the atmosphere must obtain an Environmental Compliance Approval (ECA). The emissions from all sources must meet their applicable air quality criteria under the Environmental Protection Act, R.S.O. 1990.

GHD understands that the proposed ERRC has the potential to emit odour and other air emissions. Odour from the MMF may result from the loading of organics and other odorous materials. Odour in the OPF may result from the receiving, handling, and processing (e.g., composting or anaerobic digestion) of organic materials. The ERRC will therefore require an ECA application that demonstrates compliance with applicable odour and other air emission criteria before it is constructed. Given that this is a preliminary evaluation of compliance with the applicable MOECC odour criteria, a subsequent air and odour assessment will be conducted in more detail once the finalized design has been prepared.

Based on the actual technology selected for the facility, as well as detailed equipment specifications, a more detailed air and odour assessment, called an Emission Summary and

Dispersion Modelling (ESDM) Report, will be completed as part of the future ECA application process. The ESDM Report will be undertaken following the completion of the detailed design for the MMF and the identification of all potential odour sources. Since the primary odour contributor is anticipated to be from the receiving, handling, and processing of organic materials, a subsequent ESDM will be carried out following the selection of the organics technology and the completion of the detailed design for the OPF. The ESDM reports will assess the ERRC's emissions and impacts in greater detail than this preliminary report.

7.2 Regulatory Overview

Air emissions in Ontario are regulated by Ontario Regulation 419/05 (O. Reg. 419/05) established under the Environmental Protection Act, 1990 (EPA). O. Reg. 419/05 sets point-of-impingement concentration limits for specific contaminants. Odorous substances typically have a standard with a 10-minute averaging time. Although there is no standard for odour impacts due to exposure to a mixture of unspecified odorous substances, the Ministry of the Environment and Climate Change (MOECC) has typically accepted an approach based on odour units (OU) in relation to adverse effects as defined in Section 14 of the EPA. The typical assessment guideline is 1 OU, which is defined as the concentration of odour that can be detected by 50% of the population.

According to the MOECC's technical bulletin, "Methodology for Modelling Assessments of Contaminants with 10-minute Average Standards and Guidelines under O. Reg. 419/05" dated April 2008, the MOECC accepts a tiered analysis process, with increasing levels of detail, to assess modelled odour compliance.

Modelling can be undertaken using models such as SCREEN3 or AERMOD over the entire modelling domain (typically a radius of 10 km around the facility). If this assessment shows that the 1 OU guideline is met at all locations within the modelling domain, no further assessment is necessary. However, if the guideline is not met at all locations, the concentrations at locations where activities regularly occur (sensitive receptors) are then examined.

Sensitive receptors for odour assessment include residences, health care facilities, senior citizen's residences, long-term care facilities, child care facilities, camping grounds, schools, community centres, day care centres, recreational centres, sports facilities, outdoor public recreational areas, and other locations as specified by MOECC.

If the guideline is met at all sensitive receptors, no further assessment is necessary. However, if the guideline is not met at all sensitive receptors, then a frequency analysis to determine the frequency of exceeding the guideline is performed. If the modelled number of exceedances is below 0.5% of the time on an annual basis, then the facility is deemed to meet the guideline.

This report uses a similar methodology to conduct a preliminary analysis to evaluate odour emissions and impacts. A full analysis will be performed as part of the ECA application process once the technology selection and design process is completed. As noted throughout this report, the facilities will not be operated until such time as the ECA is approved, demonstrating that environmental performance is in accordance with MOECC regulations.

7.3 Methodology

Dispersion modelling for the concentration of odour was performed using the United States Environmental Protection Agency (USEPA) multi source dispersion model AERMOD, as prescribed by O. Reg. 419/05. AERMOD is an advanced steady state plume model that has the ability to incorporate building cavity downwash, actual source parameters, emission rates, terrain and historical meteorological information to predict ground level concentrations (GLCs) at specified locations.

Odour-based dispersion modelling was performed for both a tiered receptor grid and discrete sensitive receptors, as described by O. Reg. 419/05, and the MOE technical bulletin entitled, "Methodology for Modelling Assessments with 10 Minute Average Standards and Guidelines under O. Reg. 419/05" dated April 2008.

As per the April 2008 technical bulletin, a series of modeling scenarios were performed to determine odour compliance, as described below:

- ***Step 1***: An air dispersion model, constructed as prescribed by O. Reg. 419/05, using a tiered receptor grid, is modelled for a 1 hour averaging period at ground level. All modelled results are then converted to a 10-minute averaging period. The removal of meteorological anomalies is allowed to determine the maximum compliance odour value. After this is done, if the odour based guideline of 1 odour unit (OU) is not exceeded at any modelled point, no further modelling is required. If the odour based guideline is exceeded, further modelling is required.
- ***Step 2:*** An air dispersion model, with discrete receptors located at all locations where human activities may occur, is modelled for a 1 hour averaging period. All modelled results are then converted to a 10-minute averaging period. After this is done, if the odour based guideline of 1 OU is not exceeded at any discrete receptor, no further modelling is required. If the odour based guideline is exceeded, further modelling is required.
- ***Step 3***: An air dispersion model, with a discrete receptor located where human activities may occur, is modelled for a 1 hour averaging period. All modelled results are then converted to a 10-minute averaging period. A frequency analysis by year, based on the 99.5th percentile, is then performed to determine the maximum compliance odour value. The 99.5th percentile is equivalent to removing the highest 44 modelled concentrations per year.

Additional details of the modelling scenarios, operating parameters, and model results are provided in Appendix C.

7.4 Assumptions

GHD has conducted an assessment based on a conceptual site plan and experience with other ERRC facilities, including operations similar to the MMF and OPF. Odour from the MMF may result from loading of organics and other odorous materials. Odour from the OPF may result from receiving, handling, and processing (e.g., composting or anaerobic digestion) of organic materials.

The assumed layout and building heights used in the modelling are shown in Figure 6.1. The estimated building heights are tall to allow for conservative modelling results, and do not necessarily

correspond to the building heights of the final facility; the actual facility configuration will be utilized to make an application to the MOECC for the final dispersion modeling that will support an ECA application and that will form the basis of the terms and conditions thereunder.

GHD has assumed that a biofilter will be used to control odour emissions from the ERRC. Exhaust parameters for the biofilter have been selected based on GHD experience at similar sites in Ontario that receive waste and process organic material, and are similar in size.

In the composting scenario, emissions from the biofilter are based on MOECC-approved source testing conducted at a tunnel composting facility in Ontario in 2015 to satisfy the requirements of an Environmental Compliance Approval. Feedstocks at the facility include municipal source-separated organics, leaf and yard waste, and industrial, commercial, and institutional organic waste.

In the evaluated composting option, the organics processing facility at the ERRC would not take in waste from waste collection programs that allow the use of plastic bags. This is consistent with the County of Simcoe's current waste diversion program.

In the anaerobic digestion scenario, emissions from the biofilter are based on MOECC-approved source testing conducted at an anaerobic digestion facility in Ontario in 2015 to satisfy the requirements of an Environmental Compliance Approval. Feedstocks at the facility include manure, municipal source-separated organics, fats, oils, greases, and industrial, commercial, and institutional organic waste.

GHD evaluated technology options by looking at two scenarios, as described below. Scenarios are undertaken to estimate the configuration of the final discharge points from the facilities and how they would operate with respect to the odour limits noted. Specific parameters for sources are discussed in Appendix C, the Air Quality Impact Assessment (AQIA) report.

1. Tunnel composting scenario. The biofilter stack is located at the centre of the ERRC, exhausts 20 meters above ground level and operates with a relatively high flow. This stack height provides sufficient dispersion while minimizing visual impact.
2. Anaerobic digestion scenario. The biofilter stack is located at the centre of the ERRC, exhausts 20 meters above ground level and operates with a relatively low flow. This stack height provides sufficient dispersion while minimizing visual impact.

7.5 Results

GHD modelled the different scenarios using AERMOD. The detailed results are shown in Table 4 of the AQIA report in Appendix C. In general, it is possible for the ERRC to operate within the odour guideline of 1 OU at all possible receptor locations.

The modelling performed did not identify any points off the ERRC property where discharges of odour would result in an exceedance of the 1 OU guideline.

7.6 Conclusions & Recommendations

The modelling results show that it is possible for the facilities to be located at the site to comply with the 1 OU guideline. However, meeting the guideline requires the ERRC to be carefully designed

and operated, and the implementation of an odour management plan. The MMF and OPF will need to be operated using best management practices, with care taken to reduce odour impacts. For example, the ERRC should keep bay doors closed when possible, and not allow unprocessed materials to be stored or handled outdoors.

Once a technology solution is selected for the OPF, this impact report can be refined to reflect a footprint and odour emissions associated with that particular technology and provide a more accurate assessment of odour impacts. However, the basic principles identified in this report should underpin the County's procurement process to establish environmental performance.

Odour modelling should be considered during the final design process when the air flows and building heights are known, and the stack location is determined. A refined, iterative modelling process can determine the required stack height and diameter to meet the odour guideline requirements.

Emissions from general exhaust and other untreated sources tend to have lower dispersion and result in disproportionately high ground-level concentrations at sensitive receptors. When possible, air should be treated in the biofilter and routed to the biofilter exhaust stack to aid dispersion and decrease ground-level concentrations at sensitive receptors.

All of Which is Respectfully Submitted,

GHD

Brian Dermody, P. Eng.

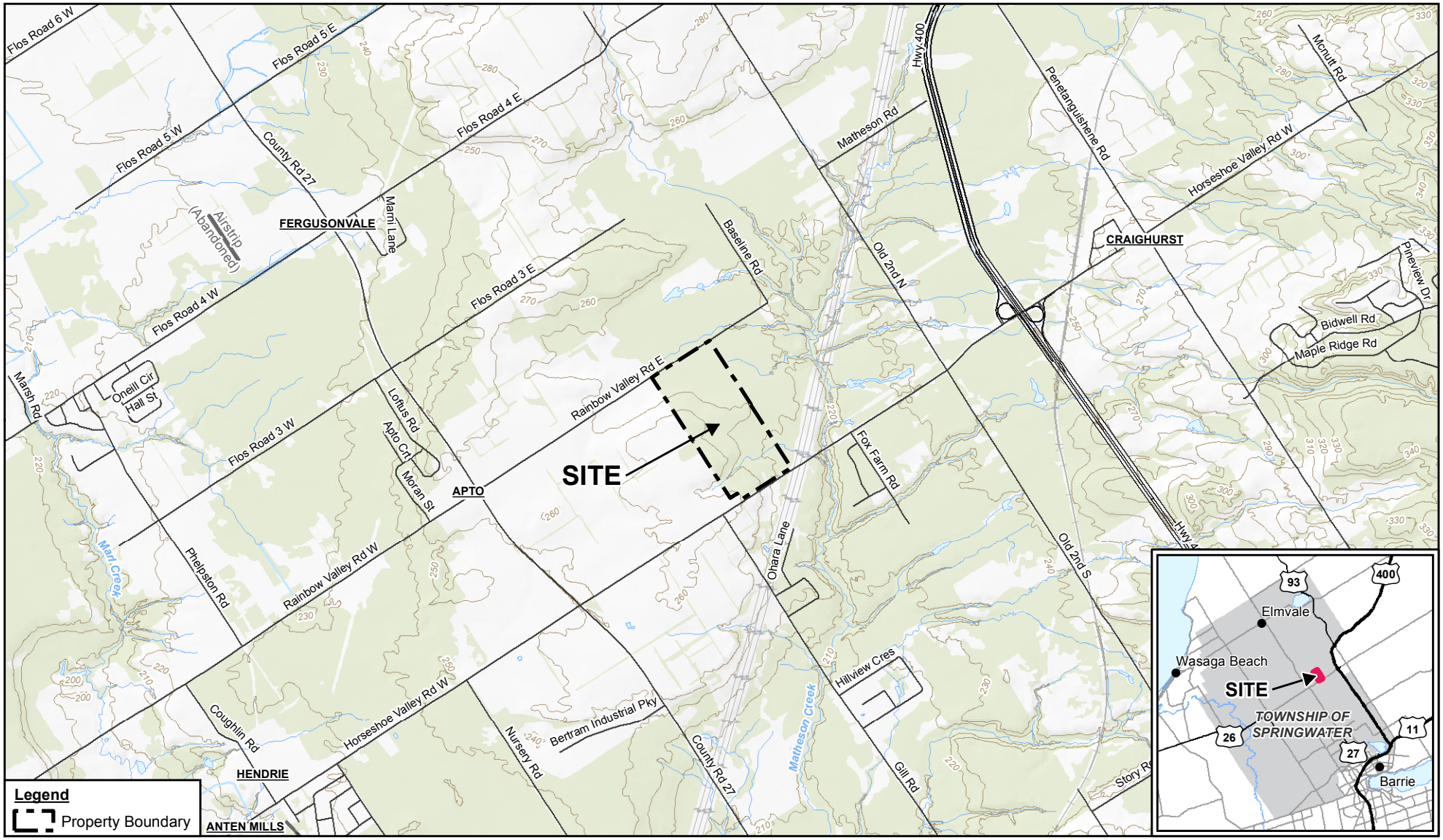
Ron Cherkewski, P. Eng.

Kosta Paliouras, P. Eng

Yuri Kopylovski, P. Eng.

Mike Masschaele, BES, LEL

Figures



Source: MNRF NRVIS, 2015. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2016;

0 500 1,000 1,500
Meters

Coordinate System:
NAD 1983 UTM Zone 17N

COUNTY OF SIMCOE
2976 HORSESHOE VALLEY ROAD WEST, SPRINGWATER
ENVIRONMENTAL RESOURCE RECOVERY CENTRE

86822
Nov 16, 2016

SITE LOCATION MAP

FIGURE 1.1

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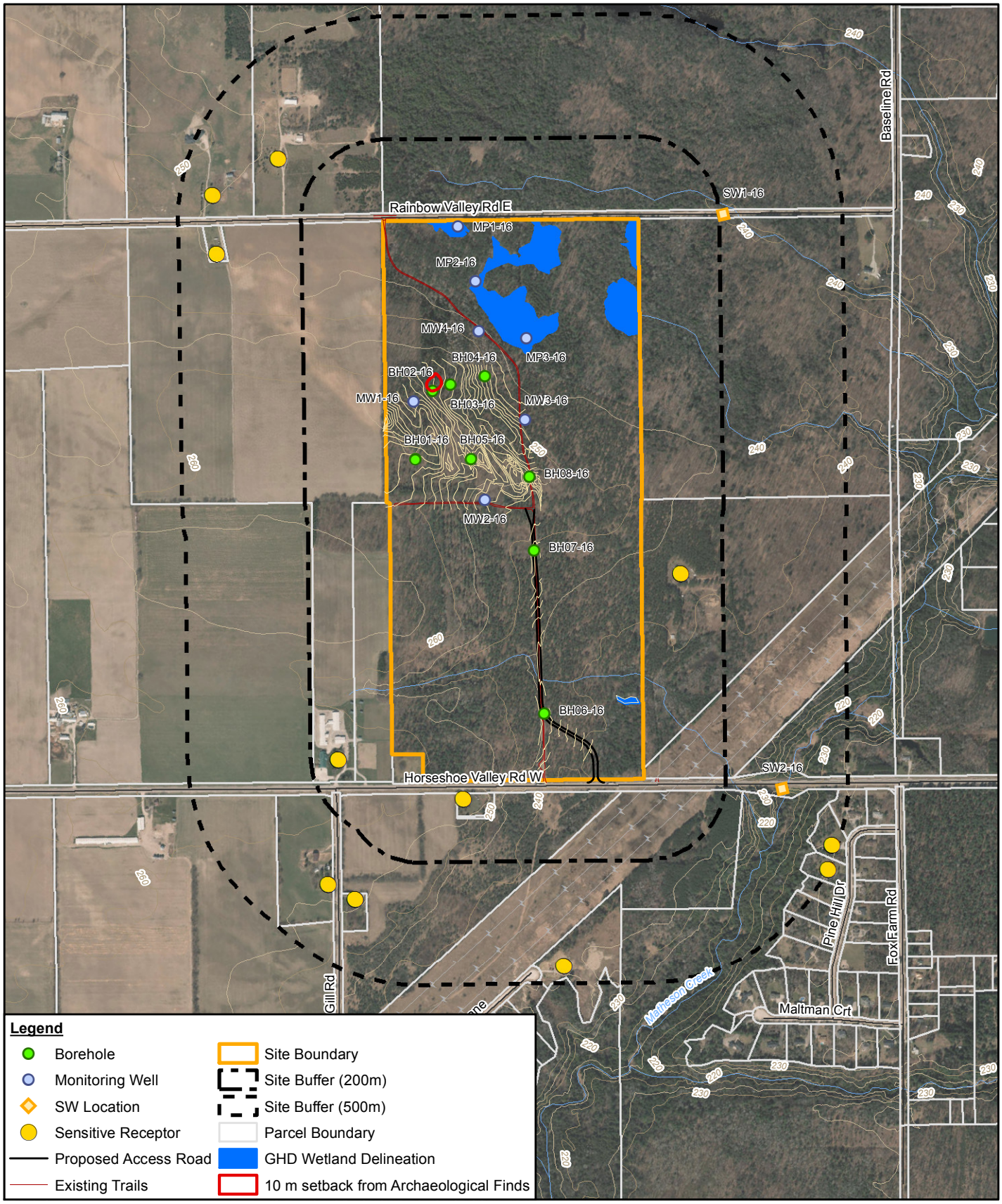


Source: MNRF NRVIS, 2015. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2016
Inset Map: ESRI Data & Maps 2008 Data Distribution Application (DDA)

0 120 240 360
Meters

Coordinate System:
NAD 1983 UTM Zone 17N

COUNTY OF SIMCOE
ENVIRONMENTAL RESOURCE
RECOVERY CENTRE

SITE FEATURES AND SURROUNDING AREA

086822
Nov 17, 2016

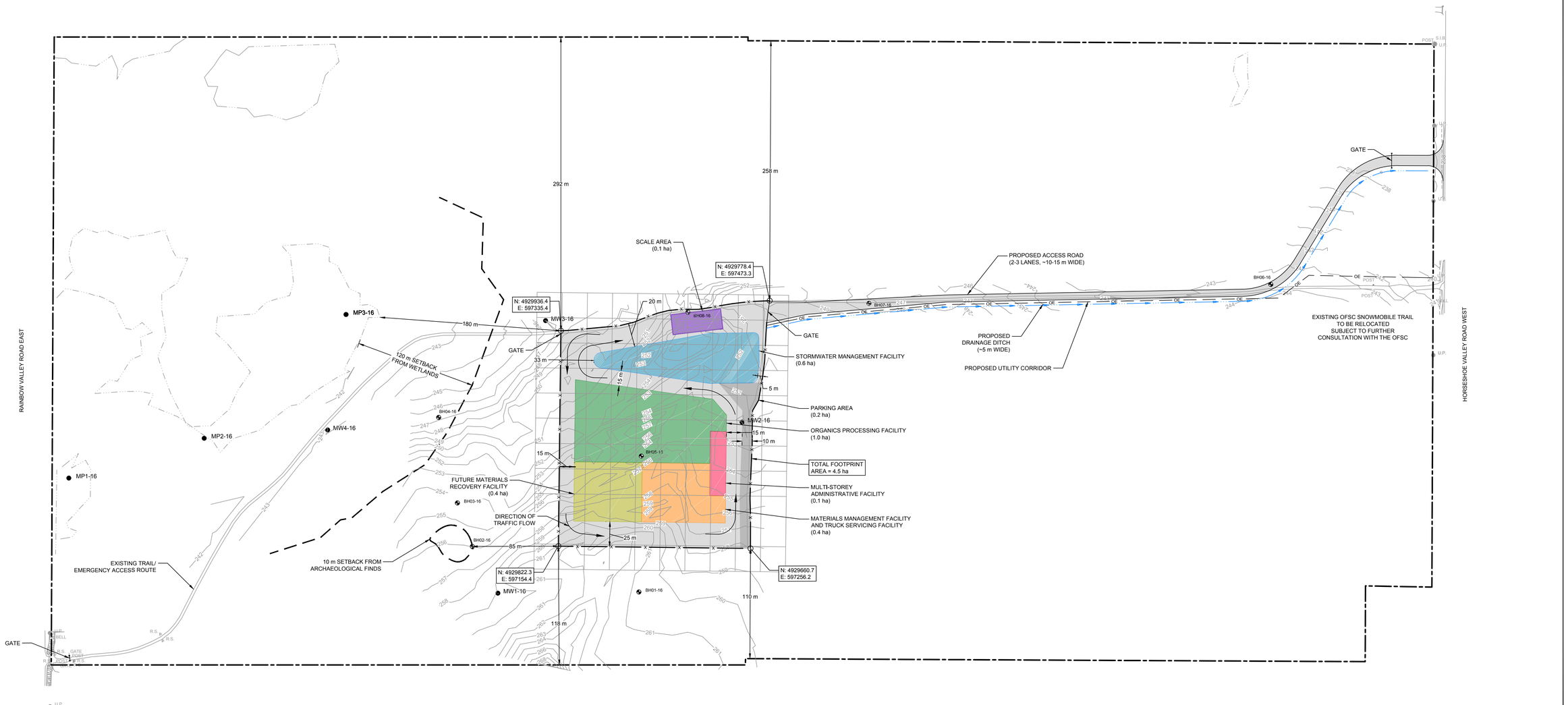
FIGURE 2.1

GIS File: Q:\GIS\PROJECTS\86000s\86822\Layouts\010\086822-03(010)GIS-WA001.mxd

LEGEND

- PROPERTY LINE
- 244 CONTOUR ELEVATION
- WETLAND DELINEATION
- 01-16 MONITORING WELL
- 02-16 BOREHOLE
- U.P. UTILITY POLE
- BELL TELEPHONE PEDESTAL
- R.S. SIGN
- POST GATE POST
- x PROPOSED CHAIN LINK FENCE
- 25 x 25 GRID

SOURCE: TOPOGRAPHIC SURVEYS COMPLETED BY GHD (AUGUST - OCTOBER 2016)



FINAL

No.	Issue	Drawn	Approved	Date
-	-	-	-	-

0 20 40 60m

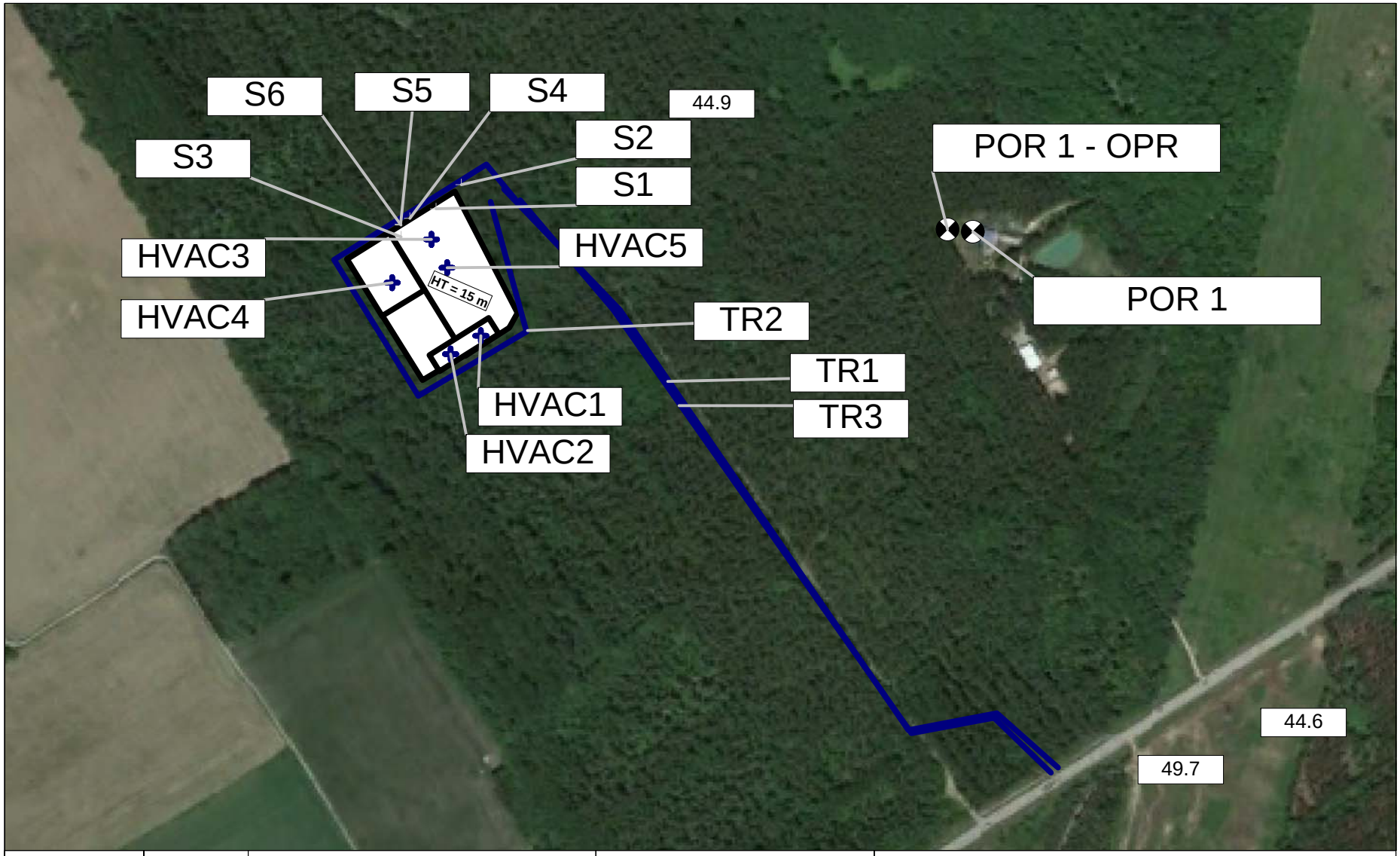
Bar is 20mm on original size drawing
0 20mm

GHD Limited
651 Colby Drive
Waterloo Ontario N2V 1C2 Canada
T 519 884 0510 F 519 884 0525 W www.ghd.com

Drawn	MW	Designer	KP
Drafting Check	BP	Design Check	DS
Project Manager	BD	Date	Nov 15, 2016
This document shall not be used for construction unless signed and sealed for construction.		Scale	1:2000

Client COUNTY OF SIMCOE
Project ENVIRONMENTAL RESOURCE RECOVERY CENTRE
Title CONCEPTUAL SITE PLAN
Project No. 86822-00
Original Size ANSI D
Sheet No. FIGURE 3.1
Sheet 1 of 1

Plot Date: 15 November 2016 - 10:48 AM Plotted By: Matt Wolfer CAD File: P:\drawings\86000s\86822\86822-PRES\86822-00(PRES001)\86822-00(PRES001)C\86822-00(PRES001)CI-WA006.dwg



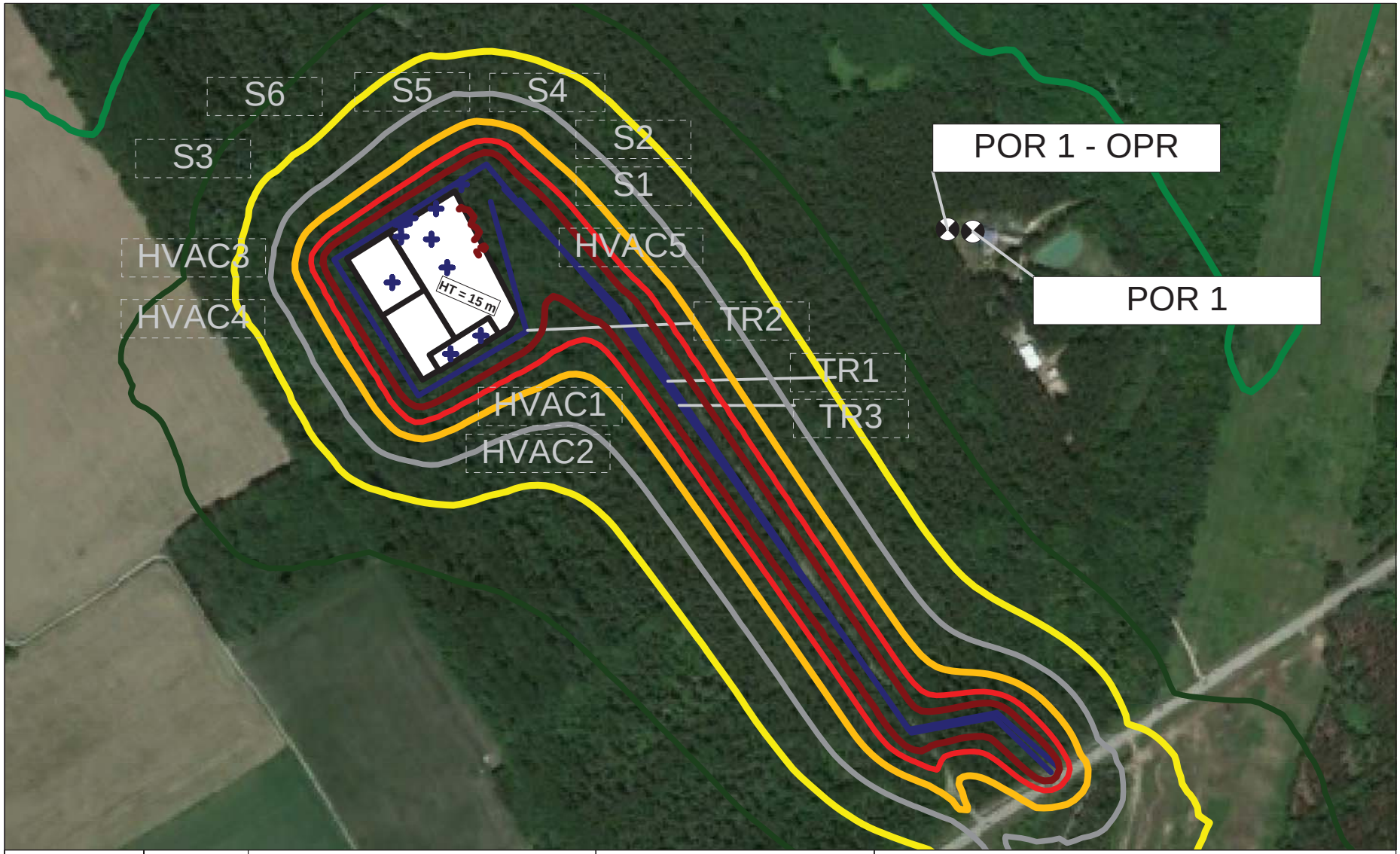
GHD

Point Source
Line Source
Building
Foliage
Receiver

> 35.0 dB
> 40.0 dB
> 45.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB

NOISE ASSESSMENT REPORT
SIMCOE COUNTY, ONTARIO

Figure 6.1
POINT OF RECEPTION AND NOISE SOURCE LOCATION PLAN



Point Source
Line Source
Building
Foliage
Receiver

> 35.0 dB
> 40.0 dB
> 45.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB

NOISE ASSESSMENT REPORT
SIMCOE COUNTY, ONTARIO

Figure 6.2
NOISE CONTOUR PLOT DAYTIME 1.5 M AG

Tables

Table 6.1

Class 3 Minimum Sound Level Limits
Simcoe ERRC

Time of Day	Minimum Sound Level	
	Plane of Window	Outdoor
7:00 a.m. to 7:00 p.m.	45 dBA	45 dBA
7:00 p.m. to 11:00 p.m.	40 dBA	40 dBA
11:00 p.m. to 7:00 a.m.	40 dBA	-

Table 6.2

Noise Source Summary
Simcoe ERRC

Source ID	Source Description	Source Facility	Sound Power Level (dBA)
S1	Biofilter exhaust stack	OPF	98.8
S2	Biofilter fan	OPF	85.5
S3	Flare	OPF	82.0
S4	Biogas Combustion Engine radiator	OPF	85.9
S5	Biogas Combustion Engine intake	OPF	89.8
S6	Biogas Combustion Engine discharge	OPF	89.8
HVAC 1 - HVAC 2	Comfort heating – administrative area	Administrative	88.0
HVAC 3 - HVAC 5	Comfort heating – operations area	MMF/OPF	97.7
TR1	Inbound and Outbound Truck Traffic (7:00 a.m. to 7:00 p.m.)	-	109.9
TR2	Inbound Truck Traffic within Facility Footprint (7:00 a.m. to 7:00 p.m.)	-	109.9
TR3	Outbound Truck Traffic (6:30 a.m. to 7:00 a.m.)	-	109.9

Table 6.3

Steady State Sound Levels
Simcoe ERRC

Point of Reception ID	Point of Reception Description	Sound Level at Point-of-Reception (Leq) Source	Verified by Acoustic Audit Yes/No	Performance Limit (1) (Leq)	Compliance with Performance Limit (Yes/No)
Daytime Operations - 7 a.m. to 7 p.m.					
POR1	Worst-Case Existing Residence	44.7 (dBA)	No	45 (dBA)	Yes
POR1-OPR	Worst-Case Existing Residence - Outdoor POR	42.5 (dBA)	No	45 (dBA)	Yes
Nighttime Operations - 7 p.m. to 7 a.m.					
POR1	Worst-Case Existing Residence	38.6 (dBA)	No	40 (dBA)	Yes
POR1-OPR	Worst-Case Existing Residence - Outdoor POR	36.4 (dBA)	No	40 (dBA)	Yes

Notes:

(1) Minimum MOECC sound level limits defined in NPC-300.

Appendices

Appendix A
Conceptual MMF Layout and Costing

Memorandum

August 23, 2017

To:	Stephanie Mack	Ref. No.:	086822
From:	Brian Dermody	Tel:	416-866-2361
CC:			

Subject: **Conceptual Layout and Estimated Costing for the Materials Management Facility**

1. Introduction

The County of Simcoe (County) is currently planning for the development of their Environmental Resource Recovery Centre (ERRC) proposed for 2976 Horseshoe Valley Road West, in Springwater, Ontario (Site or Property). The ERRC will include a Materials Management Facility (MMF), also known as a transfer station, for the consolidation of waste materials (e.g., garbage, recyclables, and organics) from multiple curbside collection vehicles into larger waste transfer trailers for more economical shipment to disposal or processing locations.

In support of the ongoing development of the ERRC, this memorandum presents conceptual sizing and layouts for the MMF as well as an estimation of the various costs associated with the development of the facility.

2. Conceptual Facility Layout and Sizing

2.1 ERRC Site

The detailed design of the MMF is expected to be developed by others following a Design/Bid/Spec approach. However, conceptual details of the facility were proposed as part of the Facility Characteristics Report (FCR) prepared by GHD in November 2016, and submitted in support of the Planning Application Package for the Site. The FCR included details surrounding the functional layout of the overall ERRC Site, as well as proposed general, high-level design features of the MMF building.

Other components of the ERRC Site are expected to include an Organics Processing Facility (OPF), Materials Recovery Facility (MRF), and ancillary facilities such as a truck servicing facility, administrative facility and public education space, access roads, and stormwater management facility.

2.2 MMF Design

The design and technology range for the MMF is limited as this is a conventional waste management facility that is mostly reliant on space for consolidation of waste from smaller vehicles into larger vehicles with no processing of the materials. The main components of the proposed MMF will include:

- Access lanes for curbside collection vehicles.
- Tipping floor.
- Storage bunkers.
- Loading area for transfer trailers.

In addition, initial plans are that the MMF will incorporate an administrative facility for operations staff and the truck servicing facility for the County's fleet of Solid Waste Management vehicles. The truck servicing facility will consist of a workshop, storage area, and two service bays.

Depending on the final design, the MMF will likely be a multi-storey building approximately 10 to 15 metres (m) high, consisting of a pre-engineered steel frame structure with exterior walls of concrete and steel sheeting. The use of internal support columns will be minimized in order to provide clear spans that allow for the unrestricted movement of materials and vehicles inside the building. Roll-up doors will provide vehicle access inside the building where materials will be loaded and unloaded. A concrete tipping floor and push walls will allow for materials to be segregated and moved around using a wheeled loader.

2.3 MMF Layout

Consultation with the County's staff that will ultimately oversee and/or operate the MMF is key to ensuring an efficient and functional layout. The County held internal discussions with operations staff in April 2017 to solicit their input to the overall function and features of the MMF. Initial key considerations for the facility were identified as follows:

- ***Grade Separation*** – the tipping floor and the loading area should be at different elevations to facilitate the loading of transfer trailers. The unloading area/tipping floor will be on the upper level, while the lower level will allow for the passage and loading of transfer vehicles from above. A grade separation of approximately 3.0 m is proposed between these levels, with a concrete wall approximately 1.3 m high at the edge of the tipping floor.
- ***Drive-Through*** – the layout should allow for vehicles to drive straight through the facility, reducing reversing movements wherever reasonable. Separate areas will be provided for the curbside collection vehicles and the transfer trailers, each consisting of two 5 m wide lanes with roll-up doors (3.7 m wide x 4.9 m high) at both ends.
- ***Flexible Layout*** – the layout of the MMF should be flexible enough to accommodate future changes in the materials (i.e., type or quantity) and the overall ERRC Site (i.e., establishment of OPF, MRF). The storage bunkers can be configured with an interlocking, modular concrete block wall system to readily allow for modifications to individual bunker sizes and configurations to best suit ongoing operations. The administrative area and truck servicing facility can be separated from the main MMF building to allow for

greater design flexibility and the ability to accommodate future needs of the ERRC (e.g., expansion, integration of administrative area for OPF). An area of approximately 15 m x 30 m has been reserved for these facilities.

2.4 MMF Sizing

The sizing of the overall MMF will be dictated in large part by the requirements for the tipping floor and the material storage bunkers. While there will be no long-term storage of materials within the MMF, the tipping floor and bunkers need to be sized to accommodate the temporary storage of materials as a contingency for temporary service disruption at downstream facilities. General sizing of these components was based on the following:

- Material quantities based on a 20% “peaking factor” applied to the daily average. This factor is applied to determine a maximum daily average – compensating for seasonal fluctuations in material.
- Material densities:
  - Garbage – 250 kg/m^3
  - Organics – 490 kg/m^3
  - Recyclable Fibres – 150 kg/m^3
  - Recyclable Containers – 50 kg/m^3
- Bunkers sized to provide 1.5 days of storage.
- Maximum pile heights of 3.5 m with 45° side-slopes were used to determine bunker area requirements.
- Tipping floor area roughly the same size as the storage bunkers to allow for unrestricted movements of the loader(s) and the curbside collection vehicles.

Commissioning of the MMF is expected to occur in 2019. The County has estimated the anticipated annual material tonnages and daily maximums out to year 2051. The overall sizing of the MMF will depend on the design service life (e.g., 30 years) and the types of materials to be transferred. To account for variation in these design parameters, two separate concepts have been developed for the MMF as follows (noting that this will be discussed in the County's business case for the facility):

- ***Conceptual Design No. 1 – design for long-term garbage, OPF commissioned in 2021.*** Given the potential changes to the blue box recycling program, this option considers development of a smaller transfer facility to meet only the County’s long-term transfer needs for garbage. There would be excess capacity until 2022 to transfer organics until the OPF is brought on-line. However, it is noted that at this smaller facility, there would be no capacity to transfer blue box recycling even until 2023 (this material is voluminous and takes significant tipping floor space).
- ***Conceptual Design No. 2 – design for long-term garbage, space for blue box recycling until 2023, OPF commissioned in 2021.*** This design considers development of the MMF for the long-term transfer of garbage but allows some additional tipping floor space for the short term transfer of blue box recycling. Organics would be taken directly to the OPF after 2021. Following transition of the blue box program (projected for 2022), no blue box recycling would come to this facility.

2.5 Concepts

2.5.1 Conceptual Design No. 1

Conceptual Design No. 1 represents design space for garbage only at the MMF. The facility was sized based on the 30-year (i.e., year 2051) capacity requirements for garbage only, requiring a bunker storage area of approximately 1,000 m^2.

It is noted that the proposed MMF will also need to transfer organics until the proposed commissioning of the OPF in 2021. The bunker storage area requirements are estimated to be 350 m^2 for garbage and 100 m^2 for organics in 2021, or 450 m^2 total. Since this material would require much less space than the proposed design, the facility should be able to easily accommodate these materials in the interim.

A conceptual layout for this facility is provided in Figure 1A. An alternate layout for the bunker storage areas for this facility is provided in Figure 1B. Alternate configurations of the bunkers are possible throughout all concepts, allowing enough flexibility to accommodate variations in material storage needs in any given year.

Table 2.1 summarizes the sizing of each MMF component for Conceptual Design No. 1.

Table 2.1 MMF Sizing – Conceptual Design No. 1

Component	Dimensions	Area
Storage bunker(s)	2 x 30 m wide x 17 m deep	1,020 m^2
Tipping floor	26 m wide x 30 m deep	780 m^2
Access/egress lanes for curbside collection vehicles	2 x 5 m wide x 60 m long	600 m^2
Loading area for transfer trailers	2 x 5 m wide x 60 m long	600 m^2
Truck servicing facility	2 x 5 m wide x 20 m long	200 m^2
Administrative facility	10 m x 15 m, 5 m x 20 m	250 m^2
TOTAL FACILITY	**Main MMF Area – 60 m x 50 m** **Truck Servicing/Admin. – 15 m x 30 m**	**3,450 m^2**

2.5.2 Conceptual Design No. 2

Conceptual Design No. 2 is based on the same long-term design capacity for garbage as Conceptual Design No. 1, but with additional short-term requirements for the storage of recyclable materials as well. With the implementation of the Waste-Free Ontario Act likely transitioning the management of recyclable materials away from the County in the coming years, it is assumed that the management of blue box recycling will cease after 2022. As such, the total bunker storage area requirement for all materials in 2023 is anticipated to be approximately 1,585 m^2.

Figure 2 provides a conceptual layout for this facility, which has additional space for the storage of recyclables or other materials should the County's programs be expanded in the future.

Table 2.2 summarizes the sizing of each MMF component for Conceptual Design No. 2.

Table 2.2 MMF Sizing – Conceptual Design No. 2

Component	Dimensions	Area
Storage bunker(s)	2 x 30 m wide x 30 m deep	1,800 m^2
Tipping floor	20 m wide x 30 m deep	600 m^2
Access/egress lanes for curbside collection vehicles	2 x 5 m wide x 80 m long	800 m^2
Loading area for transfer trailers	2 x 5 m wide x 80 m long	800 m^2
Truck servicing facility	2 x 5 m wide x 20 m long	200 m^2
Administrative facility	10 m x 15 m, 5 m x 20 m	250 m^2
TOTAL FACILITY	**Main MMF Area – 80 m x 50 m** **Truck Servicing/Admin. – 15 m x 30 m**	**4,450 m^2**

3. Conceptual Facility Costing

Conceptual costing for the MMF has been prepared based on the proposed conceptual designs and other assumptions noted herein. The County's template for estimating capital project costs was used as the basis for determining estimated costs. Previous cost estimates were reviewed and updated as appropriate to reflect our current understanding of the facility. The estimated costs for each of the proposed conceptual design are provided in Table 3.1. Additional costing details are provided in Attachment 1.

Table 3.1 Conceptual MMF Costing

Item No.	Description	Estimated Cost	
		Conceptual Design No. 1	Conceptual Design No. 2
01	**Section 1 – General Requirements**	**$648,000**	**$771,000**
01.A	Administrative Requirements	$216,000	$257,000
01.B	Bonds and Insurance	$216,000	$257,000
01.C	Mobilization and Demobilization	$216,000	$257,000
02	**Section 2 – Site Works**	**$3,585,000**	**$3,692,000**
02.A	Site Services	$720,000	$720,000
02.B	Stormwater Management System	$707,000	$799,000
02.C	Grading and Paving	$1,549,000	$1,549,000
02.D	Grounds Work	$609,000	$624,000
03	**Section 3 – Buildings**	**$6,925,000**	**$8,756,000**
03.A	Scale Facility	$300,000	$300,000
03.B	Administrative Facility & Education Centre	$325,000	$325,000
03.C	Truck Servicing Facility	$600,000	$600,000
03.D	Materials Management Facility	$5,700,000	$7,531,000

Table 3.1 Conceptual MMF Costing

Item No.	Description	Estimated Cost	
		Conceptual Design No. 1	Conceptual Design No. 2
04	**Section 4 – Engineering Services**	**$250,000**	**$375,000**
04.A	Design/Engineering	$150,000	$225,000
04.B	Construction Oversight	$100,000	$150,000
	TOTAL COST	**$11,408,000**	**$13,594,000**

Given that the design of the MMF has yet to be completed, the costs presented have only been developed to a conceptual level of detail. While these represent a reasonable range of potential facility costs, the scope and cost of these items will need to be refined as the design of the facility is developed.

It should also be noted that other facility development costs are not included in these totals, such as:

- Development costs to date (e.g., siting).
- Consulting costs for Planning.
- Environmental Compliance Approvals.
- Upgrades to Horseshoe Valley Road.
- Compensation measures (e.g., land purchase).
- Contingency.

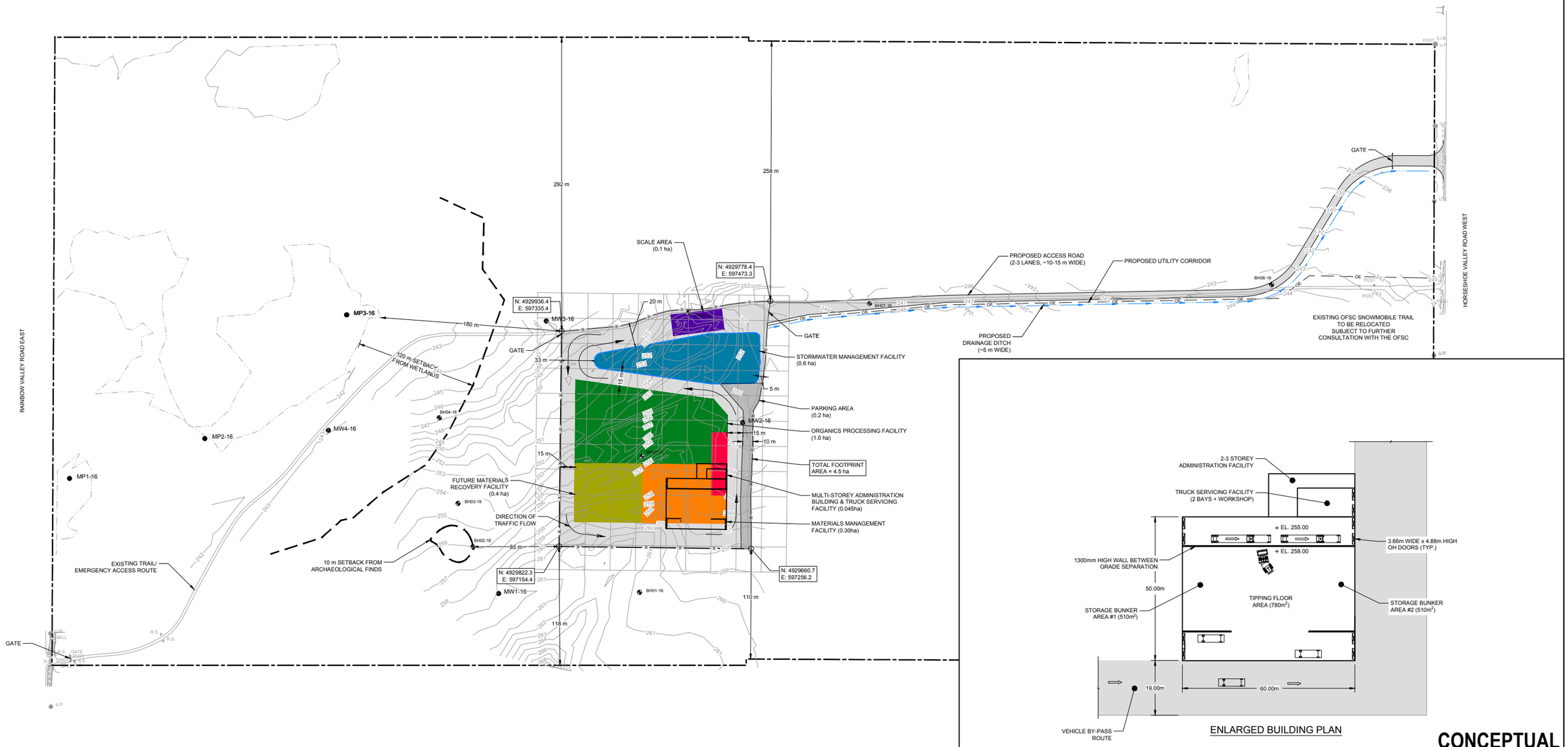
Cost savings may also be able to be realized by optimizing the design and reducing the overall size of the facility. Design considerations may include reducing the access area for curbside collection vehicles and the unloading area for transfer trailers to one lane each, and reducing the size of the tipping floor by only loading one vehicle at a time.

Figures

LEGEND

- PROPERTY LINE
- 244 CONTOUR ELEVATION
- WETLAND DELINEATION
- 01-16 MONITORING WELL
- 02-16 BOREHOLE
- U.P. UTILITY POLE
- BELL TELEPHONE PEDESTAL
- R.S. SIGN
- POST GATE POST
- x PROPOSED CHAIN LINK FENCE
- 25 x 25 GRID

SOURCE: TOPOGRAPHIC SURVEYS COMPLETED BY GHD (AUGUST - OCTOBER 2016)



ENLARGED BUILDING PLAN

CONCEPTUAL

No.	Issue	Drawn	Approved	Date
-	-	-	-	-

Bar is 20mm on original size drawing

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Drafting Check	BP	Design Check	DS
Project Manager	BD	Date	Aug 18, 2017
		Scale	1:2000

Client: COUNTY OF SIMCOE
Project: ENVIRONMENTAL RESOURCE RECOVERY CENTRE
Title: MATERIALS MANAGEMENT FACILITY DESIGN NO. 1A
Project No. 86822-00
Original Size: ANSI D
Sheet No. FIGURE 1A
Sheet 1 of 3

Plot Date: 18 August 2017 - 4:16 PM Plotted By: Shane English CAD File: P:\drawings\86000s\86822-86822-PRES\86833-03(PRES002)\86822-03(PRES001)CI-WA004.dwg

LEGEND

- PROPERTY LINE
- 244 CONTOUR ELEVATION
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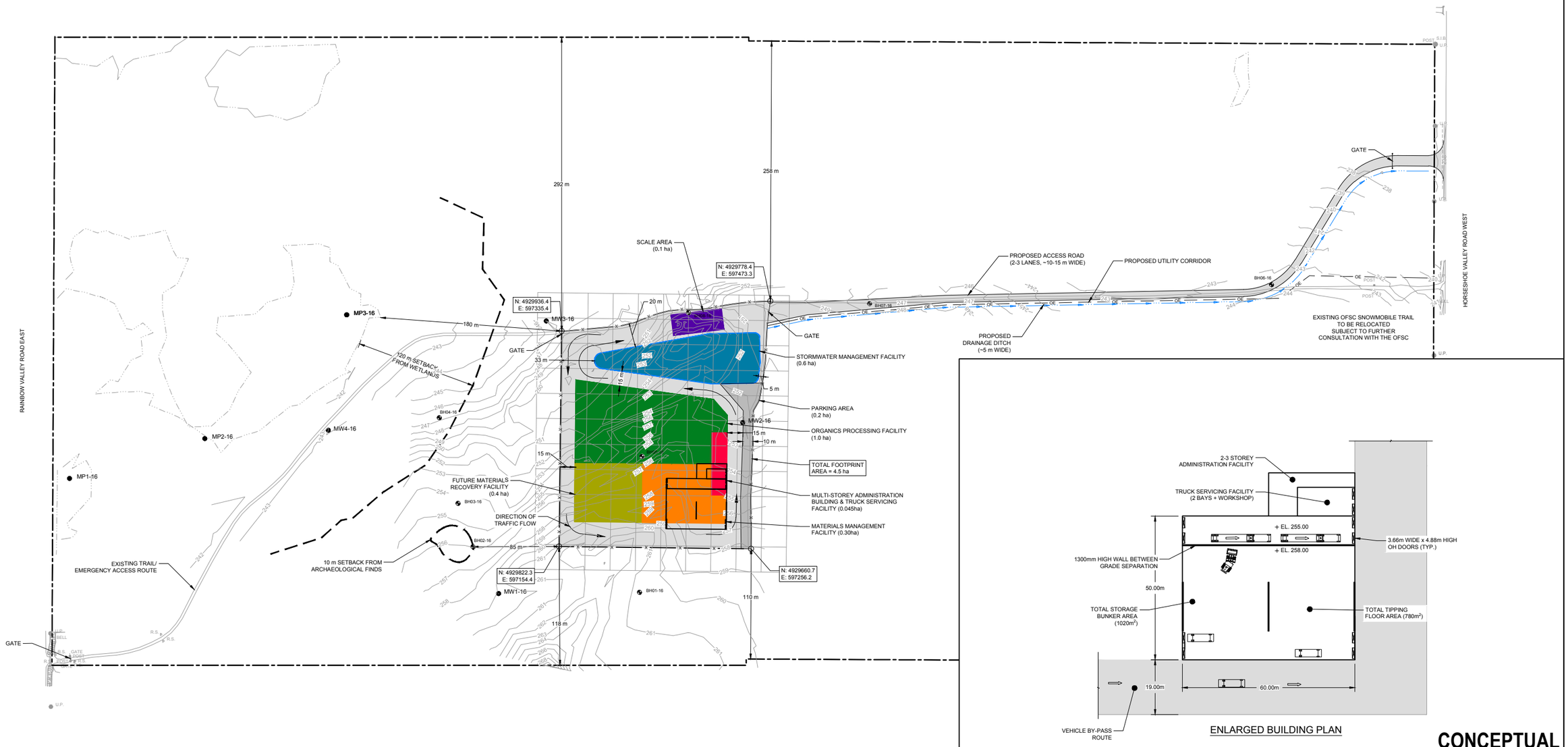
SOURCE: TOPOGRAPHIC SURVEYS COMPLETED BY GHD (AUGUST - OCTOBER 2016)



ENLARGED BUILDING PLAN

CONCEPTUAL

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Project Manager	BD	Date	Aug 18, 2017
		Scale	1:2000

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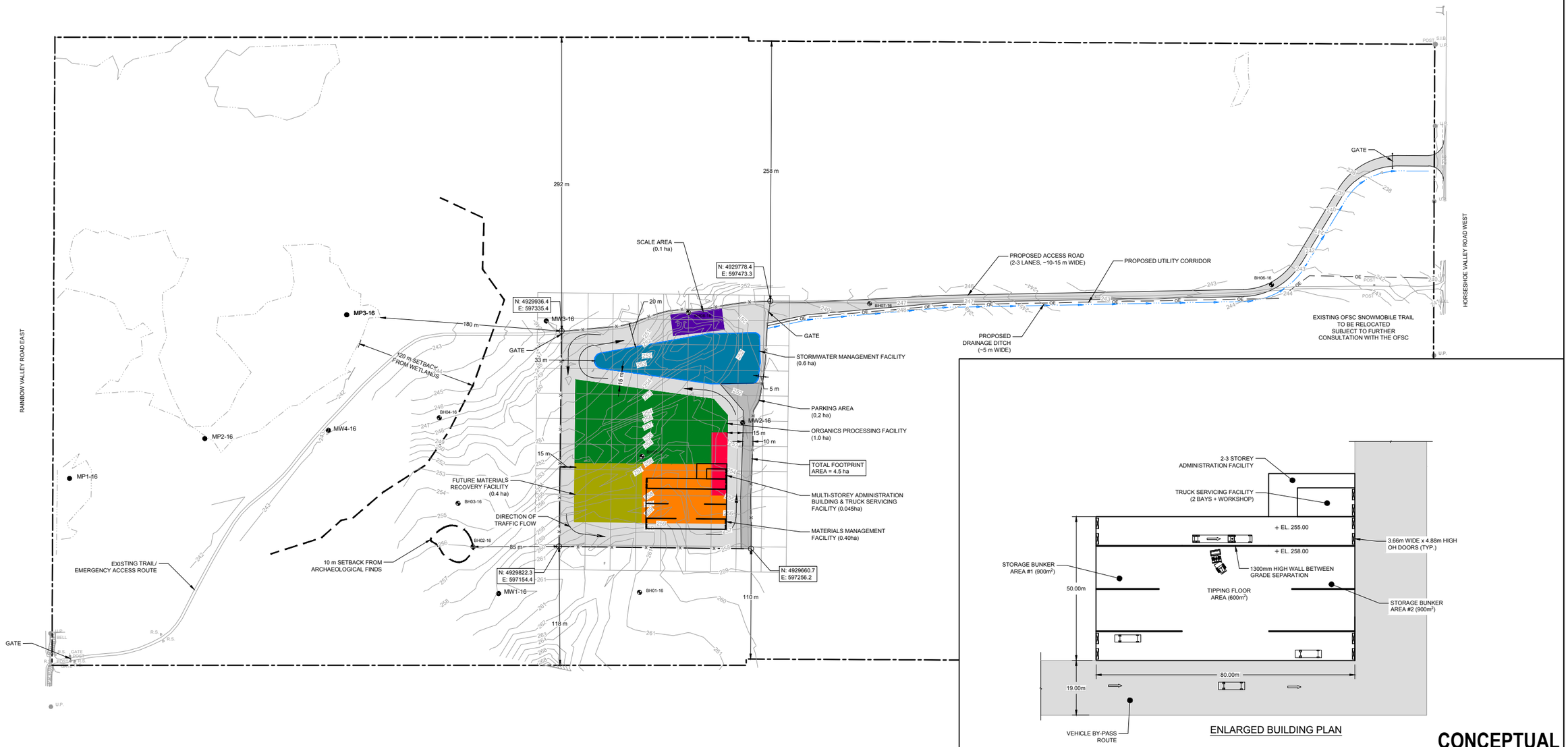
Project: ENVIRONMENTAL RESOURCE RECOVERY CENTRE
Title: MATERIALS MANAGEMENT FACILITY DESIGN No. 1B
Project No. 86822-00
Original Size: ANSI D
Sheet No. FIGURE 1B
Sheet 2 of 3

Plot Date: 18 August 2017 - 4:16 PM Plotted By: Shane English CAD File: P:\drawings\86000s\86822-86822-PRES\86833-03(PRES002)\86822-03(PRES001)CI-WA004.dwg

LEGEND

- PROPERTY LINE
- 244 CONTOUR ELEVATION
- WETLAND DELINEATION
- 01-16 MONITORING WELL
- 02-16 BOREHOLE
- U.P. UTILITY POLE
- BELL TELEPHONE PEDESTAL
- R.S. SIGN
- POST GATE POST
- x PROPOSED CHAIN LINK FENCE
- 25 x 25 GRID

SOURCE: TOPOGRAPHIC SURVEYS COMPLETED BY GHD (AUGUST - OCTOBER 2016)



ENLARGED BUILDING PLAN

CONCEPTUAL

No.	Issue	Drawn	Approved	Date
-	-	-	-	-

Bar is 20mm on original size drawing

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Drawn	SE	Designer	KP
Drafting Check	BP	Design Check	DS
Project Manager	BD	Date	Aug 18, 2017
This document shall not be used for construction unless signed and sealed for construction.		Scale	1:2000

Client: COUNTY OF SIMCOE
Project: ENVIRONMENTAL RESOURCE RECOVERY CENTRE
Title: MATERIALS MANAGEMENT FACILITY DESIGN No. 2
Project No. 86822-00
Original Size: ANSI D
Sheet No. FIGURE 2
Sheet 3 of 3

Plot Date: 18 August 2017 - 4:16 PM Plotted By: Shane English CAD File: P:\drawings\86000s\86822-86822-PRES\86833-03(PRES002)\86822-03(PRES001)CI-WA004.dwg

Attachment

Attachment 1

Simcoe County - Environmental Resource Recovery Centre
Conceptual Costing for the Materials Management Facility

Item Number	Description	Quantity		Unit	Unit Cost	Cost		Notes
		Design Concept No. 1	Design Concept No. 2			Design Concept No. 1	Design Concept No. 2	
No.01	**Section 1 - General Requirements**					**$648,000**	**$771,000**	
No.01.a	**Administrative Requirements**	2%	2%	Percentage	Total Project Cost	$216,000	$257,000	Includes temporary facilities and controls, health and safety, quality and execution requirements
No.01.b	**Bonds and Insurance**	2%	2%	Percentage	Total Project Cost	$216,000	$257,000	
No.01.c	**Mobilization and Demobilization**	2%	2%	Percentage	Total Project Cost	$216,000	$257,000	
No.02	**Section 2 - Site Works**					**$3,585,000**	**$3,692,000**	
No.02.a	**Site Services**					$720,000	$720,000	
No.02.a.1	Data Line	1	1	Lump Sum	$35,000	$35,000	$35,000	
No.02.a.2	Hydro Supply	1	1	Lump Sum	$300,000	$300,000	$300,000	Includes 3-Phase Power from HVR and Powerstream Connection Fee
No.02.a.3	Gas Line	1	1	Lump Sum	$200,000	$200,000	$200,000	Includes Enbridge Gas Extension of Line into Site, Enbridge Connection Fee (extension costs above)
No.02.a.4	Sewage System	1	1	Lump Sum	$125,000	$125,000	$125,000	Assumes 40,000 gal. septic system complete with tank and leaching field
No.02.a.5	Development of Water Well	1	1	Lump Sum	$60,000	$60,000	$60,000	
No.02.b	**Stormwater Management System**					$707,000	$799,000	
No.02.b.1	Construction of Stormwater Pond	5,400	5,400	m^2	$50	$270,000	$270,000	Excavation, grading, liner, inlet/outlet structures
No.02.b.2	Underground Storage Tank	1	1	Lump Sum	$100,000	$100,000	$100,000	Provisional.
No.02.b.3	Oil Grit Separator	1	1	Each	$125,000	$125,000	$125,000	Provisional.
No.02.b.4	Catch Basins	5	10	Each	$6,500	$33,000	$65,000	Provisional.
No.02.b.5	Storm Pipe/Ditch	100	200	m	$600	$60,000	$120,000	Provisional.
No.02.b.6	Drainage Ditch	700	700	m	$170	$119,000	$119,000	Excavation, grading, rock check dams, topsoil and seeding
No.02.c	**Grading and Paving**					$1,549,000	$1,549,000	
No.02.c.01	Grading of Site	6.5	6.5	Hectares	$26,000	$169,000	$169,000	
No.02.c.02	Asphalt Access Road and Site Area	20,000	20,000	m^2	$69	$1,380,000	$1,380,000	Based on 400 mm Granular B sub-base, 150 mm Granular A base, 60 mm HL8 asphalt base course, 40 mm HL3 asphalt surface course
No.02.d	**Grounds Work**					$609,000	$624,000	
No.02.d.01	Erosion and Sedimentation Control	1	1	Lump Sum	$45,000	$45,000	$45,000	
No.02.d.02	Clearing and Grubbing	6.5	6.5	Hectares	$18,500	$121,000	$121,000	
No.02.d.03	Curbs and Sidewalks	1	1	Lump Sum	$71,000	$71,000	$71,000	
No.02.d.04	Chain Link Fence	880	880	m	$110	$97,000	$97,000	Based on 2 m high chain link fence.
No.02.d.05	Access Gates	3	3	Each	$20,000	$60,000	$60,000	Based on 10 m wide rolling gates.
No.02.d.06	Topsoil and Seeding	2,000	2,000	m^2	$15	$30,000	$30,000	
No.02.d.07	Allowance for Landscaping	1.0	1.5	Lump Sum	$30,000	$30,000	$45,000	Plantings, beautification etc.
No.02.d.08	Allowance for Exterior Signage	1	1	Lump Sum	$5,000	$5,000	$5,000	
No.02.d.09	Lighting	1	1	Lump Sum	$150,000	$150,000	$150,000	Site and access road. Includes light standards, wiring, transformers.

Simcoe County - Environmental Resource Recovery Centre
Conceptual Costing for the Materials Management Facility

No.03	**Section 3 - Buildings**					**$6,925,000**	**$8,756,000**	
No.03.a	**Scale Facility**	1	1	Lump Sum	$300,000	$300,000	$300,000	Based on 3 x 80 ft scale decks and approaches. Does not include scalehouse since scales are expected to be monitored remotely from within the administration area.
No.03.b	**Administrative Facility & Education Centre**	250	250	m^2	$1,300	$325,000	$325,000	Basic office-type building.
No.03.c	**Truck Servicing Facility**	200	200	m^2	$3,000	$600,000	$600,000	Includes 2 service bays, maintenance and storage areas.
No.03.d	**Materials Management Facility**					$5,700,000	$7,531,000	
No.03.d.1	Pre-Engineered Steel Building	3,000	4,000	m^2	$623	$1,869,000	$2,492,000	Pre-engineered steel frame structure with exterior walls constructed of concrete and steel sheeting. Minimize internal columns to maximize unobstructed space. Approximately 15 metres high.
No.03.d.2	Building Foundation	3,000	4,000	m^2	$186	$558,000	$744,000	Proof rolling of existing ground, placement of 200 mm thick compacted granular base, concrete footings
No.03.d.3	Concrete Floor Slab	3,000	4,000	m^2	$178	$534,000	$712,000	Slab on grade at two different levels. About 3 m difference in elevation.
No.03.d.4	Concrete Pushwalls	160	200	m	$1,820	$292,000	$364,000	Combination of concrete pushwall and modular interlocking concrete blocks.
No.03.d.5	Concrete Walls	60	80	m	$3,610	$217,000	$289,000	Exterior walls and grade separation wall along transfer area.
No.03.d.6	Overhead Doors	10	10	Each	$23,000	$230,000	$230,000	Assumes typical doors of 3.7 m wide x 4.9 m tall. Sizes may vary.
No.03.d.7	Building Components	1.0	1.5	Lump Sum	$550,000	$550,000	$825,000	Masonry, metals, wood, doors, finishes, plumbing, etc.
No.03.d.8	Odour Control System	1.0	1.0	Lump Sum	$350,000	$350,000	$350,000	
No.03.d.9	HVAC	1.0	1.5	Lump Sum	$350,000	$350,000	$525,000	
No.03.d.10	Fire Suppression System - Water	3,000	4,000	m^2	$100	$300,000	$400,000	
No.03.d.11	Electrical	3,000	4,000	m^2	$150	$450,000	$600,000	
No.04	**Section 4 - Engineering Services**					**$250,000**	**$375,000**	
No.04.a	**Design/Engineering**	1.0	1.5	Lump Sum	$150,000	$150,000	$225,000	
No.04.b	**Construction Oversight**	1.0	1.5	Lump Sum	$100,000	$100,000	$150,000	
					TOTAL	**$11,408,000**	**$13,594,000**	

Appendix B
Stormwater Management Pond Storage Calculations

MOECC Pond Storage Requirements
Facility Characteristics Report
Environmental Resource Recovery Centre
County Of Simcoe, Ontario

Data Needed for Calculations		
Site Area	44944	m^2
Impervious	42696.8	m^2
Impervious	95%	%

Protection Level Wet Pond	*Storage Volume (m^3/ha) for Impervious Level 35%*	*55%*	*70%*	*85%*
Enhanced	140	190	225	250
Normal	90	110	130	150
Basic	60	75	85	95

Pond Size Requirement: Wet Pond

Protection Level	*Storage Volume (m^3) Requirement per ha*			*Storage Volume Requirement (m^3)*		
	Total	*Permanent Pool Active Storage*		*Total*	*Permanent Pool Active Storage*	
Enhanced	**267**	**227**	**40**	**1199**	**1019**	**180**
Normal	163	123	40	734	554	180
Basic	102	62	40	457	277	180

Conclusion: The wet and dry volumes provided in the design meet MOECC enhanced pond storage requirements.

Appendix B2

Stormwater Management Pond Storage Volume Calculation
Facility Characteristics Report
Environmental Resource Recovery Centre
County of Simcoe, Ontario

Depth Interval =	0.10	m	
Permanent Pool Depth =	1.40	m	
Active Storage Depth =	1.7	m	
Top of Pond Depth =	3.1	m	
Forbay W =	50	m	
Forbay L =	125	m	
Settling Pond W =	50	m	
Settling Pond L =	25	m	
Infiltration Chamber W =	50	m	
Infiltration Chamber L =	20	m	
Side Slope (P.P) =	3	:1	H:V
Side Slope (elsewhere) =	5	:1	H:V
Total Length =	170.0		
Legth-to-Width Ratio =	3.4	:1	L:W

Total Runoff Volume (by storm event):
Runoff C = 0.95
Catchment Area= 44,944 m2

	Rainfall Amount (mm)	Runoff Volume (m3)
25mm	25	1067
5-year	72.2	3083
25-year	99.5	4248
100-year	122.8	5243

Protection Level	***Storage Volume Requirement (m^3)***		
	Total	***Wet***	***Dry***
Enhanced	1,199	1,019	180
Normal	734	554	180
Basic	457	277	180

Fire Water Storage

Sediment Depth (m):	0.30
Ice Zone Depth (m):	0.50
Fire Storage (m3):	750

Depth Interval	Elevation (m)	Forebay Area (m^2)	Settling Pond Area (m^2)	Infiltration Area (m^2)	Area (m^2)	Depth (m)	Total Storage (m^3)	Fire Storage (m^3)	Live Storage (m^3)
0	0.00					0.00	0	0	
1	0.10	1370	219	380	1589	0.10	79		
2	0.20	1410	240	380	1650	0.20	241		
3	0.30	1451	261	380	1712	0.30	409		
4	0.40	1492	284	380	1775	0.40	584	174	
5	0.50	1533	306	380	1840	0.50	765	355	
6	0.60	1575	330	380	1905	0.60	952	542	
7	0.70	1617	354	380	1971	0.70	1146	736	
8	0.80	1660	379	380	2039	0.80	1346	937	
9	0.90	1703	405	380	2108	0.90	1553		
10	1.00	1746	431	380	2177	1.00	1768		
11	1.10	1789	459	380	2248	1.10	1989		
12	1.20	1833	487	380	2320	1.20	2217		
13	1.30	1878	515	380	2393	1.30			
14	1.40	1922	545	380	2467	1.40			
15	1.50	1989	578	408	2975	1.50			272
16	1.60	2056	613	438	3106	1.60			576
17	1.70	2124	648	468	3240	1.70			893
18	1.80	2192	685	500	3376	1.80			1224
19	1.90	2261	722	532	3515	1.90			1569
20	2.00	2330	761	566	3656	2.00			1927
21	2.10	2400	800	600	3800	2.10			2300
22	2.20	2470	841	636	3946	2.20			2688
23	2.30	2541	882	672	4095	2.30			3090
24	2.40	2612	925	710	4246	2.40			3507
25	2.50	2684	968	748	4400	2.50			3939
26	2.60	2756	1013	788	4556	2.60			4387
27	2.70	2829	1058	828	4715	2.70			4850
28	2.80	2902	1105	870	4876	2.80			5330
29	2.90	2976	1152	912	5040	2.90			5826
30	3.00	3050	1201	956	5206	3.00			6338
31	3.10	3125	1250	1000	5375	3.10			6867

Notes:
1. Volume for an interval calculated by Average End Area Method.
2. Assumptions
   A. The forbay is a triangle
   B. The pond (not including the forbay) is a rectangle.
   C. There are no rounded edges.
3. Please check MOE guidelines for pond design.
4. If zeros or negative numbers show up, the pond cannot be any deeper. Increase size of pond
5. Please check to make sure all the calculations are working correctly and the correct numbers are being produced.

Appendix C
Air Quality Impact Assessment Report

Air Quality Impact Assessment Report

2976 Horseshoe Valley Road West
Springwater, Ontario

Environmental Resource Recovery Centre

GHD | 184 Front Street East Suite 302 Toronto Ontario M5A 4N3 Canada

086822| Report No 17 | January 19 2018

Executive Summary

This Air Quality Impact Assessment (AQIA) Report was prepared to evaluate projected odour and related impacts from a biofilter at the proposed Environmental Resource Recovery Centre (ERRC) in Springwater, Ontario. The AQIA Report was prepared as part of the Facility Characteristics Report prepared to support a land use planning amendment application. As requested by the Ministry of the Environment and Climate Change (MOECC), the report was prepared in accordance with s.26 of Ontario Regulation (O. Reg.) 419/05. In addition, guidance in the (MOECC) publication "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated February 2017 (Procedure Document) was followed where appropriate.

The County of Simcoe has proposed to build the ERRC at 2976 Horseshoe Valley Road West, Springwater, Ontario. The site is currently designated as greenlands.

The Application and supporting documentation were prepared in accordance with all applicable regulatory and Ministry requirements that were in effect at the time of the application.

The ERRC is subject to s.20 of O. Reg. 419/05. Therefore, the modelled impact of contaminant emissions has been assessed using the AERMOD dispersion model for each contaminant and applicable averaging period.

The ERRC is expected to emit odour, ammonia, and total reduced sulphur compounds; specific contaminants depend on the organics processing technology selected during the design process and fate of products. This report assesses tunnel composting and anaerobic digestion as potential organics processing technologies.

The maximum Point of Impingement (POI) concentrations were calculated based on the most conservative operating conditions, where all significant sources are operating simultaneously at their individual maximum rates of production. The maximum emission rates for each significant contaminant emitted from the significant sources were calculated in accordance with s.11 of O. Reg. 419/05 and the data quality assessment follow the process outlined in the requirements of the Procedure Document.

A POI concentration for each significant contaminant emitted from the ERRC was calculated based on the calculated emission rates and the output from the approved dispersion model; the results are presented in the Emission Summary Table in accordance with s.26 of O. Reg. 419/05.

The POI concentrations listed in the Emission Summary Tables were compared against criteria listed in the Ministry Air Contaminant Benchmark (ACB) List and guidelines.

All contaminants with POI limits are below their corresponding POI limits. Dispersion modelling of odour emissions did not identify any points off ERRC property where discharges of odour may result in an adverse effect based on MOECC standards and guidelines.

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Table Index

Appendix Index

1. Introduction and Facility Description

This Air Quality Impact Assessment (AQIA) Report was prepared as part of the Facility Characteristics Report prepared to support a land use planning amendment application. As requested by the Ministry of the Environment and Climate Change (MOECC), the report was prepared in accordance with s.26 of Ontario Regulation (O. Reg.) 419/05. In addition, guidance in the Ministry of Environment and Climate Change (MOECC) publication "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated February 2017 (ESDM Procedure Document) PIBS 3614e03 was followed as appropriate.

For ease of review and to promote clarity this AQIA Report is structured to correspond to each of the items listed in the MOECC publication "Emission Summary and Dispersion Modelling Report Check List" PIBS 5357e.

This section provides a description of the Environmental Resource Recover Centre (ERRC) as required by subparagraph 1 of s.26 (1) of O. Reg. 419/05.

1.1 Purpose and Scope of AQIA Report

This AQIA Report was prepared to evaluate potential odour and related impacts from a biofilter at the proposed ERRC in Springwater, Ontario. Following extensive public consultation, including the development of a Facility Characteristics Report and a work plan submitted to the MOECC in December 2017, this report has been prepared to provide additional assessment of potential odour emissions associated with the proposed ERRC. The AQIA Report was prepared in accordance with s.26 of Ontario Regulation (O. Reg.) 419/05.

Although not part of an Environmental Compliance Approval (ECA) application at this time, this report is a preliminary assessment. A full Emission Summary and Dispersion Modelling report based on the detailed design of the ERRC will be submitted at the time of the ECA application.

The location of the ERRC is presented on Figure 1 and the land use designation of the site and surrounding area is presented on Figure 2. The location of the discharge from the biofilter is presented on Figure 3; the location of the biofilter discharge is specified with the source reference number.

1.2 Description of Processes and NAICS Codes

The County of Simcoe has proposed to build the Environmental Resource Recovery Centre (ERRC) at 2976 Horseshoe Valley Road West, Springwater, Ontario. The site is currently designated as greenlands.

The ERRC will include a transfer station and organics processing facility and may include a material recovery facility. This report evaluates two different organics processing options: tunnel composting and anaerobic digestion. For the purpose of odour control, this report assumes that the ERRC will be kept under negative pressure, with all collected air routed through the biofilter and associated exhaust stack to reduce odour emissions. In either case, the ERRC's NAICS code is 562210 – "Waste treatment and disposal".

1.3 Description of Products and Raw Materials

The ERRC takes in non-hazardous organic waste, including municipal leaf and yard waste, source-separated organics, and organic waste from the industrial, commercial, and institutional sectors and produces compost or digestate.

In the evaluated composting option, the organics processing facility at the ERRC would not take in waste from waste collection programs that allow the use of plastic bags. This is consistent with the County of Simcoe's current waste diversion program.

1.4 Process Flow Diagram

Refer to Figures 4A and 4B for a graphical representation of the ERRC processes.

1.5 Operating Schedule

For the purpose of this assessment, it has been assumed the ERRC can operate 24 hours a day, 7 days a week, up to 52 weeks a year.

1.6 Maximum Production Rate

For comparison with the source data, the maximum organics processing rate at the ERRC is 30,000 tonnes/year.

2. Initial Identification of Sources and Contaminants

This section provides an initial identification of all of the sources and contaminants emitted at the ERRC, as required by subparagraphs 2 to 4 of s.26 (1) of O. Reg. 419/05.

2.1 Sources and Contaminants Identification Table

Table 1 – Sources and Contaminants Identification Table tabulates all the emission sources at the ERRC. Table 1 provides the information required for subparagraphs 2 to 4 of s.26 (1) of O. Reg. 419/05.

The expected contaminants emitted from each source are also identified in Table 1. Each of the identified sources has been assigned a source reference number.

The location of the discharges from each of the sources is presented in Figure 3 as identified by the source reference numbers.

3. Assessment of Significance of Sources and Contaminants

This section provides an explanation for each source and contaminant identified as negligible in Table 1, as required by subparagraph 5 of s.26(1) of O. Reg. 419/05.

In accordance with s.8 of O. Reg. 419/05, emission rate calculations and dispersion modelling do not have to be performed for emissions from negligible sources or for the emission of negligible contaminants from significant sources.

3.1 Identification of Negligible Contaminants and Sources

Some sources at the ERRC were considered as insignificant, based on MOECC guidance. This is shown in further detail in Appendix B.

3.2 Rationale for Assessment

For each source or contaminant in Table 1 that has been identified as being negligible there is an accompanying documented rationale. The technical information required to substantiate the argument that each of the identified sources or contaminants is negligible is presented in Appendix B.

4. Operating Conditions, Emissions Estimating and Data Quality

This section provides a description of the operating conditions used in the calculation of the emission estimates and an assessment of the data quality of the emission estimates for each significant contaminant from the ERRC as required by subparagraphs 6 and 7 of s.26 (1) of O. Reg. 419/05.

4.1 Description of Operating Conditions

Section 10 of O. Reg. 419/05 states that an acceptable operating condition is a scenario that assumes operating conditions for the ERRC that would result, for the relevant contaminant, in the highest concentration of the contaminant at a Point-of-Impingement (POI) that the ERRC is capable of. The operating condition described in this AQIA Report meets this requirement.

The averaging time for the operating condition is based on the applicable averaging time for each contaminant. The contaminants have a 10-min or 24-hour. The operating condition used for this ERRC that results in the maximum concentration at a POI is the scenario where all significant sources are operating simultaneously at their individual maximum rates of production. The individual maximum rates of production for each significant source of emissions correspond to the maximum emission rate during any hour period. The individual maximum rates of production for each significant source of emissions are explicitly described in Appendix A.

4.2 Explanation of the Methods Used to Calculate Emission Rates

The maximum emission rates for each significant contaminant emitted from the significant sources were calculated in accordance with requirements of the Procedure Document.

The emission rate for each significant contaminant emitted from a significant source was estimated and the methodology for the calculation is documented in Table 2.

4.3 Sample Calculations

The technical rationale, including sample calculations, required to substantiate the emission rates presented in Table 2 is documented in Appendix A.

4.4 Assessment of Data Quality

This section provides an assessment of the data quality of the emission estimates for each significant contaminant from the ERRC.

The assessment of the data quality of the emission rate estimates for each significant contaminant emitted from the significant sources was performed in accordance with the requirements of subparagraph 7iii of s .26 (1) of O. Reg. 419/05.

For each contaminant the emission rate was estimated and the data quality of the estimate is documented in Table 2. The assessment of data quality for each source listed in Table 2 is documented in Appendix A.

All the emission rates listed in Table 2 correspond to the operating scenario where all significant sources are operating simultaneously at their individual maximum rates of production. Therefore, emission rate estimates listed in Table 2 are not likely to be an underestimate of the actual emission rates and use of these emission rates will result in a calculated concentration at POI greater than the actual concentrations.

5. Source Summary Table and Site Plan

This section provides the table required by subparagraph 8 and the site plan required by subparagraph 9 of s.26 (1) of O. Reg. 419/05.

5.1 Source Summary Table

For each source of significant contaminants the following parameters are referenced in Table 2 and are as follows:

- Contaminant.
- Chemical Abstract Service (CAS) reference number.
- Source reference number.
- Source description.
- Stack parameters (flow rate, exhaust temperature, diameter, height above grade, and height above roof)
- Location referenced to a Universal Transverse Mercator (UTM) coordinate system presented on Figure 3.
- Maximum emission rate.
- Averaging period.

- Emission estimating technique.
- Estimation of data quality.
- Percentage of overall emission.

5.2 Site Plan

The locations of the emission sources listed in Table 1 are presented in Figure 3; the location of each of the sources is specified with the source reference number. The location of the property line is indicated in Figure 3, with the southwest corner of the property-line clearly referenced in Universal Transverse Mercator (UTM) coordinate system. The location of each source is referenced to the UTM coordinates system under a column in Table 2.

The heights of the structures that are part of the ERRC are labeled in Figure 3.

6. Dispersion Modelling

This section provides a description of how the dispersion modelling was conducted at the ERRC to calculate the maximum concentration at a POI.

The dispersion modelling was conducted in accordance with the MOECC publication "Air Dispersion Modelling Guideline for Ontario" PIBS 5165e (ADMGO). A general description of the input data used in the dispersion model is provided below and summarized in Table 3.

As identified in Section 1.2, the NAICS code that applies to the ERRC is 562210 – "Waste Treatment and Disposal", which is listed in Schedule 5 of O. Reg. 419/05. As such, the ERRC is subject to s.20 of O. Reg. 419/05. An approved air dispersion model must be used and the ERRC's compliance assessed using Schedule 3 of O. Reg. 419/05. An approved model includes the United States Environmental Protection Agency (USEPA) atmospheric dispersion model AERMOD.

The AERMOD model has been identified by the MOECC as one of the approved dispersion models under O. Reg. 419/05, and currently includes the Plume Rise Model Enhancements (PRIME) algorithms for assessing the effects of buildings on air dispersion.

The AERMOD modelling system is made up of the AERMOD dispersion model, the AERMET meteorological pre-processor and the AERMAP terrain pre-processor. The following approved dispersion model and pre-processors were used in the assessment:

- AERMOD dispersion model (v. 14134).
- AERMAP surface pre-processor (v. 11103).
- BPIP building downwash pre-processor (v. 04274).

AERMET was not used in this assessment, as a pre-processed MOECC meteorological dataset was used.

The ERRC sources were modelled as point sources. A summary of the AERMOD source input parameters is provided in Appendix C.

The emission rates used in the dispersion model meet the requirements of Section 11(1) 1 of O. Reg. 419/05, which requires that the emission rate used in the dispersion model is at least as high as the maximum emission rate that the source of contaminant is reasonably capable of for the relevant contaminant. These emission rates are further described in Appendix A.

For each air contaminant, the highest predicted concentration for each averaging period was determined and used to assess against the MOECC published Schedule 3 standards. Note that high concentrations resulting from meteorological anomalies were eliminated from consideration for all contaminants.

There is no childcare facility, health care facility, senior's residence, long-term care facility or an education facility located at the ERRC and the building is located more than 5 metres (m) from the property line. Therefore same structure contamination was not considered.

6.1 Dispersion Modelling Input Summary Table

A description of the way in which the approved dispersion model was performed is included in Table 3. This table meets both the requirements of s.26 (1) 11 and Sections 8-17 of O. Reg. 419/05 and follows the format provided in the Procedure Document.

6.2 Coordinate System

The Universal Transverse Mercator (UTM) coordinate system, as per Section 5.2.2 of the ADMGO, was used to specify source locations, model object sources, buildings and receptors. All coordinates were defined in the North American Datum of 1983 (NAD83).

Property line coordinates are provided in Figure 3.

6.3 Meteorology and Land Use Data

Subparagraph 10 of s.26 (1) of O. Reg. 419/05 requires a description of the local land use conditions if meteorological data described in paragraph 2 of s.13 (1) of O. Reg. 419/05 was used. The AERMOD model was run using a MOECC pre-processed site-specific data set. The meteorological conditions which would result in the maximum concentration would typically be stable atmospheric conditions such as an inversion with low wind speed.

A land use designation plan is provided as Figure 2. Figure 2 also illustrates the extents of the ERRC property boundary and provides the zoning of adjacent land uses. The ERRC is located in an area designated greenlands, with surrounding areas designated rural, agricultural, or greenlands.

As previously noted, there are no sensitive land uses on the property, such as childcare facilities, senior citizen's residences, long-term care, or educational facilities.

6.4 Terrain

AERMOD captures the essential physics of dispersion in complex terrain though the use of a separate height scale factor for each receptor (USEPA, 1998 – AERMAP UG). The highest scale factor represents the terrain that would dominate flow in the vicinity of the receptor.

The height scale factor that is used by AERMOD is generated by an AERMAP terrain pre-processor. AERMAP utilizes terrain data, or Digital Elevation Model (DEM) data in conjunction with a layout of receptors and sources to height scale factors that can be directly used in AERMOD. Terrain data used in this assessment was obtained from MOECC (7.5 minute format).

6.5 Receptors

Receptors were chosen based on recommendations provided in Section 7.1 of the ADMGO, which is in accordance with s.14 of O. Reg. 419/05. A tiered receptor grid was defined starting with a rectangular boundary that encloses all the modelled sources (bounding box). A tiered grid was then defined starting from the edge of the bounding box with a fine resolution, to coarser resolutions further away. All tiered distances were defined relative to the bounding box. The receptor grid used is described as follows:

- 20-m spacing within 200 m of the edge of the bounding box.
- 50-m spacing from 200 to 500 m.
- 100-m spacing from 500 to 1,000 m.
- 200-m spacing from 1,000 to 2,000 m.
- 500-m spacing from 2,000 to 5,000 m.

A property line ground level receptor grid with 10-m spacing was used to evaluate the maximum property boundary concentration. No receptors were placed within the ERRC's property line.

6.6 Building Downwash

The ERRC buildings were entered into the model using the USEPA Building Profile Input Program (BPIP-PRIME). The inputs into this pre-processor include the co-ordinates and heights of the buildings and stacks. The BPIP program was executed to evaluate any building cavity downwash effects. Cavity downwash can result in air contaminants being forced to ground level prematurely under certain meteorological conditions. The on-site buildings and structures were modelled with their respective average roof heights. In this case, a 15m tall building, which would be expected to result in conservative assessment of downwash, was used for modelling.

The PRIME plume rise algorithms include vertical wind shear calculations (important for buoyant releases from short stacks [i.e., stacks at release heights within the recirculation zones of the buildings]). The PRIME algorithm also allows for the wind speed deficit factors to improve the accuracy of predicted concentrations within building wake zones that form in the lee of buildings. The BPIP input file is provided in Appendix C.

6.7 Deposition

AERMOD has the ability to account for wet and dry deposition of substances that would reduce ground level concentrations at POIs. However, the deposition algorithm has not been implemented in this assessment and therefore, the predicted POI concentrations are considered to be more conservative.

6.8 Averaging Time and Conversions

The shortest time scale that AERMOD predicts is a 1-hour average value. Schedule 3 standards of O. Reg. 419/05 apply to the ERRC; many of these standards are based on 24-hour averaging times, which are averaging times that are provided by AERMOD. For 10-minute averaging times, a conversion factor of 1.65 was applied to the 1-hour concentration.

6.9 Dispersion Modelling Options

The options used in the AERMOD dispersion model are summarized in the table below.

Modelling Parameter	Description	Used in the Assessment?
DFAULT	Specifies that regulatory default options will be used	No
BETA	Specifies the use of horizontal and capped sources	No
CONC	Specifies that concentration values will be calculated	Yes
DDPLETE	Specifies that dry deposition will be calculated	No
WDPLETE	Specifies that wet deposition will be calculated	No
FLAT	Specifies that the non-default option of assuming flat terrain will be used	No, the model will use elevated terrain as detailed in the AERMAP output
NOSTD	Specifies that the non-default option of no stack-tip downwash will be used	No
AVERTIME	Time averaging periods calculated	1-hour
URBANOPT	Allows model to incorporate the effects of increased surface heating from an urban area on pollutant dispersion under stable atmospheric conditions	Yes
URBANROUGHNESS	Specifies the urban roughness length (m)	1.0 m
FLAGPOLE	Specifies that receptor heights above local ground level are allowed on the receptors	No

6.10 Dispersion Modelling Input and Output Files

Appendix C includes the input and output files from the AERMOD model in electronic form.

7. Emission Summary Table and Conclusions

This section provides the table required by subparagraph 14 of s.26 (1) of O. Reg. 419/05 and provides an interpretation of the results as required by the Procedure Report.

7.1 Emission Summary Table

A POI concentration for each significant contaminant emitted from the ERRC was calculated based on the emission rates listed in Table 2. The output from the approved dispersion model is presented in Appendix C. The results are presented in Table 4. This table follows the format provided in the Procedure Document. For each source of significant contaminants the following parameters are referenced:

- Contaminant name.
- CAS number.
- Total emission rate.
- Approved dispersion model used.
- Maximum POI concentration.
- Averaging period for the dispersion modelling.
- MOECC POI limit.
- Indication of limiting effect.
- Schedule in Regulation 419/05.
- The percentage of standard.

The POI concentrations listed in Table 4 were compared against criteria listed in the ACB List.

7.2 Assessment of Contaminants with no MOE POI Limits

Subparagraph 14 subsection viii of s.26 (1) of O. Reg. 419/05 requires an indication of the likelihood, nature and location of any adverse effect if the contaminant is not listed in any of Schedules 1, 2, and 3.

All contaminants have corresponding criteria in the ACB list or guidelines.

7.3 Conclusions

This AQIA Report was prepared in accordance with s.26 of O. Reg. 419/05. In addition, guidance in the Procedure Document was followed as appropriate.

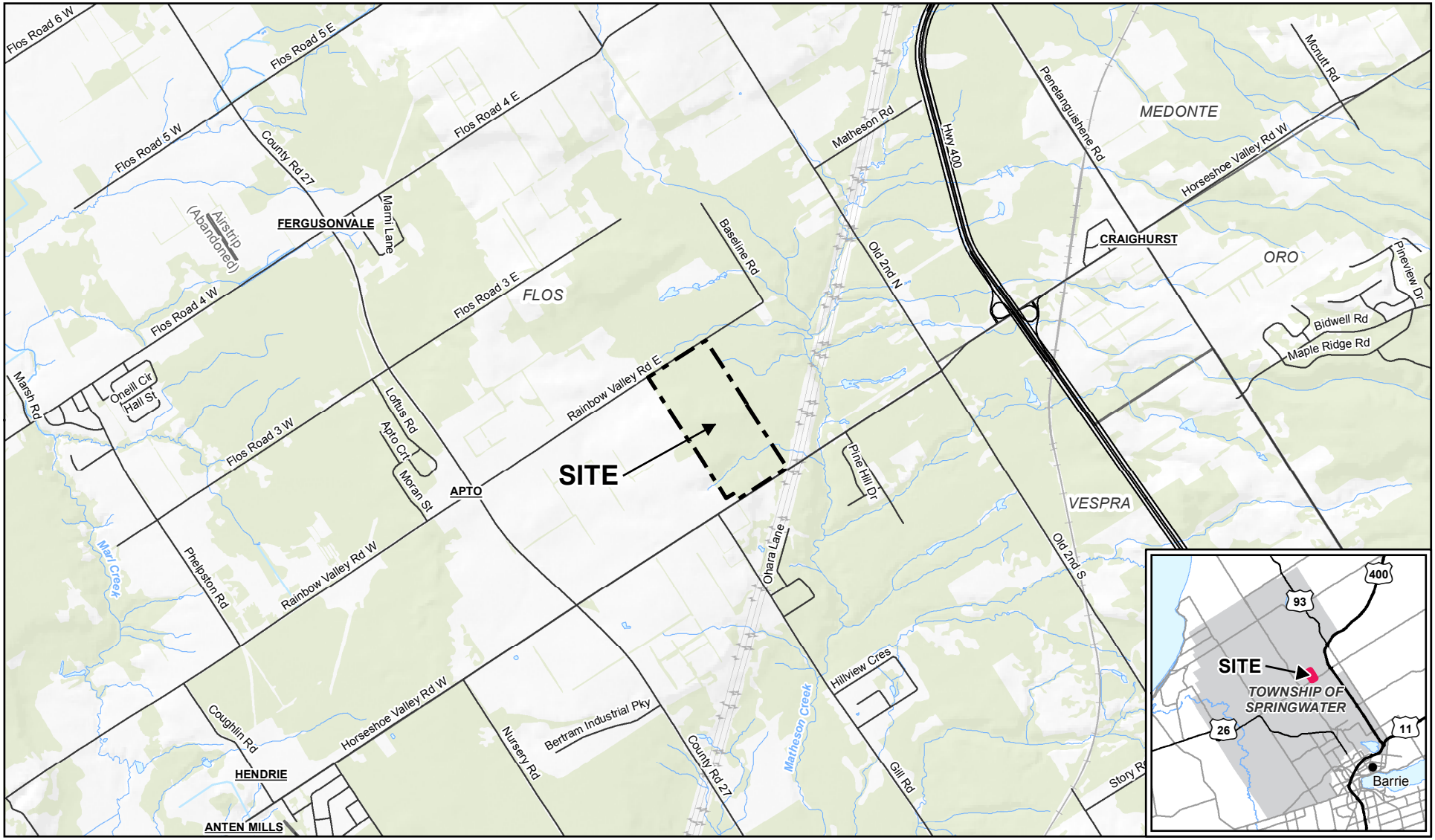
The emission rate estimates for each source of significant contaminants are documented in Table 2. All the emission rates listed in Table 2 correspond to the operating scenario where all significant sources are operating simultaneously at their individual maximum rates of production. Therefore these emission rate estimates listed in Table 2 are not likely to be an underestimate of the actual emission rates.

A POI concentration for each significant contaminant emitted from the ERRC was calculated based on the calculated emission rates and the output from AERMOD model; the results are presented in Table 4.

The POI concentrations listed in Table 4 were compared against criteria listed in the ACB list and guidelines.

This AQIA Report demonstrates that the ERRC can operate in compliance with O. Reg. 419/05. Dispersion modelling of odour emissions did not identify any points off ERRC property where discharges of odour may result in an adverse effect based on MOECC standards and guidelines.

Figures



Source: MNRF NRVIS, 2015. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2018;

0 500 1,000 1,500
Meters

Coordinate System:
NAD 1983 UTM Zone 17N

N

GHD

ENVIRONMENTAL RESOURCE RECOVERY CENTRE (ERRC)
2976 HORSESHOE VALLEY ROAD WEST, SPRINGWATER
AIR QUALITY IMPACT ASSESSMENT REPORT

86822-03
Jan 10, 2018

SITE LOCATION MAP

FIGURE 1

GIS File: Q:\GIS\PROJECTS\86000s\86822\Layouts\017\86822-03(017)GIS-WA001.mxd

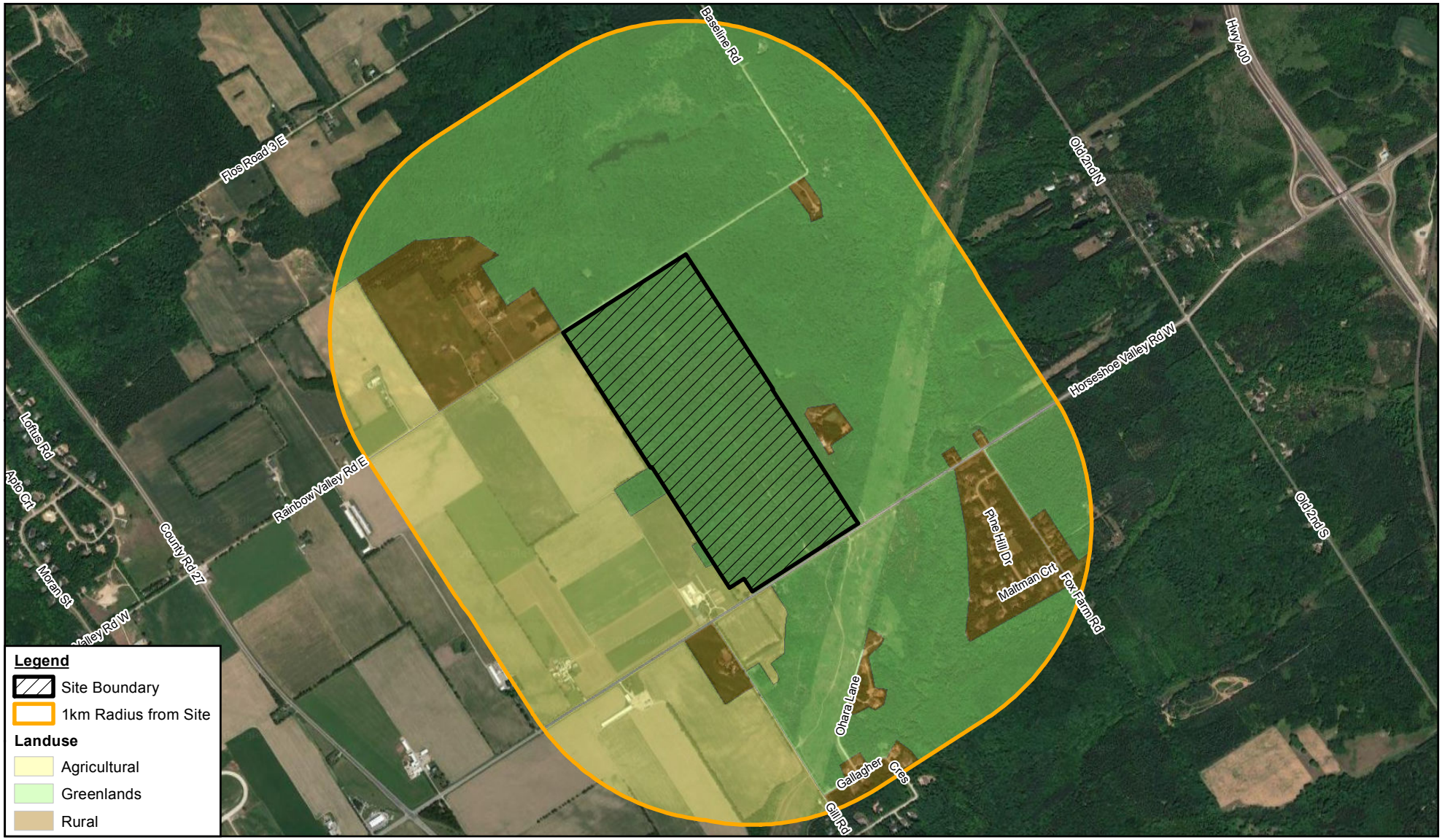


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Image ©2018 Google, Imagery date: 2015.

0 240 480 720
Meters

Coordinate System:
NAD 1983 UTM Zone 17N

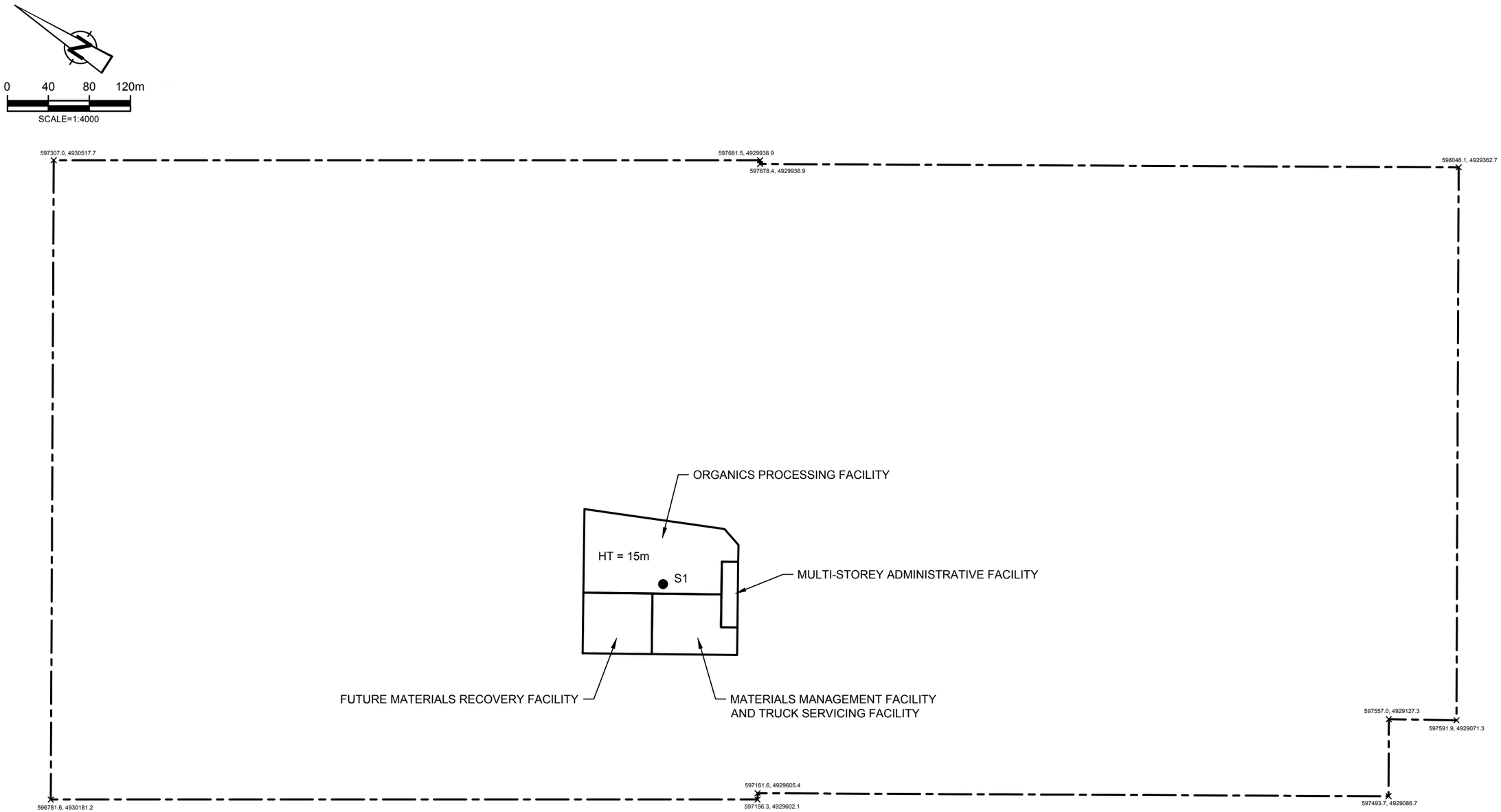
ENVIRONMENTAL RESOURCE RECOVERY CENTRE (ERRC)
2976 HORSESHOE VALLEY ROAD WEST, SPRINGWATER
AIR QUALITY IMPACT ASSESSMENT REPORT

86822-03
Jan 11, 2018

LAND USE DESIGNATION PLAN

FIGURE 2

GIS File: Q:\GIS\PROJECTS\86000s\86822\Layouts\017\86822-03(017)GIS-WA002.mxd



LEGEND

PROPERTY BOUNDARY

S1 SOURCE LOCATION

figure 3

SITE PLAN AND ROOF LAYOUT
AIR QUALITY IMPACT ASSESSMENT REPORT
2976 HORSESHOE VALLY ROAD WEST
Springwater, Ontario

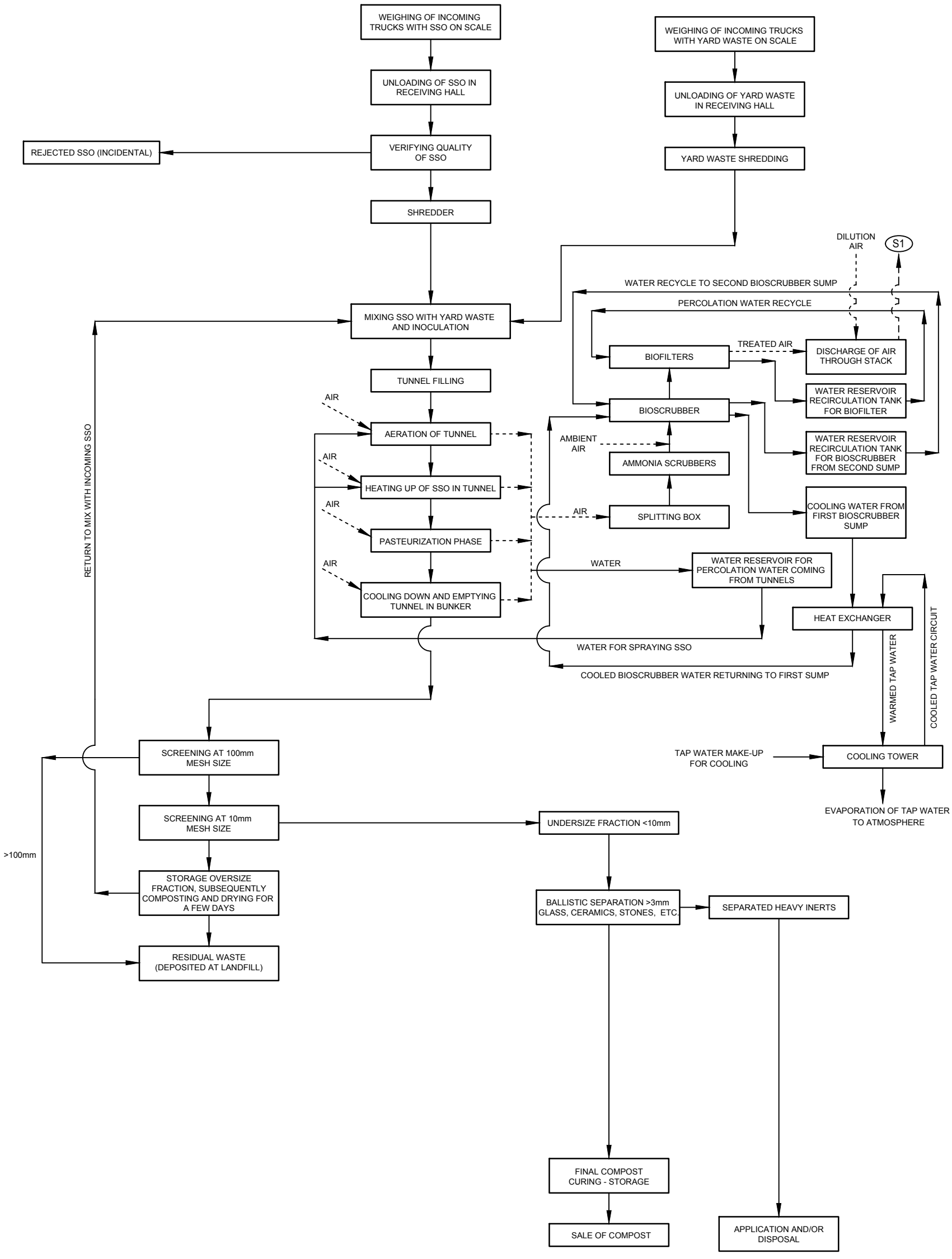


figure 4A

TYPICAL TUNNEL COMPOSTING PROCESS FLOW DIAGRAM
AIR QUALITY IMPACT ASSESSMENT REPORT
2976 HORSESHOE VALLEY ROAD WEST
Springwater, Ontario

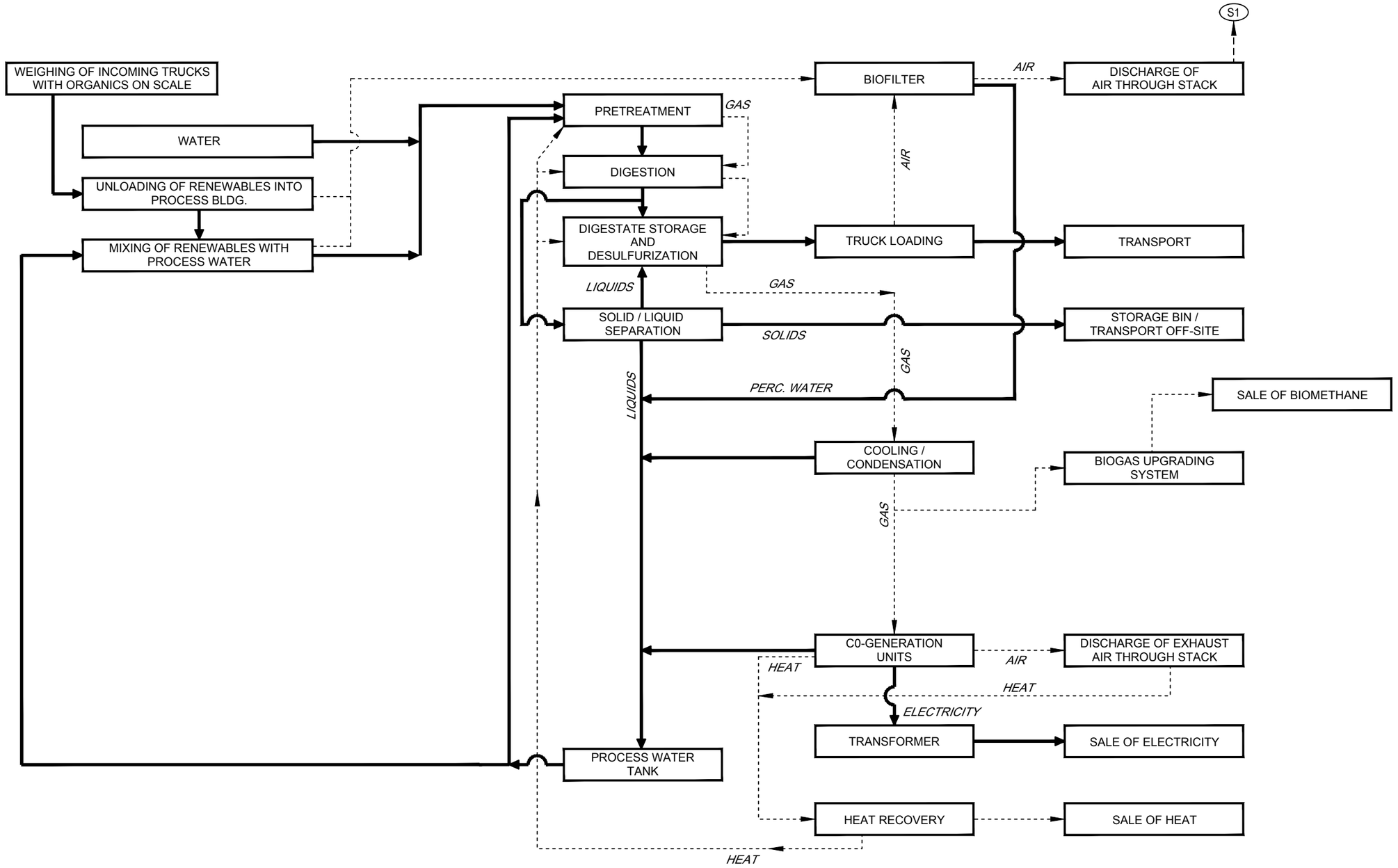


figure 4B

TYPICAL ANAEROBIC DIGESTION PROCESS FLOW DIAGRAM
AIR QUALITY IMPACT ASSESSMENT REPORT
2976 HORSESHOE VALLEY ROAD WEST
Springwater, Ontario

Tables

Table 1

Source and Contaminant Identification
Environmental Resource Recovery Centre
Springwater, Ontario

Source Information				
ID	**Description**	**Expected Contaminants**	**Significant?**	**Rationale**
S-1	Biofilter	Odour, TRS, Ammonia	Y	
	Transfer station and material recovery facility	Dust	N	Activities occur inside contained building under negative pressure.
	Roads and parking	Dust	N	Paved. See Appendix B.

Table 2

Source Summary
Environmental Resource Recovery Centre
Springwater, Ontario

Contaminant	CAS Number	Source Data									Emission Data			
		Source Identifier	Source Description	Exhaust Flow Rate	Exhaust Velocity	Exhaust Temperature	Exhaust Inner Diameter	Exhaust Height Above Grade	Source Coordinates		Maximum Emission Rate	Emission Estimation Technique	Data Quality	% of Overall Emissions
				(m^3/s)	(m/s)	(°C)	(m)	(m)	x (m)	y (m)	(g/s)			
Composting Scenario														
Odour	NA1	S-1	Biofilter	3.50	20.00	25	0.47	20	597282	4929874	4.31E+03	ST/EC	M	100.00%
Ammonia	7664-41-7	S-1	Biofilter	3.50	20.00	25	0.47	20	597282	4929874	5.41E-02	ST/EC	M	100.00%
Anaerobic Digestion Scenario														
Odour	NA1	S-1	Biofilter	1.39	20.00	25	0.30	20	597282	4929874	8.55E+02	ST/EC	M	100.00%
TRS	NA2	S-1	Biofilter	1.39	20.00	25	0.30	20	597282	4929874	2.86E-04	ST/EC	M	100.00%

Note:
ST/EC - source test and engineering calculation

Table 3

Dispersion Modelling Input Summary
Environmental Resource Recovery Centre
Springwater, Ontario

Relevant Section of the Regulation	Section Title	Description of How the Approved Dispersion Model Was Used
Section 8	Negligible sources of contaminant	Sources and contaminants that were considered negligible were explicitly identified. In accordance with O Reg 419/05 s.8, these sources were not modelled.
Section 9	Same structure contamination	Not applicable, as there are no other tenants on the site. There is no child care facility, health care facility, seniors' residence, long-term care facility, or educational facility on the site.
Section 10	Operating conditions	All equipment was assumed to be operating at the maximum production rate at the same time.
Section 11	Source of contaminant emission rates	The emission rates of significant contaminants were estimated. The methodology for each calculation is documented in Table 2.
Section 12	Combined effect of assumptions for operating conditions and emission rates	The operating conditions were estimated in accordance with O Reg 419/05, ss.10(1)1, 11(1)1.
Section 13	Meteorological data	Site-specific meteorological data was used.
Section 14	Area of modelling coverage	The modelling coverage corresponds to the receptor grid specified in O Reg 419/05 s.14(1).
Section 15	Stack height for certain new sources of contaminant	Not applicable, as O Reg 419/05 s.15 does not apply to the site.
Section 16	Terrain data	Terrain data for surrounding areas was obtained from the Ontario Ministry of the Environment and Climate Change and processed using AERMAP.
Section 17	Averaging periods	The averaging periods required under O Reg 419/05 Schedule 3 were used.

Note:

Refer to Appendix C for AERMOD dispersion modelling results.

Table 4

Emission Summary
Environmental Resource Recovery Centre
Springwater, Ontario

Contaminant	CAS Number	Total Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration (µg/m³)	Averaging Period	POI Limit (µg/m³)	Limiting Effect	Regulation Schedule	Percentage of POI Limit
Composting Scenario									
Odour - Max Grid	NA1	4.31E+03 OU/s	AERMOD v.14134	9.14E-01 OU	10-min	1 OU	Odour	-	91%
Odour - Max Receptor	NA1	4.31E+03 OU/s	AERMOD v.14134	4.87E-01 OU	10-min	1 OU	Odour	-	49%
Ammonia	7664-41-7	5.41E-02	AERMOD v.14134	1.52E+00	24-hr	100	Health	B1	2%
Anaerobic Digestion Scenario									
Odour - Max Grid	NA1	8.55E+02 OU/s	AERMOD v.14134	2.09E-01 OU	10-min	1 OU	Odour	-	21%
Odour - Max Receptor	NA1	8.55E+02 OU/s	AERMOD v.14134	1.15E-01 OU	10-min	1 OU	Odour	-	11%
TRS	NA2	2.86E-04	AERMOD v.14134	7.02E-02	10-min	13	Health	B1	<1%
TRS	NA2	2.86E-04	AERMOD v.14134	9.60E-03	24-hr	7	Odour	B1	<1%

Appendices

Appendix A
Sample Calculations

Appendix A

Sample Calculations
Country of Simcoe ERRC

Source S-1 (Biofilter)

Emissions from the biofilter consist of odour, total reduced sulphur and ammonia generated during the composting or anaerobic digestion process. It is assumed that the ERRC is kept under negative pressure and all air is processed by the odour control system before being released through the biofilter exhaust stack.

***Methodology*:** Engineering Calculation (EC), Source Testing (ST)

In the composting scenario, emissions from the biofilter are based on MOECC-approved source testing conducted at a tunnel composting facility in Ontario in 2015 to satisfy the requirements of an Environmental Compliance Approval. Feed stocks at the facility include municipal source-separated organics, leaf and yard waste, and industrial, commercial, and institutional organic waste.

In the anaerobic digestion scenario, emissions from the biofilter are based on MOECC-approved source testing conducted at an anaerobic digestion facility in Ontario in 2015 to satisfy the requirements of an Environmental Compliance Approval. Feed stocks at the facility include manure, municipal source-separated organics, fats, oils, greases, and industrial, commercial, and institutional organic waste.

The emission rate was multiplied by the ratio of annual processing rates. The source parameters were set by maintaining the contaminant concentration in exhausted air, then adjusting the stack diameter to result in a 20 m/s exit velocity.

Estimated total emissions are provided in Table A.1.

Sample Calculation (Odour – Composting Scenario):

$$ER = Source\ test\ ER \times \frac{ERRC\ processing\ rate}{Source\ test\ processing\ rate}$$

$$ER = 2.15 \cdot 10^4 \frac{OU\ m^3}{s} \times \frac{30\ 000\ tpy}{150\ 000\ tpy}$$

$$ER = 4.31 \cdot 10^3 \frac{OU\ m^3}{s}$$

Data Quality: Average/Marginal

Per Section 9.2.3 of the ESDM Procedure Document, estimates based on partially validated source testing at one specific operating conditions are considered to have average data quality.

Per Section 9.2.4 of the ESDM Procedure Document, estimates based on calculations where the scientific/technical integrity of the approach is uncertain are considered to have uncertain data quality.

This emission estimate uses a combined approach, where validated source testing results are used as inputs for an engineering calculation.

Table A.1

Estimated Biofilter Emissions
Environmental Resource Recovery Centre
Springwater, Ontario

Technology	Processing Rate (tpy)	Source Test Emissions			Proposed Parameters (Based on 30,000 tpy processing rate)				
		Odour ($OU \times m^3/s$)	TRS (g/s)	Ammonia (g/s)	Flow Rate (m^3/s)	Stack Diameter (m)	Odour ($OU \times m^3/s$)	TRS (g/s)	Ammonia (g/s)
Compost	150,000	2.15E+04	N/A	2.70E-01	3.50	0.47	4.31E+03	—	5.41E-02
Anaerobic Digestion	70,000	1.99E+03	6.68E-04	N/A	1.39	0.30	8.55E+02	2.86E-04	—

Appendix B
Supporting Information for Assessment of Negligibility

1. Appendix B

Assessment of Significance
County of Simcoe ERRC

Sources were screened for negligibility using the following screening protocols listed in the ESDM Procedure Document:

- Specific Examples of Sources that Emit Contaminants in Negligible Amounts (Table B-3).

The results of the screening are discussed in detail in the following text.

Specific Examples of Sources that Emit Contaminants in Negligible Amounts

Table B-3 of the ESDM Procedure Document and O. Reg. 524/98 lists sources that can be considered to be insignificant. The following sources at the ERRC are listed in either Table B-3 or O. Reg. 524/98:

The ERRC's NAICS code is listed in Table 7-3 of Section 7.4 of the ESDM Procedure Document. However, the site is not a landfill, all roads are paved, and storage occurs indoors. Accordingly, fugitive dust emissions can be considered insignificant, as there are no active storage piles or significant use of on-site roadways.

Material unloading and transfer operations occur indoors in a contained building under negative pressure. Air is routed through the odour control system, including a biofilter. Therefore, fugitive dust emissions from transfer station and material recovery facility operations can be considered insignificant.

Appendix C
Dispersion Modelling Files (Electronic)

www.ghd.com