



To: **Committee of the Whole**

Agenda Section: Corporate Services
Division: Engineering, Planning and Environment
Department: Solid Waste Management

Item Number: CCW - 16-266

Meeting Date: August 9, 2016

Subject: Organics Processing Facility – Project Delivery Method

Recommendation

That Item CCW 16-266, dated August 9, 2016, regarding the Organics Processing Facility – Project Delivery Method, be received.

Executive Summary

This item follows direction from County Council regarding the Development Strategy for the Materials Management Facility (MMF) and Organics Processing Facility (OPF) at 2976 Horseshoe Valley Road West, Springwater. Direction was received to advance development of the MMF first, utilizing a traditional Design-Bid-Build (DBB) procurement process. The OPF procurement process will be longer and more complex. The purpose of this item is to present a subsequent technical memorandum prepared by GHD Limited (GHD), the County's consultant on this project, outlining various project delivery methods and potential contractual arrangements for the OPF.

Following a detailed summary of options and key considerations when procuring these types of facilities, GHD has recommended that the County utilize a Design-Build-Operate (DBO) procurement method. This is consistent with other municipal facilities developed by the cities of Guelph, Hamilton, Toronto, Surrey, and Calgary and has been proven to effectively balance important factors such as cost, administration requirements, input into design, and control of operations while minimizing risk associated with environmental performance and long-term pricing.

Consultation will now be undertaken to obtain feedback on the information presented in this item, including a meeting with neighbouring landowners tentatively scheduled for September 8, 2016. Further to this, a staff report will present feedback and comments received for County Council's consideration and final direction. This will be in preparation for release of the first procurement opportunity related to the OPF, a Request for Information (RFI), set for November.

Background/Analysis/Options

The purpose of this item is to provide an overview of various project delivery methods for the Organics Processing Facility (OPF). This is further to *Item CCW 16-165 – Solid Waste Management Infrastructure Projects – Development Strategy* (May 24, 2016) and presents an additional technical memorandum prepared by the County's consultant, GHD Limited (GHD), outlining specific information on procurement of organics processing facilities. This memorandum describes various ownership and financing models, key considerations for the County (including risk), and provides a recommendation to be brought forth for County Council's consideration. For reference, the document entitled *Organics Processing Facility – Procurement and Project Delivery* (GHD Limited, July 20, 2016) is provided for reference as Schedule 1.

It is noted that in the initial viability study for the OPF undertaken by Genivar Inc. (Genivar) (*Central Composting Facility Viability Assessment Report*, May 2012), they noted that the "realization of a County-owned CCF will almost certainly involve procurement through a design-build-operate (DBO) RFP". As organics processing technology has evolved and new facilities developed since then, updated project planning for the OPF included this opportunity for further discussion on project delivery and, in addition, consultation with the public and neighbouring landowners.

Previous staff reports regarding development of these facilities, consultants' technical reports (including the Genivar report referenced above), communication material from public information and consultation sessions, and minutes of Community Engagement Committee meetings can be found at www.simcoe.ca/opf and www.simcoe.ca/mmf.

Project Delivery Method (MMF)

As outlined previously in Item CCW 16-165, although both the MMF and OPF will manage waste at the new facility, development of the OPF will be a more complex process, requiring additional time and resources to deliver. Processing involves some form of specialized equipment whereas the MMF is quite simply a building for temporary storage and consolidation of garbage and recycling. Design work for the MMF will primarily consider management of material on-site, whereas design of the OPF will consider many variables such as feedstock, end products, odour control, expansion ability and other design features. As such, the delivery method and timing for the MMF and OPF, although to be constructed at the same location, will be considered separately.

As with other similar County projects, it is recommended that work be initiated to deliver the MMF through a simple Design-Bid-Build (DBB) procurement method. This has historically been the most common method for developing municipal infrastructure projects and will involve the County retaining an engineering firm to develop detailed design and specifications for the MMF (including the tipping floor, fleet servicing portion, and administration/education space). The detailed design and specifications will form part of a tender package to obtain bids from contractors, with the contractor selected through the tender process and subsequently retained to construct the facility in accordance with the bid specifications, price, and schedule. Following commissioning, it is anticipated that given the straightforward and routine nature of waste transfer operations, that operation and maintenance of the MMF would be undertaken by the County.

Project Delivery Method (OPF)

Procurement of the OPF will be a detailed, multi-staged process which will determine the organics processing technology best suited for the County and associated costing. As outlined in Item CCW 16-165, County Council approved proceeding with Option 2 – that is, the procurement would be “technology neutral” and open the process to aerobic composting and anaerobic digestion. In order to obtain additional information and preliminary cost estimates, a market sounding Request for Information (RFI) will be undertaken this fall and the results presented to County Council in the form of a preliminary business case in early 2017. This will be followed by both a Request for Pre-Qualification (RFPQ) and Request for Proposal (RFP). Following this three-step process, site-specific development costs and a detailed business case will be presented in early 2018.

In determining the best-suited model for OPF procurement, there are a number of key considerations. Each project/municipality is unique and there is no set method for delivery. Key considerations and various discussion points, however, are summarized below in Table 1, noting that they are not independent of one another. For example, transferring risk to the private sector may increase costs for the municipality, limit input into design, and reduce control over project details and operations. Finding an effective balance is fundamental to the decision-making process.

Table 1: Key Considerations for Selecting OPF Project Delivery Method

Key Consideration	Factors and Discussion Points
Budget	<ul style="list-style-type: none"> considers lifecycle capital and operating expenditures does not include internal project management/contract administration costs must consider access to capital for delivery methods where capital expenditures are paid directly by owner as they are incurred
Schedule	<ul style="list-style-type: none"> considers the number of procurement steps required to retain various contractors private sector delivery typically requires less time
Design	<ul style="list-style-type: none"> owner input into design varies based on delivery method – more input equates to more risk specifications put forth in procurement can be design-based or performance-based
Administration	<ul style="list-style-type: none"> considers the amount of effort by the owner to manage partners and contracts multiple contracts equates to greater internal costs to manage development and operation of the facility
Control	<ul style="list-style-type: none"> transferring project risk results in less control over project details increased private sector involvement → less control by municipality control points can be included in contractual arrangements (such as environmental performance related to odour, compliance with Environmental Compliance Approval, etc.)
Risk	<ul style="list-style-type: none"> transfer of risk is the primary reason for increasing private sector involvement in a public infrastructure project for the OPF, includes consideration of risk tied to ability to provide ongoing services, environmental performance, and consistent long-term pricing
Technology	<ul style="list-style-type: none"> organics processing technologies are varied and diverse – makes design/technology selection more complicated design is generally not possible in advance for tendering

Common project delivery methods for developing organic processing facilities are consistent with other municipal infrastructure development models. Table 2 summarizes information presented by GHD on various project delivery models for the OPF and application of key considerations.

Table 2: Project Delivery Models for the Organics Processing Facility

Model	Description	Discussion Points
Design-Bid-Build (DBB)	<ul style="list-style-type: none"> owner contracts with separate entities for design and construction – also referred to as a design-tender operation and maintenance are contracted separately or undertaken by owner capital is secured by owner (may include milestone payments or monthly draws linked to progress) 	<ul style="list-style-type: none"> not a common approach to procurement of organics processing facilities – technology varies widely and pre-design is not a viable option lowest overall cost to owner but offset by administration effort/costs to manage multiple contracts generally some cost savings over the longer term but access to capital may be an impediment tends to require additional time as there are a number of procurement steps requires more design input – increases risk to owner <i>GHD conclusion – not a viable option as it requires technology to be selected and designed in advance of a tender</i>
Design-Bid (DB)	<ul style="list-style-type: none"> turnkey project delivery method owner contracts with a single entity for design and construction operation and maintenance are contracted separately or undertaken by owner capital is secured by owner (may include milestone payments or monthly draws linked to progress) 	<ul style="list-style-type: none"> lessens administration requirements – single point of contact operating risk shifts to the municipality not a common approach to procurement of this type of facility generally some cost savings over the longer term but access to capital may be an impediment would require that the County operate the facility at commissioning or let a separate contract <i>GHD conclusion – not a viable option as it is important to embed the operator into design and construction of this type of facility to ensure performance</i>

Table 2: Project Delivery Models for the Organics Processing Facility *continued*

Model	Description	Discussion Points
Design-Build-Operate (DBO)	<ul style="list-style-type: none"> • turnkey project delivery method • owner contracts with a single entity to design, construct, and operate and maintain • capital financing is secured by the owner (may include milestone payments or monthly draws linked to progress) • operations and maintenance are defined for a period of time and after which can be transferred back to owner or subsequent operator 	<ul style="list-style-type: none"> • specialization of organics processing technology favours this approach • lead entity oversees and manages sub-contracts directly – owner administers a single contract • other municipal examples – cities of Guelph, Hamilton, Toronto, Surrey, Calgary • required to define term of the operation/maintenance portion for procurement process • generally some cost savings over the long term but access to capital may be an impediment • schedule risk is reduced with scheduled milestones and penalties for missed deadlines • owner is primarily concerned with key performance criteria rather than design but municipality has some design input • performance requirements and expectations of the operator can be clearly defined in DBO contract • risk associated with ability to provide on-going service and ensure consistent long-term pricing favours this model
Build-Own-Operate-Transfer (BOOT)	<ul style="list-style-type: none"> • turnkey project delivery method • owner contracts with a single entity to design, construct, finance, own, and operate and maintain • following a period of time, ownership and operation are transferred back to municipality 	<ul style="list-style-type: none"> • approach used where a municipality intends to operate an asset at some future point • not a common approach to procurement of organics processing facilities • can be expensive as financing costs are less favourable for a newly-created entity compared to municipalities, costs can be marked-up by the contractor • schedule risk is reduced with scheduled milestones and penalties for missed deadlines • owner is primarily concerned with key performance criteria rather than design but municipality has some design input

Table 2: Project Delivery Models for the Organics Processing Facility *continued*

Model	Description	Discussion Points
Build-Own-Operate (BOO) Design-Build-Own-Operate (DBOO)	<ul style="list-style-type: none"> • turnkey project delivery method similar to BOOT except contractor retains ownership • considers variations of Public-Private Partnerships (PPP or P3) 	<ul style="list-style-type: none"> • similar to DBO but differs in regard to ownership and transfer of risk • municipality does not outlay capital but pays a tipping fee to the private sector entity • siting, technology selection, and operations are implemented by a private sector operator • typically has shortest turnaround time • schedule risk is reduced with scheduled milestones and penalties for missed deadlines • municipality has little control/input into how project is executed or designed – this may not align with public input and feedback received during consultation • owner is primarily concerned with key performance criteria – ability of municipality to control operations, however, is very limited • financial, schedule, insurance, and performance risk is transferred to the private sector • would be complicated by preferred site being County-owned – very little precedent for developing a privately-owned facility on public land

Potential for Funding – PPP Canada

In their memorandum, GHD provided some information on Public-Private Partnerships (PPP or P3), a variation of a BOO or DBOO arrangement. They noted that P3 funding is increasing in popularity as demand for infrastructure upgrades and spending outpaces available public funds. Specifically, information was provided on funding available through the Federal Government's PPP Canada program. This program funds up to 25% of a project's direct construction costs (no operation costs are included), payable at the conclusion of construction. PPP Canada involvement shifts an amount of risk and financing to the private sector while providing some up-front capital. In regard to the OPF project, 4 projects of 20 that PPP Canada have facilitated across the country could be considered analogous. These projects are listed below with the maximum amount of funding allotted (noting that this is 25% of the project's total construction costs):

- Biosolids Energy Centre (Greater Victoria, British Columbia) – \$83.40M
- Biosolids Management Facility (Greater Sudbury, Ontario) – \$11M
- Hamilton Biosolids Project (Hamilton, Ontario) – \$22.91M
- Organics Biofuels Facility Project (Surrey, British Columbia) – \$16.9M

Upon review of the above projects and based on their experience developing similar projects to the OPF, GHD noted that this funding would not be a viable option for the County given that:

- While there is no minimum or maximum size for PPP Canada projects, it is important to contextualize PPP Canada involvement in projects, which generally appears to be substantially higher than would be required for the OPF; at approximately a \$30M total capital as the County has estimated previously, the Federal funding contribution would be a maximum of \$7.5M. For further context, some PPP Canada projects (such as the Edmonton Light Rail Transit System) have Federal contributions up to \$250M.
- PPP Canada in part drives the procurement strategy and outlay of the capital project, which would potentially increase overall capital projections. Additionally, as a funder in the project, PPP Canada would represent an additional stakeholder in the project moving ahead, introducing an additional potential set of performance, monitoring, and reporting requirements which could substantially increase administration responsibilities.
- Of further note, PPP Canada funding is distributed according to funding rounds. Applications for Round 7 were closed last summer, with applicants notified of the outcome in fall of 2015. Round 8 has not been announced as yet, and thus the County has no present means of applying for this funding or certainty with respect to when it would be received and how this would affect the timelines and scope of the OPF project.

Recommendation

GHD has recommended that the County procure the OPF through a three-step Design-Build-Operate (DBO) model that allows for open consideration of technologies such as aerobic composting and anaerobic digestion. GHD noted that:

- this method would leverage private sector operating experience with biological processes and management of environmental performance;
- in order to create consistency with respect to DBO bidders, it will be important to establish the operating term up front such that bidders can provide costing on an equitable basis and evaluation of costing can be undertaken using a consistent methodology such as a life cycle costing approach;
- appropriate provisions for the County to take over operations during the operating cycle should be considered; and
- attention should be provided to the budgeting cycle for the capital required for project development.

Going Forward

Further to this item, details of the project delivery method for the OPF will be presented for consultation. A neighbouring landowner meeting has been tentatively set for Thursday, September 8. It is anticipated that feedback will be sought on the procurement strategy recommended by GHD, with comments received provided to County Council in a final report this fall. This will be in preparation for the first procurement document for the OPF, a Request for Information (RFI), to be let in November.

Financial and Resource Implications

Following the three-step procurement process, capital requirements for the OPF will be provided to County Council for their consideration and direction via the final business case. As noted in the approved Development Strategy, this is anticipated to be completed by early 2018.

Relationship to Corporate Strategic Plan

In regards to long-term processing of organics, the Solid Waste Management Strategy recommended development of a centralized composting facility within the County. Public input indicated support for in-County processing as well as for the addition of pet waste and diapers to the program.

Reference Documents

Item CCW 16-191 (May 24, 2016) Solid Waste Management Infrastructure Projects – Development Strategy

Attachments

Schedule 1 – Technical Memorandum: *Organics Processing Facility – Procurement and Project Delivery* (GHD Limited, July 20, 2016)



for CCW 16-266
Schedule 1.pdf

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July 21, 2016
July 25, 2016
August 2, 2016
August 2, 2016



Memorandum

July 20, 2016

To: Stephanie Mack (County of Simcoe) Ref. No.: 086822

From: Michael Cant (GHD) and Tej Gidda (GHD)/ks/6

cc: Brian Dermody (GHD)

Subject: Organics Processing Facility – Procurement and Project Delivery

The County of Simcoe (County) is currently in the process of developing an Organics Processing Facility (OPF) and a Materials Management Facility (MMF). Recent siting work undertaken by GHD identified a property located at 2976 Horseshoe Valley Road West in the Township of Springwater as the preferred site for both facilities, in a co-located configuration that would optimize logistics. Siting approval was received from County Council on March 22, 2016, allowing work to continue on the development of co-located facilities on the preferred site.

While both facilities will be situated on the same site, they differ in terms of technology, procurement method, approvals, and development timelines. This memorandum specifically focusses on the project delivery/procurement method for the OPF and is intended to be read in conjunction with a GHD memorandum dated May 11, 2016 and entitled "Development Strategy for Co-Located OPF and MMF" (included as Attachment 1).

1. Introduction

In 2010, the County of Simcoe approved the Solid Waste Management Strategy, which provided a framework for both short-term and long-term waste disposal and diversion options over the next 20 years.

Two recommendations from the Strategy included:

- That the County assesses development of a central compost facility and explore various technology options to meet long-term processing requirements.
- That the County assesses options for the transfer of materials, including garbage and recyclables to support processing and/or disposal elements of the waste management system.

A number of studies have been undertaken on the above recommendations since the completion of the Strategy in 2010. The final conclusion of all the work has been a recommendation that the County establish the OPF/MMF at 2976 Horseshoe Valley Road in Springwater.



On June 14, 2016, the Development Strategy for the OPF/MMF was approved by County Council. The key decisions made at this meeting included:

1. Planning and Ministry of the Environment and Climate Change (MOECC) approvals for the MMF and OPF at 2976 Horseshoe Valley Road West, Springwater proceed.
2. The procurement of design and construction of the MMF proceed as a Design/Bid/Build (DBB).
3. The procurement of technology, design and construction of the OPF proceed in accordance with the Development Strategy – Option 2 (expanding procurement to consider all organics processing technologies).

This memorandum has been prepared to further expand on point 3 with respect to OPF procurement as it relates to the Council-approved Option 2 included therein. The memorandum provides a summary of Option 2 and an overview of the different project delivery models available to the County.

2. Option 2 – OPF Procurement Strategy

Option 2 allows different technological options for the OPF to be considered. The business case for the OPF is presented in a two-step process wherein the inputs are refined over time as contractor pricing becomes more certain.

The Council direction to consider all organics processing technologies requires surveying the technology industry for approaches and vendors that would not necessarily have been available in 2010 when the original direction was provided. Since 2010, a number of technological and regulatory factors have influenced decisions regarding organics processing technologies. These are discussed in brief in this section.

An initial and relevant point is the decision by a number of private and municipal proponents to process organic materials using anaerobic digestion rather than composting. There has been a significant movement in this direction since 2010; both technologies are discussed in greater detail in a subsequent section. Traditionally, organic materials have largely been composted, providing a rich nutrient product for land application. At this point, the further advantages of anaerobic digestion (AD; smaller footprint, ability to produce energy, improved odour control) have hastened the deployment of this technology. A number of full-scale projects have been developed or are in progress utilizing AD, including the Disco Road Organics Processing Facility (City of Toronto); the Bio-En facility (Elmira); the Seacliff facility (Leamington, ON); current construction of a large-scale digestion plant in Surrey, BC; current construction of a digestion project by the City of Edmonton; and the decisions by the Region of Peel and the Region of Durham to pursue anaerobic digestion projects going forward.

An important additional motivating factor for AD in the Ontario context is new regulation, in particular Bill 172 (Climate Change Mitigation and Low-carbon Economy Act, passed as of May 2016). This Act, also known generally as cap-and-trade, focusses on the reduction of greenhouse gas emissions in Ontario to 80% below 1990 levels by 2050. While municipalities are not noted as large emitters (with corresponding greenhouse gas emission reduction obligations) under the Act and its associated regulation, the Act does promote revenue streams for voluntary greenhouse gas emission reduction initiatives via either the creation and sale of offset credits or via access to a Greenhouse Gas Reduction Account (GGRA). The GGRA will consolidate revenues



from large emitters (steel plants, cement, large natural gas users and utilities, etc.) and dispense them via projects intended to have emission reductions. A list of these projects is contained in the Ontario Climate Change Action Plan (OCCAP; <https://www.ontario.ca/page/climate-change-action-plan>) and includes funding for the provision of renewable natural gas (RNG) into the natural gas distribution system. Renewable natural gas is generally characterized as biogas that is cleaned of impurities in order to be suitable for injection into natural gas distribution systems and for use in industrial, commercial and residential applications. Per the OCCAP, between \$60,000,000 and \$100,000,000 has been allocated for RNG over the next five years, and could be a viable source of revenue or funding for the County's OPF. In the context, only AD technologies can produce biogas that could then be purified to RNG; composting, as an aerobic process, does not produce biogas and thus would not comply.

The Option 2 scenario as adopted by Council represents a three-staged procurement that is specifically intended to allow for consideration of a range of established technologies (generally comprised of AD and composting) for organics. While AD may offer the advantage of being able to generate and utilize biogas, other factors such as capital costs, distribution systems, end markets, and regulations (i.e., Bill 172) will need to be considered in the evaluation of potential technologies. This procurement approach is described below and contrasted against the typical procurement approach for transfer stations such as the MMF.

In this scenario, a Request for Information (RFI) is prepared and released requesting that respondents provide information related to their technology options from a performance, cost and technical standpoint. This is a non-binding process that essentially sounds the market for the suite of technologies that exist for organics processing, and that includes composting, anaerobic digestion, and other platforms that have measurable presence in the field at commercial scale. This type of process allows newer, more innovative technologies and approaches to make themselves known and to express interest in the County's OPF project. The RFI would also be released with initial information and details around the County's project.

One of the important factors around the RFI is that it will provide a preliminary indication of project costs. While the costs are not binding and will not be based on a design foundation at this point, the preliminary costing information can be utilized with appropriate allowances and contingencies to help build the initial business case due in early 2017. It is expected that true costs will only be derived through completion of associated activities such as site studies, municipal and environmental permitting, and conclusion of the Request for Proposal (RFP) targeted for late 2017.

The results of the RFI are used to structure the Request for Pre-Qualification (RFPQ) process, as part of a pre-qualification that targets technology types that are acceptable to the County. This process allows for consideration and inclusion of newer technologies that have entered the field and have demonstrated commercial success and potential for greater value for the County via the technology itself or via output products (such as RNG, as noted above). In this sense, an RFPQ may still provide an open definition for types of allowable technologies (AD or composting) depending on the response level to the RFI. There are two specific options for the RFPQ: to pre-qualify technologies that are then eligible for inclusion in the RFP, or to pre-qualify entire project teams for the RFP (including designer, technology provider, builder, and operator). This decision point will be discussed with County procurement personnel, as the allowable model is generally driven by procurement rules.



The RFP is built for successful respondents to the RFPQ. Two options may stem from the decision point on the RFPQ:

- Where only technology proponents are pre-qualified, the RFP would require evaluation of the project team (designer, builder, operators, and any other necessary parties), the design basis they have proposed, and their overall price.
- Where teams are pre-qualified, the RFP would require evaluation of the design basis and the overall price.

The RFI-RFPQ-RFP process is intended to be sequential in Option 2, in order to fully inform the design basis for the RFP with site and approvals factors that would be pertinent to contractor pricing. The more certainty that is generated with respect to the project design and objectives during the procurement process, the more certain the final pricing tends to be, and the more reflective the final business case will be.

As noted, under this scenario, the business case is divided into a preliminary and final component. The preliminary business case would be presented in early 2017 based on the results of the RFI, and the final business case would be presented in late 2017 based on the firm pricing provided in the proposals related to the RFP.

Option 2 includes the following potential risks:

Increased overall timeframe. This process pursues a longer overall timeframe for development of the OPF.

Segmented business case. The business case is divided into two parts. In the preliminary business case, the information from the RFI would be used to populate the financial analysis in addition to engineering estimates. These inputs would carry greater variability than would be achieved after receiving proposals to the RFP, where in the latter case these would be binding figures. A measure of judgement and accommodation for allowances would need to be included in the preliminary business case to ensure that it is representative.

In the Option 2 scenario, the delivery of the MMF has been considered under a Design/Bid/Spec (also referred to as a Design/Bid/Build). This is a conventional approach for delivery of these types of facilities, as there are no proprietary or technology-specific aspects to a transfer station, and thus there is no need to use a Design/Build approach for this development. Further information on this is included in Attachment 1. The main differentiating factor for the OPF that drives the procurement strategy is that organics processing technologies are generally either proprietary, patented, the technical information around design is centralized by the technology provider, or some combination of the above. As a result, it is extremely difficult in most situations to design an OPF under a Design/Bid/Build that viably includes the technology information. This is further made important because organics processing technologies are integrated into sites and site facilities such as buildings, so it is not viable to design a shell building without full consideration of the technology to be employed and integrated.

The above factors typically mean that OPF's are delivered under a Design/Build methodology, or some variation thereof. The variations will be explained in the subsequent section, but the basic difference between Design/Build (OPF) and Design/Bid/Spec (MMF) is that in the former case, a technology partner is



part of the Design/Build team and the overall project is undertaken under a single contract with a sole Design-Build entity. In the Design/Bid/Spec situation, different contracts are let: one for design that would culminate in a tender package, and a second contract for construction. Again, this latter approach is made feasible for the MMF because transfer stations do not involve proprietary or guarded design information; for the OPF, this is not likely to be the case, and thus a Design/Build approach is generally utilized.

The next section will discuss the different variations of Design/Build, including how this approach is integrated with Operations and with ownership.

3. Project Delivery Models

There are a number of traditional and newer emerging project delivery models available to owners or project sponsors. Each infrastructure project is unique with varying complexity, and should be evaluated individually to determine the optimal project delivery method. Similar to other infrastructure types, there is not a single best project delivery method that applies to all waste management infrastructure projects. Each project should be evaluated on its own merits based on the key considerations outlined herein, together with any owner or project specific considerations that may apply and procurement processes and rules as applicable. This section summarizes the project delivery options available, key considerations for selecting a preferred method, and provides examples of the methods applied to other organics processing facilities in Canada.

There is an abundance of publicly available literature on the subject on infrastructure delivery methods with varying terminology. The following terminology and definitions will be used herein:

‘Design-Bid-Build’ (DBB) is a project delivery method in which the owner contracts with separate entities for the design and construction of a project. Operations and maintenance are contracted separately or completed by the owner. Capital financing is secured by the owner. This method is also known as design-tender, traditional method and hard-bid. This is the most common type of project delivery method and as noted above, is particularly relevant to the MMF. It will not be considered further for the OPF, given the lack of precedent for this option as it pertains to OPF’s.

‘Design-Build’ (DB) is a turnkey project delivery method in which the owner contracts with a single entity, known as the design-builder or the design-build contractor, to design and build a project. Operations and maintenance are contracted separately or completed by the owner. Capital financing is secured by the owner. In this scenario, any technology-specific information is incorporated into the single point of contact DB. With respect to the procurement strategy for the OPF as noted in the previous section, the DB would incorporate the designer, the builder, and the technology provider.

‘Design-Build-Operate (DBO)’ is a turnkey project delivery method in which the owner contracts with a single entity to design, construct, operate and maintain capital infrastructure. Capital financing is generally secured by the owner. Operations and maintenance are for a defined period of time, after which control and operation of the facility is transferred back to the owner or subsequent operator. The duration of the operating contract and subsequent renewals is an important aspect of discussion with County procurement going forward.



One of the key aspects of DBO that is pertinent to an OPF is that organics processing technology is highly specialized. This specialization flows through the design component, favoring the design-build approach as noted above, but extends into commissioning and operations. Having the technology provider involved in some manner in the design, commissioning and operating cycle ensures that the technology is in fact operable and that the specialized elements with respect to operations are fully documented and executed. As will be demonstrated in subsequent sections, the DBO approach for OPF's is common.

This method is also known as Design-Build-Operate-Maintain (DBOM), Build-Operate-Transfer (BOT) and Design-Build-Operate-Transfer (DBOT). Financing can be secured by the owner or by the contractor. If financing is secured by the contractor, this approach is sometimes referred to as Design-Build-Finance-Operate (DBFO), which is being treated as a subset of DBO for the purposes of this discussion but is also considered a variation of the Build-Own-Operate-Transfer (BOOT) method defined below.

A further feature of the DBO approach is that, should the County be interested in taking over operations of the OPF in the future, this can be accommodated in the original RFP, specifying a shorter operating term with County options for renewal. This could, as desired by the County, further incorporate buy-outs during the DBO operating term such that the County could undertake operations at any time. Relative to the County's project, GHD would recommend that the County allow for one operating term post-completion of the OPF, in order to have a single point of responsibility (in this case the DBO) to execute the design/construction project including commissioning, and to ensure that operations are consistent and within contractual requirements for at least the initial operating term.

'Build-Own-Operate-Transfer' (BOOT) is a turnkey project delivery method in which the owner contracts with a single entity to design, construct, finance, own, operate and maintain capital infrastructure for an agreed upon period of time and then transfer ownership and operations back to the owner at the end of that period in a specified condition. The specified condition of the facility (e.g., major processing equipment must have a remaining useful life of 10 years) at the end of the contract will have a direct impact on the quality of equipment and materials utilized in the initial design of the project and thus will have a significant effect on the capital cost of the project. This is an approach used where a municipality intends to operate an asset at some point in the future and is generally not a common approach for OPF's.

'Build-Own-Operate' (BOO) is turnkey project delivery method similar to BOOT except the contractor retains ownership, including any residual value, of the infrastructure following the agreed upon contract period. For purposes of this memorandum, this approach will be referred to as Design-Build-Own-Operate (DBOO). While the basic premise is similar to DBO (single point of contact for all aspects of the project), ownership and risk transfer are very different. In this merchant capacity scenario, the municipality does not provide any capital into the facility or generally provide land for housing the facility; in simplest terms, this scenario would involve paying a tipping fee to the private sector entity, in a manner similar to the County's current management of SSO. Siting, technology selection and the operating mode would generally also be decided and implemented by the private sector operator.

Other variations of the above are also present in the market. Public-Private Partnerships (PPP or P3) are increasing in popularity as demand for infrastructure upgrades and spending outpaces available public funds



(particularly at the municipal level) for capital expenditures. In the context of the above discussion, each of these variants could be considered a P3, so this appellation holds no specific interpretation as it pertains to a delivery method.

The Government of Canada has created a federal crown corporation called PPP Canada. The PPP Canada website states, “PPP Canada acts as a leading source of expertise on P3 matters through knowledge development and sharing. Specifically, we provide expertise and advice in assessing and executing P3 opportunities at the federal level as well as leveraging greater value for money from Government of Canada investments in provincial, territorial, municipal and First Nations infrastructure through the P3 Canada Fund.” We note that this is different from a generic P3 project, as PPP Canada involvement shifts an amount of risk and financing to the private sector while providing some up-front capital. The amount of Federal funding applicable is capped at 25% of the project’s direct construction costs (no operations included) and is only payable at the conclusion of construction. The list of PPP Canada projects is housed here:

<http://www.p3canada.ca/en/about-p3s/project-map/>. Of the 20 projects listed, the following are pertinent to the County’s OPF in terms of being analogous with respect to type of project, including the (maximum) 25% Federal funding component:

- Biosolids Energy Centre (Greater Victoria, BC), \$83.40M.
- Biosolids Management Facility (Greater Sudbury, ON), \$11M.
- Hamilton Biosolids Project (Hamilton, ON), \$22.91M.
- Organics Biofuels Facility Project (Surrey, BC), \$16.9M.

To reiterate, the funding contributions listed are the Federal funding component that is capped at 25% of the total construction cost. As a result, the four projects listed can be considered to be fairly large capital projects in comparison the County’s OPF, and only one (Surrey) represents an OPF specifically. While there is no minimum or maximum size for PPP Canada projects, it is important to contextualize PPP Canada involvement in projects, which generally appears to be substantially higher than would be required for the OPF; at approximately a \$30M total capital as the County has estimated previously, the Federal funding contribution would be a maximum of \$7.5M. For further context, some PPP Canada projects (such as the Edmonton Light Rail Transit System) have Federal contributions up to \$250M.

Given the scale of the County’s OPF and the increased complexity involved with PPP Canada projects compared to conventional projects, PPP Canada involvement is not considered a viable option. In this context, we note that PPP Canada in part drives the procurement strategy and outlay of the capital project, which would potentially increase overall capital projections. Additionally, as a funder in the project, PPP Canada would represent an additional stakeholder in the project moving ahead, introducing an additional potential set of performance, monitoring, and reporting requirements which could substantially increase administration responsibilities.

Of further note, PPP Canada funding is distributed according to funding rounds. Applications for Round 7 were closed last summer, with applicants notified of the outcome in fall of 2015. Round 8 has not been announced as yet, and thus the County has no present means of applying for this funding or certainty with respect to when it would be received and how this would affect the timelines and scope of the OPF project.



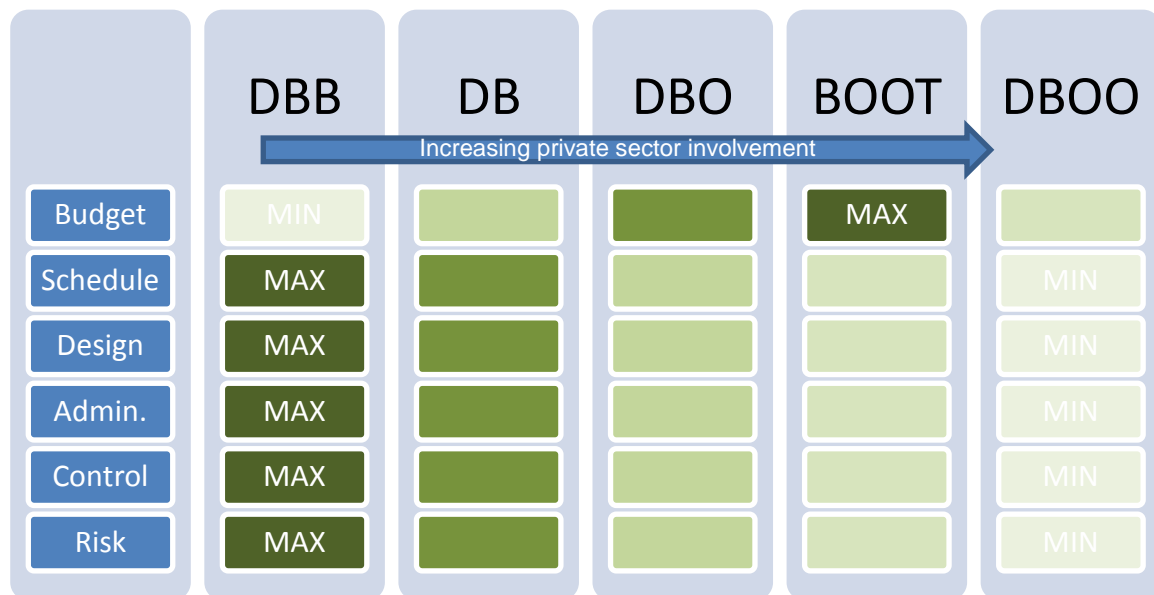
Given the timing of the County's RFP under Option 2, it would seem unlikely that a viable application could be made and successfully executed prior to release of the County's RFP.

These are the key types of project delivery methods that will be used for the purposes of the discussion herein. There are a number of variations and hybridizations between these options that can be considered. As indicated above, there is no single best approach to implementing an infrastructure project, as each project is unique and may require a unique delivery method.

3.1 Key Considerations in Selecting a Project Delivery Method

This section discusses key considerations in deciding the project delivery method for the OPF project. Figure 2.1 below summarizes which project delivery method provides the greatest and least benefit for the owner for each key consideration. Each consideration is discussed in detail following Figure 2.1.

Figure 2.1: Benefit to Owners from Project Delivery Methods



Note:

1. Min/Max determinations are made from the perspective of the owner. For example, with DBB the owner retains greater design control and responsibility but also assumes greater project risk.
2. DBB = Design-Bid-Build
3. DB = Design-Build with separate private or public operator
4. DBO = Design-Build-Operate, financing through owner or contractor
5. BOOT = Build, Own, Operate, Transfer
6. DBOO = Design, Build, Own, Operate

While the above is a general depiction, two things are apparent from this figure. First, while DBB offers a number of benefits to municipal deployment, it is not pertinent to the OPF discussion given the technology considerations noted above. Second, while DB offers a reasonable level of control over the factors listed above, the lack of an operating component shifts operating risk to the County; as noted, this risk can be substantial given the specialized nature of the AD technology that is more frequently employed in an OPF.



The main considerations are thus with respect to the final three options: DBO, BOOT, and DBOO. That said, contrast with the other approaches will be discussed throughout the balance of this section.

3.1.1 Budget

For the purposes of this discussion, budget means project lifecycle capital and operational expenditures, including consultants, but does not include internal owner costs for project management and contract administration. Actual project lifecycle costs are difficult to compare directly for infrastructure projects as each project and project environment is unique. However, in general, the traditional DBB method is considered to be the lowest overall cost for an owner; this is offset by the level of direct involvement required by the owner to maintain multiple contracts with consultants, design firm(s) and contractor(s). This cost advantage could, however, easily be relinquished due to the fact that excessive efforts would need to be made to pre-suppose specific design details that are generally held by the technology vendors alone.

A BOOT approach, while relatively simple for the owner to administer, can be expensive, as financing costs are typically less favorable for a special purpose entity newly created for the purposes of a BOOT project as compared to a municipality. Costs involved in this approach are typically marked-up further by the contractor. The specified condition of equipment at the end of the contract can also have a significant impact on the cost of the facility, and this approach requires County involvement in operations at some point.

For the DBB, DB and DBO methods, capital expenditures are paid directly by the owner as they are incurred during the design and construction phases of the project through their capital budget. For example, this may include milestone payments during the design and construction phase or monthly draws linked to progress. This approach is typically cheaper over the longer term for a municipality but access to capital may be an impediment. In DBFO, BOOT and BOO models (P3 approaches), capital expenditures are amortized through the processing fees (concessions) after the project is successfully commissioned, and after specific milestones are achieved.

3.1.2 Schedule

The DBB approach requires multiple procurement steps completed in sequence. For example, the design engineer must be procured first and the design completed before the tender process for the contractor can be initiated. Thus, the DBB approach tends to require additional time as compared with the other approaches that reduce the number of procurement steps. The DBOO approach typically has the shortest turn-around time as the private sector is able to deliver the project in a completely private manner to achieve a set of performance specifications only; while this approach may be faster, overall control of the project execution is somewhat divorced from owner requirements and preferences.

In addition, schedule risk is reduced for the owner in the DBO, BOOT and DBOO approaches, as the DB agrees to schedule milestones with penalties for missed deadlines.

3.1.3 Design

The design effort and responsibility by the owner and the owner's consultants also varies for each project delivery method. DBB typically requires more design input and risk by the owner. DBO, BOOT and DBOO approaches are appropriate where the owner is primarily concerned with key performance criteria and less



concerned with how the performance criteria are satisfied. DBO and BOOT approaches do require a minimum level of design input by the owner, whereas DBOO projects can be executed without any significant design effort. This element circles back to control of project and outcomes, as the owner may have a strong desire for design features (such as environmental protection features) due to specific local requirements. Specifically with respect to the County's project, a DBOO approach would offer the least control over design, construction and operations with respect to development on a County-owned property such as the preferred site. This may not be in alignment with input and feedback received during public consultation related to the siting process.

3.1.4 Administration

Administration effort is the highest for the DBB approach, which involves the greatest number of partners and associated contracts that need to be initiated, administered and possibly renewed at defined intervals. Minimizing the number of contracts required minimizes the administration effort required by the owner. In addition, minimizing the design and performance specifications in the agreement also minimizes the administration effort required by the owner, or the owner's consultant.

For a DBO-type arrangement, the lead entity oversees and manages sub-contracts directly; the owner thus only has a single contract with the DBO. The same considerations are in place for a DBOO.

3.1.5 Control

Transferring increased project risk to a contractor results in less control over the project details. Increased private sector involvement results in less control by the owner, apart from controls built into a single long-term contract. The importance of a good contract increases as the number of contracts decreases and the length of the contract term increases.

There are numerous control points in an OPF project: design objectives such as processing capacity and guarantees; management of environmental issues such as odour, groundwater and surface water; ensuring that high quality outputs at specified generation rates are maintained for items such as fertilizer output or biogas; ensuring that the OPF is properly maintained including refreshment of spare parts inventories and capital replacement as necessary; adherence to municipal and Ministry of the Environment and Climate Change approvals; and overall reliability and ability to continuously operate. Each of these improves with decreased private sector involvement, as these elements can then be fully placed under the County's control via contract.

It should be noted that even where a DBO is selected, the Operator may still be private-sector, and commonly is. Given, however, that the overall DBO contract is with a single entity, the performance requirements and expectations for the Operator can be clearly defined in this scenario, at a level of granularity that allows the OPF to operate as required by the County. In the DBOO case, the County's ability to control operations are very limited in comparison, as the County will not have ownership of the OPF and no direct contractual influence on operations other than on potentially at the high-level performance basis.



3.1.6 Risk

Increased risk transfer from the owner to the contractor is the primary reason for increasing private sector involvement in a public infrastructure project. In order to be able to effectively assume risk, one's exposure to that risk must be fully understood. In construction, issues of risk are closely tied to the status of the local construction market, on-site safety, the schedule and budget.

It is possible to transfer a portion or all of the financial, schedule, insurance and performance risk of a project to the private sector. The primary benefit to the owner in minimizing risk exposure is minimizing the likelihood of incurring unanticipated costs in the future.

The key overall risks associated with OPF's include: ability to provide ongoing service (favors a DBO model), manage environmental performance (favors a DBO model), and ensure consistent long-term pricing (favors a DBO model).

3.1.7 Technology Selection

As noted above, generally in the field of organics processing, there are two separate technology platforms that are used. These are described below:

Composting: this technology involves the exposure of organics to airflow, where the oxygen in the airflow is used to support bacteria that will consume the nutrients in the organics until the material is stabilized. Composting involves energy input and process control, and does not generate an energy stream. In Canada and Ontario specifically, composting of organics has been ongoing for many years, using a variety of technologies, from in-channel (open concrete vessels with turning during aeration), in-tunnel (completely enclosed high-airflow vessels), covered windrows, and variations of the above. This is an established technology for organics and is highly regulated by the Province and requires significant treatment, retention times, and footprint. This technology is good at managing SSO but requires large quantities of amendment (carbon source) to allow the process to proceed according to the MOECC composting standards. This technology can manage pet waste and diapers with appropriate pre - and post- treatment but generally requires significant investment in equipment to do so, and movement in the industry is toward anaerobic digestion technology for SSO that contains pet waste and diapers, among other contaminant-type materials. There are also challenges to processing this type of material with respect to making compost that meets the Ontario Compost Quality Standards (2012).

In terms of modularity and expansion, composting systems are well-suited to expansion over time. Vessels or channels can be added as incoming capacity increases in a modular fashion, responding to changing volumes over time.

Anaerobic digestion: this technology involves processing of organics in the absence of air, where anaerobic bacteria consume organics to generate biogas, which is mostly comprised of methane. This methane can in turn be used to generate energy, such as renewable electricity, vehicle fuel for waste fleets and other vehicles, or RNG. Anaerobic digestion has rapidly become an established technology for organics over the last few years, and offers the advantage of energy production as well as potential for smaller space requirement and, depending on deployment, reduced potential for odour emission. The production of renewable energy further has additional greenhouse gas emission reduction benefits, in that renewable



energy displaces the use of fossil fuel-derived energy. Further, organic effluent from anaerobic digestion has a number of potential uses and possibilities, including production of compost or fertilizers; for pure composting platforms, production of liquid fertilizers that could be land-applied using conventional technology would not be generally possible. Within the anaerobic digestion sphere, there are three divergent categories: wet AD (organics are processed in large, continuously-stirred tanks), high-solids AD (organics are processed in a slurry form), and dry bunker AD (organics are digested as-is in bunkers similar to composting vessels).

AD systems are likely more difficult to expand over time, especially where the main processing occurs in large tanks. With appropriate up-front planning and allowances for expansion, different elements of an AD system can be sized appropriately at the onset to accommodate expansion as required.

With respect to procurement, as noted, a DBB approach is generally not possible except for very simple technologies that have a good general design basis. This would include, for example, covered windrow-type composting and aerated static pile composting. Nevertheless, both AD and composting are biological processes that require careful knowledge and attention to biology in order to achieve suitable end products and environmental performance. Attention to operations is key where organics are involved, given the potential for odour.

It is expected that the RFI process would identify the types of projects under each of the above technology categories that may be viable for the County.

3.2 Conclusions and Recommendations on Delivery Models for the OPF

3.2.1 Conclusions

DBB

Given the County has chosen to proceed with Option 2 to allow consideration of all pertinent technologies, this model is not viable as it requires the technology to be selected and the facility to be designed in advance of the tender. This would be atypical in the field and would create significant risk in the design stage, which would not necessarily involve a technology vendor at that time.

DB

This approach would allow a single point of contract for the County, and would allow for a technology supplier to readily be involved in the design basis. However, this approach would require either that the County operate the OPF at the conclusion of commissioning, or let a separate contract to operate the facility. In the first case, the County would need to make an active decision to take on operations of an OPF; as of this date, we can think of no reasonable analogy in the industry where this occurs for an OPF, and thus there is very limited precedent for this model. In the second case, a separate operating contract being let for a project designed and built by another entity creates significant uncertainty with respect to performance, as the operator may point to design-build deficiencies for lack of performance. In this model, the operator also is not part of the design team. In GHD's opinion, operations are such a key component to any OPF that it is vitally important to embed the operator into the design and construction of the facility, at least for an initial operating term. In a DB model, this advantage is lost.



DBO

This model is reasonable for the County given the above considerations and is a typical method of municipal procurement. The following OPF projects that deal primarily with municipal organics have chosen a variation of this approach:

- City of Guelph's Organic Waste Processing Facility.
- City of Hamilton's Central Composting Facility.
- City of Toronto's Disco Road Organics Processing Facility (AD).
- City of Toronto's Dufferin Organics Processing Facility (AD).
- City of Surrey's Organics Biofuels Facility Project (in construction; AD).
- City of Calgary's Organic Waste Composting Facility.
- Region of Peel's organics facility (in development; AD).

While there are examples of private sector OPF's, a number of the above procurements are relatively recent and demonstrate a trend towards this type of municipal ownership model. Further, these tend to be high quality facilities that have avoided significant environmental or other performance impacts. Templates for this type of project from a contracting and procurement standpoint do exist, and there are qualified high-quality design-build and operating teams that occupy this space in Ontario.

Should the technology employed for the OPF be of a type that County would be interested in operating in the future, a DBO contract could be constructed to allow for relatively short operating terms such that the County could then take over operations. The DBO RFP would contain a number of provisions around providing training, operations and maintenance manuals, replenishment of spare parts inventories, and general restoration of the condition of the OPF to nominal conditions, prior to handing over to County staff. GHD notes that shorter operating terms generally increase cost-per-tonne, as operators need to accommodate fixed costs over a shorter operating cycle. The City of Toronto's operating term for its DBO contracts is 3 years plus 2 single-year renewals at the City's discretion; a mode of this nature could be applicable for the County. Discussion of the operating term is a key consideration for the County moving forward.

BOOT/DBOO

Both of these models incorporate private sector financing and control. While these scenarios have precedent in the field, they do relinquish control to the private sector in its entirety, with the exception of high-level performance expectations.

One possible variation is the deployment of this model on the County's preferred site. This is a point of discussion with the County, as the noted RFI could ask proponents if they would be willing to own-operate on publicly-owned lands. However, there is very little precedent for this type of deployment in Ontario and the specific public feedback around the preferred site suggests that the County should retain maximum practical control over design, construction and operations of the OPF going forward.



3.2.2 Recommendations

The following key points inform GHD's recommendation:

- The County has made decisions to site the OPF within the County on County-owned property. The preferred site is County-owned. Determining the cost and viability of long-term export will be compared to development of a County facility in the final business case.
- Based on precedent for OPF's, a County-owned site suggests that the County would own the OPF that would be built on the property. There is limited precedent for private ownership of facilities on public lands.
- The County would desire to utilize best practices for the design, construction and operation of the OPF. This is important given the feedback received from the public and from stakeholders around the preferred site.

As a result of these points, GHD recommends that the County pursue a DBO model for this project. A number of specific reasons for why a DBO would be consistent with the County's objectives have been provided throughout this memorandum. We recommend this approach irrespective of the technology selected, in order to leverage private sector operating experience with biological processes and management of environmental performance, while still adhering to the requirements of a municipal DBO contract. In order to create consistency with respect to DBO bidders, it will be important to establish the operating term up-front such that bidders can provide costing on an equitable basis and evaluation of costing can be undertaken using a consistent methodology such as a life cycle costing approach. However, in order to facilitate this, appropriate provisions for the County to take over operations during the operating cycle should be considered. Key points going ahead for the County's consideration include:

- Compilation of a staff report by the County, seeking direction to proceed with public consultation on the basis noted above. It is recommended that the discussion around procurement style be concluded with County Procurement staff prior to undertaking public consultation. Should County Council provide direction to proceed with public consultation, undertake this in September 2016 and report back to County Council for a final recommendation.
- The budgeting cycle for the required capital required for the development of the OPF under this model. In this scenario, the County would own and need to finance the project. Total capital would be defined by the business case noted in this memorandum, which in turn would be informed by the procurement strategy (RFI and RFP particularly).
- Evaluation of specific procurement constraints and limitations that might be of importance to the County's procurement rules. This would include key items such as duration of operating term, where DBO arrangements have demonstrated operating terms of anywhere between 5 years and 25 years. In the context, operating term would need to be defined by purchasing/procurement requirements of the County as well being informed by the County's potential desire to operate the OPF in the future; where this latter factor is important, a shorter initial operating term would be desired.
- Procure the OPF facility through a three-step DBO model that allows for open consideration of technologies such as composting and AD, and that allows for maximum value to the County by



considering value-added uses of outputs. The procurement would be for a 20,000 tonnes/year SSO processing facility that would be built initially to service the County's own organics plus other customers as applicable. One of the key elements of the RFI process would be to investigate technologies that operate economically at this scale, as most of the OPF's undertaken at the municipal level tend to be larger than this capacity. The steps in the procurement, as noted above, would consist of the following:

- Request for Information (RFI).
- Request for Pre-Qualifications (RFPQ).
- Request for Proposals (RFP).
- These steps would proceed according to the development schedule Option 2 identified in Attachment 1.



Memorandum

To: Stephanie Mack

Ref. No.: 086822

BD

From: Brian Dermody/mg/4

Date: May 11, 2016

CC: Debbie Korolnek
Rob McCullough
Tej Gidda

Re: Development Strategy for Co-Located OPF and MMF

1. Background

The County of Simcoe (County) is currently in the process of developing an Organics Processing Facility (OPF) and a Materials Management Facility (MMF). Recent siting work undertaken by GHD identified a property located at 2976 Horseshoe Valley Road West in the Township of Springwater as the preferred site for both facilities, in a co-located configuration that would optimize logistics. Siting approval was received from County Council on March 22, 2016, allowing work to continue on the development of co-located facilities on the preferred site.

While both facilities will be situated on the same site, they differ in terms of technology, procurement method, approvals, and development timelines. That said there are also many synergies that can be realized during the development of the facilities in terms of potential cost savings and means 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 projects 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.

This memorandum incorporates all of these aspects and presents an overall strategy for the development of both the MMF and the OPF. Proposed development timelines including the scheduling and duration of various aspects, key milestones, and predecessors is presented as Figure 1 and 2, while further details are discussed in the sections that follow. It is understood that this memorandum will be included as part of a Staff Report presented to County Council for approval in May 2016.

GHD notes that these are conceptual timelines built on our experience in development of similar facilities. In the County's case, the overall timeline must respect the development of two separate but related facilities. This schedule for development is expected to be a living document, and will likely evolve over time as various milestones are passed along the critical path trajectory. We recommend that the timeline be updated over time to reflect this.

With respect to the OPF, we have presented two alternate timelines. Largely, these are centralized around the previously-held timeline for the deployment of the OPF using a conventional technology platform, and an alternate timeline that would allow for consideration of different technologies for organics processing. Each approach presents its own conclusions with respect to developing a business case for the OPF, consideration of limited or expanded technologies, and risks related to expenditure of resources related to the permitting and approvals necessary for the preferred site. These options are presented for consideration by the County.

2. Planning and Engineering Studies

There are various studies required for the development of both facilities. Planning studies refer to those that are required to amend the usage on the site to a level appropriate for the intended developments. Engineering studies refer to those that are required to allow for definition of the projects on the site; how they will inter-relate and define drivers that affect conceptual and detailed design, and how they will begin to isolate factors that affect the overall cost of the facilities. Additionally, there are elements of the planning and engineering studies that overlap, and it would be beneficial to undertake them concurrently in order to make the study program more efficient from a cost and timeline standpoint.

Information related to the planning and engineering studies is presented across considerations of the MMF and options for the OPF, as these considerations are common. The impact of planning and engineering studies on timelines for the development of the MMF and OPF will be discussed in subsequent sections.

2.1 Planning Studies

Various Planning studies are required in support of amendments to the Township of Springwater (Springwater) Official Plan and Zoning By-Law, and to the County Official Plan. Following a pre-consultation meeting with Springwater Planning staff in December 2015, the following list of required studies was identified in a letter from the Township of Springwater to the County dated January 11, 2016:

1. Planning Justification Report.
2. Soil Quality Test.
3. Agricultural Potential Assessment.

4. Traffic Impact Study.
5. Environmental Impact Study.
6. Noise Assessment.
7. Odor Impact Assessment.
8. Site Plan.
9. Landscape Plan/Tree Preservation Plan.
10. Stormwater Management Report.
11. Functional Servicing (Water & Sanitary).
12. Hydrogeological Study.
13. Archeological Study.
14. Hazard Land Assessment (to NVCA satisfaction).

We note that further consultation with Springwater will isolate the specific requirements related to which studies apply and what the definition of the studies will be. We recommend undertaking this consultation as soon as possible to define specific requirements for the studies, and considerations and technical factors that are of interest to Springwater.

Completion of these studies as early as possible in the process is important since the zoning will be a pre-requisite to the design and procurement stage. GHD met with stakeholders including the County (Planning and Forestry Departments), Nottawasaga Valley Conservation Authority (NVCA), Ministry of Natural Resources and Forestry (MNR), and Springwater (Planning Department) on April 1, 2016 to discuss the scope of the Environmental Impact Study (EIS). Initiating the EIS immediately was seen as critical since it requires multiple field visits (including this winter and spring), and has the potential to identify sensitive features (e.g., species at risk) that could affect the continued development of the site.

GHD recommends initiating the remaining Planning studies as early as possible since many of them have the potential to identify potential site conditions that would preclude the continued development of these facilities on the site. This could occur at any point in the planning study period, up to and including the anticipated completion of the studies at the end of the summer. Studies should be evaluated on an ongoing basis by providing updates on major findings such that any restrictive site conditions are identified during the work, and not simply at the conclusion of the final studies. GHD notes that advancing significant other activities related to procurement prior to completing this process, or at least having reasonable definition that the planning process will be completed successfully, introduces risk to the County.

GHD recommends undertaking the Planning studies and submitting the zoning application concurrently for *both* the MMF and the OPF. The land use application would need to be completed if one of the facilities were to be developed alone, so there is no downside in applying for both. Furthermore, having the facility zoned for the OPF at the same time as the MMF will support the procurement process for the OPF, significantly increasing credibility if the zoning for the intended activity is already in place. The importance of this element will be discussed in subsequent sections.

The OPA/ZBA applications should be ready for submission immediately following the completion of the Planning studies. For this reason, the supporting documents should be prepared as early as possible in the

process, potentially prior to the completion of the Planning studies in mid-summer barring the identification of any restrictive site conditions on the property or fall site work (if required).

Undertaking the Planning studies over the summer and having the OPA/ZBA applications ready for submission at the beginning of the fall is a benchmark assumption that has been made for the balance of the timeline. This will be critical given that a review period of 180 days will be likely be required by Springwater. This approach is intended to follow a straight-line process for the approvals, while expediting the overall processes along the critical path – where this introduces risk to the County, this will be identified and discussed.

2.2 Engineering Studies

In addition to the Planning studies noted above that have a technical component, the following engineering studies will also be required in support of the OPA/ZBA and the facility design:

- Topographic Survey.
- Geotechnical Investigations.
- Facility Siting (within the property) and Conceptual Design.
- Site Servicing.
- Code Compliance Review.
- Surface Water, Process Water, and Wastewater.
- On-Site Traffic Movements.
- Odour and Noise Attenuation Assessments.
- HVAC Requirements.
- Site Safety/Security.
- Process Control/Automation.

These studies can be initiated in the summer/ fall in conjunction with the Planning studies. Wherever possible, it is recommended that field elements be advanced to coincide with the Planning studies. Primarily, any hydrogeological or other wells contemplated should be analyzed by a competent geotechnical engineer for soil bearing properties and other categorization features that would aid in subsequent foundation design activities. The proposed hydrogeological program should be compared to the geotechnical program to identify boreholes/wells that could be installed during one mobilization event in the optimal summer months. It is also recommended that any engineering studies required for *both* the MMF and OPF be carried out at the same time. The engineering studies should incorporate the range of MMF and OPF options that may be available, although some supplemental work may be required downstream depending on the final designs. A further element that crosses over between the Planning and engineering studies is the issue of a site plan – the engineering studies would build on the site plan developed for the planning process, introducing additional details around staging of the two developments and traffic flows internal to the site.

It should be noted that proceeding with any of the engineering studies before having the required OPA/ZBA in place represents a significant potential risk point for the County. While some of the engineering studies are specific to the facility (i.e., technology, process, and building) and could be translated to any site, a

reasonable quantity of the work is site specific. The risk is that funds will be expended on engineering studies without being certain that the OPA/ZBA will be approved. Should the OPA/ZBA be declined, there is also the risk that an appeal to the Ontario Municipal Board (OMB) will be required, adding significant delays to the timeline. While this potential delay is not shown in the schedule, it is a clear critical path item, as environmental approvals through the MOECC and building permits at the municipal level depend on site plan approval. Despite this risk, the County should have a good indication of the likelihood of approval based on the results of the Planning studies over the summer of 2016, and thus a reasonable comfort level that the site is suitable. This is a basic assumption that has been made in the schedule. An alternate process that would involve little to no-risk on the engineering studies would be to commence them only after the OPA/ZBA process is concluded, but this would introduce a significant measure of delay into the overall schedule.

3. Design and Procurement

3.1 MMF

GHD recommends a Design/Bid/Spec (also referred to as a Design/Bid/Build) approach to the development of the MMF. There are no proprietary or technology-specific aspects to a transfer station, and thus there is no need to use a Design/Build approach for this development. Similarly, it is anticipated that the County will operate the facility, so there is no need to wrap development into a complex Design/Build/Operate approach wherein a private-sector operator that is part of the Design/Build team is identified at the onset. There are a number of firms that can provide relatively straight-forward civil design for an MMF, providing for a competitive and cost-effective procurement process. A Design/Bid/Spec process is a typical routine that is used for transfer stations in Ontario. A Design/Bid/Spec approach also reduces the design risk for proponents and more effectively controls cost in comparison to a Design/Build approach, where the risk associated with a fixed price generally leads to the inclusion of risk factors in the Design/Build pricing.

In terms of definition, Design/Bid/Spec essentially means that an engineer would be retained to undertake preliminary and detailed design, specifications, and tender documents for the MMF, in consultation with the County. Once this package is prepared and finalized, it would be released to the construction community to identify a general contractor through a conventional bidding process. This contractor would then complete the construction, with the engineer undertaking inspections of the construction work to assert that the development is per the design.

GHD recommends that certain site development considerations also be incorporated into this scope of work. This may include items such as site clearing, site grading, roads and general surfacing/asphalt around the site, site servicing, and stormwater management systems. This work will be needed for the MMF, but could account for elements of the OPF that may be incorporated at a later date. Alternatively, the County could retain other contractors to undertake this work during the 2017 period envisioned for site preparation.

With the MMF Design/Bid/Spec process expected to be undertaken in 2017, the County should start preparing the RFP for this work immediately following the submission of the OPA/ZBA in the fall of 2016. Preparation of the RFP will take place during the anticipated 180 day Planning approval window so that it is ready to be issued in early 2017. As noted earlier, the risk with this approach is that RFP preparation work will proceed on the preferred site prior to having the OPA/ZBA in place.

The MMF Design/Bid/Spec process will be very closely tied to the engineering studies work, which will functionally define the facility, its size and configuration, its orientation on the site, and its relationship to other on-site facilities such as weigh scales, the future OPF, administration areas, and the County's fleet servicing facility. One option is to tie the engineering studies into the same detailed designer for the MMF.

3.1.1 Construction Tender

The MMF Construction Tender would be assembled by the County with input from the Design/Bid/Spec consultant, and would include a cost estimate to compare against contractor pricing. The Construction Tender would not be issued until completion of the design in late 2017, with construction anticipated to start in early 2018 as soon as weather permits. It should be noted that initiating certain aspects of the design related to the site works noted above, some construction may be possible by late 2017. In this configuration, generally, the 2017 calendar year is reserved for site preparation and clearing, and design of the MMF.

In terms of risk factors for the County, we note that construction of the MMF (currently anticipated to begin earlier than construction of the OPF in the planning timeline provided) is predicated on conclusion of the OPA/ZBA process and conclusion of the Environmental Compliance Approval (ECA) process through the Ministry of the Environment and Climate Change. Further, the ECA process is largely predicated on having the OPA/ZBA process concluded. In the above approach, should design and tendering activities for the MMF be completed in time for construction in early 2018, and the approvals noted not be in-hand or forthcoming, this work may need to be delayed.

3.2 OPF

With respect to source-separated organics (SSO), the County's 2010 Solid Waste Management Strategy recommended that the County explore various technology options, including those that could handle the addition of other organic materials to the program (i.e., pet waste and diapers). In January 2014, Staff presented costing information for various processing facilities, a proposed project plan, and a timeline recommending a phased approach to the development of a County facility with a processing capacity of 20,000 tonnes per year. This would include development of aerobic composting (Phase I) with the opportunity for future expansion to include anaerobic digestion (Phase II) if and when the energy market is proven and overall costs are reduced.

It should be noted that the County currently only has direction to consider aerobic composting. With a steady increase in the scale and variety of anaerobic digestion technologies available, the County may wish to consider seeking Council direction to open up the procurement process to include anaerobic digestion technologies. This will ensure a comprehensive approach that allows the County to evaluate which option will best meet their present and future needs.

3.2.1 Technology Options and Timing

An OPF is very technology-specific and requires integration of the operator in order to ensure that the constructed facility is operable. In addition, technologies are often proprietary and require specialized teams to operate; generally, these types of facilities are difficult to develop on a Design/Bid/Spec basis, as the necessary process-related details are generally known only to the individual technology providers, and operations must be closely linked to that process.

How the County undertakes the procurement process for the OPF going forward will require direction from Council on two key reports:

1. Development Strategy outlining technology options, timing, and key milestones (this memorandum).
2. Procurement Strategy outlining risk, project funding models, and the nature of the contract (forthcoming memorandum).

Generally in the field of organics processing, there are two separate technology platforms that are used. These are described below:

Composting: this technology involves the exposure of organics to airflow, where the oxygen in the airflow is used to support bacteria that will consume the nutrients in the organics until the material is stabilized. Composting involves energy input and process control, and does not generate an energy stream. In Canada and Ontario specifically, composting of organics has been ongoing for many years, using a variety of technologies, from in-channel (open concrete vessels with turning during aeration), in-tunnel (completely enclosed high-airflow vessels), covered windrows, and variations of the above. This is an established technology for organics and is highly regulated by the Province and requires significant treatment, retention times, and footprint. This technology is good at managing SSO but requires large quantities of amendment (carbon source) to allow the process to proceed according to the MOECC composting standards. This technology can manage pet waste and diapers with appropriate pre- and post- treatment but generally requires significant investment in equipment to do so, and movement in the industry is toward anaerobic digestion technology for this type of material.

Anaerobic digestion: this technology involves processing of organics in the absence of air, where anaerobic bacteria consume organics to generate biogas, which is mostly comprised of methane. This methane can in turn be used to generate energy, such as renewable electricity, vehicle fuel for waste fleets and other vehicles, or renewable natural gas. Anaerobic digestion has rapidly become an established technology for organics over the last few years, and offers the advantage of energy production as well as potential for smaller space requirement and, depending on deployment, reduced potential for odour emission. The production of renewable energy further has additional greenhouse gas emission reduction benefits, in that renewable energy displaces the use of fossil fuel-derived energy. Further, organic effluent from anaerobic digestion has a number of potential uses and possibilities, including production of compost or liquid fertilizers; for pure composting platforms, production of liquid fertilizers that could be land-applied using conventional technology would not be generally possible.

With respect to the Development Strategy, Council direction will be sought on the two different technology options presented below prior to the development of the Procurement Strategy.

Option 1 – Following County Council's Current Direction on Aerobic Composting

For either option, GHD recommends that the County issue a RFPQ to pre-qualify proponents based on items such as: specific technology, number and location of previous installations, scale of these installations, mass balances, references, suitability for the County's organics stream, etc. The RFPQ would be prepared by GHD based on the results of the engineering studies, taking into account what is feasible on the site. The intent of the RFPQ would be to pre-qualify technologies so that only those proponents with pre-qualified technologies that have a demonstrated track record and applicability at the required scale with reasonable performance can be utilized by contractors during the RFP stage. A further variation of this would be to

include the entire team in the pre-qualification. There are further pros and cons to this approach that should be discussed with the County and their Procurement, Fleet and Property Department.

Development of the RFP for Option 1 would be relatively straightforward given the results of the RFPQ process and the limited complexity of aerobic composting technologies. Similar to the MMF, the RFP for the OPF could be developed during the 180 day Planning approval window so that it is ready to be issued in early 2017.

As noted previously, there is risk in proceeding with the OPF procurement process prior to having the OPA/ZBA in place, potentially raising issues surrounding the credibility of the process. In an optimal process, the OPA/ZBA would be complete and the ECAs in progress, in order to reassure potential bidders that the project has no permitting risk. In GHD's opinion, a lack of approvals or progression in approvals on the site may mitigate interest in the project, especially given the time and effort required to prepare proposals, which would be at-risk to the private sector proponents should approvals not be forthcoming.

Overall, this pathway assumes that a business case can be delivered to County Council in early 2017. In order to undertake this, technology spectrum would need to be limited to composting technologies rather than the full suite of organics processing technologies currently available. Given that the RFPQ/RFP process would all be undertaken and concluded prior to the OPA/ZBA process, this introduces significant potential risks into the process, including:

Limited interest in the RFPQ/RFP from the contracting community. Early initiation of the OPF RFPQ/RFP process without advancing the zoning process will result in carrying a site through the procurement process that is not zoned appropriately. In GHD's experience, this significantly diminishes the interest from the contracting community in a project of this nature, as the lack of approvals creates uncertainty around the potential for the project to move ahead. While honorariums can be assembled to motivate interest, these honorariums typically only cover basic costs for contractors, so they are not generally productive activities for contractors to undertake on the basis of honorariums alone. The County should be aware that having limited forward progression on the permitting and approvals for the site may result in a scenario wherein the County receives no bids on the OPF RFP.

Increased permitting risk at the MOECC level. In the Option 1 scenario, the procurement process for the OPF will have been concluded significantly in advance of receiving Environmental Compliance Approvals from the MOECC. Similar to the risk related to not having the OPA/ZBA process concluded, this diminishes the credibility in the process and potentially reduces the participation of qualified, quality proponents to the RFPQ/RFP process, reducing overall competitiveness and potentially escalating price offerings to account for unknowns related to MOECC permitting. A further risk is introduced in that the MOECC process can alter the design of the facility after the procurement process concludes, during the MOECC technical review; this can introduce design alterations and performance expectations that were not included in the DBO RFP and that may subsequently alter design and pricing, and potentially the business case.

Limits to innovation. As noted, this process and timeline is limited to composting technologies, in order to meet the timelines. The field of organics processing is established in Ontario and has been for at least 20 years; however, there have been advancements in technologies in the last ten years that have increased the environmental sustainability and performance of the industry. For example, anaerobic digestion systems are now common, and offer the ability to create value-added products that are not offered by composting, such as renewable electricity, renewable natural gas, compressed natural gas for vehicle fuel, etc. However, in order to maintain the timeline, there is not sufficient duration to query the various new technology

providers to adequately understand their offerings, to procure technical and cost information around them, and to effectively deliver an RFPQ that appropriately recognizes these technologies. This is a significant barrier to the County realizing the potential technical and cost benefits of newer approaches to organics processing.

Increased costs from the DBO contractors. Given the uncertainties raised above regarding permitting, there is a risk to the County that contractors will increase design-build and operating pricing to account for the lack of clarity on municipal and environmental permitting. Especially under design-build frameworks, DBO contractors will shift uncertainties into risk pricing elements that will adversely affect the business case. Further, the inability of DBO contractors to propose technologies such as anaerobic digestion, which includes revenues from renewable energy to offset operating costs, impairs the County's ability to procure the best-value technology platform.

Aggressive schedule. The schedule as laid out for Option 1 is extremely aggressive and would require ideal levels of coordination and management, and no issues with respect to the preferred site. While the schedule is possible, it is likely that schedule slippage will be realized along this pathway given the complexity of the technical issues involved. Further, GHD would expect significant questions from the RFPQ and RFP respondents regarding the process, given that the OPA/ZBA process will not be concluded, and MOECC permitting will not have been initiated.

Lost efforts. Given that an honorarium structure is likely required to motivate DBO respondent interest in the process to mitigate concerns around the credibility of the process stemming from the noted permitting issues, any honorariums established at the RFP stage may be at jeopardy to the County if an issue is discovered on the preferred site during the permitting process. This would presumably cancel the RFP process, capitalize the honorariums to the account of the DBO contractors, and require that the County re-initiate the process on another site. Lost efforts also include those exerted to complete engineering studies to support the RFPQ and RFP process, which are almost entirely site-specific, and pre-design would that would be supported by the engineering studies and included in the RFP to help respondents provide pricing.

Option 2 – Expanding Technology Options to include Anaerobic Digestion

Option 2 is a variant of the above wherein different technological options for the OPF are considered in the process, and the business case for the OPF is presented in a two-step process wherein the inputs are refined over time. In this scenario, a Request for Information (RFI) is prepared and released in conjunction with submission of the OPA/ZBA process, requesting that respondents provide information related to their technology options from a performance, cost and technical standpoint. This is a non-binding process that essentially sounds the market for the suite of technologies that exist for organics processing, and that includes composting, anaerobic digestion, and other platforms that have measurable presence in the field at commercial scale.

The results of the RFI are used to structure the RFPQ process, as part of a prequalification process that targets technology types that are acceptable to the County. This process allows for consideration and inclusion of newer technologies that have entered the field and have demonstrated commercial success and potential for greater value for the County. The DBO RFP is built for successful respondents to the RFPQ. In this option, the RFP follows a sequential process, wherein the RFP is released after the OPA/ZBA process is concluded, allowing for any technical, performance or cost factors stemming from that process to be included in DBO contractor pricing. The results of the DBO RFP, which will include design information regarding the

various options proposed, are then used to formulate the submission packages for the MOECC permitting process.

The process noted above would be considered a more typical procurement for an organics processing facility.

Under this scenario, the business case is divided into a preliminary and final process. The preliminary business case would be presented in early 2017 based on the results of the RFI, and the final business case would be presented in late 2017 based on the firm pricing provided in the DBO proposals related to the RFP.

The Option 2 pathway includes the following potential risks:

Increased overall timeframe. While this process pursues a longer overall timeframe for development of the OPF, it does reduce many of the risks noted under Option 1 for early release of the RFPQ/RFP during the permitting process. Further, the benefits of this approach include the ability to include consideration for newer technologies that may demonstrate greater performance and cost metrics.

Segmented business case. In this scenario, the business case is divided into two parts. In the preliminary business case, which would be presented in early 2017 per the original timelines for that process, information from the RFI would be used to populate the financial analysis in addition to engineering estimates. These inputs would carry greater variability than would be achieved after receiving proposals to the RFP, where in the latter case these would be binding figures. A measure of judgement and accommodation for allowances would need to be included in the preliminary business case to ensure that it is representative, and that the final business case procured at the conclusion of the DBO RFP is a confirmatory step in the process.

4. Environmental Compliance Approval (ECA) Application

4.1 MMF

The ECA application for the MMF would be predicated on the completion of the engineering studies and the preparation of a conceptual design for the facility based on discussions with the County. Pre-consultation with the MOECC would thus occur in the fall of 2016, when there is some certainty surrounding the approvability of the OPA/ZBA and suitability of the site for both the MMF and the OPF. A placeholder in the ECA application should be included for "Future OPF", and the intended staging and start-up of both facilities should be presented during pre-consultation. Pre-consultation would cover both facilities and the site as whole, but the initial application would be for the MMF only.

4.2 OPF

The OPF would be added later as an amendment to the previously approved ECA for the MMF. However, given the risk of not having approval in place prior to construction, County Council may wish to have the ECA in place prior to the award of the DBO Contract. There are generally two options here: wait until the DBO is on-board to submit the amendment application using specific details, or pre-supply the amendment application based on information culled from RFPQ submissions. In the latter scenario, an amendment application would be submitted prior to award of the DBO Contract, and would be based on an envelope approach that would allow for consideration of multiple technologies in the ECA process. GHD has utilized

this process in the past, and notes that it would be predicated on effective pre-consultation with the MOECC. We further believe that this approach is generally more possible when the applicant is a municipality, as is the case with the County.

5. OPF Business Case

As noted above, the OPF business case progression differs between Options 1 and 2. In Option 1, the business case would be built on the information from an RFP released early in the municipal permitting process, and that would support an aerobic composting technology platform only. This business case would be delivered in early 2017. In Option 2, a preliminary business case built on the results of an RFI process would be prepared for early 2017 considering a suite of different technologies; this business case would then be refined during calendar 2017 and concluded in late 2017 based on the results of the OPF DBO RFP.

GHD recognizes the need to undertake a business case. Our recommendation would be to generally follow a process where permits and approvals and contractor procurement for the OPF is as advanced as possible, so that cost factors are known. With respect to Option 2, an RFI would be supported by information procured from the planning studies conducted over summer 2016, which would lead to an approximate basis for design of the OPF. Contractors and technology respondents would take relevant information from the RFI and provide estimated capital and operating costs to support the business case. These estimates would be further substantiated at the close of the DBO RFP. This process would further allow the County to conclude its preliminary business case and seek Council approval for the OPF prior to release of the RFPQ/RFP for the OPF, further demonstrating the County's commitment to the project to prospective respondents to that process.

The final business case will be dependent on inputs developed over time which would not be fully available until after responses to the OPF DBO Contractor RFP are received. GHD's recommendation under either Option considered is to have the framework for the analysis developed early such that it is ready to be populated by information from the successful DBO RFP respondent.

While we understand the importance of developing the business case, it is not reasonable to develop this business case until cost factors related to the preferred site are understood via Planning and engineering studies, the technology platforms are understood via a RFPQ process, and fixed contractor pricing is provided via the DBO RFP. Pre-supposing the business case at this point would lead to significant possible variances in capital and operating costs feeding into the cost model, resulting in a high level of inaccuracy.

6. Supporting Site Works

As noted in Section 3.1, there is a number of supporting site works that could be completed in advance of the construction contracts for the MMF or OPF. This may include items such as clearing the proposed construction area (which could, in part, be completed by the County's Forestry Department through tree harvesting activities), site grading, paving access roads and other areas of the site, establishing site servicing (i.e., hydro, groundwater well), and the construction of stormwater management infrastructure (e.g., ponds, ditches, culverts). Preliminary work surrounding these items, as well as securing a Building Permit and Site Plan Approval, could be initiated in early 2017 so that construction could proceed during the summer months. The County may wish to issue separate contracts for these individual elements, which are fairly simple to procure.

7. Public Consultation

Public, Aboriginal, and stakeholder engagement will continue as the project develops. At a minimum, this will include consultation with Springwater, NVCA, MOECC, First Nations, and the general public. The next public consultation event is expected to occur in the fall of 2016, and will provide a general project update surrounding technology and design and the proposed procurement methods for the OPF.

8. Contract

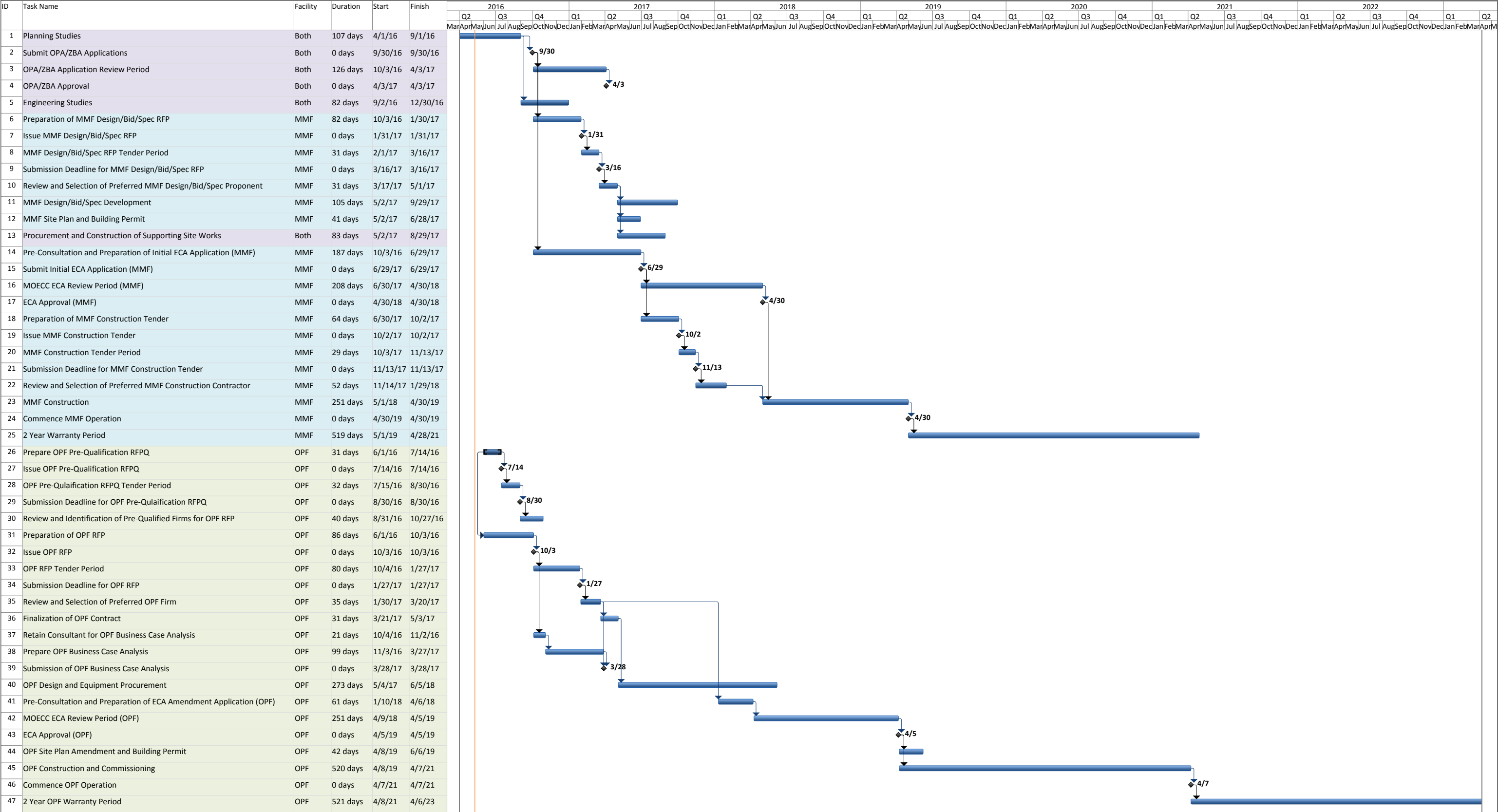
The County's current waste transfer contract with BFI in Barrie expires in April 2017. Generally, the timeline provided suggests that operation of the MMF in early 2019 would require some alternate transfer capacity until that time. As of 2019, garbage, recyclables and organics could be transferred at the MMF, with the organics requiring off-site processing for a period of approximately 2 years.

The County's current organics processing contract with AIM in Hamilton expires on October 1, 2018. When the OPF is in operations in 2021, organics would then directly enter the OPF. As the MMF will need to be designed for the inclusion of organics, applicable abatement measures should be in place to accommodate internal building liquids (sumps and storage) and the potential for odour.

Figures



OPTION 1 - Following County Council's Current Direction on Aerobic Composting
Figure 1 - Simcoe OPF/MMF Development Strategy Timeline





OPTION 2 - Expanding Technology Options to Include Anaerobic Digestion
Figure 2 - Simcoe OPF/MMF Development Strategy Timeline

