

Welcome!



Kingston Regional Biosolids & Biogas Facility

Public Information Centre

March 27, 2024

This way!



(Walk through the doors to your right)



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Integrity



Reliability



Innovation

Welcome!



Purpose of Public Information Centre (PIC)

- Learn about the objectives of this Project and how this project supports Kingston's commitment to climate leadership
- Learn about the proposed facility and location
- Learn about the proposed facility design and how it was developed
- Complete a survey about the proposed Project
- Provide input and remain informed

Project Purpose

Utilities Kingston and the City of Kingston are taking steps to reduce the overall Greenhouse Gas emissions footprint of their operations and the community.

- Utilities Kingston is investigating the feasibility of developing a combined wastewater biosolids and food waste processing facility at Knox Farm, a municipally-owned property located off Perth Road.
- The facility would process wastes from the City's wastewater treatment plants and "Green Bin" program to produce a renewable natural gas (RNG) (biogas) and other beneficial resources.
- A Municipal Class Environmental Assessment (Class EA) is being completed to support the planning and approval process for this facility.



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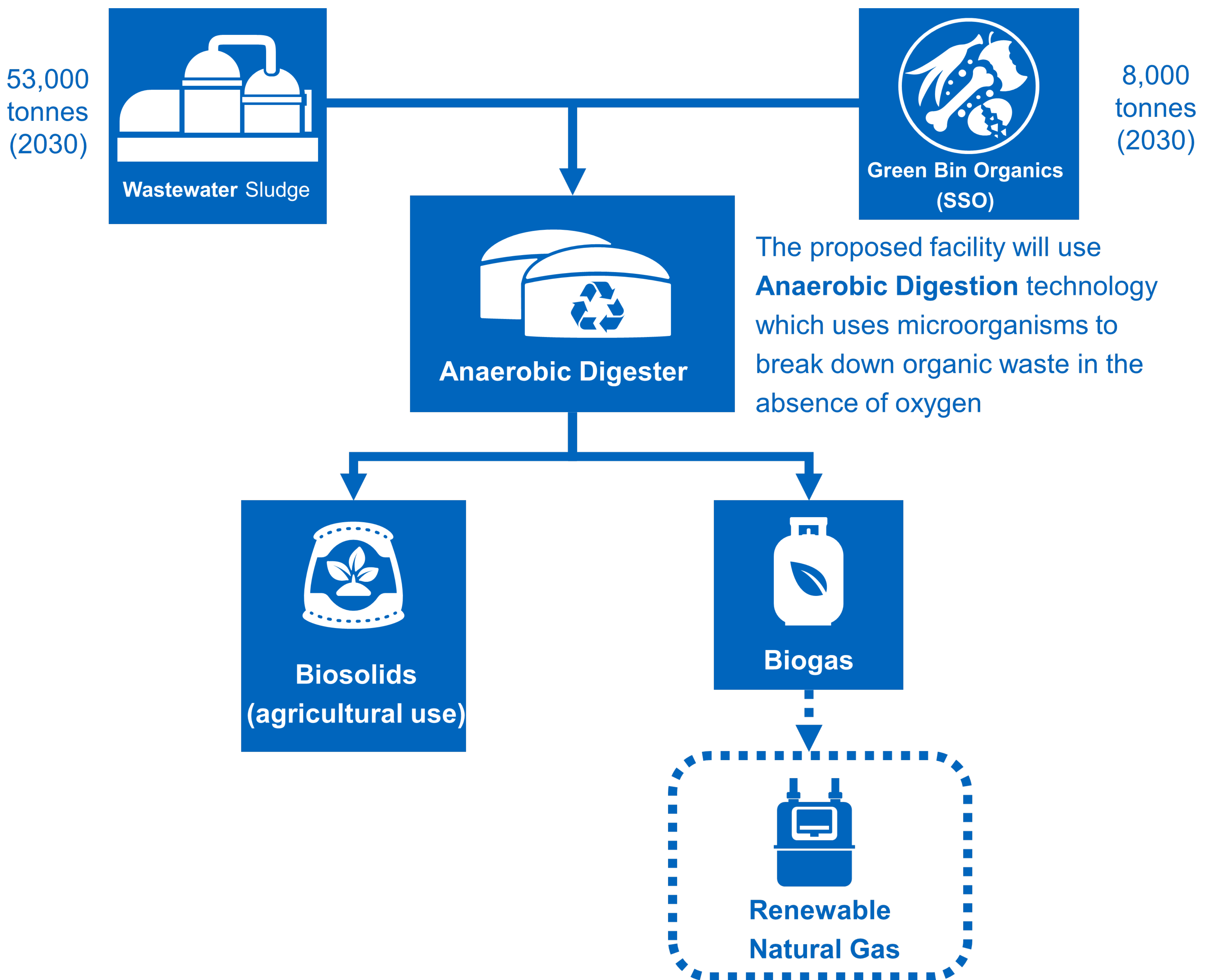
The Proposed Facility

Biosolids are the treated organic materials that are removed from our water after we flush it down the drain.

- Biosolids are produced from wastewater sludge, generated by two wastewater treatment plants operated by Utilities Kingston, one of which requires upgrades to meet future needs.

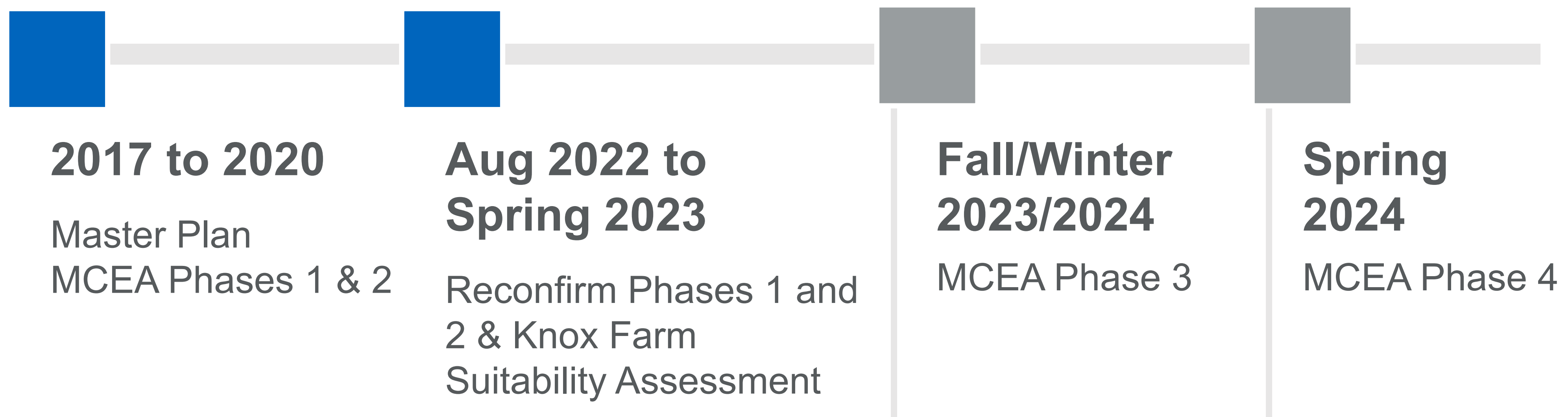
Source-Separated Organics (SSO) are the food and organic wastes that are currently accepted in the City's Green Bin program.

- SSO collected at the curbside are currently processed into compost by a private company hired by the City.



Municipal Class Environmental Assessment (MCEA)

Phases 1 and 2



Master Plan for Enhanced Biosolids Management & Biogas Utilization:

The Master Plan was completed in 2020 and followed the MCEA process and included:

- **Phase 1 – Problem / Opportunity Statement:** to establish a long-term approach to biosolids management at all WWTPs, while addressing capacity constraints at the Cataraqui Bay WWTP, and considering opportunities to enhance biogas production.
- **Phase 2 – Alternative Solutions and Preferred Alternative:** five alternative solutions were considered including maintaining the status quo, upgrades at existing wastewater facilities, and construction of a new facility at the City-owned Knox Farm property.

Reconfirmation of MCEA Phases 1 and 2:

The Project resumed in August 2022 to reconfirm Phases 1 and 2 from the 2020 Master Plan:

- **Phase 1 – Reconfirmed Problem/Opportunity:** Reconfirmed that the opportunity considers:
 - Use of wastes as resources within the context of a circular economy;
 - Aligning with provincial government interest in managing waste organics more effectively and eliminating landfilling;
 - Opportunities to generate and use renewable natural gas to reduce the City’s carbon footprint; and,
 - Use of an existing City-owned site (Knox Farm) for the potential development of a regional Facility that processes City-managed organic wastes and provides an opportunity to process organic waste from other sources in and around the City of Kingston.
- **Phase 2 – Reconfirmation of Preferred Solution:** A review of the five alternative solutions presented in the Master Plan were reviewed and the preferred solution to build a new facility at Knox Farm was reconfirmed.



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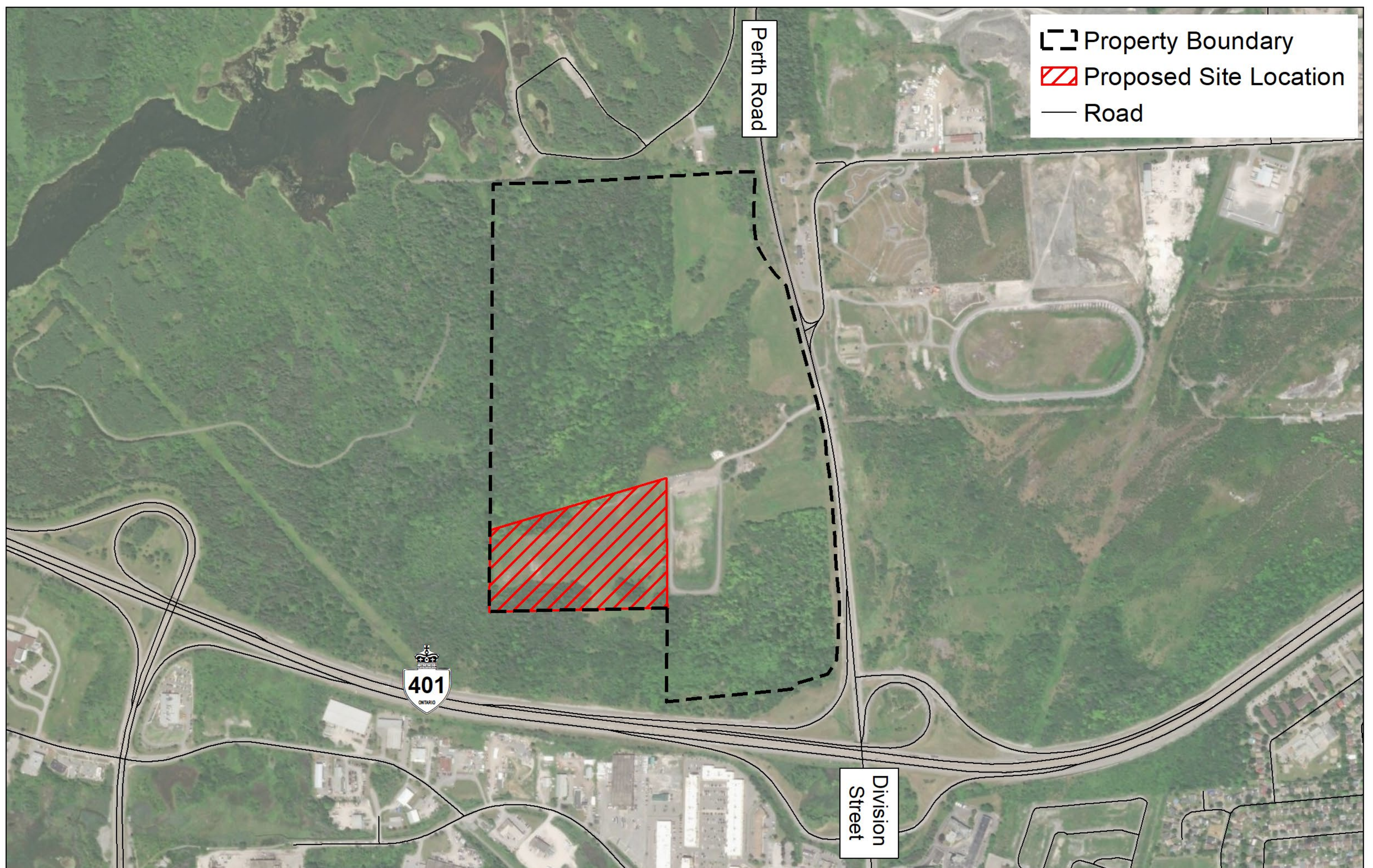


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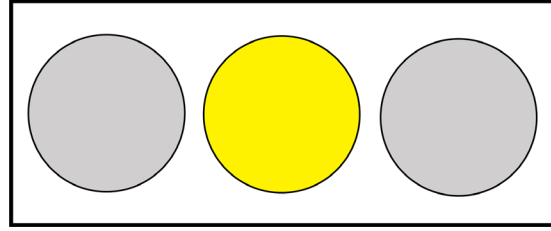

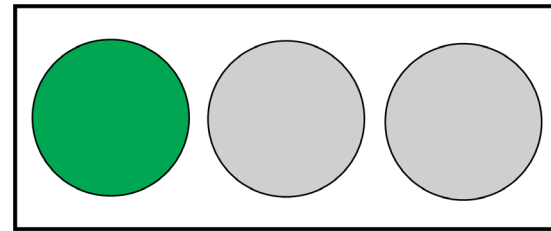
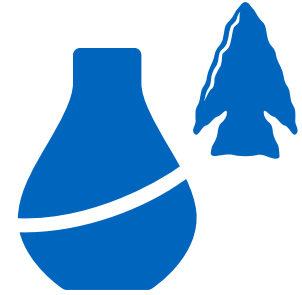
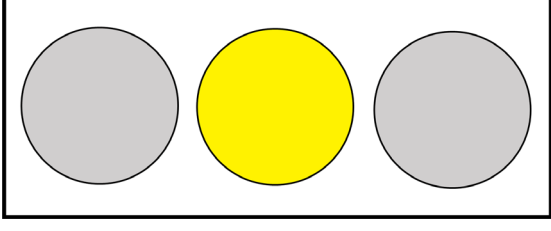
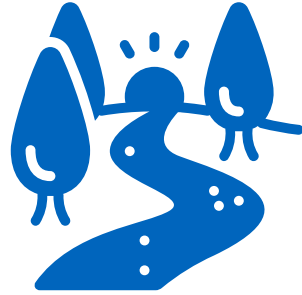
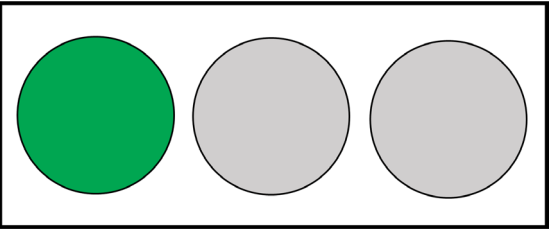

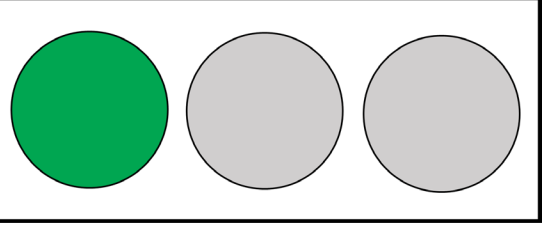

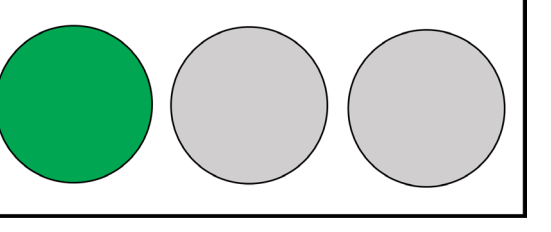

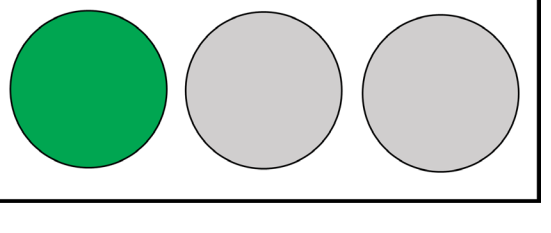
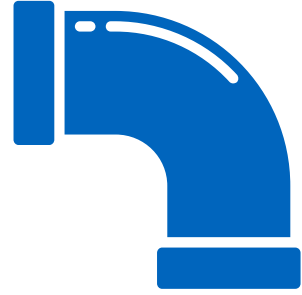
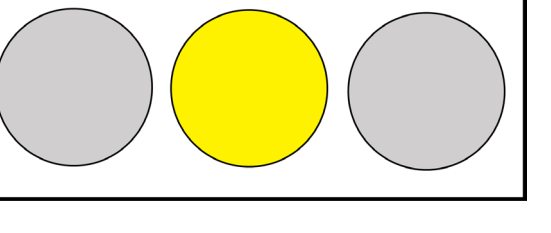

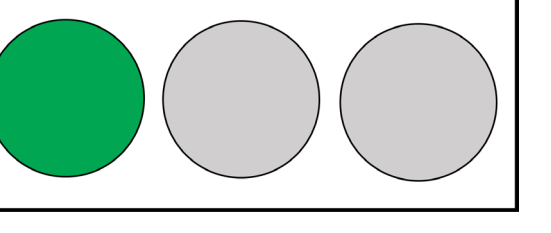

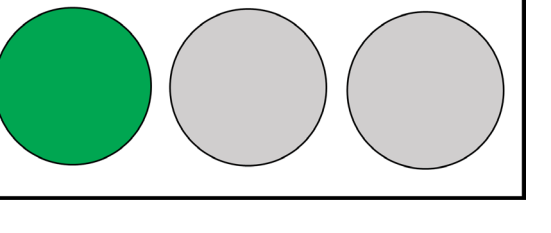
The Proposed Location

Knox Farm:

- Municipally-owned 75-hectare property and vacant site.
- Located off Perth Road, north of Highway 401 and Division Street in the City of Kingston.
- South of Little Cataraqui Creek Conservation Area and the Cataraqui Region Conservation Authority.
- Outside of the City of Kingston's Urban Boundary.
- Proposed Location: Approximately 9.3 hectares which was formerly used for sediment dewatering ponds (now decommissioned).
- The area east of the proposed site location is used by the City for seasonal snow storage.



Summary of Technical Assessment of Knox Farm

Technical Discipline		Summary	
Land Use			An amendment to the Official Plan and/or Zoning Bylaw may be required
Air Quality			No concerns identified
Archaeology			A Stage 2 Archaeology Assessment is required (completed)
Cultural Heritage			No concerns identified
Hydrogeology			No concerns identified
Natural Environment			No concerns identified
Noise			No concerns identified
Site Servicing			Additional options for water and wastewater management to be considered
Stormwater Management			No concerns identified
Traffic			No concerns identified

No major barriers were identified for Knox Farm as a potential location for the proposed facility

Municipal Class Environmental Assessment Phases 3, 4 and 5



Phase 3

Identification and Evaluation of Alternative Design Concepts

Work completed to-date as part of Phase 3 of the MCEA:

- Identified two Alternative Design Concepts;
- Conducted a comparative evaluation of the two Design Concepts and identified a Preliminary Preferred Design Concept
- Identified potential impacts from the Preliminary Preferred Design Concept and proposed mitigation.

Following this Public Information Centre the following will be undertaken:

- Confirmation of the Preferred Design Concept based on feedback received during public consultation; and
- Confirmation of potential effects and proposed mitigation for the Preferred Design Concept.

Phase 4

Environmental Study Report

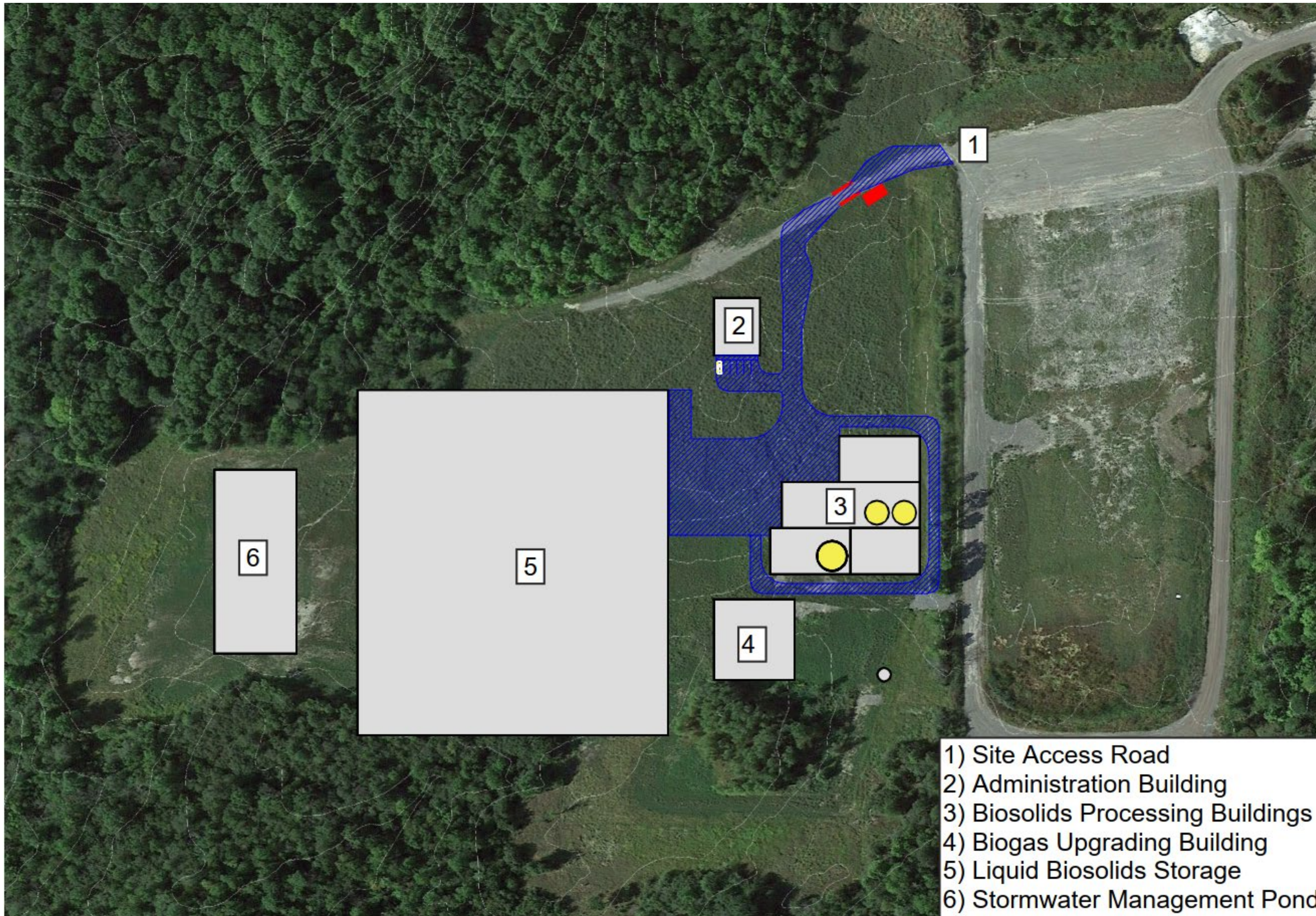
The MCEA process and conclusions will be documented in the Environmental Study Report which will be available for public review for 30 days.



If the project is recommended to proceed, MCEA Phase 5: Project Implementation will be undertaken between 2025 and 2030



Alternative Design Concept #1

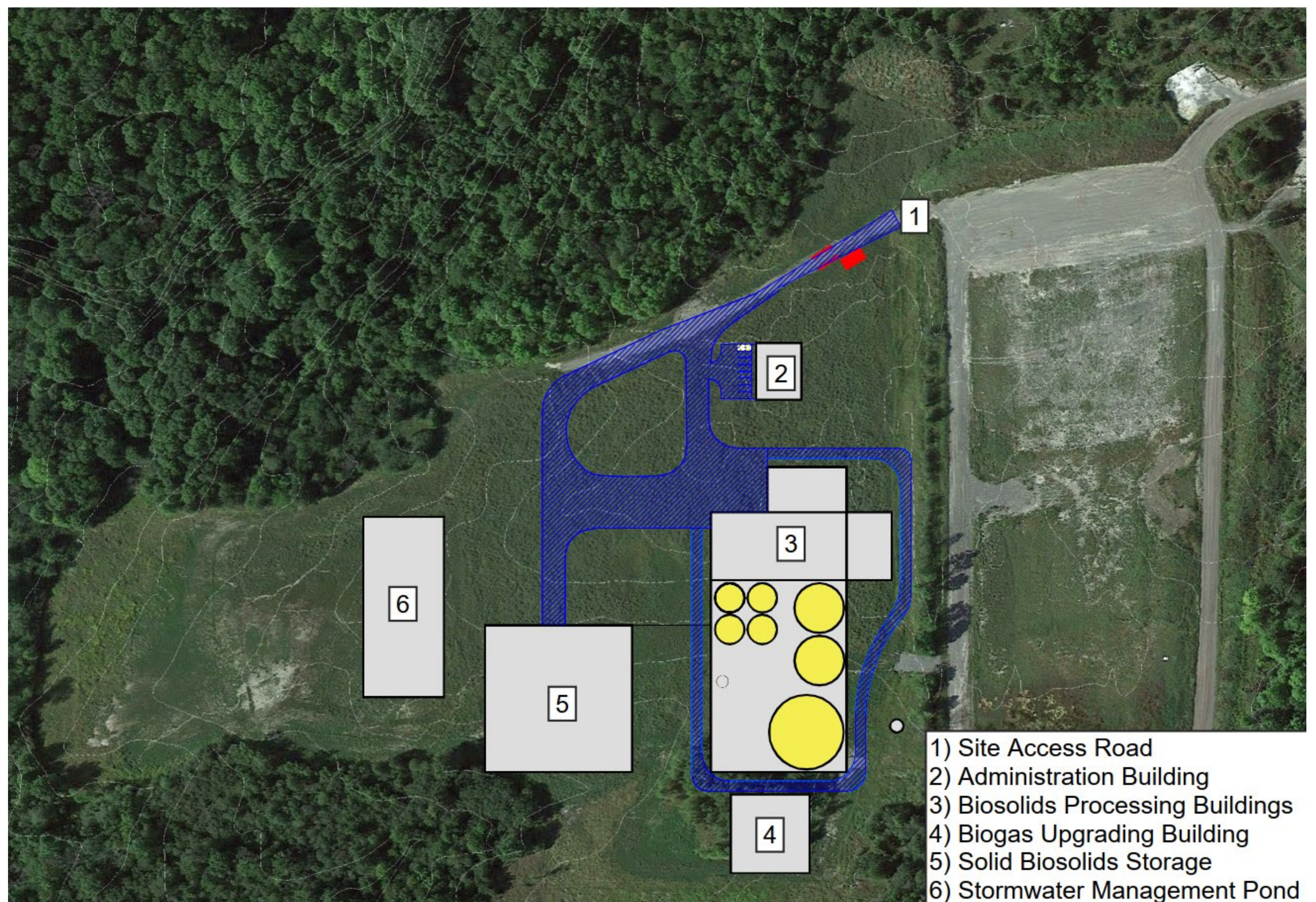


- Focus is on maximizing biogas generation
- The feedstock is pre-treated to increase biogas production
- A liquid biosolids product is produced for agricultural use

1) Site Access Road
 2) Administration Building
 3) Biosolids Processing Buildings
 4) Biogas Upgrading Building
 5) Liquid Biosolids Storage
 6) Stormwater Management Pond

Alternative Design Concept #2

- Focus is on minimizing utility demands and residual waste volumes
- Does not include feedstock pre-treatment. Less biogas is produced
- A solid biosolids product is produced by removing water from the product prior to agricultural use



1) Site Access Road
 2) Administration Building
 3) Biosolids Processing Buildings
 4) Biogas Upgrading Building
 5) Solid Biosolids Storage
 6) Stormwater Management Pond

Evaluation of Alternative Design Concepts

The two Alternative Design Concepts were assessed and compared using the following set of evaluation criteria and indicators to understand the potential impacts. The evaluation considered the following criteria:

Natural Environment

- vegetation and trees
- terrestrial and aquatic habitat & wildlife
- habitat of Species at Risk

Physical Environment

- groundwater resources and source water protection areas
- surface water and area drainage
- emission of greenhouse gases (GHGs), carbon removal, carbon storage/sink (e.g., trees and vegetation), and trucking-related GHG impacts
- adaptability to climate change effects
- noise and vibration levels
- air quality and odour emissions

Socio-economic Environment

- conformity to and consistency with municipal and provincial policies
- community nuisance impacts during construction and operations

Cultural Environment

- built heritage resources and/or cultural heritage landscapes
- archaeological resources
- traditional land and resource use and treaty rights

Financial Factors

- estimated capital costs
- estimated operating & maintenance costs
- estimated lifecycle costs

Technical Factors

- Proven technology, complexities around construction, process and maintenance
- quantity of biogas production
- ability for facility to be expanded
- process wastewater treatment requirements
- nutrient content of process end products
- amount of residuals requiring management

Evaluation of Alternative Design Concepts Natural Environment



Baseline information on the natural environment was collected through a combination of desktop background review and field investigation.

Design Concept 2 was determined to have slightly less natural environment impact than Design Concept 1.

Similarities	Differences
<ul style="list-style-type: none"> Both design concepts propose minor amount of tree removal. Neither concept is anticipated to have potential impacts to aquatic habitat & wildlife. Neither concept will remove Species at Risk (SAR) habitat. Both concepts have the potential for indirect impacts (e.g., noise, light, vibration, and human presence) to nearby SAR and SAR habitat. 	<ul style="list-style-type: none"> Design Concept #1 occupies a larger footprint resulting in more shrub and meadow vegetation removal and associated removal of more potential migratory bird habitat than Design Concept #2. Design Concept #1 occurs in closer proximity to forest habitat which may increase risk of indirect impacts (e.g., noise, light, vibration, and human presence) to nearby wildlife and wildlife habitat.

The potential impacts of both options are considered minimal and mitigatable.

Anticipated Potential Effects:

- Temporary loss or alteration of vegetation during construction.
- Temporary alteration of wildlife habitat and/or disruption of wildlife movement during construction.
- Direct impacts to SAR habitat are not anticipated but potential for operational indirect impacts (e.g., noise, light, vibration, human presence) to affect nearby potential SAR and SAR habitat that are located near the Project footprint.

Anticipated Mitigation Measures:

- Implement best practice protocols / measures for trees and for wildlife protection.
- Minimize the construction area to reduce the amount of vegetation affected.
- Limit use of lighting, where possible.
- Incorporate landscape planting of native species along Project footprint to provide a buffer for woodland areas where operational indirect impacts are anticipated.



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Evaluation of Alternative Design Concepts Physical Environment



Baseline information on the physical environment was collected to inform the assessment of potential impacts of the project on the physical environment.

The two Design Concepts were determined to have similar physical environment impacts.

Similarities	Differences
<ul style="list-style-type: none"> Both concepts have potential risk of spills. Both concepts are proposed within Significant Groundwater Recharge Areas and partially within Highly Vulnerable Aquifers. The quality and quantity of surface water are very similar and can be accommodated. Both concepts are anticipated to have minimal impacts from climate change effects. Both concepts can meet applicable noise limits. No significant sources of vibration associated with either design concept. 	<ul style="list-style-type: none"> Design Concept #2 is anticipated to need more water for the digestion process. Design Concept #1 is expected to yield more biogas production. This results in a potentially greater overall net reduction in GHGs due to replacement of community natural gas use with RNG. Design Concept #2 will consume less natural gas resulting in a lower magnitude of air emissions released from this source. Design Concept #1 requires less odour mitigation than Design Concept #2.

The potential impacts of both options are considered minimal and mitigatable.

Anticipated Potential Effects:

- Potential for groundwater quality impacts during construction and operation.
- Potential for impacts to surface water quality and quantity and within the receiving drainage area.
- Potential for noise impacts during construction and operation.
- Potential for vibration during construction.

Anticipated Mitigation Measures:

- Develop and implement a stormwater management strategy to minimize impacts to surface water resources and satisfy regulations.
- Develop and implement an erosion and sediment control plan to reduce construction related impacts to the receiving drainage area.
- Air quality impacts associated with construction activities will be minimized through the development and implementation of air quality / fugitive dust best management practices plans.
- Inspection / monitoring of fugitive dust releases will be conducted during construction to ensure mitigation measures are effective or to identify periods when additional mitigation needs to be implemented.
- Noise impacts from the Facility will comply with provincial noise limits and the City's Noise By-law.



Evaluation of Alternative Design Concepts

Socio-Economic Environment

Baseline information on the socio-economic environment was collected from a review of municipal and provincial policies and from studies completed by other technical disciplines related to potential nuisance impacts.

The two Design Concepts were determined to have similar socio-economic environment impacts.

Similarities	Differences
<ul style="list-style-type: none"> Both concepts are generally consistent with provincial and municipal land use policies. Both concepts may require a zoning bylaw amendment. Both concepts align with the province’s direction to consider waste as a resource, divert organics from disposal and to find opportunities to create RNG and reduce GHG emissions. Both concepts are relatively equal in terms of their potential nuisance impacts on the surrounding community (noise and vibration, air quality, and odour). Both concepts are estimated to generate low numbers of site truck trips that is expected to have a minimal effect on roadway traffic. 	<ul style="list-style-type: none"> Design Concept #1 requires the construction of a storage lagoon closer to the Little Cataraqui Creek Conservation Area Trails resulting in somewhat larger potential for impact to trail users than Design Concept #2.

The potential impacts of both options are considered minimal and mitigatable.

Anticipated Potential Effects:

- Potential for noise impacts during construction and operation.
- Potential for vibration during construction.
- Temporary aesthetic disruption to Cataraqui Region Conservation Authority (CRCA) trail and trail users during construction.
- Higher traffic volumes during construction.

Anticipated Mitigation Measures:

- Final design and equipment selection to be reviewed so that noise limits are met before construction.
- Construction to comply with noise by-law.
- Noise impacts are anticipated to be at or below existing background sound levels (e.g., Hwy 401).

Evaluation of Alternative Design Concepts Cultural Environment



Baseline information on the cultural environment was collected through a Cultural Heritage Assessment Report and a Stage 1 and Stage 2 Archaeology Assessments.

The two Design Concepts were determined to have similar cultural environment impacts.

Similarities	Differences
<ul style="list-style-type: none"> No cultural heritage resources were identified within or adjacent to the property. Both design concepts have minimal potential for negative impacts to archaeological resources. The Stage 2 Archaeological Assessment found no significant archaeological resources within the areas of archaeological potential identified in the Stage 1 Archaeological Assessment. No specific concerns have been received to-date from Indigenous communities to indicate potential impacts to traditional lands and treaty rights. 	<ul style="list-style-type: none"> No differences between the two design concepts.

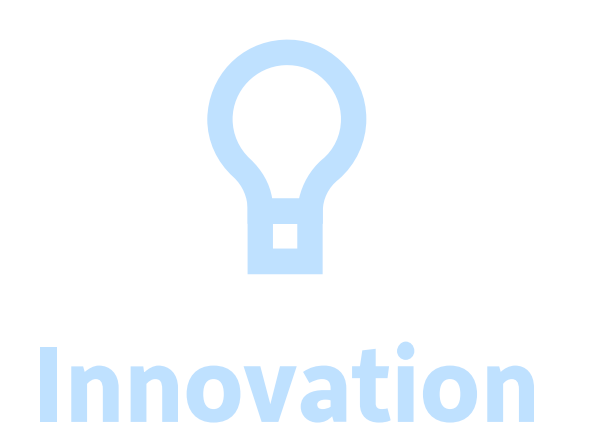
The potential impacts of both options are considered minimal and mitigatable.

Anticipated Potential Effects:

- Disturbance of previously undiscovered archaeological resources during construction.

Anticipated Mitigation Measures:

- If archaeological resources are discovered during construction, no further alteration of the site can occur and a licensed consultant archaeologist shall be engaged to carry out an archaeological assessment, in compliance with Section 48(1) of the *Ontario Heritage Act*.



Evaluation of Alternative Design Concepts

Financial Factors



Baseline information on financial factors was estimated through the Request for Information process and follow-up, consulting team experience and publicly available data.

The overall costs of the two Design Concepts are similar.

- Design Concept #1 has slightly lower capital cost.
- Design Concept #2 has slightly lower operating costs.
- Design Concept #1 has a greater potential for revenue from renewable natural gas.
- Overall costs of the two design concepts are similar.

	Design Concept #1	Design Concept #2
Capital Costs*	\$74 million	\$87 million
Annual Operating & Maintenance Costs*	\$2.6 million	\$1.2 million

*Preliminary cost estimates are approximate and subject to change.

Anticipated Potential Effects:

- Costs are higher than anticipated.

Anticipated Mitigation Measures:

- Identification of cost savings opportunities at outset of detailed design.
- Value engineering exercises held during the design process identify and evaluate additional potential cost savings.
- Consideration of alternative procurement strategies that may save costs or reduce risk of future cost increases.
- Investigate funding and private partnership opportunities through a business case assessment.



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Evaluation of Alternative Design Concepts

Technical Factors

Baseline information on technical factors was provided through a Request for Information process, consulting team experience and publicly available data.

Design Concept #1 is technically preferred compared to Design Concept #2.

Similarities	Differences
<ul style="list-style-type: none"> Both design concepts have a similar level of complexity for construction. Both design concepts are expected to have similar staffing requirements. Both design concepts are receiving the same feedstock and are assumed to have similar levels of contaminants or residuals requiring disposal. Both design concepts incorporate a technology that is considered proven and able to create and market finished products. 	<ul style="list-style-type: none"> Design Concept #1 is a comparatively less complex process. Design Concept #1 has the potential to produce significantly more biogas. Design Concept #2 is anticipated to require treatment of process-generated wastewater. Design Concept #1 will produce a liquid biosolids product which is generally more favoured for agricultural applications.

Anticipated Potential Effects:

- Construction complexity impacting schedule, nearby residents, or costs.
- Number of points of failure, risks of downtime or increased repair costs, and/or skilled operations staff required.
- Potential land constraints, particularly for product storage, limit site expandability.
- Potential need for trucked water or substantial demand from onsite well.

Anticipated Mitigation Measures:

- Construction staging planning.
- Investigate design strategies such as including pre-engineered structures or modular equipment to simplify onsite construction activities.
- Identify opportunities to simplify process during detailed design. Involvement of operations staff as contributors to facility design. Operations responsibilities established early in design process.
- Design equipment and storage with expansion in mind.
- Review additional process water needs and identify onsite (well) sources where possible.

Preliminary Comparative Evaluation Results

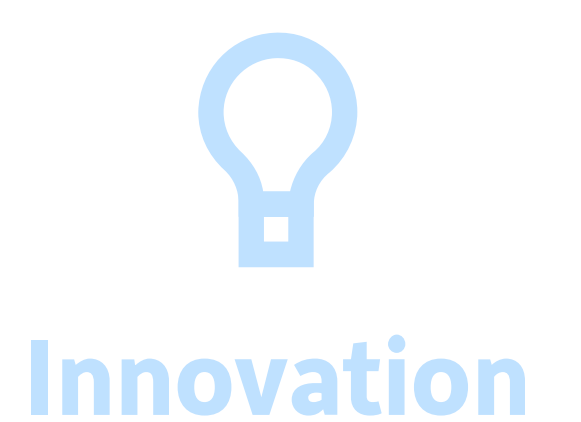
The evaluation results indicate that the two design concepts are very similar in terms of potential impacts noting that they are deemed minimal and mitigatable.

Design Concept #1 is being recommended as the Preliminary Preferred Design Concept.

Evaluation Criteria	Design Concept #1 (maximize biogas)	Design Concept #2 (minimize utility demand)
Natural Environment (vegetation/trees, terrestrial habitat & wildlife, aquatic habitat & wildlife, Species at Risk [SAR])	Somewhat Preferred	More Preferred
Physical Environment (groundwater, surface water, climate change, noise & vibration, air quality, & odour)	Somewhat Preferred	Somewhat Preferred
Socio-economic Environment (land use, community nuisance impacts)	Somewhat Preferred	Somewhat Preferred
Cultural Environment (cultural heritage resources, archaeological resources)	Most Preferred	Most Preferred
Financial Factors (capital, operating & maintenance, lifecycle costs)	Somewhat Preferred	Somewhat Preferred
Technical Factors (complexity, biogas production, servicing requirements, technology, etc.)	More Preferred	Somewhat Preferred

Design Concept #1 better aligns with the overall project goals and is being recommended due to the following factors:

- Greater contribution towards achieving the City’s climate change leadership goals;
- Not expected to generate wastewater that would require treatment at City of Kingston wastewater treatment plants;
- Higher amount of biogas generated and an associated increased revenue potential from RNG production which is assumed to be distributed into the Utilities Kingston natural gas pipeline; and
- More attractive end-use biosolids product (i.e., liquid biosolids).



Greenhouse Gas (GHG) Impacts



The project has the potential to support the City of Kingston’s and Utilities Kingston’s climate leadership goals by creating a net reduction in GHGs through the production of renewable natural gas (biogas) from the anaerobic digestion (AD) of wastewater biosolids and Green Bin organic wastes. A comparison of the net GHG emissions from current wastewater and Green Bin processes to the design concepts has been initiated.

A key outcome of the project is the production of a renewable natural gas that can partially replace petroleum natural gas within Utilities Kingston distribution lines and create a net reduction in community GHG emissions.

GHG Emissions from Current Processes

GHGs are generated by the WWTPs and Green Bin processes through:

- Natural gas combustion and electricity consumption;
- Biogas combustion (boiler, cogeneration, and flare);
- Offsite transportation of biosolids and transportation of Green Bin materials; and
- Aerobic composting of Green Bin materials and associated equipment.

Net GHG Emissions from Preliminary Preferred Alternative (Design Concept #1)

The sources of future GHG emissions considered in the assessment include:

- Ravensview and Cataraqui Bay WWTPs (modified to remove the AD process);
- The Proposed Facility; and
- Net reduction of GHG emissions from RNG replacing conventional natural gas.

Biogas generation is expected to result in a net reduction in GHG emissions. Overall GHG generation and reductions are shown as annual vehicle emission equivalents below.

Preliminary Comparison of Net GHG Emissions

Year	Preferred Alternative GHG Emissions Compared to Current Processes (Passenger Vehicle Equivalents)	Potential Reduction in CO ₂ from RNG (Passenger Vehicle Equivalents)	Overall Difference (Passenger Vehicle Equivalents)
2023	+ 407	- 1,311	-904
2030	+ 448	- 1,442	-994
2060	+ 620	- 1,999	-1,379

(Natural Resources Canada Greenhouse Gas Equivalency Calculator)



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Get Involved!



Ask Questions:

- Go to our project website:
<https://utilitieskingston.com/Projects/Detail/RegionalBiosolidsBiogasFacility>
- Send an email to join our project contact list for future project updates: ukbiogasfacility@dillon.ca

Fill the Survey!

<https://www.surveymonkey.com/r/7QT6NBV>

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Add your comments or questions about the project here:



A large, empty rectangular box with a blue border, intended for users to enter their comments or questions about the project.



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