

Environment and Climate Review

The 25-Year Waste Strategy and the Zero Waste Framework administered by Waste Services aims to maximize efforts to improve landfill diversion rates and recover and reuse waste stream materials to align with the ConnectEdmonton strategic goal of climate resilience and the City Plan's intention to support Edmontonians' transition to a low carbon future.

To meet these targets, the expanded cart roll-out program aims to improve waste diversion rates and reduce GHG emissions through source-separation of food scraps and yard wastes from multi-dwelling residential units. However, there is insufficient capacity to process the estimated 121,000 tonnes of organic waste anticipated annually by 2027. To address these constraints, Administration has presented an options analysis to assess multiple arrangements of processing methods and facilities to continue to meet the City's goals in the future. In summary, the options included in the final analysis included transitioning the organics processing options at the Edmonton Waste Management Centre (EWMC) through the construction of a new open-air facility or increasing the City's reliance on third-party organic waste processing. Continuing to operate the High Solids Anaerobic Digestion Facility (HSADF) was not included in the final analysis.

The Organics Processing Program Path Forward has implications for environment and climate in the following key areas:

- i. GHG emissions;
- ii. Environmental releases; and
- iii. Future waste diversion expansion opportunities.

The links between these areas and the related risks and opportunities are outlined below.

<p style="text-align: center;">Key Area #1 - GHG Emissions</p>	
<p>The responsible management of GHG emissions at waste management facilities is crucial to mitigate climate change and meet our environmental targets.</p>	
<p>Operational challenge: After the full implementation of three-stream waste sorting and collection in 2027, organic waste will be separated from garbage at the source. An estimated 121,000 tonnes of organic waste will require processing each year by 2027 as three-stream collection expands to apartments and condominiums.</p>	<p>Environment and Climate Risk/Opportunity: The following environment and climate considerations provide an overview of the risks and opportunities for managing GHG emissions:</p> <p>Considerations for reducing GHG emissions: GHG emissions released during each organics processing option have varying degrees of impact based on the option presented. With relation to GHG emissions, outsourcing all organics processing without an in-house solution would result in a notable increase in transportation-related GHG emissions where third-party facilities further from the City would be required to meet processing volumes by 2027. However, third-party processors with existing carbon capture and/or RNG capabilities could help offset any increases in transportation-related emissions. Additionally, if a third-party processor intends to utilize greenhouse gas (GHG) credits in their operations, they could be encouraged to provide this information to enhance our sustainable supply chain management and make informed decisions when awarding contracts.</p> <p>There remains an opportunity to formally quantify the potential GHG emissions and environmental</p>

	<p>regulatory requirements of any newly proposed City-owned facilities, in contrast to upgrading the HSADF, which currently holds an active Operating Approval. While the regulatory risk for a new outdoor bunker facility was ranked as low, there remains a certain level of risk until it is confirmed through engagement with regulatory entities.</p> <p>Considerations for renewable energy production:</p> <p>The production of renewable energy can spur new economic benefits, reduce GHG emissions lost to the atmosphere, and create a sustainable loop by which wastes are turned into new energy sources. The transition away from anaerobic digestion at the HSADF would prevent the City from reducing GHG emissions through the direct production of renewable energy.</p> <p>Upgrades to the HSADF could have allowed for the generation of renewable electricity and the sale of carbon offsets to bring in revenue against the cost of operating the facility. Conversely, using the renewable electricity generated by the HSADF to power the facility rather than selling the carbon offsets would have counted towards GHG emission reductions at the facility and helped meet the City's target of using only renewable electricity for corporate electricity consumption by 2030. The decentralized nature of providing energy close to where it is needed also reduces potential transmission losses and energy grid demand. This aligns</p>
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	<p>with ConnectEdmonton's climate resilience action to generate and expand renewable energy to reduce and mitigate climate change and help advance Edmonton towards its goal of being carbon neutral as a municipality by 2040.</p>
<p>Key Area #2 - Environmental Releases</p>	
<p>The responsible management of environmental impacts is required to protect environmental and human health, as well as maintain positive stakeholder relations.</p>	
<p>Operational Challenge: For Option 1, building a small open-air composting facility at the former ECF aeration hall location would utilize existing brownfield sites, lowering development impacts to the environment. Building a larger open air compost facility at a new off-site location would require an additional regulatory permit and could introduce higher environmental risks such as odour and air quality concerns.</p> <p>Facility upgrades or new construction would not be required if outsourcing processing to third-party facilities in Option 2. This would lower costs and some regulatory risks, but could introduce new risks associated with meeting waste processing demand while ensuring environmental compliance.</p>	<p>Environment and Climate Risk/Opportunity: The following environment and climate considerations provide an overview of the risks and opportunities for managing environmental releases at third-party and City-owned facilities:</p> <p>Considerations for third-party environmental releases: Sustainable supply chain and reputational risks associated with outsourcing organics processing to third-party facilities in neighboring communities should be considered when assessing the presented options.</p> <p>Due diligence is still required to assess the environmental performance and practices of any additional third-party waste processing facilities contracted by the City to ensure there is alignment with our environmental commitments. While we would be shifting direct responsibility for the management of odours, air quality, and other potential environmental releases to a third-party,</p>

	<p>any significant or ongoing environmental incidents occurring at their facilities could still present contract-related ESG risks to the City as a supplier of waste.</p> <p>Considerations for environmental releases at City-owned facilities: The construction of a new open air composting facility could significantly increase odours experienced by adjacent stakeholders during the breakdown of organic materials (see consultant report in Attachment 2). Odour modeling may provide useful information to predict where odours may travel under various weather scenarios. There is an opportunity to enhance facility design and implementation by incorporating additional odour monitoring and mitigation measures where required. Indoor anaerobic digestion at the HSADF would have provided a lower risk to air quality and odour concerns through processing waste.</p> <p>Additionally, since the HSADF is an enclosed facility, other potentially negative impacts to the environment such as litter, dust generation, stormwater or groundwater management, and wildlife interactions would have been lower when compared to the open air facility. The development of robust environmental control plans could help mitigate the increased risk of these elements in the open air facility.</p>
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Key Area #3 - Future Waste Diversion Expansion Opportunities

The maximization of resource recovery is key to sustainable waste management practices. As the City of Edmonton plans to experience a population growth to 2 million people, waste generation and processing demands will also increase. By recovering and reusing additional organic waste streams, there could be an opportunity to alleviate the growing demand for sustainable waste management with lower risk, revenue-generating solutions.

Operational Challenge:

Organic waste volumes are projected to increase further as Edmonton’s population continues to grow. The City of Edmonton's 50% emission reduction target by 2030 will require an estimated reduction of 247,000 tCO2e across civic operations.

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Risk/Opportunity:

Both options presented in this report would ultimately reduce waste by diverting organics from the landfill, aligning with the Greenhouse Gas Management Plan and the City Plan’s Intention to support Edmontonians’ transition to a low carbon future. In Canada, diverting one tonne of food waste through composting or anaerobic digestion reduces GHG emissions by approximately one tonne of CO2 equivalents compared to landfilling¹. Organics processing reduces the volume of waste being sent to a landfill facility, reducing land degradation and contamination concerns over the long term.

The following environment and climate considerations provide an overview of the risks and opportunities related to future expansion options:

Considerations for future expansion opportunities:

While the compost bunkers can accept and process food and yard wastes, the design is currently limited as to which

¹ [Environment Canada. 2013. Technical document on municipal solid waste organics processing.](#)

Attachment 4

	<p>organic wastes it can process. Future investment and expansion opportunities at the HSADF could have included the potential to process additional sources of organic wastes such as agricultural residues, sewage sludge from wastewater treatment facilities, and other industrial organics from industries such as breweries and paper mills. While economic feasibility studies would be required, accepting additional organic waste streams could build further capacity for the City to deliver on the Zero Waste Framework in the future.</p> <p>Additionally, a co-benefit of awarding long-term organics processing contracts to third-party customers could be spurring new technological innovation and economic development in the Edmonton region's ICI (Industrial, Commercial, or Institutional) sector. This could further increase regional capacity to process multiple streams of organic waste over the long-term to avoid the landfilling of those waste streams from public and private sources.</p>
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