Environmental Assessment Advisory Committee Meeting 3

Comparative Analysis & Recommended Method

June 9, 2025

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Presentation Agenda

1. Review of Alternative Methods
2. Comparative Analysis Example & Summary
3. Recommended Methods
4. Next Steps - Detailed Impact Assessment

Landfill Site Configuration Summary

There were three landfill configuration options being explored.

	Option A Same as Existing South Landfill (Phase 1)	Option B Max Agricultural Area	Option C Avg Agricultural Area
Maximum Height (m)	212 m	211 m	205 m
Total Capacity (m^3)	20,205,000 m^3	18,277,400 m^3	17,893,000 m^3
Area Available for Agricultural End-Use (m^2)	366,719 m^2	513,600 m^2	450,216 m^2

Leachate Management

There were two leachate treatment options being explored.

Option A	Option B
Continued & Expanded Use of the Municipal Wastewater Treatment System	Development of an On-Site Wastewater Treatment Plant

Summary of Community Feedback

Landfill Configurations

- Minimize visibility
- Maximize volume/capacity
- Maximize agricultural end-use
- Ensure cost-effectiveness to residents & businesses

Leachate Management

- Ensure cost effectiveness to residents & businesses
- Source of revenue for municipalities
- Utilize existing infrastructure
- Do not displace future WWTP capacity for community
- Reduce impacts at Campus

Comparative Analysis

What is a Comparative Analysis?

- Used to select a preferred option amongst a range of options.
- A systematic process to determine which options have more advantages than others (or least negative effects).
- An evaluation of options.

Examples of a Comparative Analysis (Landfill)

Most Preferred Less Preferred Least Preferred

Evaluation Criteria		Indicators	Option A	Option B	Option C
Natural Environment					
Geology & Hydrogeology	Effect on groundwater quality	• Predicted effects to groundwater quality at property boundaries and off-Site	No effect to groundwater flow at property boundaries and off-Site. **NO NET EFFECT**	No effect to groundwater flow at property boundaries and off-Site. **NO NET EFFECT**	No effect to groundwater flow at property boundaries and off-Site **NO NET EFFECT**
		Ranking	1st	1st	1st
		Rationale	There is no distinction between the Options in relation to geology and hydrogeology. **All Options rank the same.** Given the landfill will be designed to meet or exceed O.Reg. 232/98 requirements, and that inward hydraulic gradients will be maintained into the Site, there are no predicted effects at the property boundaries and off-Site for any of the three Landfill Configuration Options in terms of groundwater flow or groundwater quality. Therefore, all Options are equally acceptable from a Geology/Hydrogeology perspective.		

Evaluation Criteria		Indicators	Option A	Option B	Option C
Built Environment					
Agriculture	Effects on existing agricultural land base	• CLI soil capability classification	Minor reduction in agricultural capability from existing conditions (**36.7 ha of CLI Class 2T lands** and **25.87 ha of CLI Class 5T lands**). **LOW NET EFFECT**	Minor reduction in agricultural capability from existing conditions **(51.4 ha of CLI Class 3T lands** and **11.17 ha of CLI Class 5T lands)**. **LOW NET EFFECT**	Minor reduction in agricultural capability from existing conditions **(45.0 ha of CLI Class 2T lands** and **17.57 ha of CLI Class 5T lands**). **LOW NET EFFECT**
		Ranking	3rd	1st	2nd
		Rationale	**Option B is preferred over Option C, and Option C is preferred over Option A.** The three alternatives primarily differ in the amount of land available for an agricultural end use, with Option B having the greatest area of agricultural end use. Although Option B will be primarily comprised of CLI Class 3 lands and Option A and C will be primarily comprised of CLI Class 2 lands, the greater area of land available for agricultural production will outweigh any potential decreases in crop yields associated with the lower CLI Capability.		

Criteria		Indicators
Geology & Hydrogeology	▪ Effect on groundwater quality	▪ Predicted effects to groundwater quality at property boundaries and off-site
	▪ Effect on groundwater flow	▪ Predicted effects to groundwater flow at property boundaries and off-site
Surface Water Resources	▪ Effect on surface water quality	▪ Predicted effects on surface water quality on-site and off-site
	▪ Effect on surface water quantity	▪ Predicted change in drainage areas and land use ▪ Predicted occurrence and degree of off-site effects
Atmospheric Environment	▪ Effect of air quality on off-site receptors	▪ Predicted off-site point of impingement concentrations (mg/m^3) of indicator compounds ▪ Number of off-site receptors potentially affected (residential properties, public facilities, businesses, and institutions) ▪ Frequency of any exceedance of applicable standards, limits, or guidelines at identified receptors
	▪ Effect of odours on off-site receptors	▪ Predicted off-site odour concentrations (µg/m^3 and odour units) ▪ Number of off-site receptors potentially affected (residential properties, public facilities, businesses and institutions) ▪ Frequency of any exceedance of applicable standards, limits, or guidelines at identified receptors
	▪ Effect of noise on off-site receptors	▪ Predicted off-site noise level ▪ Number of off-site receptors potentially affected (residential properties, public facilities, businesses, and institutions) ▪ Predicted sound from traffic
Terrestrial & Aquatic Environment	▪ Effect on terrestrial ecosystems	▪ Predicted impact on vegetation communities ▪ Predicted impact on wildlife habitat ▪ Predicted impact on vegetation and wildlife including rare, threatened or endangered species
	▪ Effect on aquatic ecosystems	▪ Predicted impact on aquatic habitat ▪ Predicted impact on aquatic biota
	▪ Effect on culturally significant species to Indigenous peoples, and rare (vulnerable), threatened or endangered species of flora or fauna or their habitat	▪ Predicted impact on culturally significant, rare, threatened, or endangered flora and fauna species and their habitat
	▪ Effect on wetlands	▪ Predicted impact on wetlands
	▪ Effect on wildlife habitat, populations, corridors or movement	▪ Predicted impact on wildlife habitat, populations, corridors or movement
	▪ Effect on fish or their habitat, spawning, movement or environmental conditions (e.g., water temperature, turbidity, etc.)	▪ Predicted impact on fish, fish habitat, spawning behaviour, movement or environmental conditions
	▪ Effect on locally important or valued ecosystems or vegetation	▪ Predicted impact on locally important or valued ecosystems or vegetation
Land Use	▪ Effect on existing and proposed planned future land uses and associated infrastructure	▪ Current and planned future land use ▪ Proximity to off-site sensitive land uses(e.g., dwellings, churches, parks) and features (e.g., wetlands, woodlots, etc.)
	▪ Effect on views of the facility	▪ Predicted changes in views of the facility from the surrounding area ▪ Visibility of project features from selected receptor locations
Transportation	▪ Effect on traffic	▪ Operational Level of Service at intersections around the Campus
	▪ Road Safety and Geometry	▪ Traffic collision assessment ▪ Vertical and horizontal sightlines

Criteria		Indicators
Social	▪ Displacement of Residents from Houses	▪ The number of households/residents (property owners and tenants) to be displaced (i.e., forced relocation) by the project itself regardless of whether their property has been purchased or not ▪ The potential for or likelihood of voluntary out-migration of residents for consideration of the indirect effects on community character and cohesion
	▪ Disruption to use and enjoyment of residential properties	▪ The number of existing residential households and / or future households that are located at specific receptor locations and potentially affected by noise, dust, odour, traffic, agricultural and visual effects; and the potential for and likelihood of changes in the presence of vermin and gulls ▪ The number of existing residential households fronting/backing onto a haul route and potentially affected by changes in project related traffic and traffic noise ▪ Potential for or likelihood of changes in peoples' use of residential property
	▪ Disruption to use and enjoyment of public facilities and institutions	▪ The number of existing public facilities and institutions that may be affected by nuisance factors such as noise, dust, odour, traffic and visual effects; and the potential for and likelihood of changes in the presence of vermin and gulls ▪ Potential for or likelihood of changes in operations of public facilities and institutions ▪ Potential for or likelihood of changes in use and enjoyment of public facilities and institutions
	▪ Changes to community character	▪ Compatibility of landfill operations with the existing and likely future character of the community ▪ Compatibility of the proposed end use with the existing and likely future character of the community
	▪ Changes to community cohesion	▪ The extent of displacement ▪ The potential for or likelihood of voluntary out-migration ▪ Loss and the extent of disruption of recreational resources, public facilities and institutions, and the use and enjoyment of residential properties
Agriculture	▪ Effects on existing Agricultural Land Base	▪ CLI Soil Capability classification ▪ Soil suitability classification ▪ Climate ▪ Level of Fragmentation ▪ Proximity to non-farm land uses
	▪ Effects on Agri Food Network	▪ Type(s) and proximity of agricultural operations ▪ Type(s) and proximity of agricultural related facilities ▪ Predicted impacts on surrounding agricultural related facilities ▪ Predicted impacts on surrounding agricultural operations & agricultural related facilities
Economic	▪ Effect on local economy	▪ Impact on businesses ▪ Disruption/displacement of businesses (including tourism and farms) ▪ Business opportunities ▪ Labour market impacts ▪ Impact on direct, indirect, and induced employment ▪ GDP Impacts ▪ Impacts on direct, indirect and induced GDP ▪ Retention of economic benefits within local economy
	▪ Effect on Real Estate	▪ Property value impacts
	▪ Effect on public finance	▪ Impact on municipal revenue ▪ Impacts on municipal cost ▪ Impact on assessment base
	▪ Cost of services	▪ Impact on customer cost of waste services
Cultural Heritage Resources	▪ Effect on archaeological resources and areas of archaeological potential	▪ Number and type of archaeological sites affected ▪ Area (ha) of archaeological potential (i.e., areas with the likelihood to contain archaeological resources)
	▪ Effect on known or potential built heritage resources and cultural heritage landscapes	▪ Number of known and potential built heritage resources and cultural heritage landscapes displaced or disrupted

Landfill Configuration

Comparative Analysis

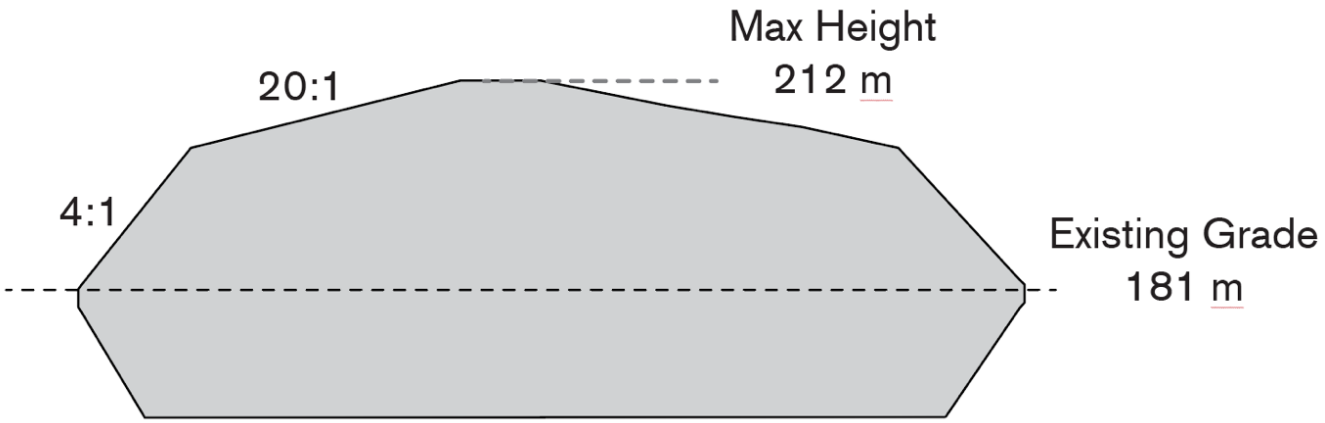
Environmental Component	Option A	Option B	Option C	Rationale
Natural Environment *(Includes Geology & Hydrogeology, Surface Water, Atmospheric, and Terrestrial & Aquatic)*				No material difference between options.
Built Environment * *(Includes Land Use, and Agriculture)*				Options B & C have slightly lesser visual and agricultural net effects
Social Environment *(Includes Transportation, and Social)*				No material difference between options.
Economic Environment *(Includes Economic)*				Option A has slightly greater economic net (positive) effects
Cultural Environment ** *(Includes Cultural Heritage Resources)*				No material difference between options.

* Visual considerations are included in the Land Use component.
** Cultural Heritage Resources considers built heritage resources, cultural heritage landscapes and archaeological resources.

 Most Preferred  Less Preferred  Least Preferred

Preferred Landfill Configuration

Same Height & Slopes as Current South Landfill Phase 1



Landfill Capacity: 20,205,000 m^3

Agricultural End Use Area: 366,719 m^2

Why it was Recommended

- Most substantial long-term benefits
- Moderate visual impact that can be mitigated/managed
- Economic benefits
  - Longer lifespan / greater waste capacity = extended employment & increased municipal revenue
- Offers enhanced regional waste management stability
- Design refinements and mitigation can offset the minor differences between Option A vs Option B & C

Leachate Management

Comparative Analysis

Environmental Component	Option A	Option B	Rationale
Natural Environment *(Includes Geology & Hydrogeology, Surface Water, Atmospheric, and Terrestrial & Aquatic*	🟢	🟡	Option A has lesser net effects due use of existing infrastructure (vs constructing & operating a new facility)
Built Environment * *(Includes Land Use, and Agriculture)*	🟢	🟡	Option A has lesser net effects due use of existing infrastructure (vs constructing and operating a new facility)
Social Environment *(Includes Transportation, and Social)*	🟢	🟢	No material difference between options.
Economic Environment *(Includes Economic)*	🟢	🟢	No material difference between options.
Cultural Environment ** *(Includes Cultural Heritage Resources)*	🟢	🟢	No material difference between options.

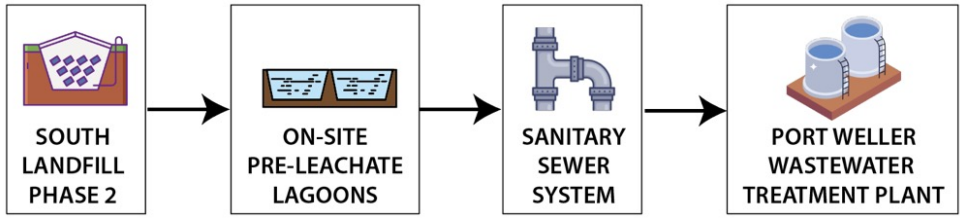
* Visual considerations are included in the Land Use component.
** Cultural Heritage Resources considers built heritage resources, cultural heritage landscapes and archaeological resources.

🟢 Most Preferred 🟡 Less Preferred 🔴 Least Preferred

Preferred Leachate Management Option

Option A

Continued & Expanded Use of the Municipal Wastewater Treatment System



Why it was recommended

- Reduced impacts from construction & operation of new infrastructure
- Capacity exists within existing municipal sewer system
- Most cost-effective option for customers

Next Steps – June to Dec 2025

1. Consultation on the Recommended Method
    - Review and gather feedback from the Public, Government Review Team/Agencies, Indigenous communities
2. Develop a Facilities Characteristics Report
    - Develop additional facility details from a design & operation perspective
3. Commence the Detailed Impact Assessment
    - Will incorporate climate change mitigation & adaptation elements
    - Will include a cumulative effects assessment

Public Information Session – June 18th

Session's purpose:

- Review the comparative evaluation process and confirm the recommended method.
- Confirm the methodology for the upcoming detailed impact assessment of the recommended method.

In Person

June 18, 2025
Drop-in anytime between
5 pm – 8 pm at Club Italia
2525 Montrose Road
Niagara Falls, ON L2H 0T9

Virtual

Available June 18 – July 7, 2025
at www.southlandfillphase2.com

Thank you

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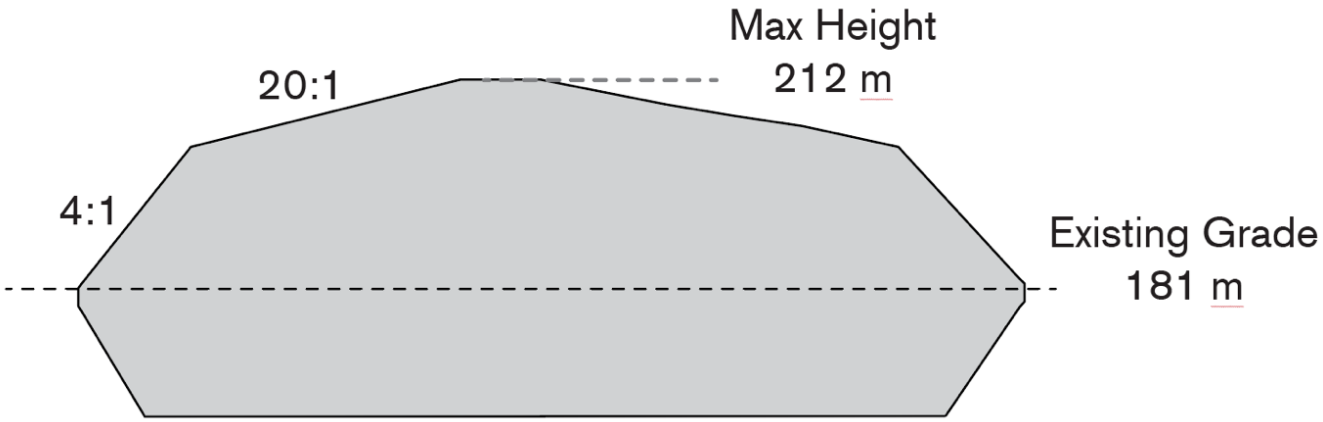
Option A

Same Height & Slopes as Current South Landfill Phase 1

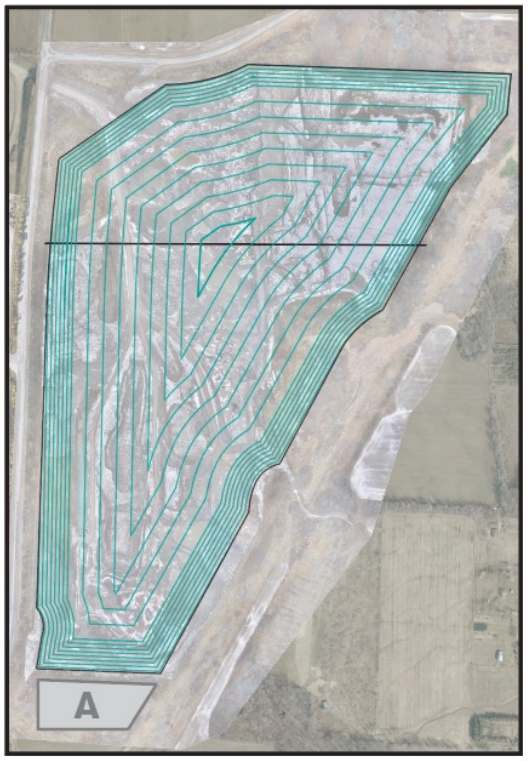


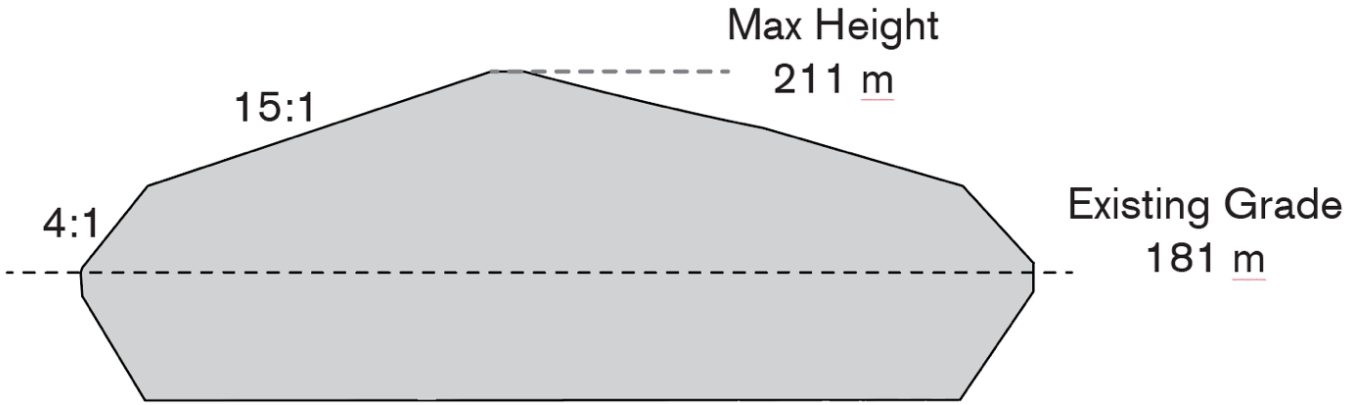
Landfill Capacity: 20,205,000 m^3

Agricultural End Use Area: 366,719 m^2

Option B

Maximized Agricultural End Use Option



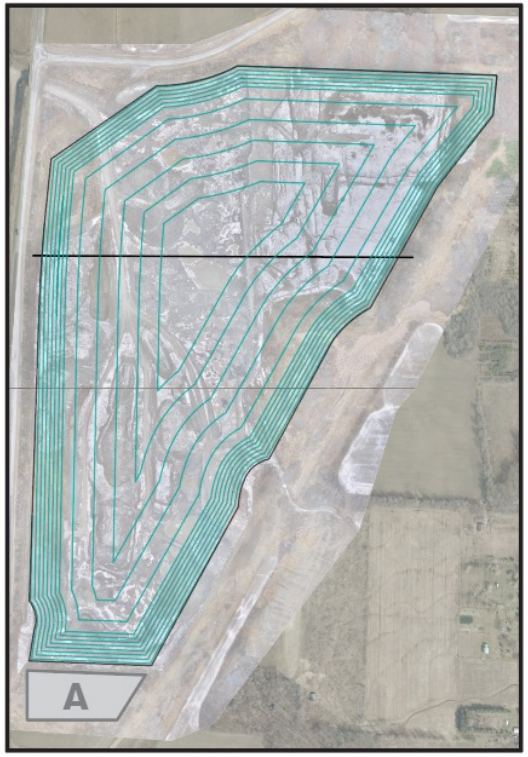


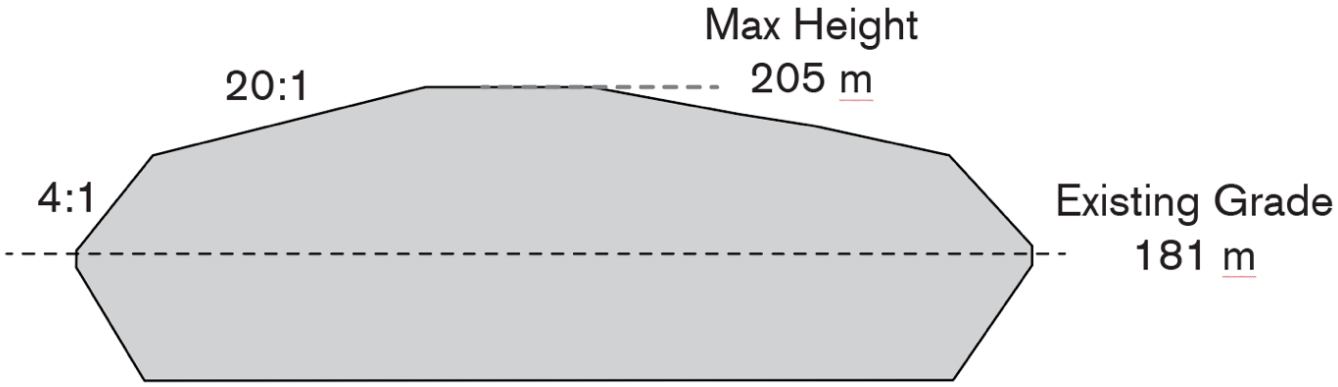
Landfill Capacity: 18,277,400 m^3

Agricultural End Use Area: 513,600 m^2

Option C

Average Agricultural End Use Option





Landfill Capacity: 17,893,000 m^3

Agricultural End Use Area: 450,216 m^2