EA AC Meeting 2

Alternative Methods

March 3, 2025

walker

Presentation Agenda*

1. Existing Conditions
2. Study Area(s)
3. Criteria & Indicators
4. Review of Alternative Methods

** In accordance with Section 9.2.4 – Key Decision-Making Milestones when Consultation will Occur, Alternative Methods.*

1. Existing Conditions

To ensure South Landfill Phase 2 can be developed safely, existing environmental conditions are being studied to understand what changes could be expected.

All **Draft Existing Condition Reports** will be available on our project website from March 6 - 21
https://southlandfillphase2.com/virtual-open-house

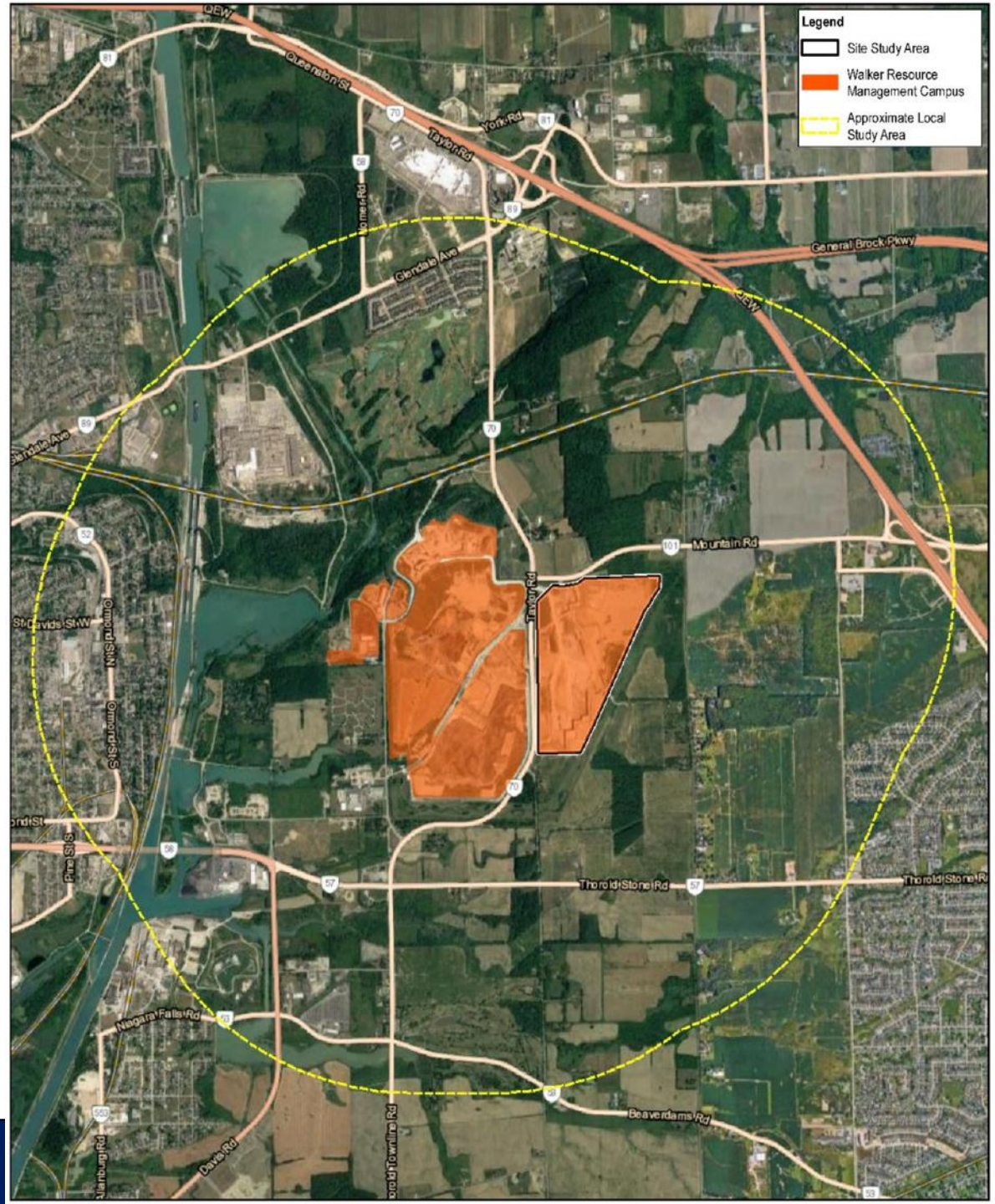
1. Existing Conditions

Range of Technical Studies Underway

- Agriculture
- Air Quality
- Archaeology
- Cultural Heritage
- Land Use
- Ecology
- Economic
- Noise
- Social
- Surface Water & Groundwater
- Traffic
- Visual

2. Study Area

- Adjacent map is a summary of the discipline study areas
  - Discipline specific Study Areas can be found in the Draft Existing Condition Reports
- Study areas may differ by discipline
- Study areas may adjust once impact assessment begins
  - e.g. If noise exceeds a guideline at the study area limit, the area will be expanded until predicted effects are below guidelines



3. Evaluation Criteria & Indicators

Why

- Used by technical experts & scientists to identify potential effects on the environment.
- Help evaluate what and how existing conditions may or may not change.

What are Criteria & Indicators?

Criteria

Identifies areas of interest that will be evaluated.

Indicators

Identifies what will be studied.

Example of Criteria & Indicators

"I'm concerned about water quality."

Criteria	Indicator
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

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

Alternative Methods

Alternative Methods are different ways the project can be build.

- The Approved Terms of Reference identifies Alternative Methods that will be evaluated during the Environmental Assessment
- Several things will not change from the current South Landfill Phase 1 operations, such as the haul route and site entrance.
- There are two (2) Alternative Methods being considered for further evaluation.
    1. Landfill Site Configurations
    2. Leachate Management Options

Alternative Methods for Consideration

1 Landfill Site Configurations

Site Configurations *are different concepts of the design for the landfill.*

Concepts being explored include:

- Peak elevation & height
- Slopes / Contours of the final cover

2 Leachate Management Options

Leachate *is water (typically precipitation) that comes into contact with waste.*

Options being explored include:

- Continued use of existing municipal wastewater treatment infrastructure
- Development of a wastewater treatment plant on Walker's campus

Site Configuration - Reference

Site Configurations are different concepts of the design for the landfill. The configurations being explored include elements such as **height, slope** and **capacity.**

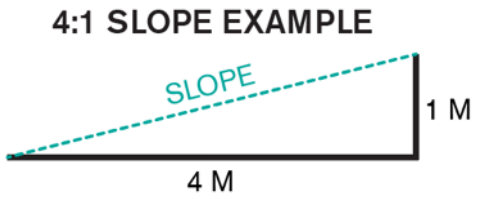
Site Configuration Considerations

Maximum Height

The maximum height identifies the highest point of the landfill.

Slope Steepness

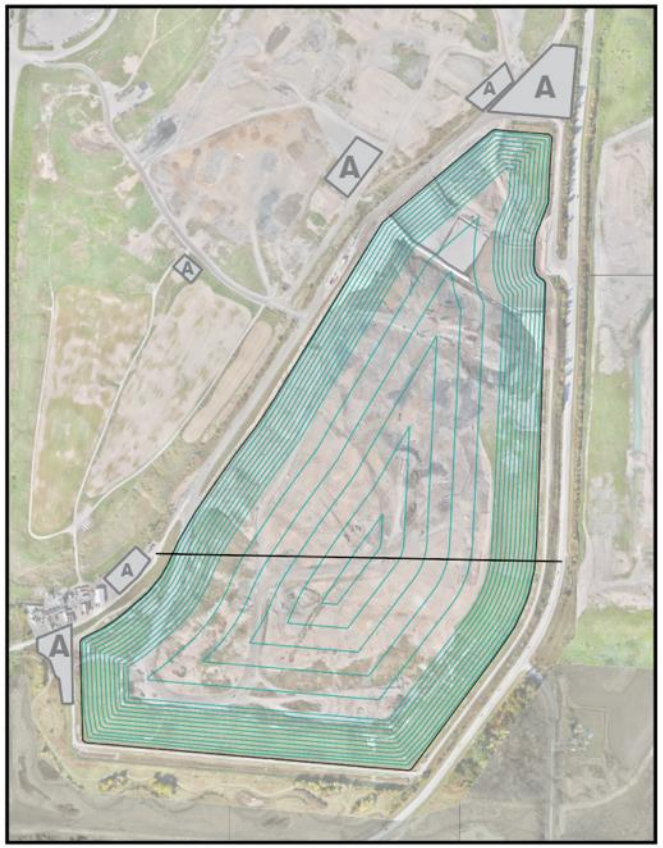
The slop identifies how steep or flat the sides & top of the landfill will be.



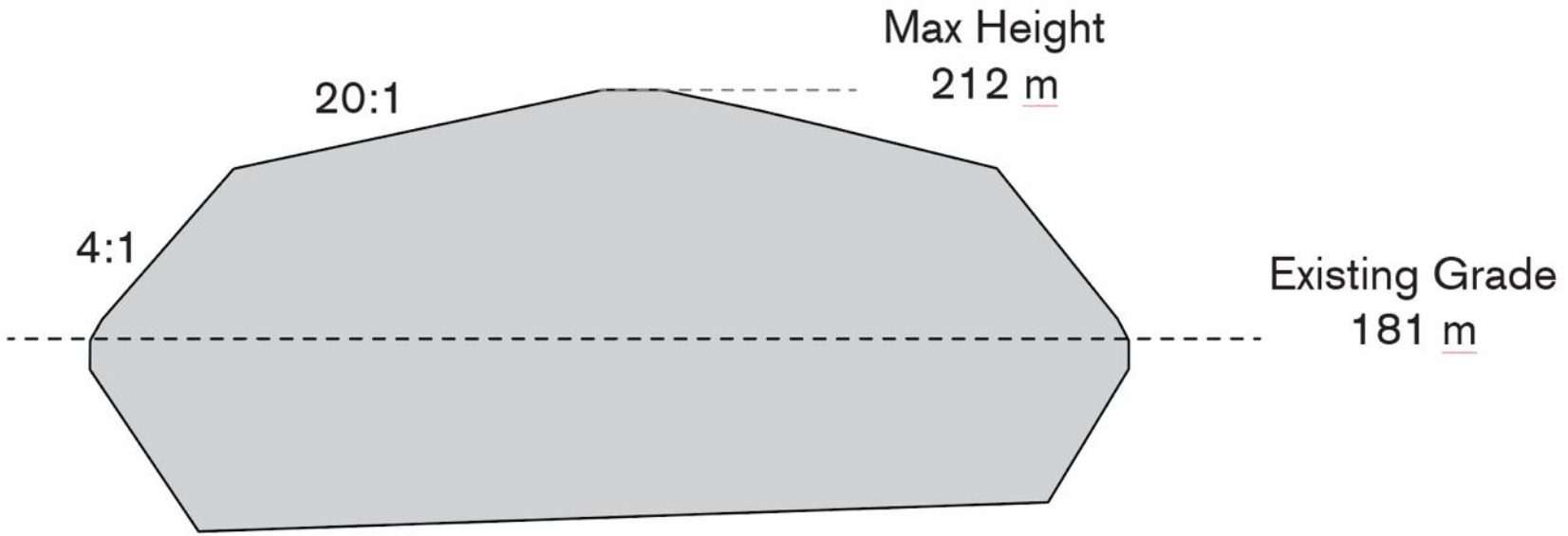
Landfill Capacity

The landfill capacity is the total amount of waste the landfill can accept before it is closed.

Example - Current South Landfill Phase 1



TEAL LINES REPRESENT A BIRDSEYE VIEW OF THE LANDFILL CONTOUR LINES



Landfill Capacity: 17,700,000 m^3 **Agricultural End Use Area:** 307,695 m^2

1

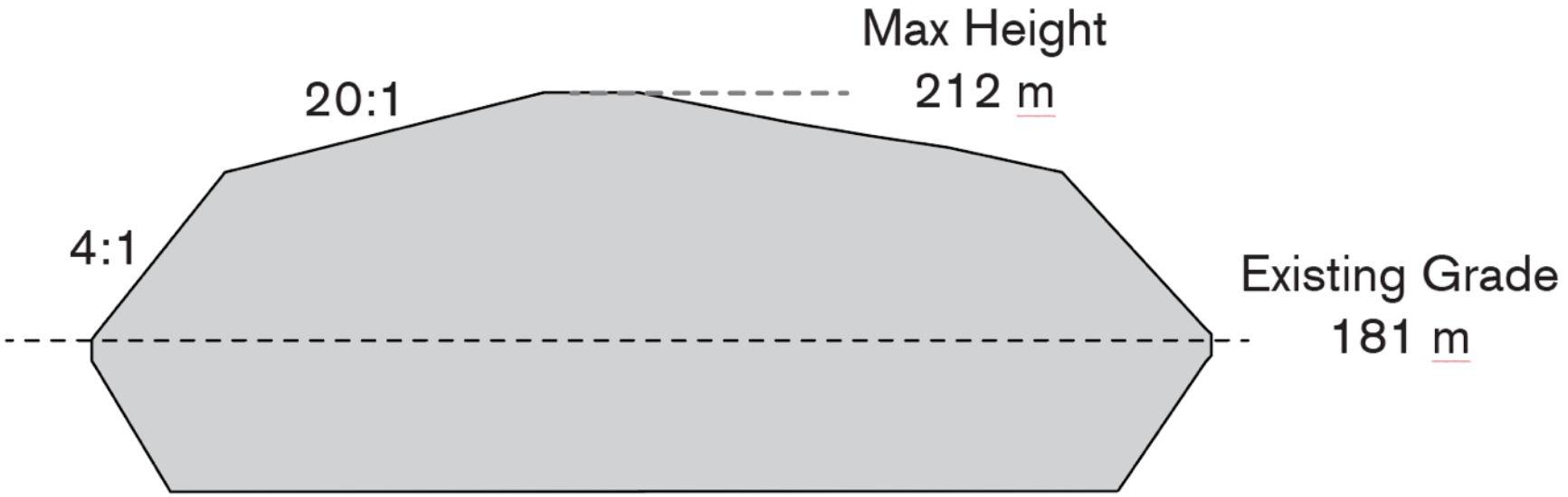
Landfill Site Configurations

South Landfill Phase 2
Options

Three Landfill Site Configuration options are presented on the next few slides showing different concepts for **heigh, slope, waste capacity,** and **area available for agricultural end use.**

Option A

Same Height & Slopes as Current South Landfill Phase 1

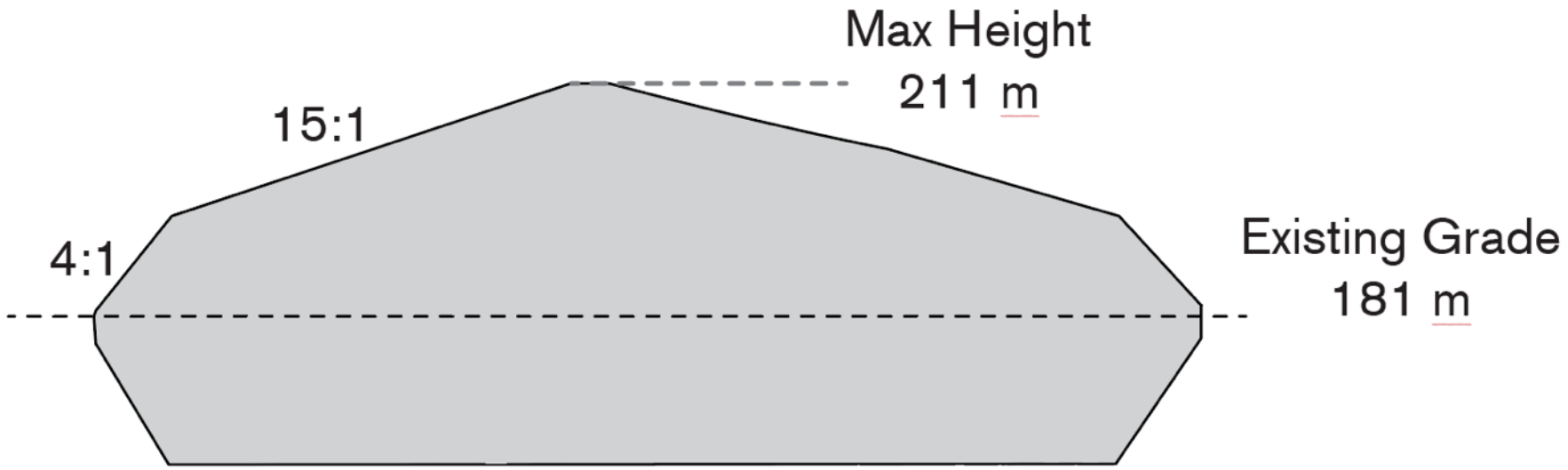


Landfill Capacity: 20,205,000 m^3

Agricultural End Use Area: 366,719 m^2

Option B

Maximized Agricultural End Use Option

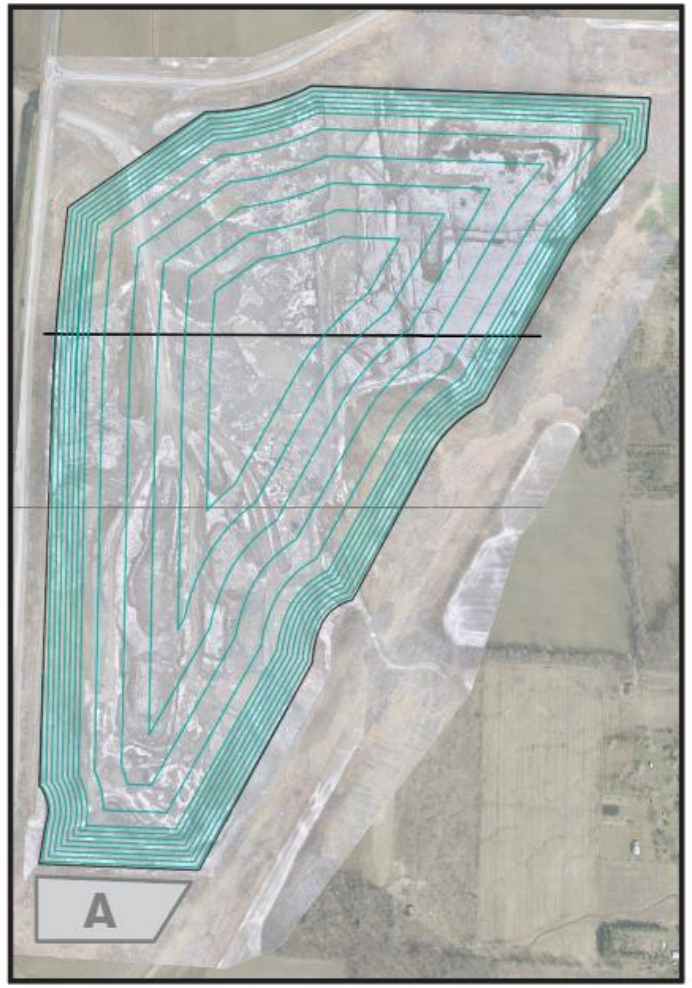


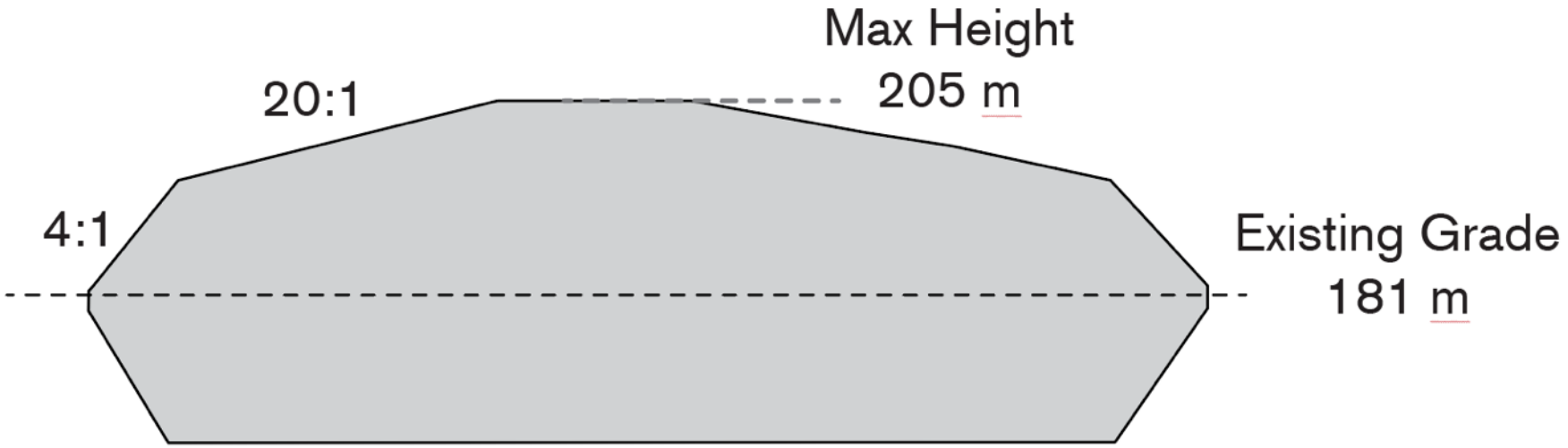
Landfill Capacity: 18,277,400 m^3

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

Landfill Site Configuration Summary

	Option A	Option B	Option C
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

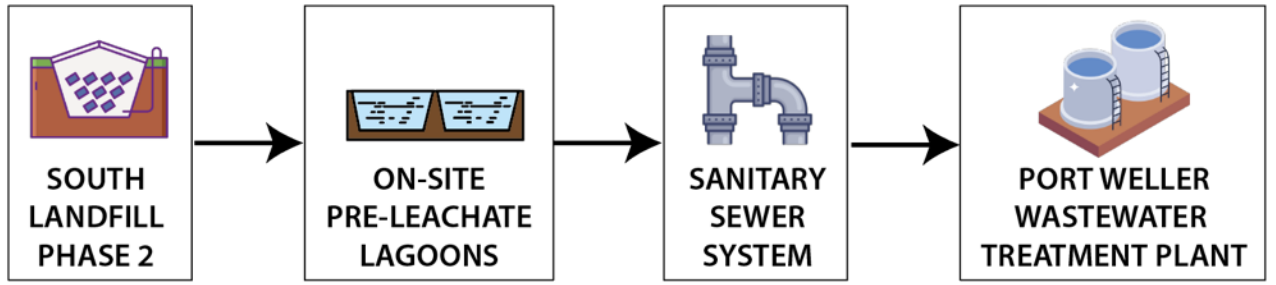
2 Leachate Management

There are two leachate treatment options being explored.

Option A

Continued Use of the Municipal Wastewater Treatment System

- Current form of treatment for the South Landfill Phase 1.
- Utilizes unused capacity in the municipal system.
- Sewer use fees will be a revenue source for municipalities.
- May include upgrading existing infrastructure.

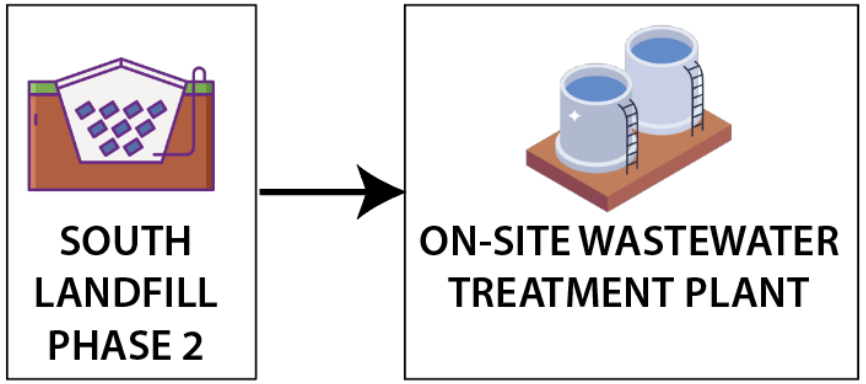


2 Leachate Management

Option B

Development of an On-Site Wastewater Treatment Plant

- Development of a treatment plant at the Walker Resource Management Campus.
- Feasibility of this option requires further analysis.



Thank you

walker

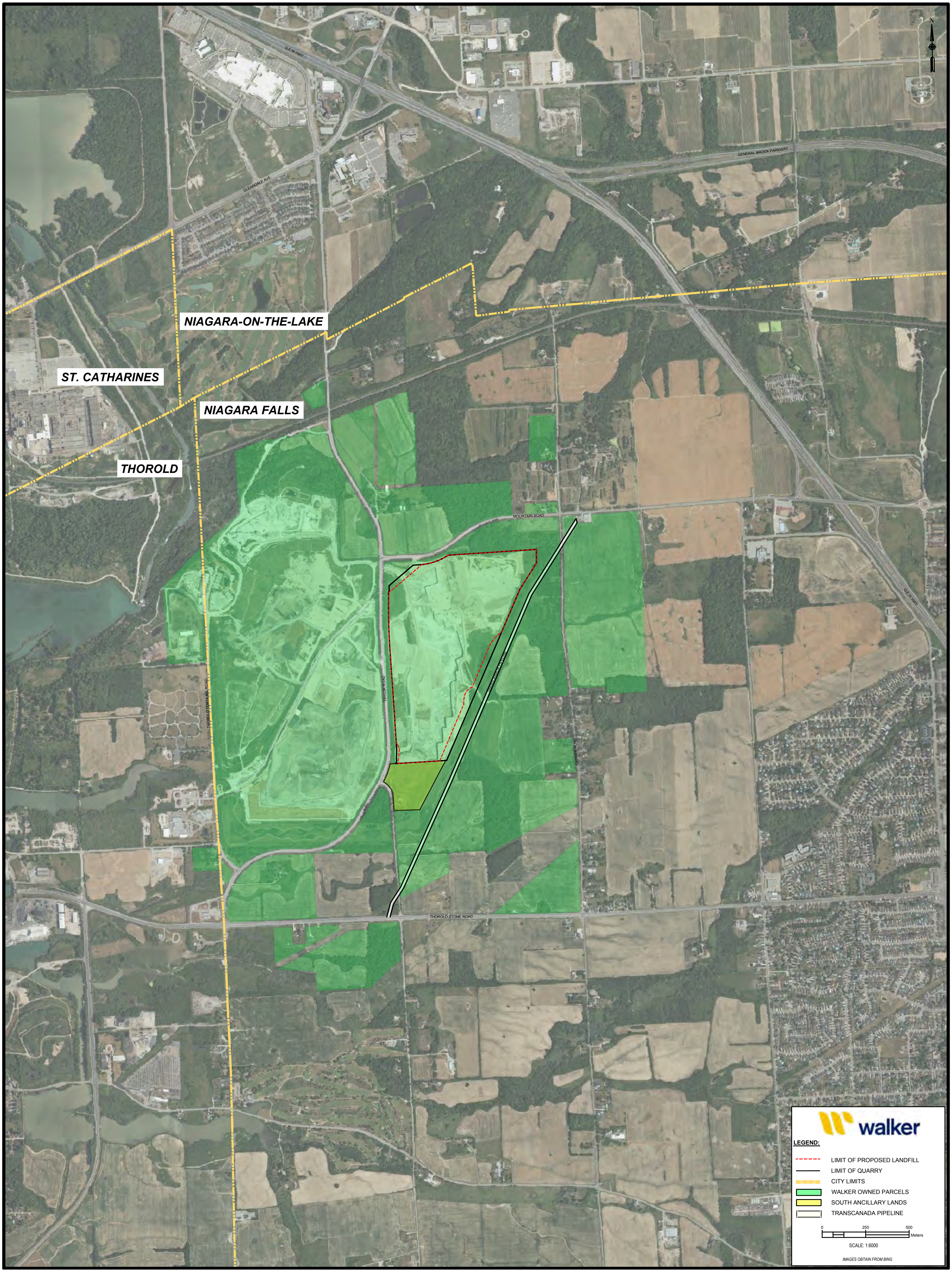

NIAGARA-ON-THE-LAKE
ST. CATHARINES
NIAGARA FALLS
THOROLD
Q.E.W HWY
GENERAL BROCK PARKWAY
GLENDALE AVE
MOUNTAIN ROAD
THOROLD STONE ROAD
LEGEND:
LIMIT OF PROPOSED LANDFILL
LIMIT OF QUARRY
CITY LIMITS
WALKER OWNED PARCELS
SOUTH ANCILLARY LANDS
TRANSCANADA PIPELINE
0
250
500
Meters
SCALE: 1:6000
IMAGES OBTAIN FROM BING

Table 1 Preliminary Criteria, Indicators, and Data Sources for each Environmental Component

Environmental Component	Evaluation Criteria	Indicators	Data Sources
Geology & Hydrogeology	Effect on groundwater quality	– Predicted effects to groundwater quality at property boundaries and off-site	– Hydrogeological and geotechnical studies – Water well records – Determination of water well users in the area – Annual Monitoring Reports – Proposed leachate control concept designs – Environment Canada Canadian Climate Normals – Leachate generation assessment – Provincial Water Quality Monitoring Network (PWQMN) – Niagara Watershed Plan – Geology and Hydrogeology Existing Conditions Report
	Effect on groundwater flow	– Predicted effects to groundwater flow at property boundaries and off-site	– Hydrogeological and geotechnical studies – Water well records – Determination of water well users in the area and water use survey – Annual Monitoring Reports – Niagara Watershed Plan – Geology and Hydrogeology Existing Conditions Report
Surface Water Resources	Effect on surface water quality	– Predicted effects on surface water quality on-site and off-site	– Topographic maps – Contemporary Mapping of Watercourses Dataset, Niagara Open Data – Permanent or Intermittent Watercourses (NES Perm Int Watercourses – Dataset Niagara Open Data) – Waterbodies – Dataset – Niagara Open Data – Quaternary Watersheds – Dataset – Niagara Open Data – Shoreline Areas (NES Shoreline Areas – Dataset – Niagara Open Data) – 1 m contour layer for the Niagara Region (2018) – Air photos – Facility layout, drainage maps and figures – Proposed on site stormwater management concept designs for vertical expansion alternatives – Existing leachate management system
	Effect on surface water quantity	– Predicted change in drainage areas and land use – Predicted occurrence and degree of off-site effects	

			– Annual Monitoring Report – Interviews and discussions with Ministry of Environment, Conservation and Parks (MECP) staff, Conservation Authorities, and Environment Canada – Published water quality and flow information from MECP, Environment Canada and conservation authorities – Niagara Watershed Plan – Site reconnaissance – PWQMN – Surface Water Existing Conditions Report – Terrestrial and Aquatic Environment Existing Conditions Report
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.	– Environment Canada or MECP hourly meteorological data and climate normals – Applicable MECP guidelines and technical standards (i.e., O. Reg. 419/05, Standard, guidelines, and screening levels, MECP Ambient Air Quality Criteria, and Canadian Ambient Air Quality Standards) – Aerial photographic mapping and field reconnaissance – Off-Site receptors confirmed on recent mapping, with consideration of future land uses (e.g., Glendale Secondary Plan and Northwest Secondary Plan). – Emissions Summary and Dispersion Modelling (ESDM) reports – Annual Monitoring Reports – Available background ambient air data, obtained from sources such as: • Site ambient air monitoring • Local Air Monitoring Network data • National Air Pollution Surveillance (NAPS) and/or MECP Ambient Air Monitoring Stations – Waste materials, landfill gas, and leachate characterization and sampling data – Proposed facility characteristics – Landfill design and operation data and associated topography – Site dust / air quality complaint history – Atmospheric Existing Conditions Report

	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	– Published odour studies for similar source types – Site specific odour source data – Environment Canada or MECP hourly meteorological data and climate normals – Applicable MECP guidelines and technical standards – Site odour complaint history – Annual Monitoring Reports – Aerial photographic mapping and field reconnaissance – Off-Site receptors confirmed on recent mapping, with consideration of future land uses (e.g., Glendale Secondary Plan and Northwest Secondary Plan). – Odour assessment reports – Waste materials, landfill gas, and leachate characterization and sampling data – Proposed facility characteristics – Landfill design and operation data and associated topography – Atmospheric Existing Conditions Report
	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	– Site-specific equipment noise measurements – Manufacturer-provided noise specifications – Traffic reports for existing and future conditions – Applicable MECP guidelines and technical standards • Noise Guidelines for Landfill Sites, October 1998 • Publication NPC-115, “Construction Equipment” • Publication NPC-118, “Motorized Conveyances” • Publication NPC-300, “Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300", August, 2013 • Publication NPC-233, "Information to be Submitted for Approval of Stationary Sources of Sound", October, 1995 • Draft technical publication NPC-207, “Impulse Vibration in Residential Buildings”, November, 1983, supplementing the Model Municipal Noise Control By-Law, Final Report, August 1978, as amended • Publication NPC-119, “Blasting”, Model Municipal Noise Control By-Law, Final Report, August 1978 • Publication NPC-233, "Information to be Submitted for Approval of Stationary Sources of Sound", October, 1995

			• Basic Comprehensive Certificates of Approval (Air), User Guide, Appendix A - Supporting Information for an Acoustic Assessment Report or Vibration Assessment Report Required by a Basic Comprehensive CofA" prepared by the Environmental Assessment and Approvals Branch, Version 2.1, April 2011 – Aerial photographic mapping and field reconnaissance to confirm off-Site receptors – Land Use Plans, and Zoning By-laws – Off-site receptors confirmed on recent mapping, with consideration of future land uses (e.g., Glendale Secondary Plan and Northwest Secondary Plan). – Acoustic Assessment Reports – Annual Monitoring Reports – Proposed facility operational characteristics and scenarios – Landfill design and operation data and associated topography – Off-site topography – Atmospheric Existing Conditions Report
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	– Previous site surveys – Site investigations – Ministry of Natural Resources and Forestry (MNRF) databases – MECP databases – Fisheries and Oceans Canada (DFO) mapping – Niagara Peninsula Conservation Authority (NPCA) databases and mapping – Contemporary Mapping of Watercourses Dataset, Niagara Open Data – Permanent or Intermittent Watercourses (NES Perm Int Watercourses – Dataset – Niagara Open Data) – Waterbodies – Dataset – Niagara Open Data – Shoreline Areas (NES Shoreline Areas – Dataset – Niagara Open Data) – Quaternary Watersheds – Dataset – Niagara Open Data – Ecological Land Classification (2020), Niagara Region – Other Wetlands Non PSW (NES Other Wetlands Non PSW – Dataset – Niagara Open Data) – Other Woodlands (NES Other Woodlands – Dataset – Niagara Open Data) – Linkages (Linkages – Dataset – Niagara Open Data)
	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	– Significant Woodlands – Dataset – Niagara Open Data – Beaverdams and Shriners Creek Watershed Plan – eBird – iNaturalist – Land Information Ontario (L.I.O) – Ontario Breeding Bird Atlas (OBBA) – Ontario Butterfly Atlas (OBA) – Ontario Reptile and Amphibian Atlas (ORAA) – Rare Vascular Plants of Ontario – Species at Risk of Ontario List (SARO) – Natural Environment Existing Conditions – Atlas of Canada (Toporama) – Niagara Official Plan, its schedules and associated mapping – City of Niagara Falls Official Plan – Niagara Escarpment Plan – Facility layout and figures – Natural Heritage Information Centre (N.H.I.C) – Draft list of plant species of importance to the community of Six Nations
	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.)	– Aerial photographic mapping and field investigations – Land Use Existing Conditions Report – Site surveys and assessments – Published data sources (i.e., Official Plans, Secondary Plans, Zoning By-laws) – Provincial Policy Statement – Growth Plan – Discussions with municipalities and, if required, property owners local to the Site – Review of findings of all the supporting studies (in relation to relevant policies and provincial guidelines) – Agricultural Land Base – Dataset – Niagara Open Data – Ortho Imagery (2020), Niagara Region
	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	– Alternative methods – Site grading plans – Aerial mapping and field investigation – Land Use Existing Conditions Report – Satellite imagery

		– Level of visual contrast of project features from selected receptor locations	– Google Earth – Web mapping sites – Existing Site-specific studies and reports – Visualization software and simulations – Ortho Imagery (2020), Niagara Region
Agriculture	Effects on existing Agricultural Land Base	– CLI Soil Capability classification – Soil Suitability classification – Climate – Level of Fragmentation – Proximity to Non-farm Land Uses	– Provincial Policy Statement, 2020 – Niagara Escarpment Plan – Greenbelt Plan – Niagara Falls Official Plan – Niagara Falls Zoning – Niagara Official Plan (2022) – Agricultural Systems Portal – AgMaps Portal – Aerial photographic mapping and field reconnaissance – Canadian Lands Inventory (CLI) mapping – Agricultural Existing Conditions Report – Terrestrial and Aquatic Environment Existing Conditions Report – Historic reports associated with the Campus (e.g., Agricultural Impact Assessment for the quarry expansion, and Vegetation Screening and Naturalization Reports) – Agricultural Land Base – Dataset – Niagara Open Data
	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 operations & agricultural related facilities	– Agricultural Systems Portal – Field inventories

Transportation	Effect on traffic	– Operational Level of Service at intersections around the Campus	– Previous transportation studies – Local data (e.g., turning movement counts, signal timing plans, AADT, etc.) from Niagara Region, City of Niagara Falls, City of Thorold, field observations, etc. – Site-specific operations data and observations – Transportation Existing Conditions Report – Roads – Dataset – Niagara Open Data – Strategic Cycling Network (Bicycle Routes), Niagara Region Bike Routes – Dataset – Niagara Open Data
	Road Safety and Geometry	– Traffic collision assessment – Vertical and Horizontal Sightlines	– Five-year collision history – Site-specific observations In-field sightline review
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	– South Landfill Phase 2 project description – Field mapping of residences Household/property owner questionnaire
	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	– South Landfill Phase 2 project description – Field mapping of residences – Household/property owner questionnaire Results from other discipline analyses

		– 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	– South Landfill Phase 2 project description – Secondary source data – Field mapping of public facilities and institutions – Interviews with facility operators – Results from other discipline analyses – Strategic Cycling Network (Bicycle Routes), Niagara Region Bike Routes – Dataset – Niagara Open Data
	Loss/Disruption of Recreational Resources	– The number/nature of existing recreational resources and/or future features potentially affected by noise, dust, odour, visual effects and changes in project-related traffic; and the potential for and likelihood of changes in the presence of vermin and gulls – Potential for or likelihood of changes in operations of recreational features – Potential for or likelihood of changes in use and enjoyment of recreational resources	– South Landfill Phase 2 project description – Secondary source data – Field mapping of public facilities and institutions – Interviews with recreational facility operators / recreational resource users – Interviews with key local and regional governmental agency representatives – Interviews with key stakeholders – Results from other discipline analyses – Strategic Cycling Network (Bicycle Routes), Niagara Region Bike Routes – Dataset – Niagara Open Data
	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	– South Landfill Phase 2 project description – Secondary source data – Public attitude research – Interviews with key local and regional governmental agency representatives – Interviews with key stakeholders Results from social assessment and other discipline analyses

	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	– South Landfill Phase 2 project description – Secondary source data – Public attitude research – Household/property owner questionnaire – Interviews with key local and regional governmental agency representatives – Interviews with key stakeholders Results from other social assessment and other discipline analyses
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 • Impact on direct, indirect, and induced GDP – Retention of economic benefits within local economy	– Interviews & surveys (businesses, associations, economic development organizations, labour organizations, etc.) – Economic development plans and reports – Niagara Economic Development – Niagara Employment Inventory – Walker • Employees • Employees place of residence • Geographical distribution of expenditures • Vendors/suppliers – Statistics Canada • Interprovincial input output model • Census profiles – Lightcast – Labor Market Analytics • Occupation reports • Industry reports Input-output reports
	Effect on Real Estate	– Property value impacts	– Interviews (real estate association and realtors) – Teranet Geowarehouse • Property reports – Canadian Real Estate Association Area real estate reports
	Effect on Public Finance	– Impact on municipal revenue – Impacts on municipal cost – Impact on assessment base	– Interviews (municipal finance and other municipal departments) – Municipal financial documents – Ontario Ministry of Municipal Affairs and Housing Financial information return reports

	Cost of Services	– Impact on customer cost of waste services	– Waste management industry scan Waste management industry reports
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)	– Published data sources (e.g., City of Niagara Falls, Niagara Region, past archaeological assessments) – Ministry of Citizenship and Multiculturalism screening checklist Criteria for Evaluating Archaeological Potential – Ontario Archaeological Sites Database records – Ontario Public Register of Archaeological Reports – Area of Archaeological Potential (NOP Area of Archeological Potential – Dataset – Niagara Open Data Niagara Region Archaeological Management Plan, December 2023 (Noting this modelling was not the result of a property-specific assessment and, therefore, does not fully account for land-use history and current conditions)
	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	– Published data sources (e.g., City of Niagara Falls, City of Thorold, Niagara Region) – Ministry of Citizenship and Multiculturalism Screening checklist Criteria for Evaluating Potential Built Heritage Resources and Cultural Heritage Landscapes – Ontario Heritage Trust – Museums, archives, other historical sources (as applicable) Municipal registers of heritage properties (for designated and non-designated resources)