



Supporting Document 3-11

Land Use Effects Assessment Report

Eastern Ontario Waste Handling Facility Future
Development Environmental Assessment

GFL Environmental Inc.

Moose Creek, Ontario

September 7, 2022

Prepared by:

Northern Futures Inc.
6 Harvard Ave
Ottawa, ON K1S 4Z1



Acknowledgements

Prepared by:

Northern Futures Inc.
6 Harvard Ave
Ottawa, ON K1S 4Z1



This Report has been prepared on behalf of GFL Environmental Inc. (GFL). This Report may not be used by any other person or entity without the express written permission of GFL and Northern Futures Inc. (Northern Futures). Any use of this Report by a third party, or any reliance on decisions made based on it, are the responsibility of such third parties. GFL and Northern Futures accept no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this Report.

This page is intentionally left blank.

Executive Summary

Northern Futures Inc. (Northern Futures) was contracted by GFL Environmental Inc. (GFL) to conduct an assessment of the effects of the Eastern Ontario Waste Handling Facility (EOWHF) future development on land use as part of the EOWHF Future Development Environmental Assessment (EA). Land use is a component of the Built Environment, and is assessed using the current and planned future land use evaluation criteria. The EA is being undertaken in compliance with the requirements of the *Environmental Assessment Act* (EAA) and the Terms of Reference (ToR) that was approved by the Ministry of Environment, Conservation and Parks (MECP) on January 14, 2021.

The EOWHF future development provides approximately 15.1 million cubic metres (m³) of additional landfill capacity at the existing EOWHF over a 20-year period. Two alternative methods to undertake the EOWHF future development were identified in the approved ToR and are presented at a conceptual design level in the Conceptual Design Report (CDR). Both alternative methods were developed according to Ontario Regulation 232/98 (O. Reg. 232/98) and are consistent with the Ministry of Environment, Conservation and Parks (MECP) landfill standards. Each alternative method includes the same leachate and landfill gas collection systems, stormwater management system, and final cover, as discussed in the CDR.

Alternative Method 1 consists of implementing the future development in five stages: one stage adjacent to and north of the existing landfill; and four stages oriented east-west within the future development lands that will be constructed in phases from south to north. Alternative Method 2 consists of implementing the future development in four stages: one stage adjacent to and north of the existing landfill; and three stages oriented north-south that will be constructed in phases from west to east.

This Land Use Effects Assessment Report determines the net effects of each alternative method on land use using the information provided in the CDR and the Land Use Existing Conditions Report. The net effects of each alternative method are compared to identify the preferred alternative that best mitigates the potential environmental effects on land use.

The comparative evaluation of net effects demonstrates that both alternative methods meet the relevant provincial and municipal land use policies. Alternative Method 2 would allow existing sensitive land uses in the Off-site Study Area continue to comply with the North Stormont Zoning Bylaw, whereas Alternative Method 1 results in one existing sensitive land use becoming a legal non-conforming land use under the North Stormont Zoning Bylaw as it would be located within the required setback. The net effects are minimized in Alternative Method 2 due to greater distances to sensitive land uses. For this reason, the comparative evaluation identifies Alternative Method 2 as the preferred alternative.

The commitments to mitigate and monitor the net effects of Alternative Method 2 associated with Land Use are as follows:

- Designing and constructing the EOWHF expanded landfill to include on-site setbacks and visual screening which will allow existing off-site land uses to remain in compliance with the applicable zoning bylaws and official plans.

Acronyms, Units and Glossary

Acronyms

Acronym	Definition
CDR	Conceptual Design Report
EAA	Environmental Assessment Act
EOWHF	Eastern Ontario Waste Handling Facility
GFL	GFL Environmental Inc.
GHG	Greenhouse Gas
HDR	HDR Corporation
MECP	Ministry of Environment, Conservation and Parks
OES	Ontario Electronic Stewardship
ToR	Terms of Reference

Units

Unit	Definition
km	kilometre
m	metre

Glossary

Term	Definition
Approval	Permission granted by an authorized individual or organization for an undertaking to proceed. This may be in the form of program approval, certificate of approval or provisional certificate of approval.
Bulking Material	Material such as woodchips added to high nitrogen materials like food scraps to provide a carbon source and increase the porosity of the compost.
Capacity (Disposal Volume)	The total volume of air space available for disposal of waste at a landfill site for a particular design (typically in m ³); includes both waste and daily cover materials, but excludes the final cover.
Composting	The controlled microbial decomposition of organic matter, such as food and yard wastes, in the presence of oxygen, into finished compost (humus), a soil-like material. Humus can be used in vegetable and flower gardens, hedges, etc.
Composting Facility	A facility designed to compost organic matter either in the presence of oxygen (aerobic) or absence of oxygen (anaerobic).

Glossary

Term	Definition
Environment	As defined by the Environmental Assessment Act, environment means: <ul style="list-style-type: none"> • air, land or water; • plant and animal life, including human life; • the social, economic and cultural conditions that influence the life of humans or a community; • any building, structure, machine or other device or thing made by humans; • any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities; or • any part or combination of the foregoing and the interrelationships between any two or more of them (ecosystem approach).
Environmental Assessment (EA)	A systematic planning process that is conducted in accordance with applicable laws or regulations aimed at assessing the effects of a proposed undertaking on the environment
Evaluation Criteria	Evaluation criteria are considerations or factors taken into account in assessing the advantages and disadvantages of various alternatives being considered
Greenhouse Gas	Any of the gases whose absorption of solar radiation is responsible for the greenhouse effect, including carbon dioxide, methane, ozone, and the fluorocarbons.
Indicators	Indicators are specific characteristics of the evaluation criteria that can be measured or determined in some way, as opposed to the actual criteria, which are fairly general
Landfill Gas	The gases produced from the wastes disposed in a landfill; the main constituents are typically carbon dioxide and methane, with small amounts of other organic and odour-causing compounds
Landfill Site	An approved engineered site/facility used for the final disposal of waste. Landfills are waste disposal sites where waste is spread in layers, compacted to the smallest practical volume, and typically covered by soil.
Leachate	Liquid that drains from solid waste in a landfill and which contains dissolved, suspended and/or microbial contaminants from the breakdown of this waste.
Methane Gas	A colourless, odourless highly combustible gas often produced by the decomposition of decomposable waste at a landfill site. Methane is explosive in concentrations between 5% and 15% volume in air.
Mitigation	Measures taken to reduce adverse impacts on the environment.
Proponent	A person who: <ul style="list-style-type: none"> • carries out or proposes to carry out an undertaking; or • is the owner or person having charge, management or control of an undertaking.
Receptor	The person, plant or wildlife species that may be affected due to exposure to a contaminant.
Terms of Reference (ToR)	A terms of reference is a document that sets out detailed requirements for the preparation of an Environmental Assessment.
Undertaking	Is defined in the Environmental Assessment Act as follows: <ul style="list-style-type: none"> • An enterprise or activity or a proposal, plan or program in respect of an enterprise or activity by or on behalf of Her Majesty in right of Ontario, by a public body or public bodies or by a municipality or municipalities; • A major commercial or business enterprise or activity or a proposal, plan or program in respect of a major commercial or business enterprise or activity of a person or persons other than a person or persons referred to in clause (1) that is designated by the regulations; or • An enterprise or activity or a proposal, plan or program in respect of an enterprise or activity of a person or persons, other than a person or persons referred to in clause (a), if an agreement is entered into under section 3.0.1 in respect of the enterprise, activity, proposal, plan or program ("enterprise").

Glossary

Term	Definition
Waste	Refuse from places of human or animal habitation; unwanted materials left over from a manufacturing process.

This page is intentionally left blank.

Contents

Executive Summary	i
Acronyms, Units and Glossary	iii
1 Introduction	1
2 Effects Assessment Methods	6
2.1 Predict Potential Environmental Effects for Alternative Methods	6
2.1.1 Study Areas	6
2.1.2 Evaluation Criteria, Indicators and Data Sources	7
2.1.3 Key Design Considerations and Assumptions	8
2.2 Comparative Evaluation and Identification of the Preferred Alternative	12
2.3 Effects Assessment of the Preferred Alternative	12
3 Net Effects Assessment	12
3.1 Alternative Method 1	13
3.2 Alternative Method 2	16
4 Comparative Evaluation of Net Effects and Identification of the Preferred Alternative	19
4.1 Comparative Evaluation Results	19
4.2 Advantages and Disadvantages of the Preferred Alternative	23
5 Commitments to Mitigation and Monitoring	23
5.1 Land Use Commitments	23
6 Land Use Approvals	24
7 References	24

Tables

Table 1-1. Environmental Aspects, Components and Evaluation Criteria	1
Table 2-1. Evaluation Criteria, Indicators and Data Sources for Land Use	8
Table 3-1. Net Effects Assessment – Alternative Method 1	14
Table 3-2. Net Effects Assessment – Alternative Method 2	17
Table 4-1. Comparison of Alternative Methods	19
Table 4-2. Comparative Evaluation of Net Effects for Land Use	21
Table 4-3. Advantages and Disadvantages of Alternative Method 2	23

Figures

Figure 1-1. Alternative Method 1	4
Figure 1-2. Alternative Method 2	5
Figure 2-1. Study Areas for Land Use	7

1 Introduction

Northern Futures Inc. (Northern Futures) was contracted by GFL Environmental Inc. (GFL) to assess the effects of the Eastern Ontario Waste Handling Facility (EOWHF) future development on land use as part of the EOWHF Future Development Environmental Assessment (EA). The EA is being carried out in accordance with the requirements of the *Environmental Assessment Act* (EAA) and Terms of Reference (ToR), which was approved by the Ministry of Environment, Conservation and Parks (MECP) on January 14, 2021.

As part of the EA process, existing conditions reports and effects assessment reports have been prepared to assess the environmental aspects, components and evaluation criteria, as listed in **Table 1-1**. This Land Use Effects Assessment Report assesses the effects of the EOWHF future development on the Current and Planned Future Land Uses using the evaluation criteria of the Built Environment aspect.

Table 1-1. Environmental Aspects, Components and Evaluation Criteria

Environmental Aspect	Environmental Component	Evaluation Criteria
Natural Environment	Atmospheric Environment	<ul style="list-style-type: none"> • Air Quality • Noise • Odour
	Geology and Hydrogeology	<ul style="list-style-type: none"> • Groundwater Quality • Groundwater Quantity
	Surface Water Environment	<ul style="list-style-type: none"> • Surface Water Quality • Surface Water Quantity
	Ecological Environment	<ul style="list-style-type: none"> • Terrestrial Ecosystems • Aquatic Ecosystems
Socio-Economic Environment	Economic	<ul style="list-style-type: none"> • Economic Effects on / Benefits to Local Community
	Social	<ul style="list-style-type: none"> • Effects on Local Community • Visual Impact of Facility
Cultural Environment	Cultural Environment	<ul style="list-style-type: none"> • Cultural Heritage Resources • Archaeological Resources
Built Environment	Transportation	<ul style="list-style-type: none"> • Effects from Truck Transportation along Access Roads
	Land Use	<ul style="list-style-type: none"> • Effects on Current and Planned Future Land Uses
	Aggregate Extraction and Agricultural	<ul style="list-style-type: none"> • Aggregate Resources • Effects on Agricultural Land

The purpose of the proposed undertaking is to provide approximately 15.1 million cubic metres (m³) of additional landfill disposal capacity at the existing EOWHF over a 20-year period, with operations anticipated to begin in 2025 and closure anticipated in 2045. The undertaking will enable GFL to continue providing disposal services for residual non-

hazardous solid waste to customers and will support local economic development over the long term. No changes to the approved fill rates or site access routes are proposed.

Two alternative methods for the EOWHF future development were identified in the approved ToR and are presented as preliminary concept designs in the Conceptual Design Report (CDR). Both alternative methods provide a landfill volume of approximately 15.1 million m³ based on the approved fill rate of 755,000 tonnes per year over a 20-year planning period. Studies completed for the EOWHF have indicated that, based on the underlying soils, the design alternatives are limited to varying lateral configurations with a consistent height. Both alternative methods will continue to use established operating procedures currently in place at the EOWHF and would maximize the use of existing site infrastructure.

Alternative Method 1 (**Figure 1-1**) consists of implementing the future development through five stages: one stage adjacent to and north of the existing landfill (Stage 5); and four stages oriented east-west within the future development lands (Stages 6 through 9). Stages 6 through 8 will be identical in size, while Stages 5 and 9 will be smaller. A stormwater management system will be constructed consisting of conveyance ditches around the perimeter of each stage and a retention pond located northwest of Stage 8. The existing pond located northeast of Stage 5 will be modified to attenuate peak flows if required.

Alternative Method 2 (**Figure 1-2**) consists of implementing the future development through five stages: one stage adjacent to and north of the existing landfill (Stage 5); and four stages oriented east-west within the future development lands (Stages 6 through 9). Stages 6 through 8 will be identical in size, while Stages 5 and 9 will be smaller. A stormwater management system will be constructed consisting of conveyance ditches around the perimeter of each stage and a retention pond located northwest of Stage 8. The existing pond located northeast of Stage 5 will be modified to attenuate peak flows if required.

For both alternative methods, the design of the stages will be consistent with the existing landfill design. Visual screening will be constructed along the north and east perimeters and a portion of the south perimeter consisting of earthen berms and/or vegetation plantings. A new road entrance will be constructed from Laflèche Road, which will include a new scale facility.

The purpose of the Land Use Effects Assessment Report is as follows:

- present the potential environmental effects of both alternative methods on land use;
- compare the net effects of each alternative method;
- select a preferred alternative method;
- assess the potential environmental effects of the preferred alternative method;
- describe commitments to mitigate and monitor potential environmental effects of the preferred alternative method; and
- identify additional required land use approvals.

The results from this Land Use Effects Assessment Report will be documented in an EA Study Report in accordance with the approved ToR and will be submitted to the MECP for review.

1 2 3 4 5 6 7 8

TRANS-CANADA HWY

417

FRASER DRAIN

SOIL PAD

ROXBOROUGH-PLANTAGENET BOUNDARY MUNICIPAL DRAIN

LOT 18

LOT 17

EXISTING POND

LEACHATE TREATMENT FACILITY

LOT 16

LOT 15

LOT 14

LOT 13

STORMWATER POND

STAGE 5

STAGE 9

STAGE 4

STAGE 8

STAGE 7

STAGE 6

EXISTING GFL EASTERN ONTARIO WASTE HANDLING FACILITY

OVERSIZED DRAINAGE DITCH (TYP) SIZE TBD.

LEACHATE AERATION PONDS

LFG UTILIZATION FACILITY

SOIL PAD

LAFLECHE ROAD

3 - 26m x 4m SCALE WITH 3m LONG RAMPS

20m WIDE ENTRANCE ROADWAY

ROAD 138

ALLAIRE ROAD

UPPER TAYSIDE DRAIN

VISUAL SCREENING BUFFER

6m WIDE ACCESS ROADWAYS (TYP.)

LEGEND

- GFL SITE LIMITS
- PROPOSED ACCESS ROAD
- PROPOSED DRAINAGE DITCH
- EXISTING DRAIN
- + EL. 65.00 EXISTING SPOT ELEVATION
- + EL. 65.50 PROPOSED SPOT ELEVATION

4 | September 7, 2022



Figure 1-2. Alternative Method 2



2 Effects Assessment Methods

Using the evaluation criteria, indicators, rationale and data sources from the approved ToR and the existing conditions from the Land Use Existing Conditions Report, the Land Use Effects Assessment Report was completed using the following methodology:

- predict the potential environmental effects of each alternative method on land use (Section 3);
- identify the preferred alternative method by comparing the net potential environmental effects of each alternative method (Section 4); and
- identify mitigation measures and monitoring programs to assess the net effects, advantages, and disadvantages of the preferred alternative method on land use (Sections 4 and 5).

2.1 Predict Potential Environmental Effects for Alternative Methods

The potential environmental effects for each alternative method are predicted for the evaluation criteria and indicators from the approved ToR. The potential effects can be positive or negative, direct or indirect, and short or long term. The potential effects on land use may be mitigated through components of each alternative method. The net effects account for the effectiveness of each alternative method to mitigate potential effects of the expanded landfill on land use.

2.1.1 Study Areas

The existing EOWHF is located within the Township of North Stormont, approximately 5 km north-northwest of the village of Moose Creek, Ontario, and 5 km east of the village of Casselman, Ontario, on the western half of Lot 16 and Lots 17 and 18, Concession 10, Township of North Stormont, United Counties of Stormont, Dundas and Glengarry, near the intersection of Highway 417 and Highway 138. The municipal street address for the facility is 17125 Laflèche Road, Moose Creek, Ontario. The lands to the east of the existing EOWHF, being considered for the future development, include the eastern half of Lot 16, Lots 14 and 15, and the majority of Lot 13 of Concession 10. The existing EOWHF encompasses a site area of 189 hectares, while the future development lands include approximately 240 hectares.

The study areas include the existing site as well as the future development areas and potentially affected surrounding areas. The on-site and off-site study areas identified for the EA in the approved ToR are as follows (**Figure 2-1**):

- On-site Study Area: The existing EOWHF, and the future development lands comprising the eastern half of Lot 16, Lots 14 and 15, and the majority of Lot 13 of Concession 10 east of the EOWHF; and
- Off-site Study Area: The area surrounding the future development lands extending approximately 1km from the on-site study area.

Table 2-1. Evaluation Criteria, Indicators and Data Sources for Land Use

Evaluation Criteria	Rationale	Indicators	Data Sources
Built Environment –			
Current and Planned Future Land Use			
Effects on Current and Future Land Uses	The continued operation of the landfill may not be fully compatible with certain current and/or planned future land uses in the off-site study area. Waste disposal facilities can potentially affect the use and enjoyment of recreational resources in the vicinity of the site.	<ul style="list-style-type: none"> • Current land use • Planned land use • Type(s) and proximity of off-site recreational resources within 500 m of a landfill footprint potentially affected • Type(s) and proximity of off-site sensitive land uses (e.g., dwellings, churches, parks) within 500 m of a landfill footprint potentially affected 	<ul style="list-style-type: none"> • United Counties of Stormont, Dundas and Glengarry Official Plan • Township of North Stormont Zoning By-law • Aerial photographic mapping and field reconnaissance • Published data on public recreational facilities/activities • Provincial Policy Statement • Proposed facility characteristics • Landfill design and operations data
Aggregate Extraction			
Aggregate Resources	Aggregate resources may be present in the area surrounding the expanded landfill.	<ul style="list-style-type: none"> • Presence of known or identified aggregate resources and the predicted impact of impairment of their use due to the proposed footprint, construction and operation on-site 	<ul style="list-style-type: none"> • Aggregate resources inventory mapping • Ontario geological survey • Proposed facility characteristics • Landfill design and operations data

Source: HDR, 2020.

2.1.3 Key Design Considerations and Assumptions

The CDR (HDR, 2022) describes the details of each alternative method for the future development lands. The key design considerations and assumptions for the alternative methods, as they relate to land use, are described below. Design considerations and assumptions focus on the current and future land use planning context of the On-site and Off-site Study Areas.

Existing Land Uses

The Land Use Existing Conditions Report identified the existing land uses within 1 km of the on-site study area. The existing land uses within 1 km of the On-site Study Area consist mostly of agricultural (crop/product) with some extraction (aggregate/peat), vacant/natural, heavy industrial, agricultural (livestock), residential and commercial land uses. Guideline D-4 lists a number of land uses that are assumed to be compatible with operating landfills (MECP, 1994, Section 5.1.2). These compatible land uses include:

- a) *utilities and above grade transportation routes except major highways;*
- b) *fences;*

- c) *wood harvesting and other forestry activities;*
- d) *certain farming activities;*
- e) *industrial uses, including incinerators permitted to operate under O. Reg. 347;*
- f) *gravel pits and quarries, and other mining activities (provided the landfill water table is not affected); or*
- g) *such land uses which would not be threatened by any hazard to public health or safety and would not be impaired by nuisance effects.*

The Land Use Existing Conditions Report also identified four sensitive land uses in 'permanent structures' that are within 500 m of the perimeter of the expanded landfill (NFP, 2022). Guideline D-4 states that the most significant environmental and aesthetic effects of a landfill are felt within 500 m of the perimeter of a landfill area (MECP, 1994, Section 5.3). Sensitive land uses for operating landfills include:

- a) *a permanent structure used in animal husbandry; or*
- b) *agricultural land used for pasturing livestock; or*
- c) *a permanent structure where:*
 - i. *a person sleeps, or*
 - ii. *a person is present on a full time basis;**but not including food or motor vehicle service facilities adjacent to a highway, utility operations, scrap yards, heavy industrial uses, gravel pits, quarries, mining or forestry activities; or*
- d) *cemeteries.*

For this reason, existing sensitive land uses were only identified within the 500 m boundary. The four existing sensitive land uses are listed below and none include recreational resources:

1. An **agricultural use** operated by Champion Mushrooms. The building is located at 1454 Highway 138. Several full-time employees work at the indoor mushroom growing facility.
2. A **commercial administrative office** operated by Calco Soils that is located at 17305 Allaire Road and supports 2 full-time employees. The office is an ancillary use to Calco's nearby peat and topsoil extraction and processing facilities.
3. A **residential dwelling** is located at 1397 Highway 138. GFL has purchased the property. The residential dwelling was vacated in Summer 2022 and will be demolished prior to the implementation of the future development landfill.
4. A **residential dwelling** is located at 17319 Allaire Road.

On-site Study Area

The existing uses of the On-site Study Area include the existing EOWHF site and agricultural crop/products and associated agricultural business activities. The agricultural uses are on lands owned by GFL and will be relocated as a part of the future development plans.

No impacts to existing land uses within the On-site Study Area are anticipated because the alternative methods are consistent with the Official Plan and Zoning By-law. The Official Plan was amended to recognize the on-site area as part of the expansion lands for the existing EOWHF, as demonstrated by the waste disposal site symbol spanning the on-site study area.

A recent amendment to the Zoning By-law permits the waste disposal site use in the on-site study area. Both alternative methods are not expected to impact the existing uses within the On-site Study Area because they are permitted within the Waste Disposal zone.

Active Development Applications

The Township of North Stormont and the Nation Municipality were contacted to identify any planned land uses subject to active development applications such as site plan control, rezoning or building permit applications. The Township of North Stormont confirmed that there are no active development applications within 1 km of the future development lands, as of May 16, 2022. The Nation Municipality confirmed that there are two active site plan control applications within 1 km of the future development lands, as of May 17, 2022. The two site plan control applications, which are located approximately 700 m from the On-site Study Area on County Road 8 north of Highway 417, include a mini storage development and a biosolids transfer station. Both applications are industrial in nature and would be compatible with the expanded landfill.

Future Development Potential

The future development potential of lands within 1 km of the On-site Study Area was identified using the United Counties of Stormont, Dundas and Glengarry (SDG Counties) Official Plan, Prescott-Russell Official Plan, North Stormont Zoning Bylaw, and The Nation Municipality Zoning Bylaw.

SDG Counties Official Plan

The SDG Counties Official Plan designates the areas south, east and west of the On-site Study Area as “Agricultural Resource Lands”, “Rural District”, “Employment District”, and “Extractive Resource Lands (Licensed Pit & Quarry)”. The SDG Counties Official Plan “generally discourages” development within 500 m of an existing waste management system (SDG Counties, 2017, Section 4.3.5.5). However, future development may be permitted within 500 m of the expanded landfill in cases where studies show landfill effects will not impact the proposed development. Additionally, proposals for future development must show that they will not impact future expansion of the landfill.

Prescott-Russell Official Plan

The Prescott-Russell Official Plan designates the areas north and west of the On-site Study Area as “Agricultural Resource Area” and “Rural Policy Area”. The Prescott-Russell Official Plan “generally discourages” development within 500 m of a waste site (United Counties of Prescott and Russell, 2018, Section 3.5.4). However, future development may be permitted within 500 m of the expanded landfill in cases where studies show landfill effects will not impact the proposed development. Additionally,

proposals for future development must show that they will not impact future expansion of the landfill.

Township of North Stormont Zoning Bylaw

The North Stormont Zoning Bylaw zones the areas south, east and west of the On-site Study Area as “Agriculture”, “Rural”, “Rural Industrial”, “Quarry”, “Waste Disposal”. The North Stormont Zoning Bylaw prohibits development containing sensitive land uses within 200 m of a waste site (Township of North Stormont, 2021, Section 3.34.3b). For waste sites located in the “Waste Development – Special Exception 2 (WD-2) Zone” development may occur if the potential effects of the landfill are assessed to the satisfaction of the Township and SDG Counties.

The Nation Municipality Zoning Bylaw

The Nation Municipality Zoning Bylaw zones the areas north and west of the On-site Study Area as “Agriculture”, “Rural” and “Highway Commercial”. The Nation Municipality Zoning Bylaw prohibits all development within 50 m of a landfill (The Nation Municipality, 2006, Section 4.30.7).

The municipal policies restrict land uses due to the potential effects of a landfill which are experienced within 50 m, 200 m, or 500 m of landfill, depending on the planning authority. The Guideline D-4 restricts land uses within 30 m of the expanded landfill (MECP, 1994, Section 5.2.1). Based on these municipal and provincial policies, it is understood that future development in the Off-site Study Area is restricted in the following ways:

- All future development is prohibited within 30 m of the expanded landfill;
- All future development is prohibited within 50 m of the expanded landfill in the Nation Municipality;
- Sensitive land uses are prohibited within 200 m of the expanded landfill within the Township of North Stormont; and
- All future development is restricted within 500 m of the expanded landfill in the SDG Counties and Prescott-Russell Counties, subject to additional studies and approvals. Additionally, proposals for future development will need to show that they will not impact future expansion of the landfill.

Aggregate Resources

No aggregate resource sites exist within the On-site Study Area. Two aggregate resource sites exist within the Off-site Study Area:

- Peat harvesting on the lands southwest of the existing EOWHF. These activities are undertaken by Calco Soils. The peat harvesting activities occur on lands designated Agricultural Resource Lands and Rural District in the Official Plan, and on lands zoned Agriculture and Rural in the Zoning Bylaw. The use conforms with the Official Plan and Zoning Bylaw. Peat harvesting is not considered a “sensitive land use” as per Ontario Guideline D-4.

- Aggregate extraction at the Martin Quarry operated by A.L. Blair Construction Ltd. east of the subject lands at 17423 Allaire Road. Together these land uses comprise 163 hectares of land. The Martin Quarry is a licensed quarry that is extracting aggregate materials. This quarry use conforms to the Extractive Resource Lands designation policies. Pits and quarries are not considered a “sensitive land use” as per Ontario Guideline D-4.

2.2 Comparative Evaluation and Identification of the Preferred Alternative

The two alternative methods are assessed and evaluated using the ToR criteria and indicators to determine the preferred alternative. The differences in the potential environmental effects remaining following the implementation of potential mitigation/management measures (i.e., net effects) are used to identify and compare the advantages and disadvantages of each alternative method.

The net effects are used to compare how each alternative method meets the criteria and indicators for each discipline. The following two--step method was applied to complete the comparative evaluation for the land use discipline:

1. Identify the predicted net effect(s) associated with each alternative method for each indicator and assign a preference rating (i.e., Preferred, Not Preferred, No Substantial Difference); and
2. Rate each alternative method at the criteria level (i.e., Preferred, Not Preferred, No Substantial Difference) based on the identified preference rating for each indicator and provide a rationale.

2.3 Effects Assessment of the Preferred Alternative

The net effects of the preferred alternative are assessed using the same criteria and indicators from the ToR. The effects assessment considers the potential mitigation measures and monitoring programs as well as the cumulative effects. The net effects of the preferred alternative will be presented in the EA Study Report.

3 Net Effects Assessment

The policies of the SDG Counties Official Plan, Prescott-Russell Official Plan, North Stormont Zoning Bylaw, and the Nation Municipality Zoning Bylaw as well as the Guideline D-4 are used to identify the potential effects of the EOWHF expanded landfill on the current and planned future land uses in the Off-site Study Area. The presence of recreational resources and sensitive land uses in the Off-site Study Area are assessed to determine the potential effects of the expanded landfill on these specific uses.

The net effects of the expanded landfill on land use are determined by assessing whether the proposed mitigation measures for each alternative method address the potential effects of the future development lands on current and planned land uses, recreational resources, and sensitive land uses.

The results of the net effects assessment for each alternative method are provided in Sections 3.1 and 3.2.

3.1 Alternative Method 1

The net effects assessment for Alternative Method 1 is presented in **Table 3-1**.

Table 3-1. Net Effects Assessment – Alternative Method 1

Evaluation Criteria	Indicator	Key Design Considerations and Assumptions	Potential Effects	Mitigation Measures	Net Effects
Effects on Current and Future Land Uses	Current land use	<ul style="list-style-type: none"> Most existing surrounding land uses are compatible and are not sensitive to the expanded landfill The establishment of an expanded landfill triggers municipal and provincial policies that restrict sensitive land uses in the off-site study area 	<ul style="list-style-type: none"> The sensitive land use located at 1454 Highway 138 (Champion Mushrooms) is adjacent to the On-site Study Area and would become legal non-conforming under the North Stormont Zoning Bylaw 	None required.	<ul style="list-style-type: none"> The sensitive land use located at 1454 Highway 138 (Champion Mushrooms) would become legal non-conforming under the North Stormont Zoning Bylaw which would prevent future building expansions or changes of use
	Planned land use	<ul style="list-style-type: none"> Future development in the Off-site Study Area may be restricted by municipal and provincial policies based on distance from expanded landfill North setback: 145 m East setback: 242 m South setback: 100 m Visual screening around the periphery of the site consisting of earthen berms and/or vegetation plantings Phasing of landfill stages from south to north 	<ul style="list-style-type: none"> Future development may be restricted within 500 m of the expanded landfill in all municipalities Future development will be prohibited within 30 m of the expanded landfill in all municipalities Future development will be prohibited within 50 m of the expanded landfill in the Nation Municipality Future development of sensitive land uses will be prohibited within 200 m of the expanded landfill in the Township of North Stormont No effect on existing development applications (700 m from On-site Study Area). 	None required.	<ul style="list-style-type: none"> Future development will be restricted within 500 m of the landfill area, except in cases where mitigation measures minimize potential landfill effects to the satisfaction of local planning authorities
	Type(s) and proximity of off-site recreational resources within 500 m of a landfill footprint potentially affected	<ul style="list-style-type: none"> No recreational resources are located in the off-site study area 	<ul style="list-style-type: none"> No potential effects on off-site recreational resources 	None required	<ul style="list-style-type: none"> No net effects on off-site recreational resources
	Type(s) and proximity of off-site sensitive land uses within 500 m of a	<ul style="list-style-type: none"> Sensitive land uses are prohibited within 200 m of the On-site Study Area in North Stormont 	<ul style="list-style-type: none"> The sensitive land use located at 1454 Highway 138 (Champion Mushrooms) is adjacent to the On-site Study Area and would become legal non- 	None required.	<ul style="list-style-type: none"> The sensitive land use located at 1454 Highway 138 (Champion Mushrooms) would

Table 3-1. Net Effects Assessment – Alternative Method 1

Evaluation Criteria	Indicator	Key Design Considerations and Assumptions	Potential Effects	Mitigation Measures	Net Effects
	landfill footprint potentially affected	<ul style="list-style-type: none"> D-4 Guidelines advise that potential impacts may be experienced by sensitive land uses within 500 m of a landfill fill area North setback: 145 m East setback: 242 m South setback: 100 m Visual screening around the periphery of the site consisting of earthen berms and/or vegetation plantings 	<p>conforming under the North Stormont Zoning Bylaw.</p> <ul style="list-style-type: none"> The D-4 guidelines will apply and must be reviewed for any change proposed to any of the four existing sensitive land uses. 		<p>become legal non-conforming under the North Stormont Zoning Bylaw which would prevent future building expansions or changes of use</p> <ul style="list-style-type: none"> The D-4 guidelines will apply and must be reviewed for changes to the sensitive land uses.
Aggregate Resources	Presence of known or identified aggregate resources and the predicted impact of impairment of their use due to the proposed footprint, construction and operation on-site	<ul style="list-style-type: none"> Section 2.5 of the PPS states that mineral aggregate resources shall be protected for the long-term. 	<ul style="list-style-type: none"> No net effects on the land use approvals for continuation or expansion of aggregate resource land uses. 	None required.	<ul style="list-style-type: none"> None.

Note: Setback distances are measured from the proposed landfill perimeter to the property boundary.

Sources: HDR, 2022; HDR, 2020; MECP, 1994; NFP, 2022; The Nation Municipality, 2006; Township of North Stormont, 2021; United Counties of Prescott and Russell, 2018; SDG Counties, 2017.

3.2 Alternative Method 2

The net effects assessment for Alternative Method 2 is presented in **Table 3-2**.

Table 3-2. Net Effects Assessment – Alternative Method 2

Evaluation Criteria	Indicator	Key Design Considerations and Assumptions	Potential Effects	Mitigation Measures	Net Effects
Effects on Current and Future Land Uses	Current land use	<ul style="list-style-type: none"> Most existing surrounding land uses are compatible and are not sensitive to the expanded landfill Establishment of an expanded landfill triggers municipal and provincial policies that restrict sensitive land uses in the off-site study area 	<ul style="list-style-type: none"> No potential effects on off-site current land uses 	None required	<ul style="list-style-type: none"> No net effects on off-site current land uses
	Planned land use	<ul style="list-style-type: none"> Future development in the Off-site Study Area may be restricted by municipal and provincial policy based on distance from expanded landfill or future development lands North setback: 210 m East setback: 241 m South setback: 100 m Visual screening around the periphery of the site consisting of earthen berms and/or vegetation plantings Phasing of landfill stages from west to east 	<ul style="list-style-type: none"> Future development may be restricted within 500 m of the expanded landfill in all municipalities Future development will be prohibited within 30 m of the expanded landfill in all municipalities Future development will be prohibited within 50 m of the expanded landfill in the Nation Municipality Future development of sensitive land uses will be prohibited within 200 m of the expanded landfill in the Township of North Stormont No effect on existing development applications (700 m from On-site Study Area). 	None required	<ul style="list-style-type: none"> Future development will be restricted within 500 m of the landfill area, except in cases where mitigation measures minimize potential landfill effects to the satisfaction of local planning authorities
	Type(s) and proximity of off-site recreational resources within 500 m of a landfill footprint potentially affected	<ul style="list-style-type: none"> No recreational resources are located in the off-site study area 	<ul style="list-style-type: none"> No potential effects on off-site recreational resources 	None required	<ul style="list-style-type: none"> No net effects on off-site recreational resources

Table 3-2. Net Effects Assessment – Alternative Method 2

Evaluation Criteria	Indicator	Key Design Considerations and Assumptions	Potential Effects	Mitigation Measures	Net Effects
	Type(s) and proximity of off-site sensitive land uses within 500 m of a landfill footprint potentially affected	<ul style="list-style-type: none"> • Sensitive land uses are prohibited within 200 m of the On-site Study Area in North Stormont • D-4 Guidelines advise that potential impacts may be experienced by sensitive land uses within 500 m of a landfill fill area • North setback: 210 m • East setback: 241 m • South setback: 100 m 	<ul style="list-style-type: none"> • The D-4 guidelines will apply and must be reviewed for any change proposed to any of the four existing sensitive land uses. 	None required	<ul style="list-style-type: none"> • The D-4 guidelines will apply and must be reviewed for changes to the sensitive land uses.
Aggregate Resources	Presence of known or identified aggregate resources and the predicted impact of impairment of their use due to the proposed footprint, construction and operation on-site	<ul style="list-style-type: none"> • Section 2.5 of the PPS states that mineral aggregate resources shall be protected for the long-term. 	<ul style="list-style-type: none"> • No potential effects on the land use approvals for continuation or expansion of aggregate resource land uses. 	None required.	<ul style="list-style-type: none"> • None.

Note: Setback distances are measured from the proposed landfill perimeter to the property boundary.

Sources: HDR, 2022; HDR, 2020; MECP, 1994; NFP, 2022; The Nation Municipality, 2006; Township of North Stormont, 2021; United Counties of Prescott and Russell, 2018; SDG Counties, 2017.

4 Comparative Evaluation of Net Effects and Identification of the Preferred Alternative

A comparative evaluation of the net effects of each alternative method and the identification of a preferred alternative are carried out in accordance with the methods described in Section 2.2. The results of the comparative evaluation are provided below.

4.1 Comparative Evaluation Results

Both alternative methods satisfy the Guideline D-4 requirement that a 30 m buffer be maintained around the perimeter of a landfill area (MECP, 1994). Furthermore, both alternatives propose to maintain a minimum 100 m setback between the perimeter of the expanded landfill and the property boundaries which meets the maximum recommended landfill area buffer of the Guideline D-4 (HDR, 2022; MECP, 1994). The minimum 100 m setback presented in Alternatives 1 and 2 provides the required 50 m buffer from Section 4.30.7 of the Nation Municipality Zoning Bylaw (2006).

Alternative Method 1 and Alternative Method 2 differ in their on-site setbacks, distances from existing surrounding sensitive land uses, and the landfill development phasing methods, as shown in **Table 4-1** below.

Table 4-1. Comparison of Alternative Methods

	Alternative Method 1	Alternative Method 2
North Setback	145 m	210 m
East Setback	242 m	241 m
South Setback	100 m	100 m
Distance to 1454 Highway 138 (Champion Mushrooms)	165 m	279 m
Distance to 17305 Allaire Road (Calco Soils)	310 m	411 m
Distance to 1397 Highway 138 (Residential Dwelling)	308 m	308 m
Distance to 17319 Allaire Road (Residential Dwelling)	414 m	493 m
Phasing of Landfill Stage Development	South to North (Stages 6-9)	West to East (Stages 6-8)
Direction of Fill	West to East	South to North

Sources: HDR, 2022; ESRI, 2022, Worldview03 0.5 m Colour Imagery, Provided by Maxar, Image date: June 26, 2018.

Alternative Method 2 provides a greater buffer between the northern landfill perimeter and property line as well as greater off-site distances between the landfill perimeter and existing sensitive land uses in the surrounding area. The greater buffer distances in

Alternative Method 2 would mitigate the land use net effects of the expanded landfill more effectively than Alternative Method 1. Additionally, Alternative Method 2 proposes to phase landfill development in stages that progress from west to east as opposed to south to north in Alternative Method 1. The west to east phasing of Alternative Method 2 keeps a greater distance between the active landfill area and existing sensitive land uses in the surrounding area. This phasing would better mitigate net effects until later phases of the future development. For these reasons, Alternative Method 2 is the preferred method.

Alternative Method 1 would cause the sensitive land use located at 1454 Highway 138 (Champion Mushrooms) to become legal non-conforming under the North Stormont Zoning Bylaw.

The results of the comparative evaluation for land use are provided in **Table 4-2**.

Table 4-2. Comparative Evaluation of Net Effects for Land Use

Evaluation Criteria	Indicators	Net Effects of Alternative Methods	
		Alternative Method 1	Alternative Method 2
Effects on Current and Future Land Uses	Current land use	<p>Sensitive land uses are prohibited within 200 m of the expanded landfill in North Stormont.</p> <p>Alternative Method 1 proposes the following buffer distances between the expanded landfill and the existing sensitive land uses:</p> <ul style="list-style-type: none"> • 1454 Highway 138 (Champion Mushrooms): 165 m • 17305 Allaire Road (Calco Soils): 310 m • 1397 Highway 138 (Residential Dwelling): 308 m • 17319 Allaire Road (Residential Dwelling): 414 m <p>Alternative Method 1 does not provide the 200 m buffer between the expanded landfill and the existing sensitive land use at 1454 Highway 138 (Champion Mushrooms). This would cause the sensitive land use to become legal non-conforming under the North Stormont Zoning Bylaw.</p> <p>Not Preferred</p>	<p>Sensitive land uses are prohibited within 200 m of the expanded landfill in North Stormont.</p> <p>Alternative Method 2 proposes the following buffer distances between the expanded landfill and the existing sensitive land uses:</p> <ul style="list-style-type: none"> • 1454 Highway 138 (Champion Mushrooms): 279 m • 17305 Allaire Road (Calco Soils): 411 m • 1397 Highway 138 (Residential Dwelling): 308 m • 17319 Allaire Road (Residential Dwelling): 493 m <p>Alternative Method 2 provides the 200 m buffer between the expanded landfill and all four existing sensitive land use allowing them to continue to be in compliance with the North Stormont Zoning Bylaw.</p> <p>Preferred</p>
	Planned land use	<p>Development will be restricted within 500 m of the future development landfill, except in cases where mitigation measures minimize potential landfill effects to the satisfaction of local planning authorities.</p> <p>No Substantial Difference</p>	<p>Development will be restricted within 500 m of the future development landfill, except in cases where mitigation measures minimize potential landfill effects to the satisfaction of local planning authorities.</p> <p>No Substantial Difference</p>
	Type(s) and proximity of off-site recreational resources within 500 m of a landfill footprint potentially affected	<p>There are no net effects of the expanded landfill on the type and proximity of recreational resources in the surrounding area in Alternative Method 1 or 2.</p> <p>No Substantial Difference</p>	<p>There are no net effects of the expanded landfill on the type and proximity of recreational resources in the surrounding area in Alternative Method 1 or 2.</p> <p>No Substantial Difference</p>

Table 4-2. Comparative Evaluation of Net Effects for Land Use

Evaluation Criteria	Indicators	Net Effects of Alternative Methods	
		Alternative Method 1	Alternative Method 2
	Type(s) and proximity of off-site sensitive land uses within 500 m of a landfill footprint potentially affected	<p>Sensitive land uses are prohibited within 200 m of the expanded landfill in North Stormont.</p> <p>Alternative Method 1 proposes the following buffer distances between the expanded landfill and the existing sensitive land uses:</p> <ul style="list-style-type: none"> • 1454 Highway 138 (Champion Mushrooms): 165 m • 17305 Allaire Road (Calco Soils): 310m • 1397 Highway 138 (Residential Dwelling): 308 m • 17319 Allaire Road (Residential Dwelling): 414 m <p>Alternative Method 1 does not provide the 200 m buffer between the expanded landfill and the existing sensitive land use at 1454 Highway 138 (Champion Mushrooms). This would cause the sensitive land use to become legal non-conforming under the North Stormont Zoning Bylaw.</p> <p>Not Preferred</p>	<p>Sensitive land uses are prohibited within 200 m of the expanded landfill in North Stormont.</p> <p>Alternative Method 2 proposes the following buffer distances between the expanded landfill and the existing sensitive land uses:</p> <ul style="list-style-type: none"> • 1454 Highway 138 (Champion Mushrooms): 279 m • 17305 Allaire Road (Calco Soils): 411 m • 1397 Highway 138 (Residential Dwelling): 308 m • 17319 Allaire Road (Residential Dwelling): 493 m <p>Alternative Method 2 provides the 200 m buffer between the expanded landfill and all four existing sensitive land use allowing them to continue to be in compliance with the North Stormont Zoning Bylaw.</p> <p>Preferred</p>
	Criteria Rating & Rationale	<i>Alternative Method 2 is preferred over Alternative Method 1 with regard to the “Effects on Current and Future Land Uses” criterion because Alternative Method 2 provides greater buffer distances between the expanded landfill and the existing sensitive land uses. Alternative Method 2 allows all existing sensitive land use to continue to be in compliance with the North Stormont Zoning Bylaw.</i>	
Aggregate Resources	Presence of known or identified aggregate resources and the predicted impact of impairment of their use due to the proposed footprint, construction and operation on-site	<p>There are no net effects on the land use approvals for continuation or expansion of aggregate resource land uses.</p> <p>No Substantial Difference</p>	<p>There are no net effects on the land use approvals for continuation or expansion of aggregate resource land uses.</p> <p>No Substantial Difference</p>
	Criteria Rating & Rationale	<i>There is no substantial difference between the Alternative Methods with regard to the “Aggregate Resources” criterion. Both methods allow all existing aggregate resources to continue to be in compliance with the North Stormont Zoning Bylaw.</i>	

Sources: HDR, 2022; Township of North Stormont, 2021; ESRI, 2022.

4.2 Advantages and Disadvantages of the Preferred Alternative

The differences in net effects are used to identify and compare the advantages and disadvantages of each alternative method. Alternative Method 2 is identified as the preferred alternative from a land use perspective. The advantages and disadvantages of Alternative Method 2 are listed in **Table 4-3**.

Table 4-3. Advantages and Disadvantages of Alternative Method 2

Evaluation Criteria	Advantages	Disadvantages
Current and Planned Future Land Uses	Alternative Method 2 provides greater separation distances between the expanded landfill and existing sensitive land uses in the off-site study area. All existing sensitive land uses would continue to be in compliance with the North Stormont Zoning Bylaw.	No disadvantages to current and planned land uses anticipated.
Aggregate Resources	No advantages to existing Aggregate Resources are anticipated. All Aggregate Resources uses would continue to be in compliance with the North Stormont Zoning Bylaw.	No disadvantages to existing Aggregate Resources are anticipated.

5 Commitments to Mitigation and Monitoring

Alternative Method 2 orients the landfill stages to provide a greater setback between the expanded landfill and the closest existing sensitive land use at 1454 Highway 138 (Champion Mushrooms). This setback distance mitigates any zoning compliance issues and allows the sensitive land use to continue to be in compliance with the North Stormont Zoning Bylaw. No monitoring measures are proposed for the preferred alternative method.

5.1 Land Use Commitments

The commitments associated with Alternative Method 2 are as follows:

- Maintain a minimum 50 m setback from the expanded landfill to the property boundaries.
- Construct landfill stages to maintain a minimum 200 m buffer between the expanded landfill and existing sensitive land uses in the surrounding area as identified below:
 - 1454 Highway 138 (Champion Mushrooms)
 - 17305 Allaire Road (Calco Soils)
 - 1397 Highway 138 (Residential Dwelling)

- 17319 Allaire Road (Residential Dwelling)
- Ensure the building located at 1397 Highway 138 approximately 278 m from the future development lands will no longer be used as a residential dwelling.
- Install visual screens using earthen berms and/or vegetation plantings around the expanded landfill.
- Phase development of the landfill stages from west to east (regardless of the direction in which the stages are filled).

6 Land Use Approvals

In addition to EA approval, the following Land Use approvals are required:

- lift holding symbol from the expansion lands in the Township of North Stormont Zoning Bylaw, and
- site plan control approval.

Note that the Existing Conditions report identifies the need for amendment to the SDG Counties Official Plan and North Stormont Township Zoning Bylaw. An amendment to the SDG Counties Official Plan was completed on March 22nd, 2022, to permit a waste management system and ancillary uses in the Agricultural Resource Lands designation which currently applies to the future development lands.

An amendment to the North Stormont Zoning Bylaw was completed on April 5th, 2022 to re-zone the future development lands to Waste Disposal (WD) Zone as well as to remove the Area of Natural or Scientific Interest (ANSI) Zoning Overlay. The Zoning bylaw amendment placed a holding symbol on the lands, requiring that Site Plan Control approval and EA approval be granted prior to expansion of a waste management system.

7 References

ESRI

- 2022 Worldview03 0.5 m Colour Imagery. Provided by Maxar. Image date: June 26, 2018.

HDR Corporation (HDR)

- 2020 *Terms of Reference*. Eastern Ontario Waste Handling Facility Future Development Environmental Assessment. September 11, 2020.
- 2022 *Conceptual Design Report*. Eastern Ontario Waste Handling Facility Future Development Environmental Assessment. April 5, 2022.

Ministry of Municipal Affairs and Housing (MMAH)

- 2020 *Provincial Policy Statement*. May 1, 2020.

Ministry of the Environment, Conservation and Parks (MECP)

- 1994 *D-4 Land Use on or Near Landfills and Dumps*. April 1994.

Northern Futures Planning (NFP)

2022 *Land Use Existing Conditions Report*. Eastern Ontario Waste Handling Facility Future Development Environmental Assessment. February 6, 2022.

The Nation Municipality

2006 *Comprehensive Zoning By-law 2-2006*. March 6, 2006.

Township of North Stormont

2021 *Comprehensive Zoning By-law No.08-2014*. Consolidated October 2021.

United Counties of Prescott and Russell

2018 *Official Plan*. Consolidated November 2018.

United Counties of Stormont, Dundas and Glengarry (SDG Counties)

2017 *Official Plan*. Adopted July 17, 2017.