DILLON CONSULTING

THE TOWNSHIP OF HURON-KINLOSS

Kinloss Landfill Expansion

Options Evaluation

December 2022

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Kinloss Landfill Expansion Options Evaluation

Dear Mr. Yungblut,

Dillon Consulting Limited (Dillon) is pleased to provide the Township of Huron-Kinloss (the Township) with the draft Kinloss Landfill Expansion Options Evaluation report for the existing landfill site at 690 Kairshea Avenue, Huron-Kinloss Ontario.

Dillon completed a site visit with the Township on October 7, 2021 to better understand the current size and uses of the site. This report provides an evaluation of five options developed for potential future uses for the site and provides next steps required for a selection of options discussed.

Sincerely,

DILLON CONSULTING LIMITED

Dave Lake, P.Eng.
Project Manager

RAD:mc

Our file: 22-4087

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Definitions and Abbreviations

– B –

BASWR, Bruce Area Solid Waste Recycling

– E –

ECA, Environmental Compliance Approval, formerly known as Certification of Approval

– I –

IC&I, Industrial, commercial and institutional

– M –

MECP, Ministry of Environment, Conservation and Parks, formerly known as the Ministry of the Environment

– O –

Organic waste, refers to waste that can be composted and includes food waste, leaf waste and brush

– S –

Site, Kinloss landfill located at 690 Kairshea Avenue

– W –

Waste, refers to garbage that is disposed of in landfill

Waste diversion, refers to sending waste to programs or processing rather than the landfill

Executive Summary

The Township of Huron-Kinloss currently operates two licensed landfill facilities: the Huron Landfill, which currently receives the Township's waste and the Kinloss Landfill, which has not received waste since 2002. This report evaluates options for the future use of the existing Kinloss Landfill which is located at 690 Kairshea Avenue.

Five future uses are contemplated for the Site, including:

1. Developing the landfill without expansion, which considers reopening the Site to use the remaining airspace without modifying the currently approved final contours;
2. Constructing a Public Drop-Off Depot, which considers the construction of a public drop-off depot at the Site, where residents deposit separated waste materials for diversion;
3. Constructing a Composting Facility, which considers the construction of a composting facility at the Site for organic material from residential and IC&C sources can be composted;
4. Constructing a Transfer Station, which considers the construction of a Transfer Station to receive waste and/or recyclables, temporarily storing materials as needed and loading them to be processed or disposed off-site;
5. Expanding the Landfill, which considers expansion of the current Site and would involve mining the existing waste, and designing and building a modernized landfill with additional capacity.

As a preliminary step, the options were evaluated at a high level to identify their benefits, what would be required to make each option feasible, and how the size of the site, the scale of the project, or the demand for the services provided might impact the Township's preference for it. This initial process was used to narrow down the number of options from five to three. Two options, developing the landfill without expansion and constructing a public drop-off depot, were eliminated on the basis that they did not provide sufficient benefit relative to the effort that would be required to move that option forward, and because it would not significantly fulfill the Township's needs.

Secondly, the three preferred options were evaluated at a high-level using a triple bottom line framework that considers social, environmental and financial impacts. In summary, this framework included three core questions:

- Social: How is the local community impacted by the option?
- Environmental: Can improvements to air, water and soil quality be made?
- Financial: How much will the option cost the Township?

The assessment of the three options assigned a numerical score for social, environmental and financial considerations for each option. To provide a rationale for the score, a qualitative analysis identified benefits and drawbacks in each area. To provide a level of detail that would further support the Township's decision-making processes, the report also provides financial and timing estimates and a description of the process and timeline required for the implementation of the option.

1.0 Introduction

Dillon Consulting Limited (Dillon) was retained by the Township of Huron-Kinloss (the Township) in November 2021 to evaluate landfill expansion options for the existing Kinloss Landfill (the Site) located at 690 Kairshea Avenue. This report evaluates five options for providing long-term capacity or alternative uses for the Site, which ranged from reopening the Site with and without expansion, as well as undertaking construction projects so that the Site can be used as a public drop-off depot, or by the Township as a composting facility or transfer station. Following a high-level evaluation of these five options, three potential uses are recommended for further investigation. After consultation with the Township, Dillon's evaluation criteria this assessment is based on a triple bottom line framework that considers social, environmental and financial outcomes.

The Township is located in western Ontario, adjacent to Lake Huron and is one of eight lower tier municipalities in Bruce County. Currently, lower tier municipalities are primarily responsible for most waste management services in Bruce County, including garbage collection and disposal, and curbside and depot recycling collection which is provided mainly by a not-for-profit organization, Bruce Area Solid Waste Recycling (BASWR). In total, the lower tier municipalities in Bruce County own eight open landfills that accept garbage from residential, industrial, commercial and institutional (IC&I) and some demolition customers and are responsible for the perpetual care of over 20 closed landfills. Notably, Bruce County is undertaking work to determine its future role the provision of solid waste management services. Currently the County provides a Household Hazardous Waste program for residents as well as promotion and educational materials. As the County works to review its opportunity to play an increased role in waste management, it may recommend waste diversion programs in order to prolong the life of lower tier municipalities and to meet the needs and expectations of its residents and visitors.

The Township currently operates two licensed landfill facilities, the Huron Landfill and the Kinloss Landfill. The Huron Landfill is currently the Township's primary disposal landfill and is anticipated to reach capacity around 2029. The Kinloss Landfill is currently only open to the public for four hours on Saturdays from April through October for the acceptance scrap metal, white goods, brush, tires, and recyclables[1]. The Township the transports received materials to other facilities for recycling or composting. Landfilling activities occurred at the Site over a 22 year period, but operations ceased two decades ago. The Dillon team had the opportunity to understand the scale and orientation of the landfill on October 7, 2021 when Township staff hosted a site visit.

1.1 Site Setting

As mentioned, the Township currently operates two licensed landfill facilities, the Huron Landfill and the Kinloss Landfill.

[1] Note: White goods will only be accepted by the Township if the resident has had Freon removed prior to arrival.

The Huron Landfill is located on part of Lots 19 & 20, Con. 5 in the County of Bruce (the former Huron Township). The Huron Landfill is approximately 17.7 hectares (43.74 acres), with 4.62 hectares of buffer lands acquired to the south. It has been in operation since 1988 and is approved for landfilling solid waste over an area of 8 hectares. In July of 2018, solid waste from the community of Lucknow was diverted to the Huron Landfill following the closure of the Mid-Huron Landfill which was located in Huron County. On October 15, 1991, the Ministry of Environment issued a Certificate of Approval (No. A272601) for the Huron Landfill. It was amended a number of times: February 12, 1993; February 27, 1996; and July 2010. The July 2010 amendment to the Certificate of Approval increased the solid waste capacity to 288,000 m^3 and, based on current volumes, it is estimated to have capacity until 2029.

The Kinloss Landfill is located at the north on part of Lot 16, Con. 6 in the former Kinloss Township in Bruce County. The existing conditions of the Kinloss Landfill are shown on Figure 1. The Kinloss Landfill is approximately 6 hectares (14.83 acres), with a primary landfilling area of 3.9 hectares. The Township also owns 3.0 hectares immediately to the south, and holds a 99-year lease on a 12.3 hectare property adjacent to the eastern side of the property. The Kinloss Landfill accepted solid waste from 1980 until 2002, when the amalgamated Huron-Kinloss Township decided to focus landfilling of waste at the Huron Landfill and only use the Kinloss Landfill for receipt of recyclables and brush waste. The Kinloss Landfill operates under the Provisional Certificate No. A-272801 from the Ministry of the Environment, dated October 1st, 1980. The Kinloss Landfill has a remaining landfilling capacity of approximately 85,600 m^3; however, it is not approved to accept waste at this time.

Six monitoring wells were installed in 1985 and sampling results have been documented in an annual monitoring report for the Site. The Township also commissioned a recent topographic survey of the Site on October 12, 2020 and completed a test pitting program to determine the limit of the waste.

2.0 Preliminary Site Options Evaluation

Five options for the future use the Site are evaluated below. To identify the benefits and barriers of each option, the subsections below describe the option and identifies what would need to be done to make it feasible. Each option also includes a note to describe what the Township might want to consider in the event that scale of activities, size of the property or demand for the service was adjusted. This preliminary analysis lays a foundation for Section 3 of this report, which will apply a triple bottom line assessment to three of these options.

2.1 Developing Landfill without Expansion

2.1.1 Description and Benefits

This option considers reopening the Site to use the remaining airspace without modifying the currently approved final contours. The benefit of this option would be to allow the Township to use the remaining landfill capacity available at the Site. Consideration of this option can function as a baseline against which to contract the other options presented, particularly the final one which expansion at the Site.

2.1.2 High-level Requirements

- This option would require a review by the Ministry of the Environment, Conservation and Parks (MECP) of environmental impacts of restarting landfilling operations. Because the Site does not meet current landfill standards, it is anticipated that the MECP would require significant changes to its design. An ECA amendment for landfill operations to restart is likely to require upgrades to modernize the Site and implement environmental controls, such as a leachate containment/ treatment system and a landfill gas capture system;
- It is recommended that Township staff complete a review of staff and operational resources (i.e., equipment) in order to determine the feasibility and costs of managing two operational landfill sites at once. The Township may wish to restart operations at the Kinloss Landfill only after the Huron Landfill has been closed to optimize the use of its assets and staff resources; and
- If the landfill is reopened without modifying the approved final contours, the Township would require a closure and perpetual care plan, as well as a plan for an alternative disposal site as its lifespan would be shortlived. Based on the remaining landfill capacity of 85,600 m^3 and the Townships' filling rate of 9,000 m^3 per year, the remaining lifespan of the site would only be approximately 9 years.

2.1.3 Scale, Size and Service Demand Considerations

This option considers the potential for the Kinloss Landfill to remain small in scale, as it does not provide an option to significantly increase its capacity/ lifespan. Not expanding the Site would mean that the

investments required to make it operational would be significant in relation to the value added. Section 2.5 discusses the scenario in which the landfill would be expanded.

2.2 Constructing a Public Drop-off Depot

2.2.1 Description and Benefits:

This option considers the construction of a public drop-off depot at the Site. The proposed depot would have an access road leading to an area where residents could unload household materials into designated bins. The benefit of this option would be to expand services offered to the public with the aim of increasing waste diversion.

2.2.1.1 High-level Requirements

- The Site is already permitted as a waste disposal site and that can accept scrap metal, white good, brush, tires and recyclables from the public, but would need to apply for an ECA amendment to permit the transfer of additional materials. This process would be relatively straightforward for this option as compared to other options discussed;
- Promotion and education materials would need to be updated to inform residents of the new depot. It should also be noted the Site is remote in comparison to the local population centres, and the travel distance may reduce resident participation;
- Because this option does not provide the Township with additional landfilling capacity, a separate long-term waste management solution is required; and
- The Township should conduct a further evaluation before selecting this option because of the potential lost opportunity and because the services offered through an expanded depot could be redundant and unnecessary. That is to say, the Township should consider whether this option underutilizes the Site from a permitting and landfill capacity utilization perspective to increase services for which there is low demand from residents.

2.2.2 Scale, Size and Service Demand Considerations:

The existing footprint of land that the Township owns would be suitable for traffic flow, bin set-up, and a staff area required for this option. Thus, there are no further expansion or scale considerations involved in considering this option from a site scaling perspective. For this option, attention should be paid to the extent of residents' demand for services and there may be insufficient rationale to support its development.

2.3 Constructing a Composting Facility

2.3.1 Description and Benefits

This option considers the construction of a composting facility at the Site which could be used to process organic waste from residential and IC&I sources.

The Food and Organic Waste Framework (Framework) which was released by MECP on April 30, 2018, provides one reason for considering this option. The Framework aims to reduce food and organic waste, recover resources from food and organic waste, support resource recovery infrastructure and promote beneficial uses of recovered organic waste. Its accompanying Policy Statement sets ambitious targets for waste reduction and resource recovery of food and organic waste, which vary based on different sectors (i.e., residential, institutional) and communities (based on population and population density).
While the Framework does not contain targets that are applicable to the Township, it indicates that a prohibition against disposing of organics in landfill is coming. Like the neighbouring municipalities in Bruce County, the Township does not currently have a program for the collection of household food and organic waste. This option would provide a processing facility that could be used if a program was introduced for the Township or the County, or if organic waste from another source, such as farms or businesses in the agricultural sector.

Because it is anticipated that the incoming tonnages would be relatively small, the analysis developed for this report assumes that a new composting facility would not include a biogas facility.

2.3.2 High-level Requirements

- An amendment to the ECA to allow for organic waste processing would be required;
- The Township should develop projections to better understand the potential tonnage of organic waste likely to be received at the Site. This would include reviewing quantities of brush already accepted and considering barriers such as the distance that resident need to travel to drop off their yard waste;
- To elaborate on the projections, the Township should also engage with Bruce County and/or other neighbouring townships and the agricultural sector to develop an understanding of opportunities for collaborating regionally to develop a strategy to manage organic waste;
- In engaging with the agricultural sector, the Township should also consider any other potential IC&I partners. Market research would aim to better understand the needs of the community for organic waste processing as well as any opportunities to sell finished compost to residents, farmers or other entities;
- A separate, long-term waste management solution would be required for the Township if this option were selected as it does not address the Township's need for landfill capacity;
- To advance reuse and demonstrate innovation in the waste management sector, the Township could further consider the feasibility of using the Site for the management of wood waste. This could include providing a space for processing wood (i.e., grinding) that is collection from construction and

demolition activities. Alternatively, the feasibility of collecting wood that is collected following extreme weather event, and granting limited access to community partners could be explored[2].

2.3.3 Scale, Size and Service Demand Considerations

Acquiring additional land adjacent to the Site could allow for a larger composting facility to be built. However, organic waste projections would provide further insight on whether the Township is likely to receive such quantities. In addition, the Township could engage with the County, to develop a regional forecast for organic waste. With additional land, the option of constructing a composting facility may also be combined with the construction of a Transfer Station option (see next option for more details). If such a program were to be considered, the Township would need to and would need to consider the costs, risks, and opportunities for initiating one separately or together with another municipality.

2.4 Constructing a Transfer Station

2.4.1 Description and Benefits

This option considers the construction of a Transfer Station to accept waste and/or recyclables. It would include areas for receiving, sorting, temporary storage and the loading of materials that would be processed/disposed off-site. The option does not include reopening the Site to landfilling operations, which would reduce requirements around modernizing the landfill and engaging in a lengthier approvals process.

Given the significant shift in the management of municipal Blue Box programs across the province as a result of the Waste Diversion Transition Act and Regulation 391/21, a new transfer station may be a desirable asset for the Township. The Township could consider whether a new transfer station would be operated by the Township or whether there would be an opportunity to enter into an agreement with another entity to lease and operate the facility.

2.4.2 High-Level Requirements

- An amendment to the ECA to allow for waste receiving, storage and transfer would be required;
- A separate, long-term waste management solution would be required for the Township if this option were selected as it does not address the Township's need for landfill capacity;
- A financial study would be required to understand the costs of disposal at an alternative landfill, including transportation;
- Bruce County is currently considering the future role and governance of BASWR and is investigating the potential for efficiencies of scale within waste diversion programs, including the Blue Box

[2] Refer to the City of Greater Sudbury's Construction and Demolition Materials Area at the Sudbury Landfill New Construction and Demolition Materials Area at Sudbury Landfill (greatersudbury.ca)
Refer to examples of wood reuse initiatives: Local sawmill makes sure trees downed by major wind storm won't go to waste | CBC News;

program. An initial step in considering the construction of a transfer station would include gathering information about the anticipated future needs of the County and BASWR. This would include better understanding the timing of anticipated changes as the Blue Box program is transitioned from municipalities to producers and as the provision of recycling services by BASWR will change.

2.4.3 Scale, Size and Service Demand Considerations

For the option of constructing a Transfer Station, acquiring additional land would allow for a larger Transfer Station to be built, which may be necessary once Huron Landfill reaches its landfilling capacity. As mentioned in the previous option, if additional land were to be acquired, the option to construct a Transfer Station could be combined the option to construct a Composting Facility.

2.5 Expanding the Landfill

2.5.1 Description and Benefits

This option considers expansion of the current Site and would involve mining the existing waste, developing additional airspace and designing and constructing modern landfill controls (i.e., a liner system and leachate collection system). This option offers the opportunity to maximize the Township's existing landfill assets, including the Site (physical property) and its ECA, and any recoverable recycling that was disposed in the landfill. The outcome of this option could be a new, modernized landfill site with capacity to receive waste from other jurisdictions.

Landfill mining involves excavating the landfilled waste in order to remove bulky items, recyclables (mainly ferrous metal) and excess soil. Landfill mining recovers landfill space, addresses environmental concerns, such as leachate plumes or lack of a liner, and allows for leachate and landfill gas collection systems to be installed.

Excavated waste can be processed through a rotating trommel screen to separate soil, metals, recyclables, etc. Bulky items (e.g., mattress or furniture) can be separated and shredded to reduce their volume before being re-landfilled. The removal of excess soils, ferrous metals, and other recyclables, along with the shredding of bulky items, can reduce the volume of waste to be redeposited and extend the lifespan of the landfill. Depending on what type, condition, and quantity of materials are recovered, recovered soils could be used on site as daily cover material, and recovered metals and recyclables could be sold. The waste would then be returned to the landfill once the landfill liner, leachate, and landfill gas collection systems are in place[3].

The Ontario Waste Management Association estimates that there are 14.5 years of remaining landfill capacity across Ontario and that over 60% of the disposal capacity in Ontario is located in seven landfills,

[3] Lawson, 2020

with smaller landfills being likely to reach their capacity limits earlier[4]. This option would provide a long-term waste management solution for the Township and would mean that a modernized landfill would be made available at a time when few others are.

The Township is well positioned to execute this option because of its ability to coordinate operations and with the Huron Landfill and to continue to use that site while construction is underway. It is proposed that following landfill mining, liner installation, leachate and landfill gas collection system installations, the Township would return excavated waste to the newly lined cell at the Kinloss Landfill and then regular landfilling operations could begin. It is assumed that if this option were selected, the Kinloss Landfill would not be utilized until the Huron Landfill has been closed to optimize utilization of equipment and staff, however, decisions about the extent of landfill mining processes, the management of excavated waste, the commissioning of the new landfill, etc. would be further evaluated at a later time.

2.5.2 High-level Requirements

- Further research, analysis and decision-making is required to better understand the appropriate scale for the expansion (i.e., identifying the ideal size of the Site and landfill operations);
- A new ECA would be required. The time and effort required for the approvals process will depend on decisions about the scale of the project;
- Public engagement and consultation will be required to inform and address concerns of the local community;
- Studies will be required to plan the landfill mining operations and to design the new landfill, including new environmental control systems (e.g., size and depth of landfill, type of liner, leachate management, landfill gas); and
- Studies will be required to plan surface water quality controls;
- There is no sanitary service to the site and leachate will need to be managed via either onsite treatment or by a holding tank and liquid trucked to a treatment facility.
- The capital cost, budget, and any funding available to undertake this work will require consideration.

2.5.3 Scale, Size and Service Demand Considerations

As compared to the other options, it is especially important to consider how scaling-up this option would benefit the overall outcome. If this option is selected, the Township could explore whether acquiring additional land around the Site would allow for an increased landfilling capacity, and would make better use of the investment made to develop the Site. Furthermore, it is possible that if the Site is expanded, other options could be selected alongside landfill expansion (i.e., a composting facility and transfer station could be included in the expansion plans). Lastly, an expanded site could present the

[4] OWMA, January 2021. "State of Waste in Ontario: Landfill Report", 1. State of Waste in Ontario: Landfill Report, January 2021 (owma.org)

opportunity to receive waste from surrounding townships, and tipping fees could be a revenue source for the Township.

2.6 Summary

Based on the preliminary site options evaluation, the following options will not be carried forward to the next stage of evaluation:

- Developing the landfill without expansion; and,
- Constructing a Public Drop-Off Depot.

Developing the site without expanding it is not recommended because of the lack of environmental controls currently in place and the small landfilling capacity that would be provided without a lengthy approval process, modernization, and potential need to expand the area of the Site by acquiring new land.

Dillon does not recommend further consideration of the Public Drop-Off Depot option due to the inefficient use of the land, coupled with the option not addressing the Township's long-term waste management needs.

The three remaining options that Dillon suggests giving further consideration to are:

- Constructing a Composting Facility;
- Constructing a Transfer Station; and
- Expanding the Landfill.

To use the Site and resources such as staff hours and equipment efficiently, the Township may also consider the potential to combine the remaining options, which could be even more feasible if additional land were to be acquired. For example, if the Township determines there is a need to construct both a composting facility and a transfer station, it would be efficient to go through the approvals process, planning and construction one time only. Also, once the Site becomes operational, there could be an opportunity to share staff and equipment between the two facilities. This example, however, does not addresses the Township's long term waste management needs, and therefore other combinations should also be considered. The option to expand the landfill, which includes expanding the Site's footprint, using landfill mining and modernize landfill controls, would be the best option to address long term management needs for the Township.

3.0 Triple Bottom Line Assessment

The triple bottom line assessment developed for this project takes into account social, environmental and financial implications of implementing the option. The assessment has been developed to answer the following core questions:

- Social: How is the local community impacted by the option?
- Environmental: Can improvements to air, water and soil quality be made?
- Financial: How much will the option cost the Township?

Table 1 provides the evaluation scheme used to assess the three options. To assign a score, the Dillon team applied the questions in the "Evaluation Criteria" column to each option and assigned an overall score for each area (social, environmental and financial). Equal weighting was given to each of the areas when the final score was calculated although the Township may wish to change the assigned score or the weighing as further information becomes available. For example, the Township may learn of funding sources or partnership opportunities that would offset costs and make the financial score less relevant.

Also, it should be noted that, while the score in each area was developed independently, there are ways that the three areas overlap in which overlap will occur. For example, once the Township moves into planning stages for its preferred option, further thought can be given to ways in which increased promotion and education (which is currently part of the Social score) can result in an improvement in the option's environmental score.

Table 1: Evaluation Matrix

Area	Evaluation Criteria	Ranking System
Social How is the community impacted?	• Does the option fulfill a community need and will it be appropriate for the community over the long-term? • Will there be an increase in nuisance concerns (e.g., noise, odours dust, truck traffic)? • Are there health & safety issues that cannot be mitigated, (e.g., injury on site if someone were to enter illegally or attempt to scavenge materials)? • Will the option provide increased access to services for residents at a convenient location? • Is there an opportunity to increase promotion and education about waste reduction and waste services?	1 to 3 The community is likely to resist the option or there is risk to the community; 4 to 6 Further consideration should be given; 7 to 9 The community is expected to benefit from the option.

Area	Evaluation Criteria	Ranking System
	• Will the option provide additional employment opportunities to the community and/or enhance the quality of work? • Might the option allow the Township to showcase an innovative idea or become known as a leader for a circular economy initiative that advances reuse and reduction or uses waste as a resource?	
Environmental Can improvements to air, water and soil quality be made?	• Does the option promote waste diversion, reuse or reduction? • Does the option reduce the quantity of organics disposed of in landfill? • Can landfill gas emissions be reduced? • Will transportation emissions from the transportation of materials be reduced (i.e., by managing waste close to its source)? • Is there a high risk of surface water contamination? • Can leachate be captured and treated? • Can end-products be used to improve soil quality?	1 to 3 Air, water and soil quality will be negatively impacted; 4 to 6 Risks can be mitigated to avoid environmental impacts; 7 to 9 Air, water and soil quality can be improved.
Financial How much will it cost the Township?	• What is the expected cost of an ECA amendment? • What is the expected cost for new site designs (e.g., new site plan, new features)? • What is the expected cost for construction (e.g., new features or major retrofitting of existing features)? • What operational costs are involved? • Are there long-term costs such as perpetual care / environmental monitoring? • What are the costs to the integrated waste management system as a whole (i.e., what are the costs if the option does not provide sufficient capacity and an alternative site is required)? • Are there opportunities to generate revenue (e.g., through user fees, disposal fees or the sale of waste products)? • Are there opportunities to defer capital costs, receive funding, or engage in cost sharing (e.g., pilot funding for new diversion programs or collaboration with other municipalities)text	1 to 3 The costs outweigh the benefits significantly; 4 to 6 Budgetary impacts are close to neutral; 7 to 9 There is opportunity for a positive financial business case.

3.1 Constructing a Composting Facility

As mentioned, this option considers the construction of a composting facility at the Site which could be used to process organic waste from residential and IC&I sources. A conceptual plan for a composting facility is shown on Figure 2.

3.1.1 Evaluation

Table 2 assigns a score for each area included in the triple bottom assessment (i.e., social, environmental and financial) and gives a rationale for the assigned score. The score and rationale were developed through consideration of the evaluation criteria presented in Table 1.

Table 2: Triple Bottom Line Assessment for Constructing a Composting Facility

Area	Score	Rationale
Social	6	Key benefits: This option would provide composting services to residents, institutions and businesses in the area, which is not highly demanded currently but could be in future years. It is likely that residents would support the construction of such a facility at the Site, however, the location is not particularly convenient for most people in the Township to access. Some jobs could be created as a result of selecting this option, but not as many as there would be compared to the other two options. It is possible that such a facility could be used to showcase an innovative program, such as wood reuse or diversion of construction and renovation waste. The Township could be recognized for its leadership in reuse and organic waste diversion. Key drawbacks: While there is some risk of odours from the facility, however, controls would be in place to mitigate the migration of odours outside of the property boundaries. Similarly, there is some potential dust created from facility operations, and controls would be in place to mitigate the production of dust from facility operations. Additional truck traffic accessing the Facility could result of disturbance to the community.
Environmental	7	Key benefits: This option would promote the diversion of organics from landfilling and support compliance with the anticipated ban on the disposal of organics in landfills.

Area	Score	Rationale
		The option would not only remove organic waste from landfill but also return nutrients to the soil to improve its quality. By reducing organic material in landfill, it would also reduce the amount of leachate and methane produced at the landfill. Key drawbacks: The location of the composting facility is not particularly close to a source of food waste and no collection program currently exists. Surface water runoff would need to be managed to ensure operations do not impact surface or groundwater quality outside of the property limits. Monitoring and control measures would need to be in place to mitigate these impacts.
Financial	5	Key benefits: The Site is permitted as a waste disposal site, and the Township would require an amendment to the existing ECA to change operations to a composting facility. This process would be less expensive than obtaining a new waste ECA application, and less expensive compared to application for a Transfer Station or Landfill Expansion. There could be revenue from tipping fees if organic waste was to be received from outside the Township. Also there could be revenue from the sale of finished compost, although the volume of compost generated is expected to be small. As a result of a reduction in landfill gas and leachate quantities, the Township could potentially see a decrease in management costs at the landfill, if less organic waste is disposed within the landfill. Key drawbacks: This option does not address the waste disposal or recyclables management for the Township, and the Township would still require a long-term waste solution be developed. The Township would still incur costs associated with disposal at an alternative site. Investments would be required for the design and construction of the composting facility including an access road, scale, drainage and erosion and sediment control features. Although there would be some design and construction costs associated with this option, it would be far less costly than the other options considered.

In summary, the option is desirable because it support diversion from landfill and recovers nutrients from organic materials to benefit soil quality. However, fairly significant investment would be required

for measures and controls to ensure that the composting facility does not negatively impact surface water.

3.1.2 Financial Estimate

To expand upon the financial analysis provided in the triple bottom line assessment, Table 3 provides the estimated cost/revenue and timeframe for key items associated with this option.

Table 3: Costs Estimates for Constructing a Composting Facility

Item	Estimated Cost
ECA Amendment and Permitting costs	$40,000 - $60,000
Compost Facility Design costs	$60,000 - $80,000
Compost Facility Construction costs	$75,000 – $125,000
Total One-Time Costs	$175,000 - $265,000
Annual Operating and Maintenance costs	$55,000/year

With the Site already being permitted with a Waste ECA, amending the current ECA to allow operation of a composting facility is expected to be relatively minor. The design and construction costs associated with the composting facility, likely a bunker-style facility based on the expected volume of material to be managed, is also small compared to the other two options.

There is the potential for sale of composted products, but this is not likely to generate a significant income for the facility due to the small yield and has been excluded from this cost estimate.

The cost to transport, dispose of wastes, and manage recyclables is not included with this option and would need to be evaluated separately. This would be a significant cost to the Township which is not included in this option, and lowers the Financial Assessment score of this option.

3.1.3 Process and Timeline

As an initial step, the Township would need to amend its ECA because it does not currently allow for the receipt and processing of organic waste. Also, one of the first tasks is for the Township to determine the desired type of composting system that it wishes to use, and the capacity that is required. This could include a review of the current tonnage managed by the Township, and communication with the County and stakeholders in the agricultural sector, and potential IC&I customers to identify whether there is demand for additional organic waste processing from neighbouring jurisdictions or other sectors.

Once plans have been made and an ECA amendment has been approved, the Township can move forward with designing the Site. Construction activities including an access road, scale, as well as drainage and erosion and sediment control features would not take more than a month to build based

on the conceptual design. Construction of a bunker-style composting facility that managements approximately 560 metric tonnes per year can be expected only require a few weeks.

3.1.4 Recommendations

While the site could be repurposed as cost-effective composting yard, the main drawback of this option is that waste disposal and recyclables management is not addressed at all and would need to be addressed by another means.

3.2 Constructing a Transfer Station

As mentioned, this option considers the construction of a transfer station to accept waste and/or recyclables. The transfer station would include areas for receiving, sorting, temporary storage and the loading of materials that would be processed/disposed off-site. A conceptual plan for a transfer station facility is shown on Figure 3.

3.2.1 Evaluation

In keeping with the assessment process used for the previous option, Table 4 assigns a score for each area included in the triple bottom assessment (i.e., social, environmental and financial) and gives a rationale for the assigned score. The score and rationale were developed through consideration of the evaluation criteria presented in Table 1.

Table 4: Triple Bottom Line Assessment for Constructing a Transfer Station

Area	Score	Rationale
Social	6	Key benefits: This option continues the provision of service that is already in place: residents can already drop off materials diversion at the Site. This may simplify promotion and education and support waste diversion efforts. There could be some employment opportunities that result from operations at the facility, however, the number of jobs would be smaller with this option than with landfill expansion. There is an opportunity to enhance waste diversion by establishing new programs at the site, such as the collection of construction and demolition materials. Key drawbacks: This option would still require that a long term waste solution be developed. Waste and recyclables would be collected and compacted for shipment, but the ultimate waste disposal and recyclables management arrangement would need to be determined.

Area	Score	Rationale
		Truck traffic would increase as a result of vehicles accessing the Facility which could be a nuisance for other road users. However, including a waste compactor in site designs would reduce the number of vehicles required. Potentially, odours from the facility could impact neighbouring properties. However, controls can be in place to mitigate this risk. Security measures are likely to be required to ensure that the public does not access the Site without cause and so that scavenging does not occur (e.g., if there are unattended bins for scrap metal).
Environmental	6	Key benefits: The Site would not be a long term liability for the Township. If the Facility were to close, no long term monitoring of the Site would be required. Key drawbacks: To reduce nuisance concerns, particularly odour, waste would only be stored at the transfer station for a short time. This option does not provide a long-term waste solution and depends instead on the transportation of waste to another site(s).
Financial	6	Key benefits: The Site is already permitted as a waste disposal site and it is relatively inexpensive to amend an ECA than to apply for a new ECA. Furthermore, monitoring or reporting costs would be comparable to what is currently completed at the Site. Key drawbacks: While waste and recyclables will be collected and prepared for transport, this option would still require a long term waste solution be arranged for waste disposal and recyclables management. Investments would be required for the design and construction of the transfer station, including an access road, drop off locations, an area to retain the waste, drainage and erosion and sediment control features.

In summary, the option to construct a Transfer Station Measures and controls would need to be in place to ensure that the new facility does not negatively impact the lands outside of the property boundaries, and to reassure residents of this; however, there are not major concerns with this type of Facility since the waste is only temporarily stored at the Site.

3.2.2 Financial Estimate

To expand upon the financial analysis provided in the triple bottom line assessment, Table 5 provides the estimated cost/revenue and timeframe for key items associated with this option.

Table 5: Cost Estimates for Constructing a Transfer Station

Item	Estimated Cost
ECA amendment costs	$80,000 - $120,000
Transfer Station Design costs	$80,000 - $120,000
Transfer Station Construction costs	$400,000 - $600,000
Total One-Time Costs	$560,000 - $840,000
Annual Operating and Maintenance costs	$200,000/year
Tipping fees earned (assuming a $115/MT tipping fee)	+ $310,000/year

With the Site already being permitted with a Waste ECA, amending the current ECA to allow operation of a transfer station would be easier than at an undeveloped property. The design and construction costs associated with a new transfer station are much less than for a landfill expansion.

The cost to transport, dispose of wastes, and manage recyclables is not included with this option and would need to be evaluated separately. This could be a major cost to the Township depending on the agreement made with the receiver, however, a Transfer Station would allow the Township to efficiently transport waste to a receiver. This option addresses most of the process for waste and recyclables management, and allows the Township a long-term option which does not require landfilling within the Township.

3.2.3 Process and Timeline

Once a decision has been made to proceed with this option, the Township will need to develop a site plan and design and apply for an amendment to its ECA.

Once plans have been made and an ECA amendment has been approved, the Township can move forward with an approval of site design, which is anticipated to take a few months. Construction activities would include an access road, scale and scale house, receiving and storage areas, as well as drainage and erosion and sediment control features.

3.2.4 Recommendations

While a Transfer Station would not completely address the waste management needs for the Township (waste disposal and management of recyclable would need to be arranged) this option is quite promising and a good future use for the site.

3.3 Landfill Expansion

As per the description in Section 2.5, this option considers expansion of the current Site and would involve mining the existing waste, developing additional airspace and designing and constructing

modern landfill controls (i.e., a liner system and leachate collection system). A conceptual plan for a landfill expansion is shown on Figures 4 and 5.

3.3.1 Evaluation

Following the evaluation process used for the preceding two options, Table 6 assigns a score for each area included in the triple bottom assessment (i.e., social, environmental and financial) and gives a rationale for the assigned score. The score and rationale were developed through consideration of the evaluation criteria presented in Table 1.

Table 6: Triple Bottom Line Assessment for Landfill Expansion

Area	Score	Rationale
Social	6	Key benefits: The option provides a long-term waste disposal site in proximity to the community that will be available over the long-term, at a time when Ontario's overall landfill capacity is declining quickly. Employment opportunities would result from the expansion and staff currently employed at the Huron Landfill may quality for positions when waste disposal moves over. The community could be engaged and consulted with during the planning stages. Key messages in information provided about the project could stress the importance of waste diversion and the lack of landfill capacity across Ontario. Key drawbacks: Nearby residents including the owners of adjacent properties may be concerned about the expansion. The option could present nuisances for the community: Truck traffic would increase as a result of vehicles accessing the landfill. Potentially, odours or pests (e.g., gulls, rats) could impact neighbouring properties. However, controls can be in place to mitigate these risks.
Environmental	4	Key benefits: The Site currently lacks proper environmental controls and these would be put in place (i.e., base liner system, leachate collection system, landfill gas management, additional groundwater and surface water monitoring, etc.). There is an opportunity to enhance waste diversion by combining this option with another (e.g., include compost facility in Site plans).

Area	Score	Rationale
		Key drawbacks: There is a risk of surface water contamination and mitigation measures would be required to ensure that environmental controls are in place.
Financial	1	Key benefits: This option represents a long-term investment but addresses the Township's waste management needs for the expanded life of the Site. Revenue could be generated through tipping fees. The Township can coordinate operations (e.g., commissioning and decommissioning dates) and the use of resources (e.g., staff and equipment) between the Huron Landfill and the expanded Kinloss Landfill, which is likely to result in efficiencies and financial savings. Key drawbacks: This option is the most costly of the options with regards to the ECA. Construction of the Site and its environmental controls would be a significant capital investment. Costs associated with annual monitoring and long-term monitoring of the Site would be significant. Costs associated with addressing the lack of sanitary access, either managing it on Site or building in a forcemain to remove it from Site to be treated elsewhere (holding tank and forcemain infrastructure costs).

In summary, the option to expand the landfill considers the long-term disposal needs compared to the other options. It is also the most costly and large scale of the options, and would only be reasonable if it could be undertaken at scale (so as to invest in landfill capacity for a longer time period).

3.3.2 Financial and Timing Estimates

To expand upon the financial analysis provided in the triple bottom line assessment, Table 7 provides the estimated cost/revenue and timeframe for key items associated with this option.

Table 7: Cost Estimates for Landfill Expansion

Item	Estimated Cost
ECA application costs	$900,000 - $1,300,000
Landfill Expansion Design costs	$300,000 - $500,000
Landfill Mining costs (not including bulk excavation)	$1,100,000 - $1,500,000
Landfill Construction costs (including bulk excavation, base liner system, leachate collection system)	$3,500,000 - $5,100,000
Supporting Construction costs (including scale, scale house, office, entrance paving, new potable well, septic holding tack, leachate holding tank)	$650,000 - $950,000
Total One-Time Costs	$6,450,000 - $9,350,000
Annual Operating and Maintenance costs	$700,000/year
Tipping fees earned (assuming a $115/MT tipping fee)	+ $4,300,000

3.3.3 Process and Timeline

Once a decision has been made to proceed with this option, the Township will need to develop a site plan and design and apply for an amendment to its ECA. Due to the proposed additional waste volume that would be part of this expansion, the site would need to undergo the full Environmental Assessment process. This process would likely take over a year to complete and secure approval. Design would likely take a minimum of six months to a year, with construction being completed the following year.

3.3.4 Recommendations

While a landfill expansion at the site would maximize the landfilling capacity at the Site, include the addition of modern environmental protections, and address the waste disposal needs for the Township beyond what the Site is currently approved for, the landfilling capacity increase is relatively small. However, if additional land could be secured a landfill expansion option would be much more feasible and could potentially meet the Townships' waste disposal needs for many years.

3.4 Triple Bottom Line Assessment Conclusion

The result of the triple bottom line assessment favours the option to further evaluate the potential for developing the site as a Transfer Station. The total scores are provided in Table 8.

Table 8: Assessment Summary

Triple Bottom Line Area	Compost Facility	Transfer Station	Landfill Expansion
Social	6	6	6
Environmental	7	6	4
Financial area	5	6	1
Total	17	18	11

4.0 Next Steps

The Township can use the results of this assessment to further understand the social, environmental and financial implications of the three options discussed. The assessment is intended to support the Township's decision making as it learns more about the practicality of these options and the potential for stakeholders, such as Bruce County, to join the discussion.

Another next step for the Township is to contact the MECP to learn more about the steps involved in applying for the appropriate ECA amendment or new ECA.

5.0 Conclusions & Recommendations

Recommendations:

- Investigate potential options for waste disposal outside of the Township as part of a Transfer Station option.
- Investigate the potential for the Township to secure additional land adjacent to the Site, and if so, evaluate the potential for a landfill expansion further.

6.0 References

Lawson, E. (2020, April 01). Landfill Mining and Its Tremendous Potential. Retrieved from Waste 360: https://www.waste360.com/landfill-operations/landfill-mining-and-its-tremendous-potential

Figures

CON 6 LOT 15
730 KAIRSHEA AVE

LOCKART STREET

KAIRSHEA AVE

CON 5 PT LOT 16; RP 3R1300 P
697 KAIRSHEA AVE

HP

WELL

CSP CULVERT

FENCE (TYP.)

GRAVEL ACCESS ROAD

EDGE OF ASPHALT ROAD

TREE LINE (TYP.)

CON 6 PT LOT 16; RP
3R4858 P
690 KAIRSHEA AVE

NOT FOR CONSTRUCTION

NOTE:
1. EXISTING TOPO SHOWN FROM SURVEY COMPLETED BY SMC GEOMATICS DATED OCTOBER 12, 2020.

1:2000 20 0 25 50 75 100m

DILLON CONSULTING

DATE July 2022

PROJECT KINLOSS LANDFILL
PRELIMINARY SITE OPTIONS EVALUATION

PROJECT NO. 22-4087

TITLE EXISTING CONDITIONS SITE PLAN

FIGURE NO. 1

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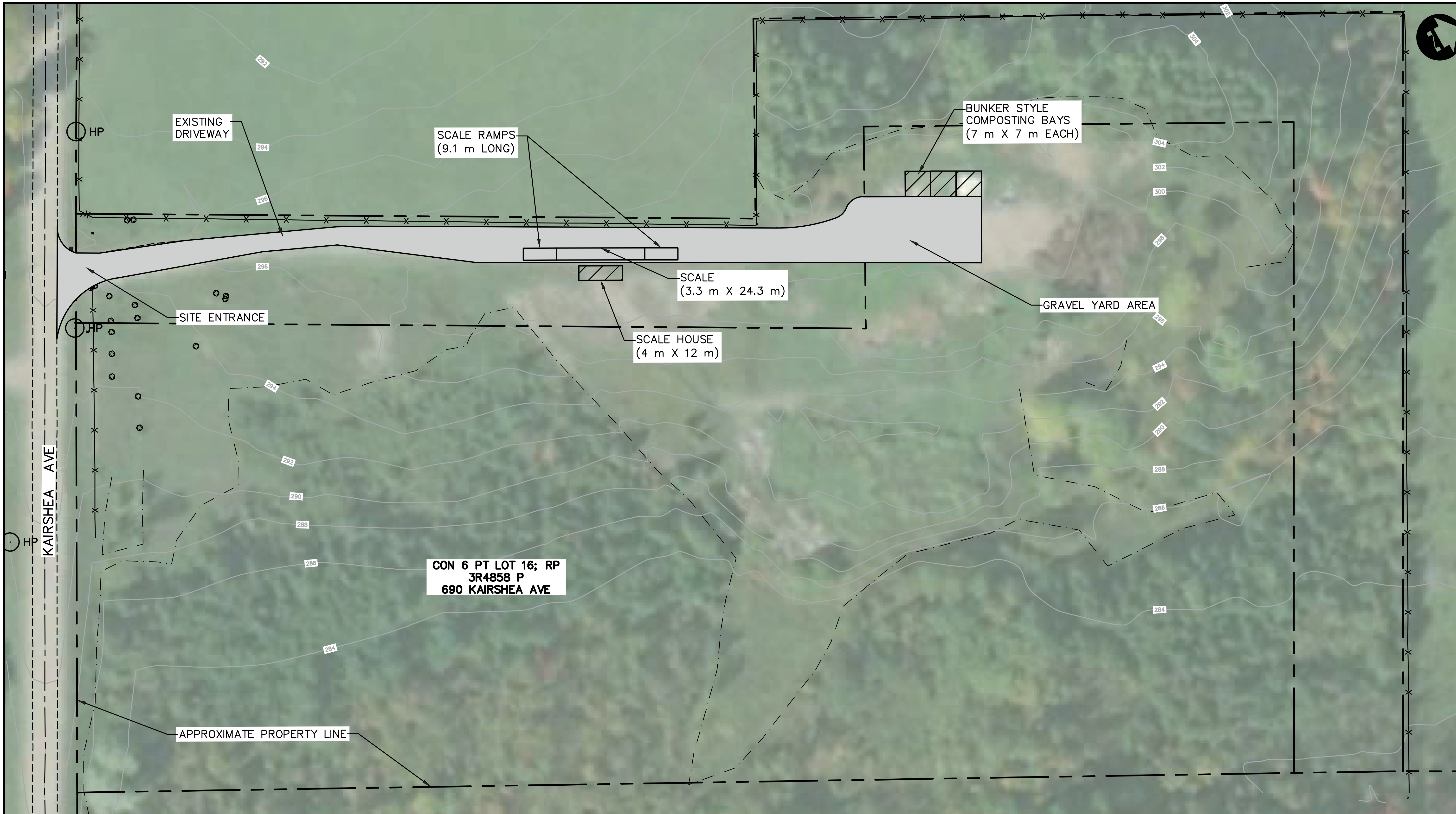

NOT FOR CONSTRUCTION

NOTE:
1. EXISTING TOPO SHOWN FROM SURVEY COMPLETED BY SMC GEOMATICS DATED OCTOBER 12, 2020.

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DILLON CONSULTING

DATE July 2022

PROJECT
KINLOSS LANDFILL PRELIMINARY SITE OPTIONS EVALUATION

PROJECT NO. 22-4087

TITLE
PROPOSED SITE PLAN WITH COMPOSTING FACILITY

FIGURE NO. 2

FileName:c:\pw working directory\projects 2022\dillon_43bqs\dms21793\224087-02-site-con.dwg

EXISTING DRIVEWAY

SCALE RAMPS (9.1 m LONG)

OFFICE BUILDING (10 m X 10 m) WITH 4 PARKING SPOTS

TRANSFER STATION (25 m X 20 m)

SCALE (3.3 m X 24.3 m)

SCALE HOUSE (4 m X 12 m)

PAVED AREA

SITE ENTRANCE

HP

KAIRSHEA AVE

CON 6 PT LOT 16; RP 3R4858 P
690 KAIRSHEA AVE

APPROXIMATE PROPERTY LINE

NOT FOR CONSTRUCTION

NOTE:
1. EXISTING TOPO SHOWN FROM SURVEY COMPLETED BY SMC GEOMATICS DATED OCTOBER 12, 2020.

1:1000 10 0 10 20 30 40 50m

DILLON CONSULTING

DATE July 2022

PROJECT KINLOSS LANDFILL
PRELIMINARY SITE OPTIONS EVALUATION

PROJECT NO. 22-4087

TITLE PROPOSED SITE PLAN WITH TRANSFER STATION

FIGURE NO. 3

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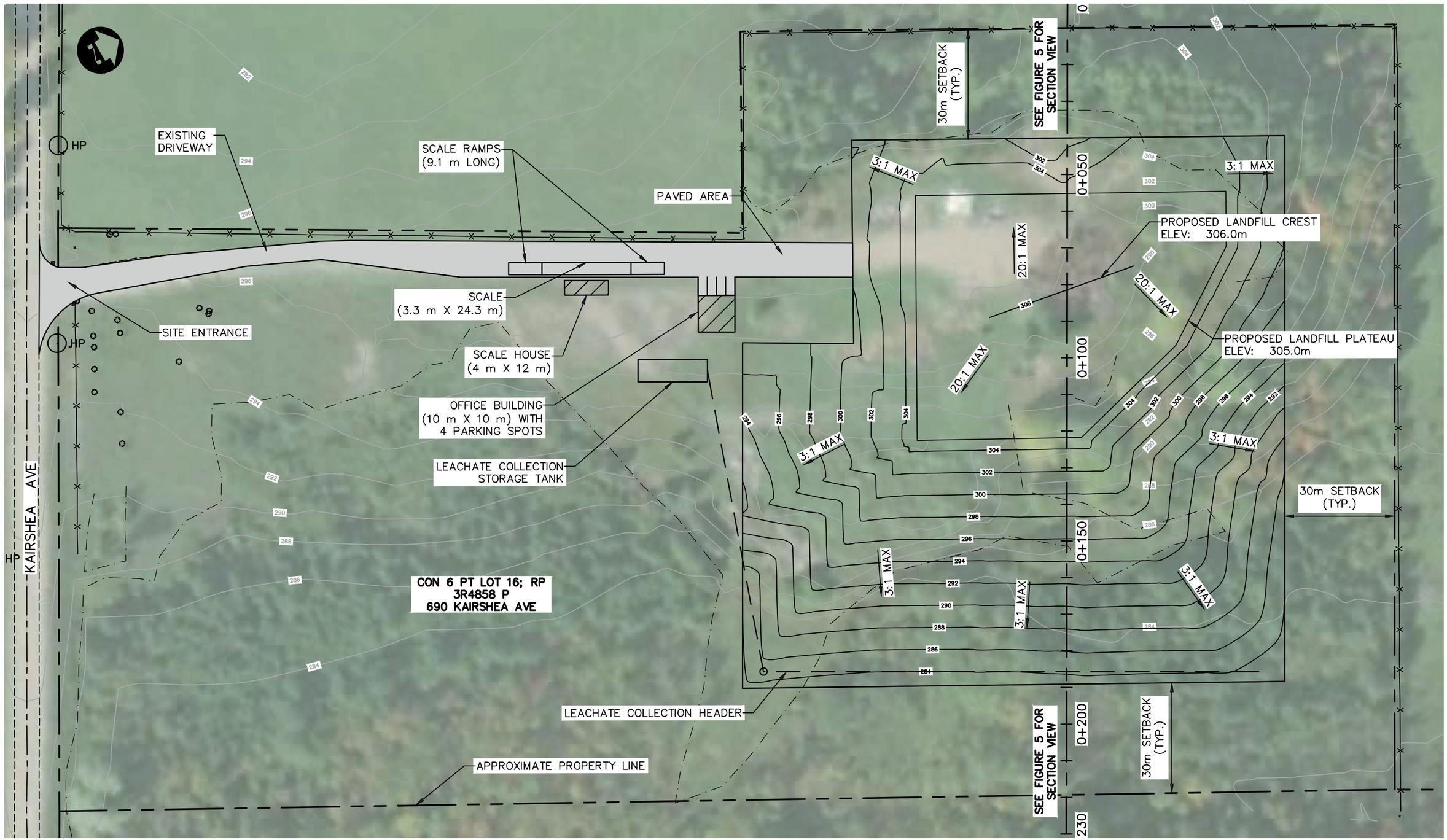

NOT FOR CONSTRUCTION

NOTE:
1. EXISTING TOPO SHOWN FROM SURVEY COMPLETED BY SMC GEOMATICS DATED OCTOBER 12, 2020.

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DILLON CONSULTING

DATE July 2022

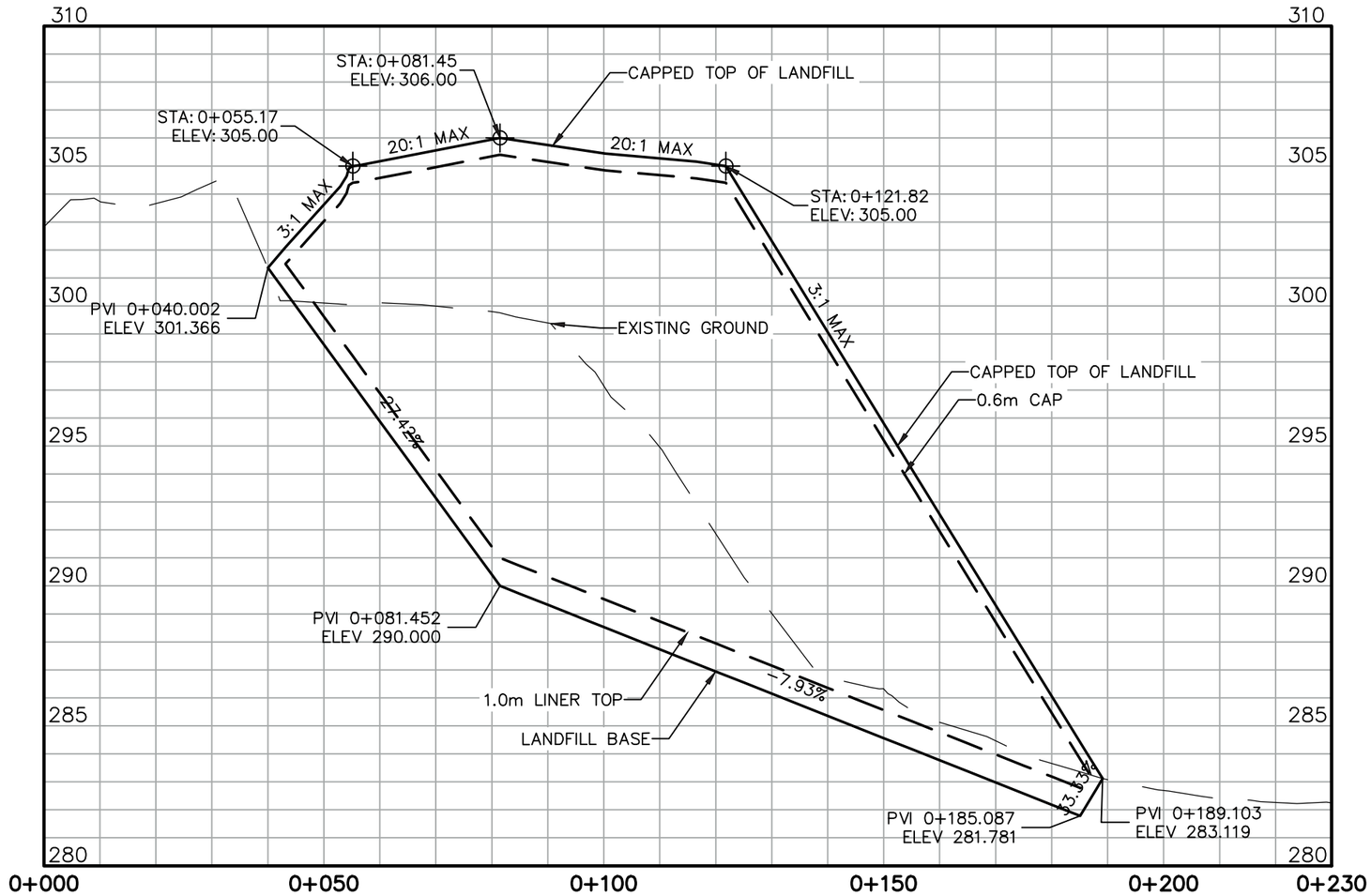
PROJECT KINLOSS LANDFILL
PRELIMINARY SITE OPTIONS EVALUATION

PROJECT NO. 22-4087

TITLE PROPOSED SITE PLAN WITH LANDFILL EXPANSION

FIGURE NO. 4

FileName:c:\pw working directory\projects 2022\dillon_43bqsldms2\1793122\4087-02-prlf-con.dwg



NOT FOR CONSTRUCTION

NOTE:
1. EXISTING TOPO SHOWN FROM SURVEY COMPLETED BY SMC GEOMATICS DATED OCTOBER 12, 2020.

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VERT. 1:200 2 0 2 4 6 8 10m

DILLON CONSULTING

DATE July 2022

PROJECT KINLOSS LANDFILL
PRELIMINARY SITE OPTIONS EVALUATION

PROJECT NO. 22-4087

TITLE PROPOSED SITE PLAN
WITH LANDFILL EXPANSION - SECTION

FIGURE NO. 5

FileName:c:\pw working directory\projects 2022\dillon_43bqsldms2179312240 87-02-prlf-con.dwg