DRAFT FOR DISCUSSION

Stoney Creek Regional Facility Environmental Assessment

Draft Proposed Terms of Reference

GHD terrapure

1195 Stellar Drive, Unit #1 Newmarket Ontario L3Y 7B8 Canada
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1. Introduction

The Terms of Reference (ToR) sets out the proposed framework that will be followed during the preparation of the Stoney Creek Regional Facility (SCRF) Environmental Assessment (EA) to satisfy the applicable requirements of the Ontario *Environmental Assessment Act* (*EA Act*, Act). For proposed "undertakings" in the Province of Ontario that are subject to the EA Act, a ToR is the first step of a two-step approval process. A ToR is a document prepared by a proponent that sets out the framework or work plan for the planning and decision-making process to be followed during preparation of the EA. A ToR is submitted to the Ontario Minister of the Environment and Climate Change (Minister) for approval.

The SCRF is owned and operated by Terrapure Environmental Ltd., herein referred to as Terrapure (Owner, Proponent). This Draft proposed ToR provides the framework Terrapure is proposing to reconfigure its SCRF back to its original Ministry of the Environment and Climate Change-approved footprint to continue to accept additional post-diversion solid, non-hazardous industrial residual material. This reconfiguration would allow Terrapure to utilize the existing space more efficiently while retaining the same overall geographic size of the site and continue to serve nearby industries and the community of upper Stoney Creek and the City of Hamilton. In order to reconfigure the SCRF, Terrapure is required to follow the two-step approval process, starting with the ToR.

The SCRF is located at the northwest corner of Mud Street and Upper Centennial Parkway (Highway 20) in the community of upper Stoney Creek (see **Figure 1.1**) and has been part of the local community since it was approved by the Ministry of the Environment and Climate Change (MOECC) in 1996.

The SCRF is unique in Ontario in that it only takes in excavation materials and by-products from industries, such as local steel production. The highly engineered site ensures maximum environmental protection and has been called "state of the art" by an independent panel of experts[1]. The SCRF, which operates under Environmental Compliance Approval (ECA) No. A181008, as amended, has a total approved site capacity of 8,320,000 cubic metres (m^3) (6,320,000 m^3 for solid, non-hazardous residual material and 2,000,000 m^3 for industrial fill), with an approved maximum annual volume of 750,000 tonnes. The proposed reconfiguration would not change the type or annual volume of residual materials currently accepted at the facility, nor the maximum number of vehicles to the site per day. The existing SCRF is only permitted to accept solid, non-hazardous residual material from commercial, industrial and institutional sources. These are truly "end of life" materials that have exhausted all recycling options. Putrescible waste (i.e., municipal solid waste, organic material) disposal is not permitted at the SCRF.

The SCRF is expected to reach capacity in the next 16 to 22 years, accepting a combination of residual material and industrial soils or "fill," which is required to bring the site to final grade. By changing the configuration of the site and accepting more residual materials than industrial soils, it is expected that the SCRF may be able to close sooner (13-20 years) than currently anticipated because the market for residuals is much stronger and more consistent than that for soils.

This proposal would also mean that Terrapure would continue to provide over $1 million additional dollars each year to the community while remaining in operation as it relates to accepting residual

[1] Final Report: Taro East Landfill Expert Panel 4 October 2000

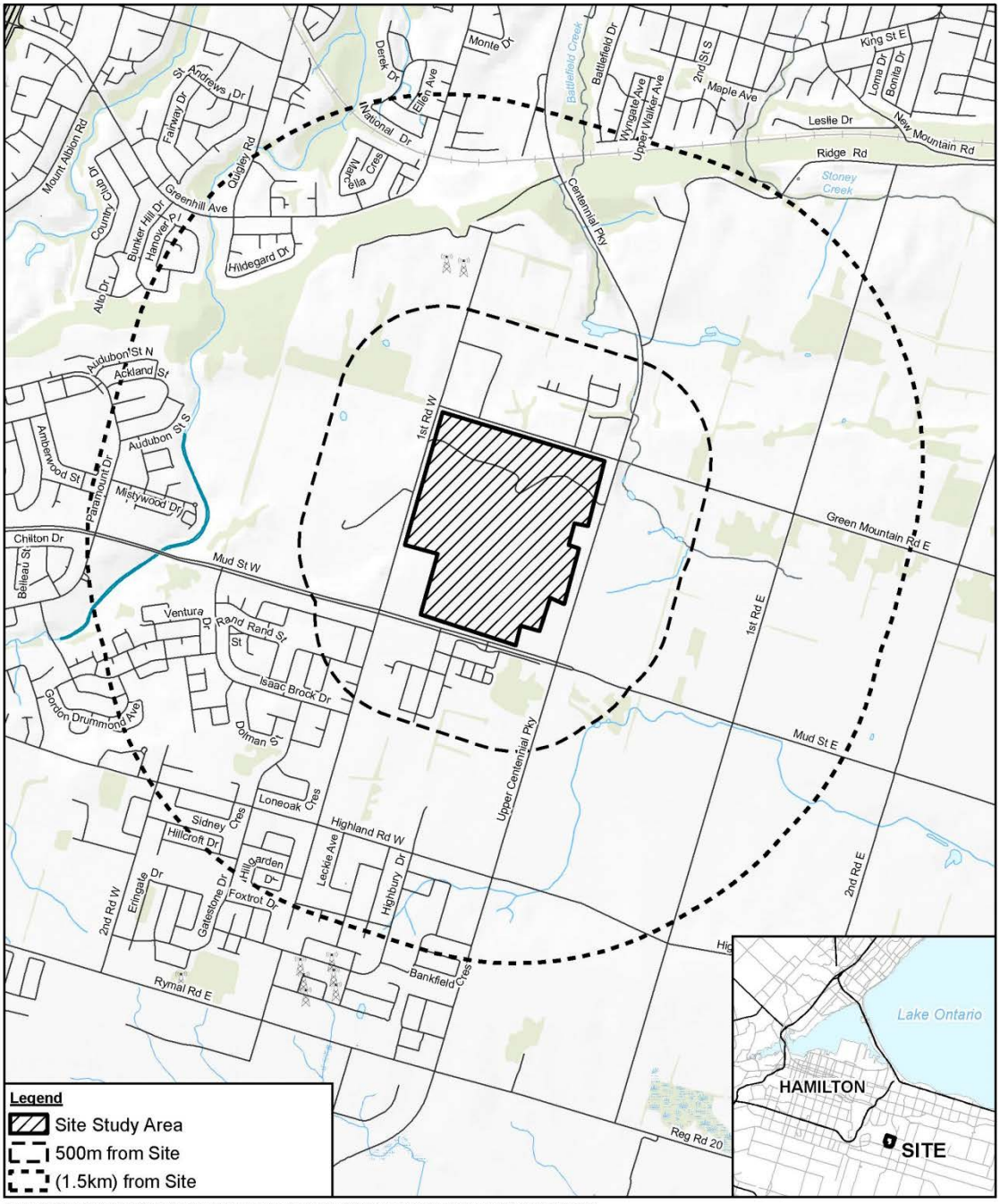
materials. Terrapure has provided over $22 million to the City of Hamilton and the Heritage Green Community Trust for local infrastructure projects and charitable initiatives over the history of the SCRF, based on a $1 per tonne agreement with both the City of Hamilton and the Heritage Green Community Trust.

The Draft proposed ToR has been prepared in accordance with Sections 6(2)(c) of the *EA Act*, which sets out the commitments of the Proponent for the preparation of the EA. The EA will be prepared in accordance with subsection 6.1(3) of the *EA Act*. In addition, the ToR has been prepared in accordance with and having regard for the following MOECC guidance documents:

- Code of Practice Preparing and Reviewing Terms of Reference for Environmental Assessments in Ontario (MOECC, January 2014)
- Code of Practice Preparing and Reviewing Environmental Assessments in Ontario (MOECC, January 2014)
- Code of Practice Consultation in Ontario's Environmental Assessment Process (MOECC, January 2014)
- Guide to Environmental Assessment Requirements for Waste Management Projects in Ontario (MOECC, March 2007)

The Notice of Commencement for the ToR was issued on June 7, 2016. The Draft proposed ToR has been prepared for consultation with interested parties. A Record of Consultation will be prepared and submitted to the MOECC, along with the Draft proposed ToR, describing the consultation program during the ToR and its results.

Figure 1.1 Site Location



Source: MNRF NRVIS, 2015. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2016
Inset Map: ESRI Data & Maps 2008 Data Distribution Application (DDA)

GIS File: N:\CA\Newmarket\Projects\Projects in Progress\8-chars\11------\1110----\111027--\11102771\05 - EA\GIS Figures\MXD\11102771-00(INT007)GIS-WA001.mxd

2. Identification of the Proponent

The Proponent for the SCRF EA is Terrapure Environmental Ltd., owners and operators of the SCRF. Terrapure is a leading Canadian provider of innovative, cost-effective environmental services and recycling solutions that help address industry's most complex environmental challenges. With an unwavering focus on environmental, health and safety excellence, the company provides services that minimize waste and maximize the recovery or recycling of valuable industrial by-products through a coast-to-coast facility network and on customer sites.

3. Identification of How the EA will be Prepared

Terrapure has prepared the Draft proposed ToR in accordance with subsection 6(2)(c) of the *EA Act*, which allows Terrapure to set out in detail the requirements for the preparation of the EA. The EA will consist of those items listed in subsection 6.1(2) of the *EA Act* as described in these ToR, as permitted by subsection 6.1(3) of the Act. Terrapure intends to follow subsections 6(2)(c) and 6.1(3) to describe the rationale and alternatives within the ToR.

The MOECC Code of Practice *Preparing and Reviewing Terms of Reference for Environmental Assessments in Ontario* (January, 2014) outlines how a proponent can proceed under subsection 6(2)(c) and 6.1(3) if the proponent is further along in the defined planning process and additional detail is known regarding their proposal. As an example, The Code of Practice states:

…what is reasonable for one proponent to implement may not be reasonable for another when trying to solve a similar problem because the circumstances between proponents may vary widely. A private sector proponent's inability to expropriate land or implement public programs will influence the range of alternatives it may examine.

As it relates to the Proponent and its business, the Code of Practice also makes reference to private sector proponents in the waste industry as follows:

> *The private sector proponent may only consider landfill or on-site diversion because:*
>
> - *It cannot implement a municipal waste diversion program such as curbside recycling;*
> - *Export would affect their business; and,*
> - *Thermal technology is not economically viable because waste volumes are too small.*

Terrapure is a privately owned and operated company, conducting business in the Province of Ontario. As such, the question as to whether there is a need for the services that Terrpaure provides is largely based on business decisions. Similarly, the question as to how they it provide these services is a Terrapure business decision. A specific example as it relates to the proposed undertaking is demonstrated through the recent indications and experiences that Terrapure is encountering with respect to external markets for residual materials and industrial fill – the market for residual material is much stronger and more consistent than that for industrial fill. Discussion on the Rationale for the Undertaking, as well as what alternatives Terrapure is able to consider, were prepared within the context of Terrapure operating the SCRF as a private facility within the Province of Ontario and are highlighted in Supporting Documents #1 and #2 to the ToR.

Based on the above, following approval of the ToR, Terrapure will prepare an EA and submit an EA Report for review and approval by the Minister that will contain the following:

1. A further description of the *purpose* of the undertaking.
2. A refined *description* of the undertaking based on the consideration of alternative methods and detailed impact assessment.
3. The *rationale* for the undertaking, as described in Section 5 of the ToR.
4. The *alternatives to the undertaking*, as described in Section 6 of the ToR.
5. A description of the *environment potentially affected* by the undertaking.
6. An assessment of the *alternative methods* of carrying out the undertaking. Terrapure will consider the alternative methods described in Section 6.2 of the ToR.
7. A description of the *effect*s that will be caused or that might reasonably be expected to be caused on the environment by the undertaking or the alternative methods.
8. A description of *mitigation measures* that are necessary to prevent or reduce significant adverse effects on the environment.
9. An evaluation of the *advantages and disadvantages* to the environment as a result of the undertaking and the alternative methods.
10. A description of *consultation* undertaken by Terrapure in association with the EA.

Further to the above, the following additional aspects not normally part of the Ontario EA process are proposed for the SCRF EA:

- Assessment of the effects of the environment on the project, specifically as it relates to Climate Change Adaptation and Mitigation, as well as how the proposed undertaking may contribute to the reduction of greenhouse gas (GHG) emissions.
- Assessment of the cumulative effects of the proposed undertaking and other non-SCRF projects/activities that are existing, planned and approved or reasonably foreseeable.

3.1 Organization of this Terms of Reference

The Draft proposed ToR has been prepared in accordance with the following MOECC Codes of Practice and guidance documents:

- *Code of Practice Preparing and Reviewing Terms of Reference for Environmental Assessments in Ontario (MOECC, January 2014)*
- *Code of Practice Consultation in Ontario's Environmental Assessment Process (MOECC, January 2014)*

This document contains the Draft proposed ToR, four appendices, four Supporting Documents and a Record of Consultation, as follows:

- **Section 1** of this ToR provides background information about the project
- **Section 2** identifies the proponent

- **Section 3** identifies how the EA will be prepared well as the purpose and organization of this ToR, appendices, and supporting documents
- **Section 4** describes the purpose of the proposed undertaking
- **Section 5** provides an overview of the analysis and rationale to determine the undertaking
- **Section 6** provides an overview of the alternatives to the undertaking and identifies and describes the alternative methods of implementing the proposed undertaking
- **Section 7** provides an overview of the environment that may be affected by the proposed undertaking and a description of study areas that will be used to characterize existing environmental conditions and to conduct the assessment of effects
- **Section 8** provides an overview of the proposed methods for conducting the comparative evaluation of alternatives
- **Section 9** describes the proposed commitments and monitoring strategy
- **Section 10** summarizes the consultation plan for the EA
- **Section 11** describes the flexibility for accommodating new circumstances during the EA
- **Section 12** outlines the other approvals potentially required for the undertaking
- **Appendix A** is a Glossary of Terms
- **Appendix B** contains a more detailed list of the proposed Evaluation Criteria, Indicators and Data Sources for the evaluation of Alternative Methods
- **Appendix C** is the proposed work plans for conducting the EA and individual environmental components
- **Appendix D** is a description of the proposed ToR commitments
- **Supporting Document 1** is a presentation of the purpose and description of and Rationale for the Undertaking
- **Supporting Document 2** is the description of and rationale for the Alternatives To Evaluation
- **Supporting Document 3** is a description of the Environment
- **Supporting Document 4** is a description of the Alternative Methods and Evaluation Methodology

4. Background & Purpose of the Undertaking

4.1 History of the Stoney Creek Regional Facility

Terrapure has a been a fixture in the Stoney Creek/Hamilton area for over 20 years, providing environmental services to numerous local and Ontario-wide generators of solid, non-hazardous industrial residual material. Terrapure operate the SCRF, which is a unique facility in Ontario, in that it only accepts solid, non-hazardous industrial residual material, consisting mainly of waste from the steel making industry (i.e., basic oxygen furnace oxide, slag, foundry sand) and soils from contaminated site cleanups.

The existing SCRF has been in operation since 1996 when it was approved by the Minister following the successful completion of an EA. The SCRF's total approved disposal capacity under the Environmental Protection Act (EPA) approvals is 6,320,000 m^3 for residual materials, with an additional allowance for acceptance of 2,000,000 m^3 of industrial fill/soils, for a site total of 8,320,000 m^3. The annual maximum approved fill rate for the site is 750,000 tonnes per year. Newalta Corporation acquired the site in 2006 from PSC Industrial Services Canada, and Terrapure took over ownership in 2015 with their acquisition of the former industrial division of Newalta.

The SCRF is an engineered landfill site that ensures maximum environmental protection through a double-liner system. The site is constructed with two levels of natural clay liner and a single geosynthetic membrane liner along with extensive leachate and groundwater collection systems. The liner system is approximately 10 feet thick and provides protection to the natural environment. The design has been called "state of the art" by an independent panel of experts[2].

The SCRF is regulated by the MOECC under ECA No. A181008. The SCRF operates Monday to Friday, from 7:00 a.m. to 5:00 p.m., and is permitted to receive up to 250 trucks per day; however, the current average daily number of trucks received is around 70-80 trucks, which is well below the approved limit.

As previously mentioned, the SCRF is unique in the sense that it provides a safe and efficient disposal option for residual material that has already had the maximum value extracted from it. While the SCRF is permitted to receive solid, non-hazardous residual material from the commercial, industrial and institutional sectors, it is not permitted to accept any residual materials that are putrescible (i.e., waste that contains organic matter which is capable of decomposing and may generate methane gases and odors and has the ability to attract vectors, such as seagulls, vermin, etc.).

Given that the site does not accept waste capable of decomposing and generating gases, it should therefore be noted that very little gas is produced at the SCRF and, as such, the facility is not required to have a corresponding gas collection system in place. Ontario Regulation (O. Reg) 232/98 requires that a gas recovery system be installed at sites with a capacity that exceeds 1.5 million m^3 unless it can be demonstrated that the site does not generate significant quantities of gas. Terrapure successfully applied to the MOECC for an exemption from this requirement. The exemption was supported by a gas emission study and annual confirmatory monitoring. Historically, the SCRF has provided disposal capacity for materials including residues from steelmaking and other industrial operations, excavated soil from industrial sites and demolition projects, construction/ demolition waste and rubble, and solidified/stabilized industrial residual materials. These materials are truly end-of-life wastes that have exhausted all economically viable diversion options.

4.1.1 Approval Alterations

Over the course of the SCRF's history, two major alterations to the ECA have occurred:

1. Amendment to Annual Waste Receipts and Service Area Provisions (2012).
2. Landfill Footprint Reconfiguration (2013).

[2] Final Report: Taro East Landfill Expert Panel 4 October 2000

Both of these alterations were undertaken in accordance with appropriate legislative requirements, including the Environmental Screening Process under the Waste Management Projects Regulation – O. Reg 101/07 and the EPA, respectively. Further discussion on these alterations and the appropriate legislation are provided in Sections 4.1.2 and 4.1.3 below.

4.1.2 Waste Receipts & Service Area

In 2012, the SCRF went through an Environmental Screening Process under O. Reg 101/07 to amend the existing ECA to accomplish the following:

1. Allow the SCRF to continue to receive up to 750,000 tonnes of waste a year, but to allow for the limit to occur over any consecutive 12 month period instead of the calendar year. This change provided operational flexibility by accommodating busier months of receiving waste.
2. Allow the site to receive approved wastes from anywhere within the province of Ontario. This change allowed for operational efficiency, as material from outside of Hamilton previously had to be processed at other facilities in Hamilton prior to being transported to the SCRF.

O. Reg. 101/07 allows certain types of projects to fulfill the requirements of the Ontario *EA Act* by completing an Environmental Screening Process. The Environmental Screening Process is permitted for a certain "list" of projects where the effects are easily understood, and the potential environmental effects, can be negated or reduced with proven mitigation measures.

The amendments were approved by the MOECC in 2013, improving the flexibility and efficiency of operations while significantly reducing truck traffic and related air emissions in the north-end industrial core of Hamilton around Terrapure's other facilities. It was estimated that these improvements resulted in a reduction of over 35,000 truck trips and 135 tonnes of CO_2 equivalent emissions annually.

4.1.3 Revisions to Approved Footprint

In 2013, the SCRF footprint was revised to reduce the size of the residual material footprint from the originally approved 59.1 hectares (ha) to an area consistent with the base liner system that had been constructed to date at that time. There was no change to the approved total disposal volume (6,320,000 m^3), and the reconfiguration effectively increased the height, while reducing the overall footprint area for residual material from 59.1 ha to approximately 41.5 ha. As a result, the setback distance between the limit of residual material and Green Mountain Road was increased from 30 metres (m) to a minimum of 140 m. This revision was approved by the MOECC in 2014 as an amendment to the ECA under the EPA.

In addition to the revised footprint, the site was also permitted to accept approximately 2,000,000 m^3 of fill to complete the final site grading. The fill material for the final site grading is to be "Table 3" industrial fill, which is "non-waste." Based on current market conditions for industrial fill, it may take 13-17 years or more after reaching waste capacity to receive all of the material necessary before site closure activities can begin. Therefore the total remaining lifespan for operations at the site – accepting residual material and placement of industrial fill – is roughly 16 to 22 years.

4.2 Purpose of the Undertaking

The purpose of the proposed undertaking is to reallocate the current space reserved for Industrial fill/soils (i.e. Table 3 materials) as well as the provision for additional capacity at the SCRF for solid, non-hazardous industrial residual material generated generally within Hamilton and the Greater Toronto Area (H&GTA). In defining the purpose of the undertaking, Terrapure has reviewed the steady demand for continued local and regional service and developed a business case for reconfiguring the existing SCRF and replacing the current requirement to bring in industrial fill with residual material. The proposed reconfiguration will allow the facility to maintain its standing as a regional facility and provide continued service to the Hamilton area market for existing local and regional customers.

The purpose of the proposed undertaking will be further refined during the EA.

5. Description of and Rationale for the Undertaking

5.1 Background

As previously mentioned, Terrapure operate the SCRF, which is a unique facility in Ontario in that it only accepts solid, non-hazardous industrial residual material, consisting mainly of material from the steel making industry (i.e., basic oxygen furnace oxide, slag, foundry sand) and excavated soils from infrastructure development projects.

The SCRF does not accept what is known as "putrescible waste," which is the waste that residents would typically discard from their homes (i.e., municipal solid waste, organic material). The existing SCRF is the only facility within Hamilton accepting only industrial residual material and soils. It is also unique from the perspective that its location is within close proximity to where the majority of these materials are generated, reducing the need for long haul travel and therefore reducing GHG emissions from longer haul travel to other locations in the H&GTA, within Ontario or outside of Canada (i.e., across the border to Michigan and New York state). Essentially, this facility serves a primarily industrial customer base, who have already extracted the value from their residual material and need a permitted, environmentally secure facility to manage the residual material their operations generate.

For the purposes of this ToR and EA, the H&GTA is generally described as including the following municipal boundaries (*note: this does not include municipal waste from these areas*) (See **Figure 5.1**):

- City of Hamilton
- Region of Halton
- County of Haldimand
- County of Brant/City of Brantford
- Region of Niagara
- Region of Waterloo
- County of Wellington/City of Guelph

- Region of Peel
- County of Dufferin
- City of Toronto
- Region of York
- County of Simcoe/City of Barrie/City of Orillia
- Region of Durham
- City of Kawartha Lakes
- County of Peterborough/City of Peterborough
- County of Northumberland

Terrapure intends to continue serving its existing customer base and is responding to continued and growing demand from local and regional industries that require a facility that is permitted to manage the residual materials they generate, particularly from existing customers in the Hamilton area. Local businesses such as the steel industry and local infrastructure projects rely on the SCRF to provide a safe, environmentally sound facility. This in turn supports the growth of the local Hamilton economy, as well as portions of the GTA. To demonstrate the types of projects that the SCRF supports, a list of recent projects is provided as follows:

Recent Key Projects

Pan-am Aquatics Centre	2013
McMaster Children's Hospital Expansion	2014/2015
St. Joseph's Healthcare Centre	2014/2015
James Street CN/GO Station/Metrolinx	2014/2015
CN Centennial Pkwy	2014/2015
Stoney Creek Dairy future site of Retirement Home	2014
Good Shepherd	2015
Upper James Road Remediation	2013
Joseph Brant Hospital (Burlington)	2015-2016
Bell & MacKenzie – Grit sand from the James N. Allan Skyway Bridge refurbishing	2013-ongoing

In addition to the recent key projects, there are a number of future projects that Terrapure is aware of within the Hamilton area that are expected to occur within the next 3-5 years, including redevelopment of key areas of the City (i.e., Pier 7 & 8, other sites within Hamilton Harbour, etc.) that will require a facility that can manage their residual material.

Under the current operation, the existing SCRF is expected to reach its approved capacity in the next 16-22 years, accepting a combination of solid, non-hazardous industrial residual material as well as non-hazardous industrial soils or fill. The non-hazardous industrial fill is required to establish appropriate final grades at the site. By changing the configuration of the site and accepting more residual materials than industrial fill/soil, the SCRF would reach capacity quicker and, ultimately, Terrapure would be able to close the site sooner than currently anticipated (13-20 years instead of

16-22 years), because the market for residuals is much stronger and more consistent than that for soils. The SCRF currently has an approved capacity of 6,320,000 m^3, plus an additional 2,000,000 m^3 for industrial fill, for a site total of 8,320,000 m^3. The reconfiguration proposed under this EA is to allow for the addition of 3,680,000 m^3, which would effectively reallocate the 2,000,000 m^3 of space for industrial fill for solid, non-hazardous residual material, as well as some additional capacity for a site total of 10,000,000 m^3.

Given the regional role the SCRF plays with industrial residual material generators within the H&GTA and surrounding areas, Terrapure intends to consider the future operating role of this facility. Terrapure is preparing to undertake the EA to provide for the ongoing operation of its SCRF to accept the same material that it is currently permitted to receive.

In keeping with the MOECC Code of Practice, Terrapure determined the rationale for its proposed undertaking based on an analysis of the key problems and opportunities. Terrapure understands there is an ongoing need to continue the operation of the existing SCRF in order to provide additional local and regional capacity for solid, non-hazardous industrial residual material for the following reasons:

- Terrapure will continue to provide its existing regional customer base (i.e., local industrial clients, major public infrastructure undertakings within the H&GTA) with a local, reliable, secure and cost effective disposal option for end-of-life waste materias that have exhausted all recycling options and, effectively, cannot re-enter the circular economy.
- Long term contractual obligations to these existing clients (mainly local industrial clients) who operate within the City of Hamilton will be honoured and fulfilled.
- Terrapure's proposal aligns with the government's direction on continuing to require a permitted, well-designed, environmentally-secure facility to manage residual materials, namely through the *Strategy for a Waste Free Ontario: Building The Circular Economy*. The relatively short lifespan will provide an important bridge as the government and society work towards the vision of a zero-waste economy.
- The SCRF will provide a safe and secure facility able to accept residual material from major infrastructure projects that support the H&GTA economy through the implementation of key provincial growth and transit-related developments (i.e., Growth Plan, Metrolinx).
- Environmental impacts of GHG emissions will be minimized through a reduction in the number of waste related trucks hauling material over longer distances.

Further discussion on the above bullet points is provided below and within Supporting Document #1.

5.2 Problem & Opportunity Assessment

5.2.1 Waste Generation in Ontario – Overview

In 2012, Statistics Canada estimated that Ontario produced approximately 13 million tonnes of industrial, commercial and institutional (IC&I) waste and municipal solid waste (MSW) annually. Of this total, approximately 6 million tonnes are landfilled in Ontario, 3.5 million tonnes are landfilled in other jurisdictions (i.e., across the border to Michigan or New York), and 3.5 million tonnes are diverted from landfill (e.g., through recycling, composting, etc.). While IC&I waste makes up

approximately 60 percent of the waste produced in Ontario, approximately 12 percent of IC&I sector waste is diverted from landfill at present.

In 2016, the Ontario Waste Management Association (OWMA) published a *State of Waste in Ontario: Landfill Report*, which provided a breakdown on the amount of waste landfilled in Ontario as well as the amount of waste exported to other jurisdictions, specifically Michigan and New York State. In 2014, Ontario landfills received a total of 7.7 million tonnes of waste[3]. This includes MSW, industrial waste, hazardous waste, contaminated soil, and additional materials used for annual daily cover. These numbers do not include the nearly 3.5 million tonnes of waste that is exported annually to the United States (U.S.). In its last report, Michigan indicated that 2.4 million tonnes of Canadian waste was imported, while New York has consistently imported around 1 million tonnes of waste from Ontario. The OWMA Report calculated Ontario's existing landfill capacity to be between 11.4 years (if all waste generated in Ontario were to be disposed of in Ontario) to 16.5 years (if 30 percent of Ontario's waste continues to be sent to the US for disposal)[4]. Recognizing that this represents all types of waste from various sectors, it nevertheless demonstrates the amount of waste generated in Ontario as well as the amount landfilled in Ontario or exported to landfills in the US. Further, it reinforces the fact that the amount of landfill capacity remaining in Ontario is decreasing – for all sectors.

Developing local solutions (such as the reconfiguration of the SCRF) to address in Province waste management needs is environmentally responsible, financially sound, and provides for secure waste management infrastructure for the province.

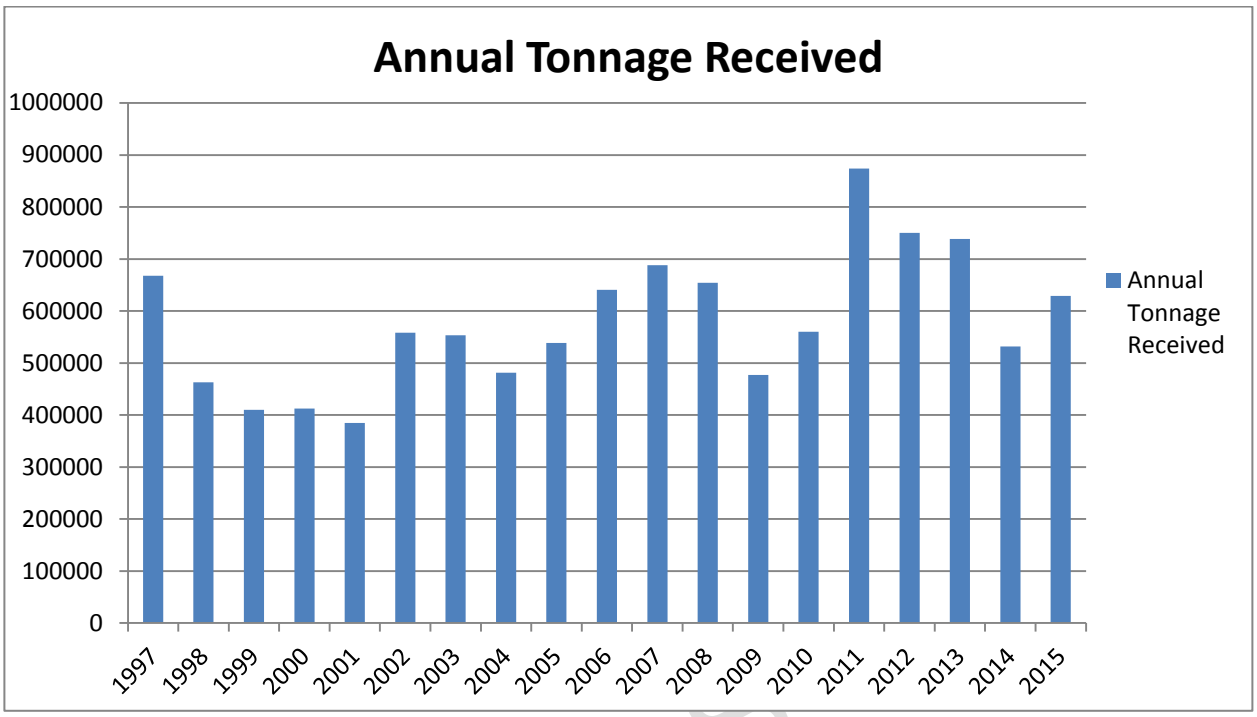
5.2.2 Industrial Waste Generation

As mentioned above, the breakdown of waste generation from the ICI sector is approximately 60 percent of the total waste stream in Ontario. However, a further breakdown of materials generated specifically relating to the type of industrial residual material accepted at the SCRF is not available on an Ontario wide basis. As part of the business case established by Terrapure, a review of historical tonnages received at the SCRF was reviewed to understand the amount of solid, non-hazardous industrial residual material generated within the approved service area of the SCRF.

Table 5.1 provides a break-down of the amount of material received over a 19 year period (1997 to 2015). The site has received an annual average of 540,000 tonnes per year over its operating life.

[3] State of Waste in Ontario: Landfill Report, OWMA, 2016.
[4] Ibid

Table 5.1 Historical Annual Tonnage



It should be noted that the volumes received in 2011 largely relate to the Pan Am Games Aquatic Centre, where volumes of material from that Provincial project increased considerably in latter months of the year. The Pan Am Games Aquatic Centre needed to be completed by the end of 2011 and, as such, all material was brought to the site in a rapid fashion to ensure the timelines would be met by the Province. Given the nature of the material (i.e. excavated soils) there were no concerns of any potential effects and the site was still within the daily/annual truck movements as permitted under the ECA. It should be noted that the additional volumes received in 2011 resulted in additional funds being generated for the royalty program with the City of Hamilton and the Heritage Green Community Trust (i.e. $1 to each for every tonne received). Further, 2012 and 2013 also saw higher than average totals, which were related to other Pan Am specific projects (i.e. Athlete Village). This was a trend across private landfills in Ontario during these years, largely due to the amount of redevelopment and major infrastructure projects that were occurring at the time. The top private landfills in Southern Ontario saw 82 percent of their annual capacity (combined) utilized in 2011.

It is clear that the site has consistently accepted a high volume of solid, non-hazardous industrial residual material and the amount of this material has generally increased over the last 19 years. Over the last 5 years, the SCRF has accepted approximately 3.5 million tonnes of material, with a yearly average of approximately 700,000 tonnes.

The facility plays a critical role in supporting local industry and the local economy with a well-located, environmentally sound disposal outlet for non-recyclable industrial residual materials. Nearly 50 percent of the materials received at the facility come from industrial operations directly within the City of Hamilton, while more than 93 percent of the materials received at the facility are generated at locations within the H&GTA (See **Figure 5.2**).

Figure 5.2 Percentage breakdown of residual material received by location

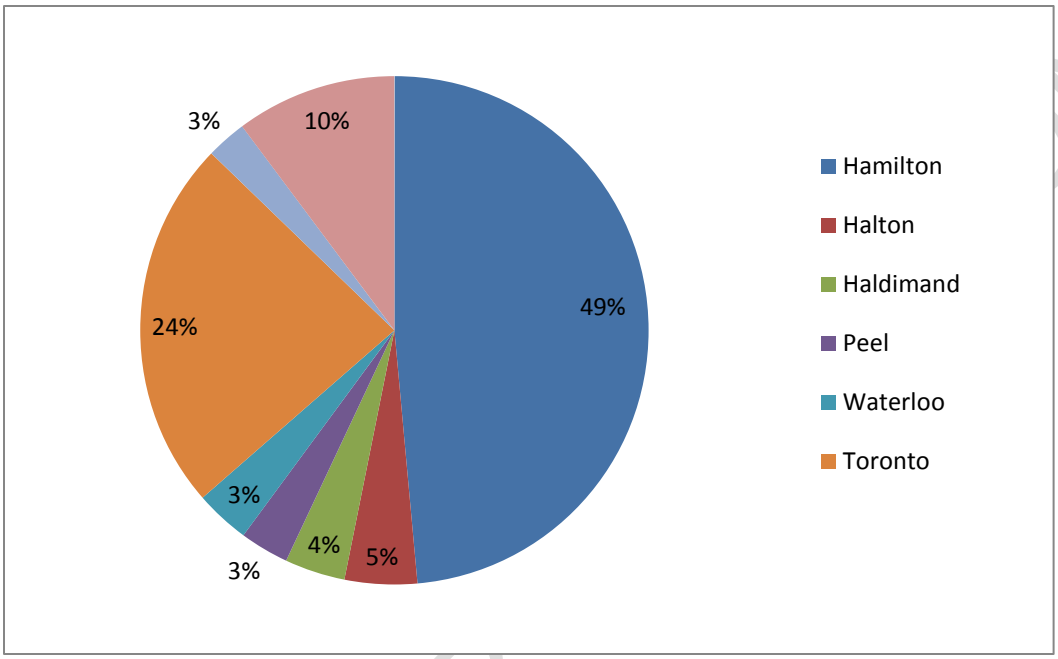


Figure 5.3 demonstrates the H&GTA waste sources and tonnages received relative to the service area (including distances) this EA is focused on, which shows the key role the SCRF plays as a regional facility.

Figure 5-3 Hamilton & Greater Toronto Study Area

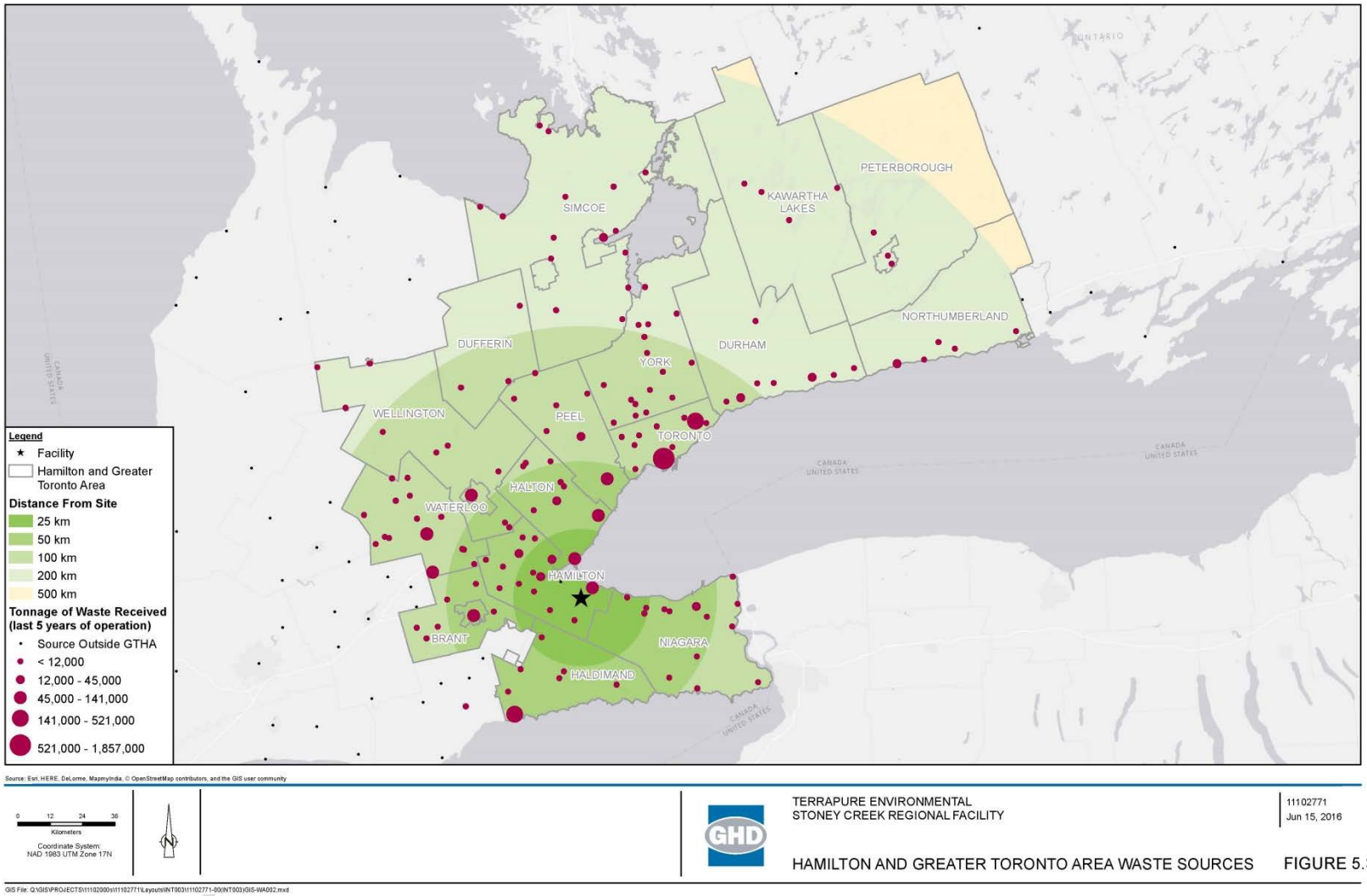
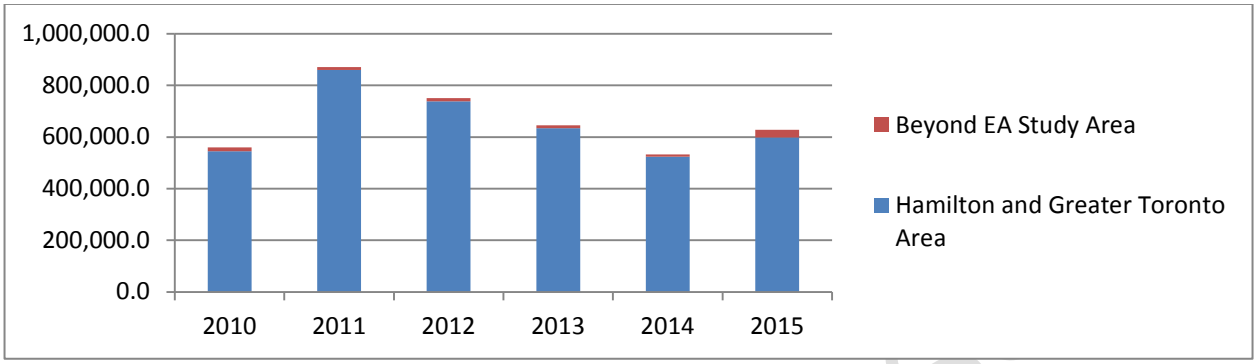


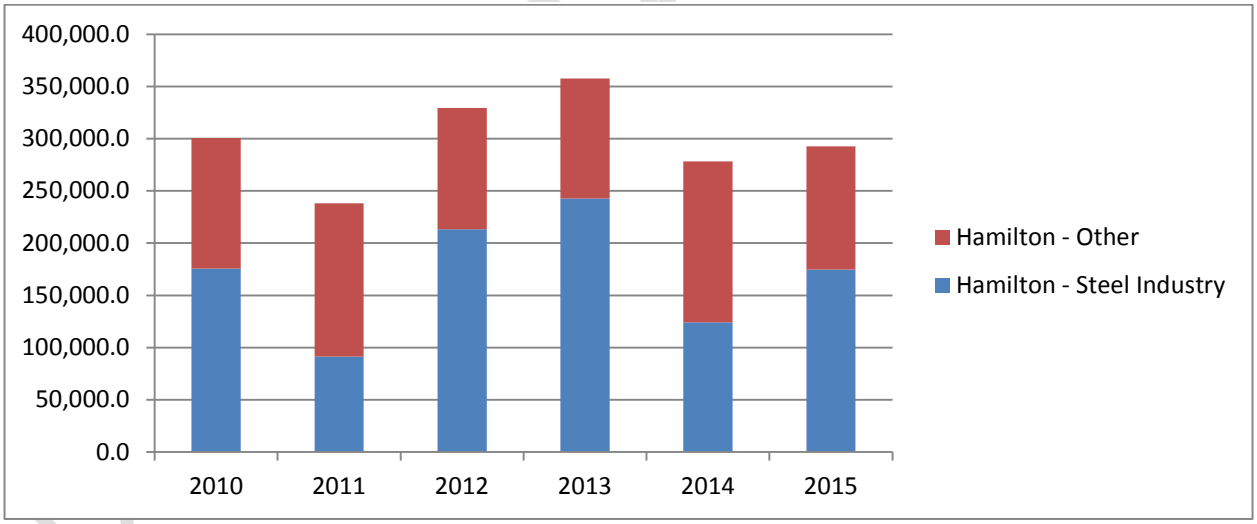
Table 5.2 demonstrates the amount of solid, non-hazardous industrial residual material accepted at the SCRF from within the H&GTA and surrounding area relative to the total tonnage accepted over the last 6 years.

Table 5.2 Location of Generated Waste (2010-2015)



As one local example, the SCRF has accepted a significant quantity of material from the major local steel making industry over the life of the facility. **Table 5.3** presents the tonnages received from the local Steel Industry in relation to the nearly 50 percent received from operations within the City of Hamilton. 57 percent of all material received from customers within the City of Hamilton comes from the local Steel Industry, demonstrating the significance of the SCRF to the local Hamilton economy.

Table 5.3 Tonnage Received from local Steel Industry relative to Total Tonnage Received from Hamilton customers

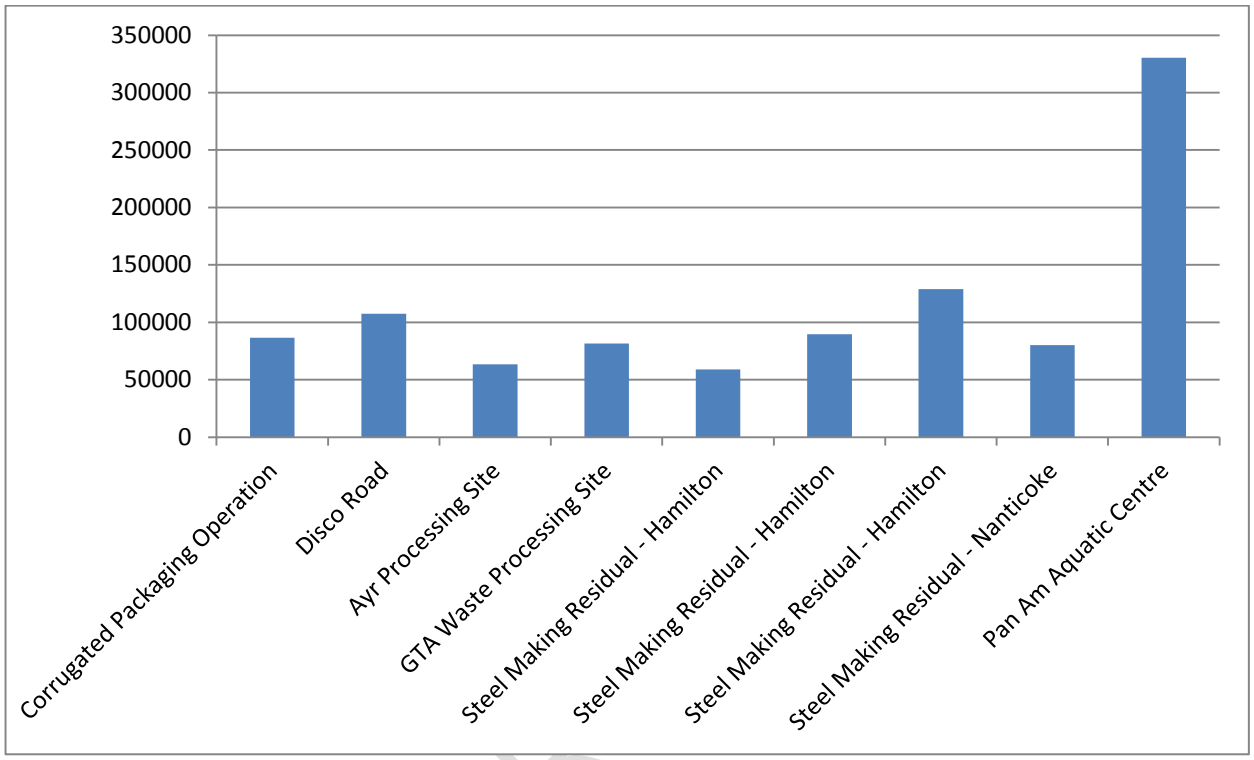


Further, given the proximity of the local Steel Industry to the SCRF, there are significant benefits from a reduction in travel distance and, ultimately, from a GHG reduction perspective. The SCRF provides a local solution, while minimizing GHG emissions. Through this proposed undertaking, Terrapure intends on maintaining the waste management service they provide to a long-standing local steel making industry clients.

In addition to the local steel making industry, the SCRF has supported a number of major infrastructure projects within the local Hamilton Area, as well as across the GTA, as previsouly

described in **Section 1.1** of this report. An example of other major customers and projects from within the H&GTA that utilize the SCRF to manage their residual materials are identifed in **Table 5.4**.

Table 5.4 Regional Customers/Projects (2010-2015)



The SCRF has provided capacity for residual material generated from other projects within the H&GTA that are facilitating a number of provincial intiatives including intensification in Growth Centres (See **Figure 5.4**) identified in the *Places to Grow Act*, as well as the supporting transportation infrastructure identified by Metrolinx in *The Big Move.* As an example, Terrapure provided capacity for the James Street North Hamilton GO Station for Metrolinx.

Development and re-development to accommodate the expected growth within the H&GTA will generate specifiic waste types, particularly during construction, and this residual material needs to be sent to a continually operated, local facility that is reliable, trusted, permitted and operating to the highest possible standards. This facility should be located close to the source of the generated residual material, prefereably within the local area. The SCRF offers this local and regional solution. A separate analysis[5] (See **Attachment A to Supporting Document #1**) was completed with respect to the cost impacts for the SCRF's current customers that would need to transport their residual material to alternative sites, should the proposed undertaking by Terrapure not move forward. Incremental costs to current SCRF customers were estimated by calculating the additional transportation costs based on distance (midpoint of each city from which residual materials were being transported by each customer for each alternative site, less the current distance to the SCRF site), multiplied by cost per kilometre (km)/tonne for each site, plus disposal costs per tonne.

[5] Economic Impacts of the Stoney Creek Regional Facility, RIAS Inc., 2016

Figure 5.4 – Provincial Growth Plan Urban Growth Centres

Overall, the increased costs to SCRF customers of transporting wastes to alternative landfill sites is estimated to range from $4.8 million to $17.5 million per year. In present value terms, these higher costs range from about $28 million to $100 million. The economic impacts of these increased costs are considerable as four principal sectors of the Ontario economy would be affected: Non-residential construction, waste management and remediation services, steel manufacturers, and petroleum refining operations.

5.3 Future Role of the SCRF

Based on the average annual tonnages historically received at the SCRF and, more specifically, over the past 5 years, a level which is expected to continue, it is evident that there is a continued need for disposal capacity for solid, non-hazardous industrial residual material within the City of Hamilton and the GTA. The SCRF has played a significant role in meeting the local needs for businesses operating with the City Hamilton, as nearly 50 percent of material received has come from customers within the City of Hamilton.

Given that the SCRF will reach its current approved capacity in the next 16-22 years, and that it has consistently accepted industrial waste over a 19 year period averaging approximately 540,000 tonnes per year, and a 700,000 tonne average over the past 5 years, there is a need to develop additional solid, non-hazardous industrial residual material disposal capacity. Solid, non-hazardous industrial residual material continues to be generated from a number of existing industries, clients and major projects, both locally within the City of Hamilton and from other areas across the GTA. The SCRF is able to provide this regional capacity for the H&GTA. Disposal capacity should be as close to the source as possible, to encourage a reduction in GHG emissions associated with transporting waste. Utilizing the SCRF would ensure there is a GHG reduction ranging from about 23,500 to 64,000 tonnes per year (RIAS Inc. 2016).

The SCRF currently has an approved capacity of 6,320,000 m^3, plus an additional 2,000,000 m^3 for industrial fill, for a site total of 8,320,000 m^3. The reconfiguration proposed under this EA is to allow for the addition of 3,680,000 m^3 for residual material, which would effectively reallocate the 2,000,000 m^3 of space for industrial fill for solid, non-hazardous residual material, for a site total of 10,000,000 m^3. Therefore, after the reallocation of the industrial fill for residual material, the total increase is 1,680,000 m^3 or a 20 percent increase over the total site capacity of 8,320,000 m^3.

By changing the configuration of the site and accepting more residual materials than industrial fill/soil, the SCRF would reach capacity quicker and, ultimately, Terrapure would be able to close the site sooner than currently anticipated (13-20 years instead of 16-22 years), because the market for residuals is much stronger and more consistent than that for soils.

Based on the business case developed by Terrapure, there is a clear need to provide additional residual material capacity for the local and regional customer base. Further, given that the site has been in operation for close to 20 years with an exemplary compliance record, Terrapure's proposal aligns perfectly with the government's direction on continuing to require permitted, well-designed, environmentally-secure landfills to manage residual materials. The relatively short lifespan will provide an important bridge as the government and society work towards the vision of a zero-waste economy.

5.4 Summary

Based on the historic tonnages accepted at the SCRF, Terrapure has determined that there is a sustainable market opportunity for the company to continue to provide disposal capacity for solid, non-hazardous industrial residual material. Further, Terrapure believes that this material is best suited to be disposed of as close to its source as possible, and that their SCRF is well placed from a regional perspective within the H&GTA market, thus negating the need for long-haul disposal to other facilities and reducing the amount of GHG emissions related to hauling waste. Terrapure's

SCRF is able to adequately accommodate an additional amount of residual material (3,680,000 m^3) to meet local and regional industrial residual material disposal needs.

6. Description of and Rationale for the Alternatives

6.1 Alternatives to the Undertaking

After establishing that there is an ongoing need for regional solid, non-hazardous industrial residual material disposal capacity within the H&GTA, Terrapure reviewed different ways of meeting this need. In EA terms, this is the assessment of "Alternatives To" the proposed undertaking. Alternatives to the proposed undertaking are functionally different ways of addressing the need. In accordance with Section 6.1(2) of the EA Act, Terrapure has considered alternatives to that are appropriate and reasonable for the company to implement. The alternatives considered, and the assessment of these alternatives is described within this section as well as Supporting Document #2 to this ToR.

The methodology used by Terrapure to assess alternatives to was to conduct a screening assessment to identify a preferred alternative. The methodology consisted of the following steps:

- **Step 1** – Identify a range of alternatives to, which are reasonable, to meet the need established in **Supporting Document #1** (regional industrial solid waste disposal capacity)
- **Step 2** – Prepare a brief description of each alternative and predict what may occur if the alternative was implemented.
- **Step 3** – Conduct a screening analysis to determine if the alternatives are feasible, reasonable and practicable and to identify a preferred alternative.

A reasonable list of alternatives was identified by Terrapure and a description of each alternative being considered has been prepared. The description includes any assumptions regarding the design and operation of the alternative and the environmental impact mitigation that is assumed to be incorporated.

6.1.1 Identification, Screening and Selection of Alternatives

6.1.1.1 Step 1 – Identification of Alternatives

Terrapure identified four potential alternatives for consideration that it can reasonably implement, to address the opportunity available to Terrapure to provide regional solid, non-hazardous industrial residual material disposal capacity within the H&GTA. These four alternatives are as follows:

- **Alternative 1** – Do nothing
- **Alternative 2** – Establish a new site elsewhere in the City of Hamilton
- **Alternative 3** – Reconfigure the SCRF to allow for additional capacity
- **Alternative 4** – Export to other disposal facilities

6.1.2 Step 2 – Description of Alternatives To

6.1.2.1 Alternative 1 – Do Nothing

The "do nothing" alternative would mean that the current SCRF would no longer have the capacity to accept solid, non-hazardous industrial residual material after the currently approved capacity for waste is exhausted in approximately 3-5 years. Terrapure would be required to find an alternative way(s) to dispose of the solid, non-hazardous industrial residual material it currently receives from a number of existing, local and regional customers who rely on the site to dispose of this unique waste stream. As mentioned, approximately 50 percent of the material received annually at the SCRF comes from customers who operate businesses within the City of Hamilton. The SCRF plays a critical role in supporting local industry and the local economy with a conveniently located, environmentally sound facility for non-recyclable industrial residual material.

Under the "do nothing" alternative, a number of long-standing users of the SCRF, including major Hamilton steel making businesses, would be required to haul their industrial residual material further to an appropriately sized and approved facility (closest facility is approximately 50 km further east from the SCRF, one way travel), increasing the cost to manage this residual material and the associated carbon footprint. In addition, the SCRF has provided the H&GTA with the closest regional option for waste generated during major infrastructure and development projects in the regional area, including the McMaster Children's Hospital expansion, the new James Street GO Station and the Pan-Am Aquatics Centre, thereby negating long-haul trips and reducing GHG output and ensuring that there is no increase to the financial burden to our customers.

Under the current operation, the existing SCRF is expected to reach its approved capacity in the next 16-22 years, accepting a combination of solid, non-hazardous industrial residual material as well as non-hazardous industrial soils or fill. By changing the configuration of the site and accepting more residual materials than soil, the SCRF would reach capacity quicker and ultimately Terrapure would be able to close the site sooner than currently anticipated (13-20 years instead of 16-22 years), because the market for residuals is much stronger and more consistent than that for industrial fill.

6.1.2.2 Alternative 2 – Establish a New Site Elsewhere in the City of Hamilton.

Under this alternative, Terrapure would initiate an EA and other required approval processes to find, construct and operate a new (greenfield) site within the City of Hamilton. In addition, the existing SCRF would continue to operate and accept Industrial fill/soils until the maximum approved limit of this material is accepted (2,000,000 m^3) and we anticipate that to be an additional 13-17 years on top of the 3-5 year capacity for residual materials. The new facility would be built elsewhere within the City of Hamilton in order to continue to serve the existing local customers as close to where the residual material is generated, which is 50 percent from within the City of Hamilton. This would require that Terrapure determine an appropriate location and acquire the site for development. In order to achieve this alternative, a suitable site would need to be identified within the City of Hamilton, as well as obtaining all necessary regulatory approvals and agreements.

There would be considerable uncertainty in the scope, timing and cost in the approval processes, which would be expected to take a number of years and the outcome itself would be uncertain. It is doubtful that a new site could be approved and made operational by 2018-19. To justify the cost and effort, a new landfill would need an operational life of 25 years or more, well beyond the

planning period for the purposes of this undertaking. In addition, a new facility would need to be identified and located within the City of Hamilton, otherwise it would not provide a location as close to the majority of residual material accepted (50 percent from within the City of Hamilton) as well as to the remaining regional users.

If approvals were to be obtained and a new facility was to be constructed, Terrapure would be able to meet its capacity needs. The cost for approval, construction and operation of a new facility would be significant, and it should be noted that a new "greenfield" site has not been developed in Ontario in the last 20+ years. Further, Terrapure would be operating two independent sites within the City of Hamilton, one new site for solid, non-hazardous industrial waste, and the existing SCRF for industrial soils/fill.

6.1.2.3 Alternative 3 – Reconfigure the Stoney Creek Regional Facility for additional capacity

Under this alternative, reconfiguring the SCRF to add capacity would occur on the lands that include the existing footprint, as well as the area designated to receive industrial soils/fill. These areas are shown on **Figure 4.1**. In essence, this alternative would involve a reconfiguration that would closely resemble the original approved footprint from 1996.

Moving the footprint laterally towards Green Mountain Road is not a new concept. The original EA approval (1996) and Design and Operations (D&O) Plan (1995) for this site placed the limit of waste a minimum of 30 m from the property line along Green Mountain Road; however, the site was reconfigured in 2013 to increase the height of the landfill, while reducing the overall footprint area from 59.1 ha to approximately 41.5 ha. This effectively pushed the limit of waste back from Green Mountain Road to a setback distance of approximately between 140 and 280 m. This revision to the footprint was approved in 2014 by the MOECC as an amendment to the ECA and SCRF D&O.

The rationale for revising the footprint under the previous ownership was to reduce the size of the footprint area to an area consistent with the base liner that had been constructed to date. There was no change in the approved landfill disposal volume as part of the previous footprint revisions. The changes to the site also allowed for the existing entrance and exit, Centennial Parkway and First Road West, respectively, remaining operational.

Although there were a number of refinements to the site that provided ancillary benefits, as described in Supporting Document #1, Terrapure is now responding to growing demands from local customers, particularly those in Hamilton who bring approximately 50 percent of the residual material to the SCRF. Industries such as steel-making and infrastructure developments like the McMaster Children's Hospital expansion and the new James Street GO Station rely on the SCRF to provide a safe, environmentally sound facility to support the growth of the local economy. This alternative would allow for the facility to maintain its standing as a regional facility and provide continued service to the H&GTA market and existing local and regional customers.

6.1.2.4 Alternative 4 – Export to other disposal facilities

This alternative assumes that the SCRF would be used until it reaches its approved solid, non-hazardous industrial waste capacity limits. This alternative would see industrial non-hazardous wastes delivered to the existing SCRF or another location (such as Terrapure's Brant Street transfer station), processed (if necessary) and then transferred to other waste disposal facilities able to

accept solid, non-hazardous waste. Under this alternative, the existing SCRF would continue to operate and accept industrial fill/soils until the maximum approved limit of this material is accepted (2,000,000 m^3).

It is anticipated that the waste would be transferred to other disposal facilities not owned by Terrapure in Ontario (e.g., Waste Management's Twin Creeks Landfill in Sarnia, Walker Environmental Group's South Landfill in Niagara Falls), Michigan State, or New York State. This would allow for Terrapure to continue a portion of their business (i.e., collection and transfer), but would rely on other operators for disposal. Further, the distance the waste will travel from the H&GTA will be greater as the nearest options are in Niagara Falls and Twin Creeks, thereby increasing the GHG emissions from transporting the waste.

6.1.3 Step 3 – Screening Assessment of Alternatives

Terrapure conducted a preliminary screening of the alternatives as part of their internal business planning before the EA process was initiated. This screening identified **Alternative 3 – Reconfigure the Stoney Creek Regional Facility to allow for additional capacity** as the preferred alternative to. This assessment was updated and documented during the preparation of the Draft proposed ToR and comments and input from the public and stakeholders on the Draft proposed ToR are being considered.

As part of the preliminary screening, an assessment of the four alternatives was undertaken to confirm their feasibility with respect to addressing the need/ rationale established. A series of screening questions were applied to each of the alternatives to determine if they were feasible, achievable and reasonable for Terrapure to implement. The screening assessment consisted of answering the following screening criteria, which are in conformance with the MOECC Code of Practice:

1. Does the alternative address the rationale for the undertaking?
2. Is the alterative practical, financially realistic and economically viable?
3. Is the alternative technically feasible?
4. Is the alternative consistent with applicable land use planning controls (official plan/zoning by-law)
5. Is the alternative capable of enabling Terrapure to continue to provide regional service to the H&GTA?
6. Is the alternative within the ability of the proponent to implement?
7. Is the alternative consistent with Ontario government priorities including the circular economy, climate change and reduction of greenhouse gases?

6.1.4 Alternatives Analysis

An analysis of the four alternatives after the screening questions have been applied is summarized below. Further details are also provided in Supporting Document #2.

6.1.4.1 Alternative 1 – Do Nothing

Although the "do nothing" alternative would not achieve the purpose stated in the proposed ToR, it is included because it provides a benchmark against which the consequences of the other alternatives can be measured.

The "do nothing" alternative does not satisfy the goals for Terrapure within the H&GTA. The closure of the existing SCRF would create a significant gap in the company's services for long-standing customers within the H&GTA as it has historically provided approximately 50 percent of the annual disposal capacity for residual material generated by businesses and operations locate within the City of Hamilton and a total of 93 percent within the City of Hamilton and the Greater Toronto Area. Without the ability to provide regional solid, non-hazardous industrial residual material disposal capacity, Terrapure's operations within the H&GTA would have to be significantly restructured. This alternative is not acceptable to Terrapure from an economic perspective, as it would place the company at a significant economic disadvantage within the local marketplace and decrease its ability to compete within the Ontario market.

Further, the "do nothing" alternative would not address the current regional waste disposal needs of the H&GTA, which would force generators of industrial residual materials within the H&GTA to look further afield to dispose of locally and regionally generated waste. One principle of responsible waste management that Terrapure believes in relates to managing wastes generated within the local and regional area and providing a solution that is local to the H&GTA, rather than exporting to other jurisdictions, or out of country. The "do nothing" alternative would require disposal of waste in other Ontario landfills and potentially landfills within Michigan and New York State. The additional trucking required to take the industrial waste generated within the H&GTA outside of the regional area, would increase GHG and contradict Ontario's current priorities relating to climate change and the Waste Free Ontario Act and Strategy, which calls for zero GHG emissions within the waste sector by 2030. It is expected that the "do nothing" option would potentially increase GHG emissions for longer trips to other waste facilities by approximately 23,500 to 64,000 tonnes per year[6]. The requirement to ship to other locations would create a financial burden to Ontario industries, ranging from $4.8 to $17.5 million[7].

It should also be noted that the "do nothing" alternative would still permit the SCRF to accept industrial soils/fill, which would increase the overall site life in comparison to accepting solid, non-hazardous industrial wastes. The current market for industrial soil/fill puts Terrapure at an economic disadvantage given the relatively low market value/ tip fee received. Terrapure may need to wait for market conditions to improve with respect to industrial soils/fill before it begins to accept large quantities and therefore ultimately implement the closure plan for the site.

While this alternative is technically feasible, Terrapure does not consider the "do nothing" alternative a reasonable option for its ongoing business, its customers, the H&GTA or the Province of Ontario.

[6] Economic Impacts of the Stoney Creek Regional Facility, RAIS Inc, June 2016.
[7] Ibid.

6.1.4.2 Alternative 2 – Establish a new site elsewhere in the City of Hamilton

Terrapure is not aware of other lands within the City of Hamilton that have been identified as suitable for a new site that could accommodate the volume of solid, non-hazardous industrial residual material sought as part of this EA. Although Terrapure does own other properties within Hamilton (i.e., Brant Street transfer station), they are not suitable to accommodate the proposed undertaking. As a private corporation, Terrapure does not have the powers of expropriation to obtain a site, if such a location existed. Further, a new site within the City of Hamilton would require additional approvals under the Planning Act (i.e. Official Plan and Zoning By-Law Amendments), adding a degree of uncertainty to the process.

It is reasonable to assume that this alternative is within the ability of Terrapure to implement if it was able to identify and obtain ownership of a suitable site. However, the development of a new site elsewhere in the City of Hamilton is also not an economically attractive option. If a new site was identified and approved, it would require a significant investment with respect to land purchase, building, services and utility construction and creation of infrastructure and management. The ability to utilize the required infrastructure for the new site that is already in place at the current SCRF operation would be lost. Making capital and operational investments elsewhere would put Terrapure at a financial disadvantage and make the business less competitive. Further, it is unlikely that the company could identify, purchase and secure approvals for a new site within a reasonable time period relative to the remaining lifespan for solid, non-hazardous industrial residual material at the current site.

Unlike the "do nothing" option, this alternative is able to address the rationale for the undertaking, it is technically feasible, would potentially allow for Terrapure to continue operating on a regional basis and is consistent with Ontario government priorities. However, establishing a new site at another location in the City of Hamilton is not practical from a timing standpoint, relative to the remaining capacity at the existing site, nor is it advantageous from an operations perspective to operate two sites.

6.1.4.3 Alternative 3 – Reconfigure the Stoney Creek Regional Facility for additional capacity

This alternative would meet Terrapure's stated goal by continuing to provide local and regional solid, non-hazardous industrial residual material disposal capacity to its existing H&GTA customers and would be constructed and operated at an existing environmentally sound and secure facility. This alternative is able to be implemented with minimal issues (practically and economically) as Terrapure owns the necessary property for reconfiguring the site and the required infrastructure for the increased residual material is already in place or can be put in place in a cost-effective manner.

The SCRF has been successfully operating since 1996 and has become an important member of the local community by creating employment opportunities, hosting educational events and facility tours, and contributing financially to the City of Hamilton and the Heritage Green Trust, which provides grants to numerous community facilities and initiatives around Stoney Creek. The company maintains strong community relationships with the City and surrounding neighbours. The proposed site reconfiguration would allow Terrapure to continue to provide a significant economic contribution to the local community, with well-paying jobs and over $14 million in additional funding to community groups and local infrastructure projects in Stoney Creek. It is important to note that $1 per tonne of residual material accepted at the site is provided to the Heritage Green Trust and to the

City of Hamilton (each) – this would not occur when accepting only industrial fill. Under Alternative #3, the financial contributions to both the Heritage Green Trust and the City of Hamilton, would continue.

Further, this alternative is consistent with applicable land use planning controls and will allow for continued regional service to the H&GTA. This speaks to the alternative also being consistent with Ontario government priorities, namely climate change and reduction of GHG as reconfiguration of the SCRF site would avoid increased GHG emissions, ranging from about 23,500 to 64,000 tonnes per year[8]. The reconfiguration of this site would avoid considerable cost increases for customers of the current SCRF site, ranging from $4.8 to $17.5 million[9].

While Ontario works towards its goal of zero waste, as identified in the *Waste Free Ontario Act* and in particular the Strategy for a Waste Free Ontario: Building the Circular Economy, there will still be a need for landfill space, particularly as it relates to the redevelopment and intensification of property within H&GTA. The Strategy also discusses how the Province would carefully consider the need and location of landfills, including the expansion of existing sites. Reconfiguring the existing Terrapure SCRF would ensure that wastes generated within H&GTA continue to be disposed of at a Regional facility, as close to the generated wastes as possible. This would then negate the need to develop a new landfill within Hamilton or within the GTA for that matter.

This alternative is the most practical, financially and economically viable option to address the identified business need to allow Terrapure to operate in the long-term; making the most efficient use of land already designated for this purpose and site infrastructure already developed.

6.1.4.4 Alternative 4 – Export to other disposal facilities

The exporting of waste to a facility outside of the H&GTA, either in Ontario or out-of-country (i.e., Michigan, New York State) does not satisfy the strategic or economic goals for Terrapure's operations. Relying on a third party for disposal is not economically acceptable as Terrapure's customers would not only be charged for transfer fees as well as disposal fees, but would also be subjected to the risks associated with the trans-boundary movement of wastes. Reliance on a third party disposal facility would put Terrapure at a significant disadvantage competitively and would not enable them to continue providing local and regional capacity to the H&GTA.

Further, this alternative is also not consistent with Ontario government priorities, including climate change and reduction of GHG. The additional trucking required to take the industrial waste generated within the GTHA outside of the regional area, would increase GHG and contradict the current Ontario priorities relating to climate change and the Waste Free Ontario Act and Strategy, which calls for zero GHG emissions within the waste sector by 2030. It is expected that this alternative would potentially increase GHG emissions for longer trips to other waste facilities by approximately 23,500 to 64,000 tonnes per year[10]. The requirement to ship to other locations would create a financial burden to Ontario industries, ranging from $4.8 to $17.5 million[11].

It is no longer acceptable to assume that waste may be exported to the U.S. because of strong political opposition. Exporting waste to the U.S. is both costly and risky due to fluctuations in the

[8] Economic Impacts of the Stoney Creek Regional Facility, RAIS Inc, June 2016.
[9] Ibid
[10] Economic Impacts of the Stoney Creek Regional Facility, RAIS Inc, June 2016.
[11] Ibid.

value of the Canadian dollar, fuel prices, and the potential for border closures to Canadian waste due to security or health concerns.

While this alternative is technically feasible and able to be implemented, it does not address the rationale for the undertaking, nor does it support Terrapure's regional service model for the H&GTA and puts the company at a significant financial and economic disadvantage in the market.

6.1.5 Preferred Alternative To

The existing SCRF has been successfully operating since 1996 and wishes to remain an active member of the community through the continued operation of this site. The establishment of a new landfill site or export of waste elsewhere are not feasible options. As a result, Alternative 3 – Reconfigure the SCRF for additional capacity, is the only practical and financially feasible means of addressing the identified business opportunity for providing continued local and regional solid, non-hazardous industrial residual material disposal capacity within H&GTA.

Terrapure is responding to growing demands from local customers, particularly those in Hamilton. Local industries such as steel-making and local infrastructure developments like the McMaster Children's Hospital expansion and the new James Street GO Station, rely on the SCRF to provide a safe, environmentally sound facility to support the growth of the local economy. Fifty percent of the material received annually comes from customers in the City of Hamilton, with a total of 93 percent coming from the H&GTA. If the material had to go to another facility farther away, it would add significant cost and environmental impact from increased transportation. Reconfiguration of the SCRF would avoid increased GHG emissions, ranging from about 23,500 to 64,000 tonnes per year[12]. The reconfiguration of this site would avoid considerable cost increases for customers of the current SCRF site, ranging from $4.8 to $17.5 million[13]. The proposed site reconfiguration would allow Terrapure to continue to provide a significant economic contribution to the local community, with well-paying jobs and over $14 million in additional funding to community groups and local infrastructure projects in Stoney Creek.

The other alternatives do not address Terrapure's opportunity to meet long-term customer commitments or avoid business risks and they are not consistent with Ontario government priorities of addressing climate change and reduction of GHG.

This preferred alternative is Terrapure's proposed undertaking which will be considered further in the EA. Further detail on the Alternatives To the Undertaking is provided in Supporting Document #2.

6.2 Alternative Methods of Carrying Out the Undertaking

Identification and evaluation of "Alternative Methods" or different ways that the project can be developed is a key element of the EA process. In accordance with Section 6.1(2) of the *EA Act*, Terrapure will consider alternative methods that are appropriate and reasonable for the company to implement as it relates to the preferred alternative to, which is to "**Reconfigure the SCRF**." The alternative methods referred to in this section are in relation to "alternative footprints" as the proposed development of additional capacity at the SCRF may be achieved through alternative footprint configurations at the Facility. Two alternative methods for developing additional capacity at

[12] Economic Impacts of the Stoney Creek Regional Facility, RAIS Inc, June 2016.
[13] Ibid

the SCRF have been identified and are described in this section, as well as within Supporting Document #4. It should be noted that the alternative footprints presented in this section and Supporting Document #4 are at a conceptual design level and these alternative footprints will be further refined, as appropriate, during the EA.

In accordance with Section 6.1(2) of the *EA Act*, the EA must consist of:

- A description of and a statement of rationale for the alternative methods of carrying out the undertaking.
- A description of:
    - The environment that will be affected or that might reasonably be expected to be affected, directly or indirectly.
    - The effects that will be caused or that might reasonably be expected to be caused to the environment.
    - The action necessary or that may be reasonably be expected to be necessary to prevent, change, mitigate or remedy the effects upon or the effects that might reasonably be expected upon the environment, by the alternative methods of carrying out the undertaking.
- An evaluation of the advantages and disadvantages to the environment of the alternative methods of carrying out the undertaking.

The above requirements of the *EA Act* will be fulfilled through the generation and evaluation of the Alternative Methods, or "alternative footprints."

The methodology for generating and evaluating the Alternative Methods is composed of the following four steps:

- Step 1 – Generation of the Alternative Methods
- Step 2 – Assessment of the Alternative Methods
- Step 3 – Comparative Evaluation of the Alternative Methods and Selection of the Recommended Method
- Step 4 – Identification of the Preferred Method

This section provides an overview of the alternative footprints that were generated and will be assessed in the EA. Further information on how the assessment and evaluation of the alternative methods will be undertaken during the EA is described in Section 8.0 of the ToR.

6.2.1 Alternative Methods of Carrying Out the Undertaking

As part of the ToR process, alternative footprints have been generated and developed to a conceptual level of design. A series of criteria and assumptions were established to guide the development of these conceptual footprint alternatives for the SCRF. These include projected residual disposal capacity requirements and regulatory requirements relating to landfill design geometry. In addition, assumptions were made relating to operational criteria including required on-site infrastructure.

To set the stage for developing conceptual footprint options, a review of the current approved footprint was undertaken. In 2013, the site was reconfigured by previous owners to reduce the size of the landfill footprint area from the originally approved 59.1 ha (See **Figure 6.1**) to an area consistent with the base liner system that had been constructed to date at that time (See **Figure 6.2**).

Figure 6.1 – Original 1995 Approved Footprint

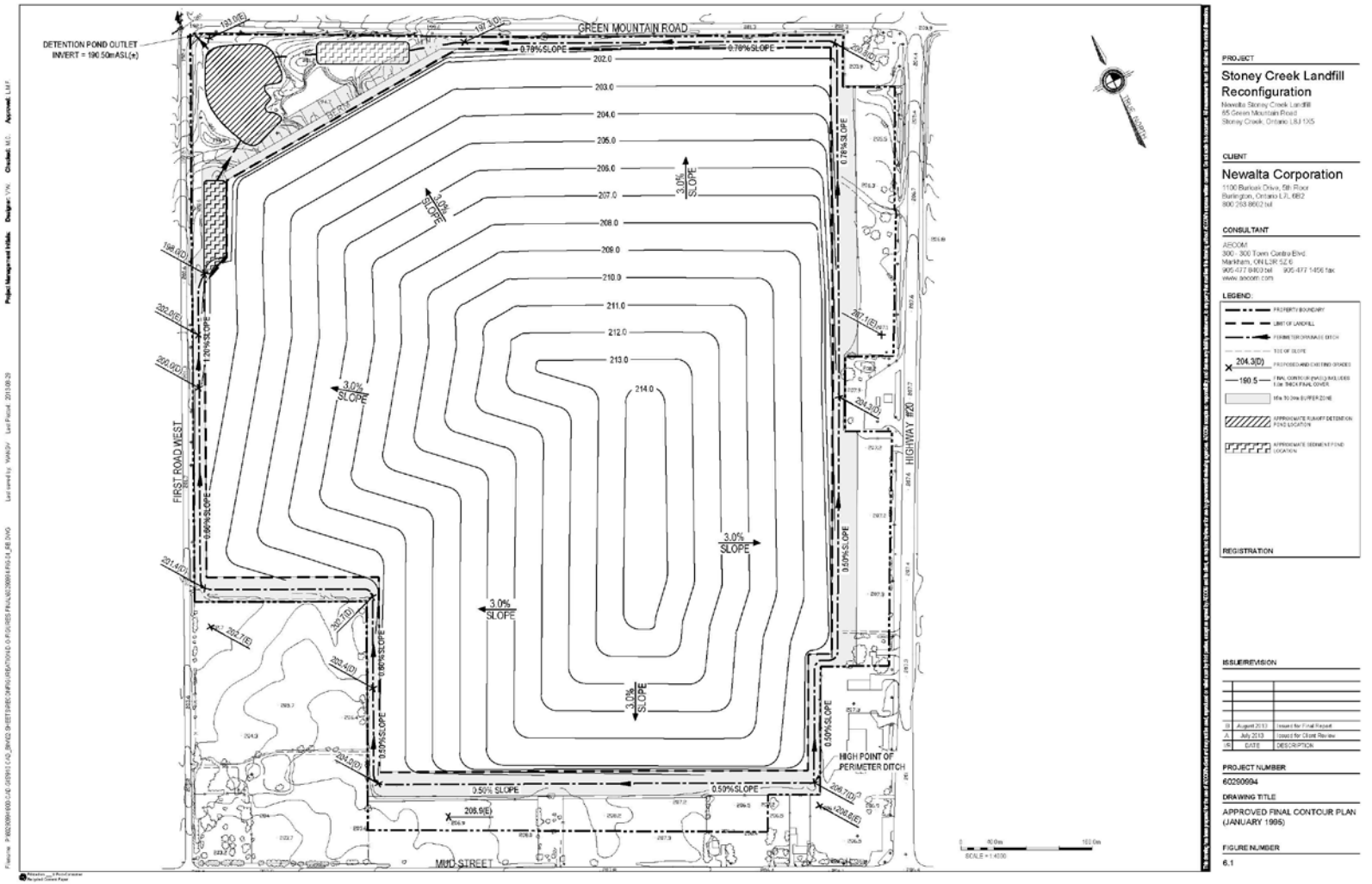
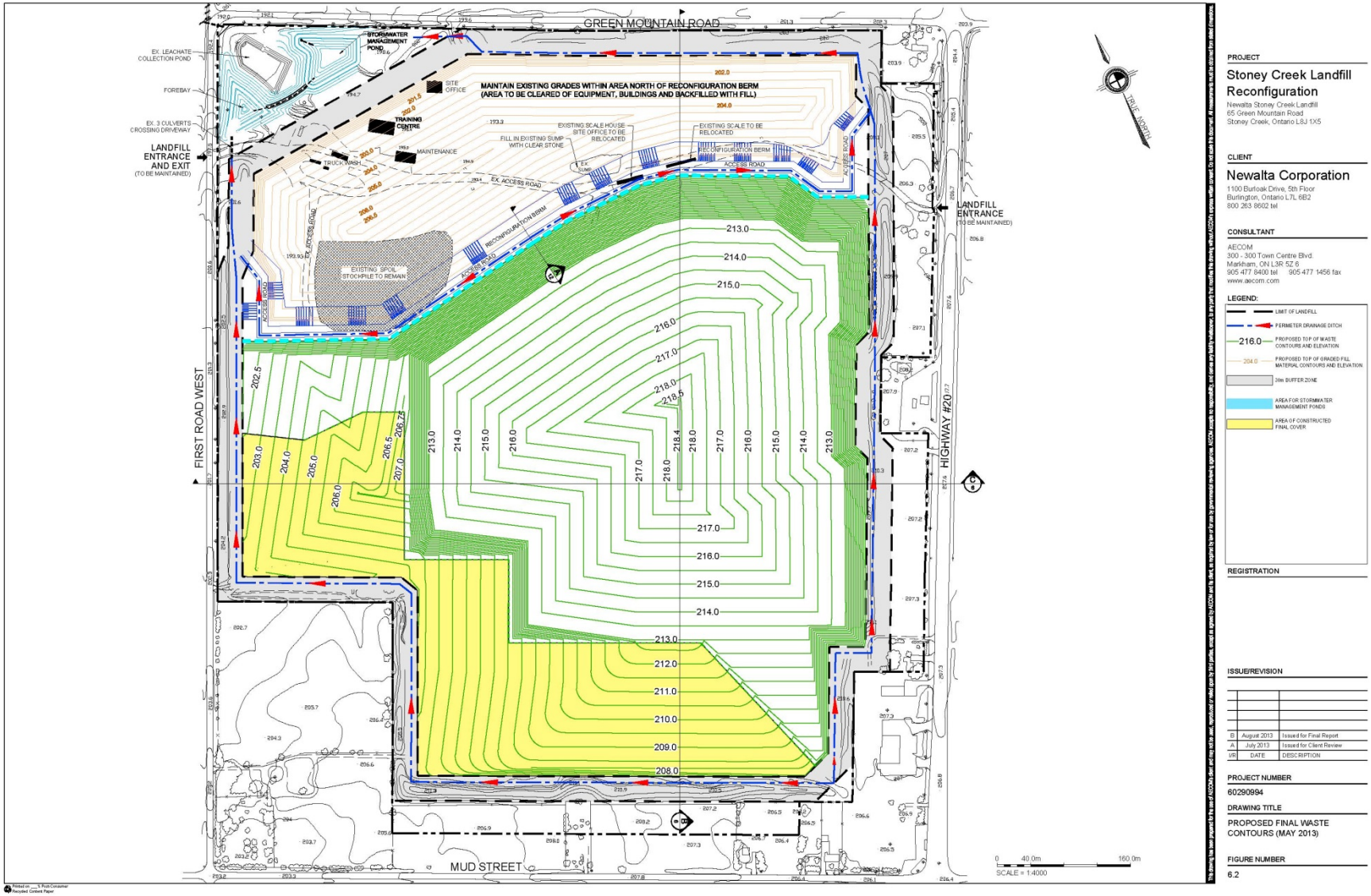


Figure 6.2 – Current Approved Footprint (Amended in 2013)



PROJECT
Stoney Creek Landfill Reconfiguration
Newalta Stoney Creek Landfill
65 Green Mountain Road
Stoney Creek, Ontario L8J 1X5

CLIENT
Newalta Corporation
1100 Burloak Drive, 5th Floor
Burlington, Ontario L7L 6B2
800 263 8602 tel

CONSULTANT
AECOM
300 - 300 Town Centre Blvd.
Markham, ON L3R 5Z 6
905 477 8400 tel 905 477 1456 fax
www.aecom.com

LEGEND:
LIMIT OF LANDFILL
PERIMETER DRAINAGE DITCH
216.0 PROPOSED TOP OF WASTE CONTOURS AND ELEVATION
204.0 PROPOSED TOP OF GRADED FILL MATERIAL CONTOURS AND ELEVATION
30m BUFFER ZONE
AREA FOR STORMWATER MANAGEMENT PONDS
AREA OF CONSTRUCTED FINAL COVER

REGISTRATION

ISSUE/REVISION

VR	DATE	DESCRIPTION
B	August 2013	Issued for Final Report
A	July 2013	Issued for Client Review

PROJECT NUMBER
60290994

DRAWING TITLE
PROPOSED FINAL WASTE CONTOURS (MAY 2013)

FIGURE NUMBER
6.2

There was no change to the approved total volume (6,320,000 m^3), and the reconfiguration effectively increased the height, while reducing the overall footprint area from 59.1 ha to approximately 41.5 ha. As a result, the setback distance between the limit of waste and Green Mountain Road was increased from 30 m to a minimum of 140 m. This reconfiguration was approved in 2014 by the MOECC as an amendment to the Facility's ECA.

Under the reconfiguration, no solid, non-hazardous residual material would be placed in the area fronting Green Mountain Road; however, this area of the site was permitted to accept approximately 2,000,000 m^3 of industrial fill to complete the sites final grading. Therefore, while the reconfiguration called for a reduction in area where the solid, non-hazardous waste would be placed, additional fill material was still to be accepted and placed within the original 1995 approved landfill footprint area.

As previously described in the ToR, under the proposed undertaking, Terrapure is proposing to reconfigure the site to realize design and operational efficiencies. In essence, the section closest to Green Mountain Road would switch back to accepting solid, non-hazardous industrial residual material, rather than accepting industrial fill. Terrapure would retain the same overall geographic size of the site and there would be no change to the type or maximum annual volumes of materials that are currently received at the site.

Therefore, Terrapure has developed alternative footprints that are based on the original approved footprint from 1995 as a starting point. By changing the configuration of the site and accepting more residual materials than industrial fill/soil, the SCRF would reach capacity quicker and ultimately Terrapure would be able to close the site sooner than currently anticipated (13-20 years instead of 16-22 years), because the market for residuals is much stronger and more consistent than that for soils.

6.2.2 Alternative Footprint Design Considerations

A series of criteria and assumptions were established to guide the development of the alternative footprint design concepts for the Site. These include Terrapure's projected solid, non-hazardous industrial residual material capacity requirements (3,680,000 m^3 as identified in Section 5.0 and Supporting Document #1) and regulatory requirements relating to landfill design geometry. In addition, assumptions were made relating to site operations. These criteria and assumptions are as follows:

Capacity and Fill Rate

As previously mentioned, the SCRF currently has an approved capacity of 6,320,000 m^3, plus an additional 2,000,000 m^3 for industrial fill, for a site total of 8,320,000 m^3. The reconfiguration proposed under this EA is to allow for the addition of 3,680,000 m^3, which would effectively reallocate the 2,000,000 m^3 of space for industrial fill for solid, non-hazardous industrial residual material, for a site total of 10,000,000 m^3. This capacity is the same for all footprint alternatives considered, as is the annual maximum fill rate, which is 750,000 tonnes.

Setbacks and Height

The design and operations for landfills in Ontario are laid out in O. Reg. 232/98. The parameters identified in the regulation relevant to the proposed undertaking were reviewed and considered in generating the alternative conceptual designs.

The regulatory requirements specify a 100 m wide buffer area between the limit of the waste footprint and the site boundary, but allow this to be reduced to 30 m if it is shown to be appropriate based on a site specific assessment (e.g., if the buffer provides adequate space for vehicle movements, ancillary facilities, and ensures that potential effects from the landfill operation do not have unacceptable impacts outside of the site). Buffer areas to the south, east and west are already approved and established and will not be altered as part of this undertaking. Buffer areas to the north (towards Green Mountain Road) will be a minimum of 30 m under the alternative conceptual designs, consistent with the remainder of the site.

There are no regulatory requirements specifically constraining landfill height, although maximum height is indirectly governed by regulatory requirements to ensure that adequate foundation conditions exist and that slopes are stable. The suitability of a proposed height increase is relative to the subsurface conditions, which will be evaluated in more detail during the EA. Terrapure reviewed a number of potential increases to the landfill height in order to understand the magnitude of a height increase and to assist in generating conceptual alternative footprint designs that would minimize the increase as much as possible, while obtaining the desired capacity determined as part of the rationale for the undertaking..

Terrapure has generated two footprint options that would entail an approximate 2.5 m crest height increase and potential overall peak height increase of up to 4 m. It should be noted that these footprint alternatives are conceptual in nature and will be reviewed and refined during the EA and through consultation with the public and agencies.

Slopes of 4:1 (33 percent) were used in developing the alternatives in order to meet the desired additional capacity. The suitability of the proposed slopes will be evaluated in more detail during the EA.

On-Site Infrastructure

The existing on-site infrastructure is required as part of both conceptual alternative footprint designs and any reconfiguration will need to adjust the current location of this infrastructure. This includes, but is not necessarily limited to, the following:

- Site entrance/exit
- Internal roadways
- Scale/scale house
- Maintenance buildings
- Wheel wash
- Site office
- Stormwater, groundwater, and leachate management systems

Site Operations

O. Reg. 232/98 requires that the SCRF be designed and operated to ensure that nuisance impacts are minimized, and the regulation requires that the proponent prepare a report describing all aspects of the operation as well as maintenance procedures that will be followed.

A key objective in planning landfill operations is to minimize nuisance impacts including noise, litter, vectors, dust, visual and odour. Given that putrescible wastes (i.e. organic/food waste) are not permitted the SCRF, typical nuisance issues around odour and vectors are greatly reduced. Typical operating practices relating to nuisance issues that have been implemented at the SCRF are described in Supporting Document #4.

These types of operating practices will continue and will be common to all conceptual alternative footprint designs (with slight variations). While these would not significantly influence the generation of conceptual alternative footprint designs, they were nevertheless considered.

6.2.3 Conceptual Alternative Footprint Designs

Based on the above, Terrapure has developed two conceptual alternative footprint designs to be evaluated during the EA. It should be reiterated that both conceptual alternative footprint designs provide the same total capacity.

Alternative Footprint #1

Alternative Footprint #1 is presented in **Figure 6.3** and a general description is as follows:

Increase in approved residual material capacity of 3,680,000 m^3, resulting in a total site capacity of 10,000,000 m^3

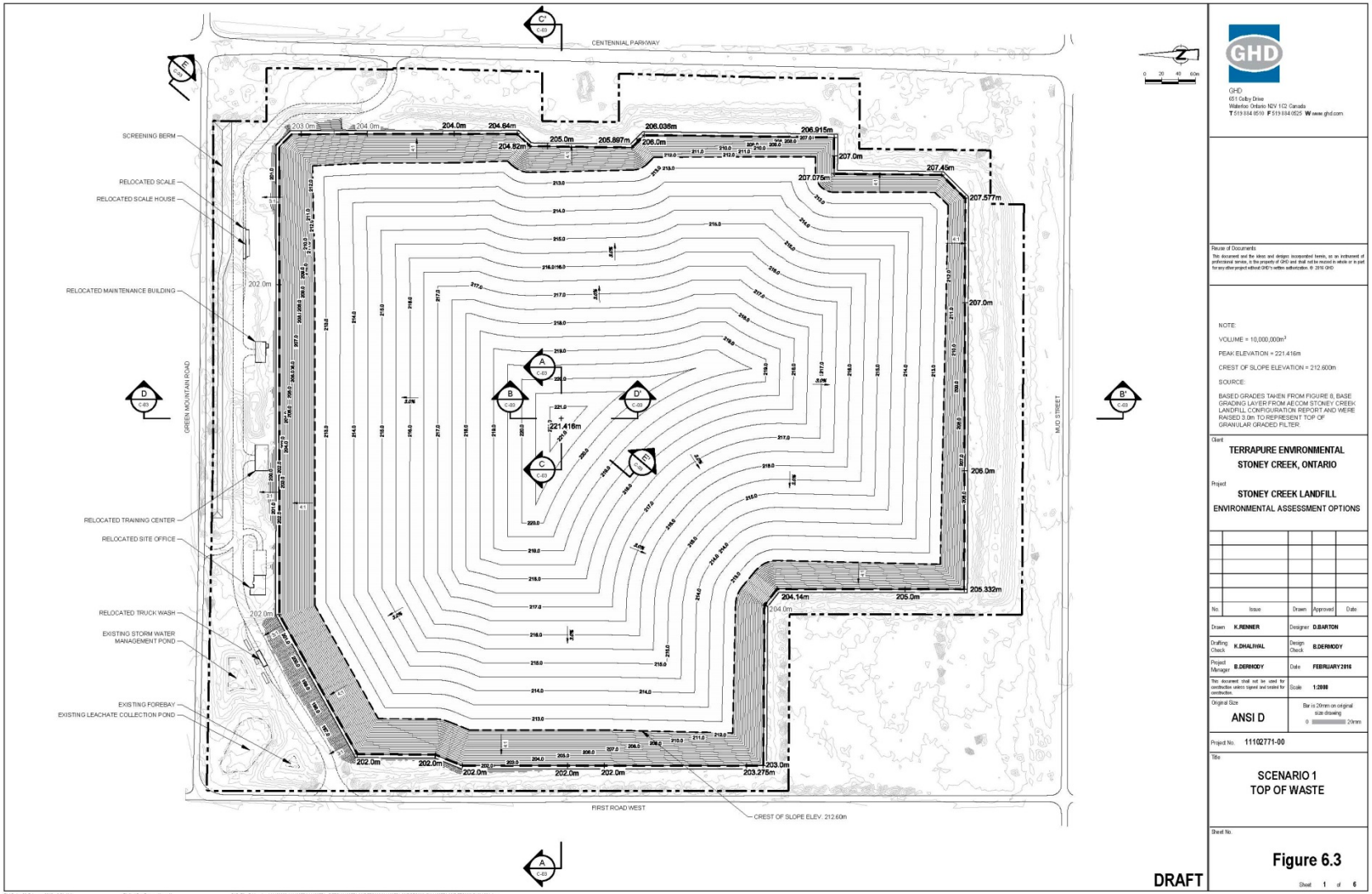
Footprint size of 54.3 hectares

Peak elevation of 221.4 m

Crest elevation of 212.5 m

Increased buffer area in the north to accommodate the relocation of site infrastructure

Figure 6.3 – Alternative Footprint #1

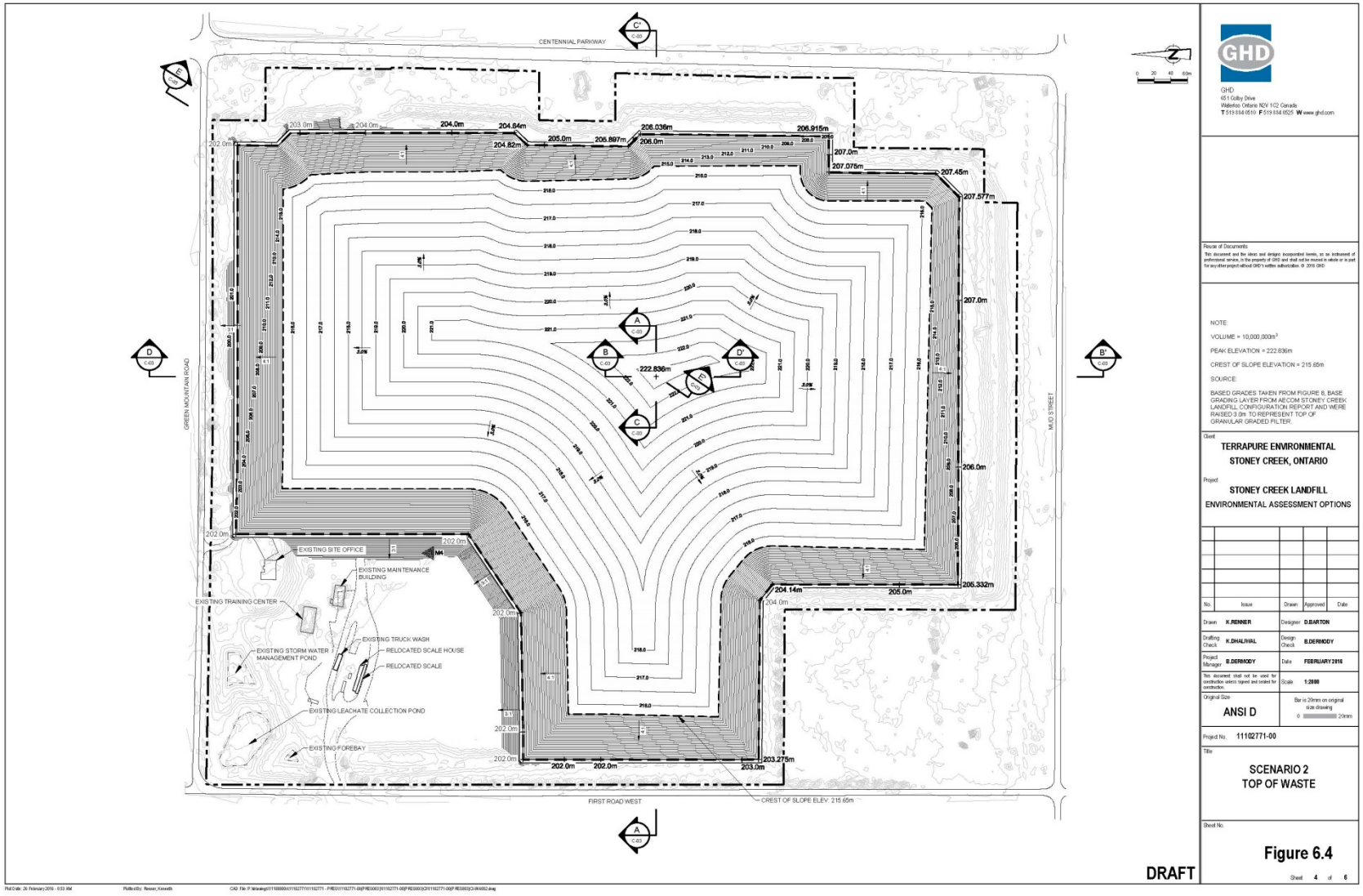


Alternative Footprint #2

Alternative Footprint #2 is presented in **Figure 6.4** and a general description is as follows:

- Increase in approved residual material capacity of 3,680,000 m^3, resulting in a total site capacity of 10,000,000 m^3
- Footprint size of 50.0 hectares
- Peak elevation of 222.8 m
- Crest elevation of 215.5 m
- No liner constructed in the northwest area of the site, allowing some of the existing infrastructure to remain in place

Figure 6.4 – Alternative Footprint #2



7. Description of the Environment

An extensive description of the existing environment at the SCRF that will be used to assess the potential effects of the various alternatives on the environment is described in this section reflecting the broad definition of the environment as per the *EA Act*. The EA Act defines "environment" broadly to include:

1. Air, land or water
2. Plant or animal life, including human life
3. Social, economic, and cultural conditions influencing the life of humans or a community
4. Any building, structure, machine or other device or thing made by humans
5. Any solid, liquid, gas, odour, heat, sound, vibration, or radiation resulting directly or indirectly from the human activities
6. Any part or combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario

It is proposed that the EA will address the following components of the environment that may be affected by the alternative methods of carrying out the undertaking:

- Atmospheric (including air quality, odour and noise)
- Geology and Hydrogeology
- Surface Water
- Terrestrial and Aquatic
- Transportation
- Land Use, Social and Economic
- Technical (Site Design and Operation)

It should be noted that given that the site is currently in operation and previously went through an EA, archaeological and built heritage will not be included in the EA.

Further, given that the site has been in operation for 20 years, the amount of existing data and information from available reports (i.e. annual monitoring reports) has allowed Terrapure to prepare existing conditions reports as part of the ToR. Supporting Document #3 contains all of the existing conditions reports for the environmental components that will be assessed further in the EA.

7.1 Study Area

The proposed On-Site and Site-vicinity study areas for the EA are listed below:

- **Site Study Area**, including all lands (41.5 ha (102.5 acres)) within the existing, approved boundaries of the SCRF, as defined by ECA No. A181008, as amended.
- **Local Study Area**, including all lands within at least 500 m of the Site Study Area boundaries and in some cases, up to 1,500 m of the Site Study Area boundaries.

It should be noted that each technical discipline has established their own Local Study Area boundaries to reflect the types of potential effects relative to their evaluation criteria. Further details on the Local Study Areas are provided in Section 7.2 of the ToR and Supporting Document #3.

7.2 Description of the Environment

The following is a summary of the existing environmental conditions in the Site Study Area and the Local Study Area. Further details are also provided in Supporting Document #3.

7.2.1 Natural Environment

Atmospheric (Air and Odour)

From an air and odour environmental perspective, the characterization of existing conditions within the following study areas are appropriate:

- **Site Study Area**, including all lands within the existing, approved boundaries of the SCRF, as defined by ECA No. A181008, as amended.
- **Local Study Area**, including all lands within a 1 km radius of the Site Study Area boundaries.

As part of the existing conditions, the site area as well as the local study area around the property has been assessed, as the Site's ECA requires that particulate air contaminant concentration levels be measured at the property line as well as at sensitive receptors.

As part of the ECA, the Facility is required to monitor wind speed and wind direction and provide it monthly to the City of Hamilton. The wind speed is monitored hourly by Rotek Engineering and included in the Facilities annual PM10 monitoring Report. Between 2013 and 2015, the Site was able to provide wind speed and direction data for 99 percent of the reporting period. Based on background information and secondary source review, the dominant wind comes from the northeast.

The closest existing residential buildings are approximately 120 m northeast and south of the footprint and approximately 50 m northeast and south from the Site property boundary. The closest proposed residential development is approximately 140m north of the northwest corner of the Site property boundary along Green Mountain Road. The main road into the Facility is paved, while all other roads on-site are unpaved and consist of either gravel or sand. Current fugitive emissions of road dust from the Site are minimal as the Site has implemented a Fugitive Dust Management Plan for all road dust on-Site.

The air contaminant of concern from this Facility is particulate matter. Particulate matter is emitted primarily from vehicle traffic on paved and unpaved roads on-site and fugitive windblown dust. The particle matter less than 10 microns (PM10) is the inhalable particle size fraction. Larger particle sizes are likely to settle on or very close to the site. As part of its ECA, the SCRF is required to monitor PM10 daily and provide to the City of Hamilton the PM10 concentration at the following three locations in and around the study area:

1. West of the East Quarry, on the west side of 1st Road West ("upwind" sample)
2. East of the East Quarry, on the west side of Highway 20 ("downwind" sample)
3. At a nearby residence.

In reviewing the number of exceedances from 2012 to 2015, it can be seen that the PM10 concentration decreases as a result of mitigation measures that the Facility has put into place. The higher number of exceedances in 2012 can be attributed to a "Cell Construction Project" that required equipment to work in close proximity to the monitors location.

To mitigate the PM10 emissions, the Facility has implemented regular watering of haulage roads and using street sweepers on the off-site roads. The Facility also has a truck wash station that removes dirt from trucks before they are sent off-site.

The Facility tracks wind direction, wind speed, temperature and weather to plan their day-to-day operations. If wind speed is high, the working face will be adjusted as required. This assists in reducing the potential for particulate to be picked up by high winds. The SCRF will also, if required, water down incoming material if it has potential to release elevated levels of PM10.

The three sampling locations provide a clear depiction of the particulate emissions from the SCRF as well as allow an understanding of where the emissions are coming from and how they can be mitigated. These sampling locations also allow the Facility to confirm if they are the source for particulate emissions or if it is coming from an off-site source, such as Upper Centennial Highway (Ontario Highway 20) or emissions from construction on adjacent properties. It should be noted that because of the current off-site operations and construction to the north of Green Mountain Road, the background levels off-site have an influence on the overall area. This aspect will be documented and accounted for during the EA. The PM10 emissions are continuously monitored throughout the year.

Because the site does not receive putrescible or organic material, very little landfill gas is produced at the SCRF and as such, the facility is not required to have a landfill gas collection system in place. O. Reg. 232/98 requires that a gas recovery system be installed at landfills with a capacity that exceeds 1.5 million m^3 unless it can be demonstrated that the site does not generate significant quantities of landfill gas. In the past, Terrapure successfully applied to the MOECC for an exemption from this requirement. The exemption was supported by a gas emission study which included sampling for surface and point source gas (e.g., leachate collection clean-out structures) emissions, analysis of the samples for methane, carbon dioxide, hydrogen sulphide, and non-methane organic compounds, and predictive gas emission modelling.

In recent years the SCRF has put procedures in place to ensure that odour is continuously controlled. The major potential odour sources consist of the leachate pumping station, equalization tank, retention pond and the working face. The SCRF has implemented several odour abatement strategies to mitigate the potential for odour release. Given that the site is not permitted to accept putrescible material, waste received from the site with an odour is a rare occurrence.

Atmospheric (Noise)

From a Noise environment perspective, the characterization of existing conditions within the following study areas are appropriate:

- **Site Study Area**, including all lands within the existing, approved boundaries of the SCRF, as defined by Environmental Compliance Approval (ECA) No. A181008, as amended.
- **Local Study Area**, including all lands within a 500 m radius of the Site Study Area boundaries.

The rationale for the Local Study Area for the noise discipline is that the off-site environmental noise impact from the existing SCRF or the proposed undertaking will be defined by the sound power generated by the equipment and activities on-Site and the proximity and line-of-sight noise exposure to the off-site receiver locations which are the subjects of this analysis. In the absence of other developments and intervening built structures, such as businesses or institutions, the rural residential dwellings within the Local Study Area represent the receiver locations which are the subject of the assessment.

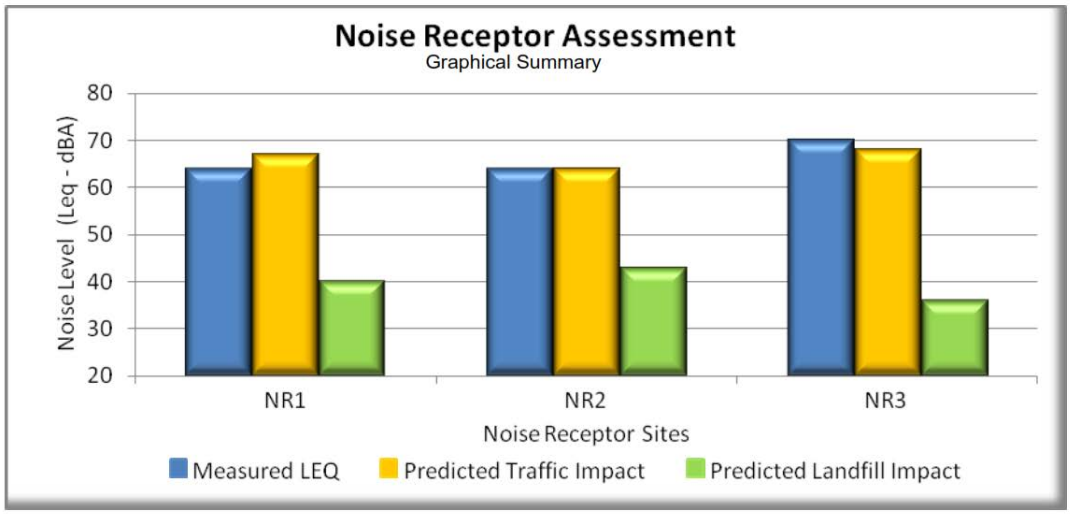
The nearest existing residential dwelling is approximately 110 m northeast of the existing property boundary. There are approximately 500 existing residential dwellings within the Local Study Area with the largest concentrations to the south and southwest of the site along Mud Street. An additional subdivision is being constructed to the north.

Adjacent road traffic travelling along the Mud Street West and Upper Centennial parkway arterial roads are the predominant 24-hour ambient noise sources.

The historical background noise studies indicated that the ambient one-hour Leq sound levels during the daytime periods ranged from 56 dBA to 63 dBA. Nighttime levels were not documented as the SCRF does not operate at night.

A semi-annual noise monitoring survey was completed during 2012 to measure noise levels at the nearest receptors around the SCRF. In addition, road traffic noise modeling was completed. The survey results are documented in the **Figure 7.1**.

Figure 7.1 Noise Receptor Assessment



The annual noise monitoring report documented measured noise levels at the receivers around the SCRF, which included heavy contributions from adjacent road traffic. The existing Facility operations are predicted to be well below the predicted traffic impact.

Geology & Hydrogeology

From a geologic and hydrogeologic environment perspective, the characterization of existing conditions within the following study areas is appropriate:

- **Site Study Area**, including all lands within the existing, approved boundaries of the SCRF, as defined by ECA No. A181008, as amended.
- **Local Study Area**, including all lands within a 500 m radius of the Site Study Area boundaries.

A 500 m radius from the Site Study Area boundaries has been selected for a Local Study Area as this represents a likely potential zone of influence with respect to groundwater impacts from the existing or proposed facility expansion.

The existing SCRF is located within fractured bedrock of the Niagara Escarpment in a former quarry. The closed Terrapure landfill, historically referred to as the "West Landfill" (closed landfill), located to the west of the SCRF, (across 1st Road West) is also located within a former quarry. The SCRF and closed landfill are underlain by a sequence of shale and dolostone of the Lockport and Clinton formations.

A prominent geologic feature within the Site Study Area is a small escarpment known as the Eramosa Scarp, located along the northern extent of both the SCRF and closed landfill. The Eramosa Scarp was formed by the removal of some rock units at the surface during glacial advancement. Subsequent glacial activity has resulted in burial of the Eramosa Scarp beneath a veneer of overburden.

Previous investigations have identified 5 distinct bedrock groundwater flow zones within the Local Study Area. Natural groundwater flow direction in these flow zones within the Local Study Area would be to the northwest towards the Niagara Escarpment; however there are several natural and man-made features that influence the movement of groundwater in the vicinity of the Local Study Area.

Various construction and infrastructure projects in the vicinity of the Local Study Area have influenced local groundwater flow directions and/or gradients. For example, construction of sewers within or below groundwater flow zones can influence groundwater flow by creating preferential pathways for groundwater movement within the granular trench bedding. Additional details on projects in the area having an influence on groundwater flow are presented in the Geology and Hydrogeology Existing Conditions Report in Supporting Document #3.

Previous investigations undertaken within the Site Study Area identified groundwater impacts related to the closed landfill to the west of the existing SCRF. The impacts are the result of infiltrated rainwater coming into direct contact with buried waste within the un-engineered landfill cells. The results of the monitoring program for the closed landfill to the west of the SCRF, have demonstrated that operation of the groundwater remediation systems has been effective at collecting and controlling groundwater at the closed site. The impacts are the result of infiltrated rainwater coming into direct contact with buried waste within the un-engineered landfill cells. No impacts to groundwater from the SCRF are evident as the SCRF is fully lined and under-drained.

In the vicinity of the operating SCRF, shallow groundwater enters from the south within the Eramosa Dolostone. The majority of the shallow groundwater is intercepted by the groundwater collection trenches located in the southern portion of the operating site. From these trenches,

groundwater is directed to the Groundwater Pumping Station, where it is pumped to the sanitary sewer system.

Groundwater flow in the deeper bedrock flow zones within the Site Study Area is largely affected by the groundwater remediation systems currently in operation, with influences from infrastructure being apparent (e.g. vertical sewer shaft at Green Mountain West and Highway 20). The dominant horizontal hydraulic gradients in the lower flow zones indicate an overall groundwater flow direction from east to west or towards Davis Creek and the Niagara Escarpment.

The groundwater monitoring network for closed landfill and operating SCRF consists of:

- 23 monitoring locations within the closed landfill property
- 15 monitoring locations within the SCRF (operating site)
- 23 off-property monitoring locations
- 2 private domestic wells

Natural groundwater quality in the flow zones monitored beneath the closed landfill and operating SCRF ranges from generally non-potable shallow groundwater to saline or concentrated brine at depth. The natural poor groundwater quality is the result of the characteristics of the bedrock units and the relatively slow groundwater flow velocity.

Terrestrial and Aquatic

From a natural environment perspective, the characterization of existing conditions within the following Study Areas is appropriate:

- **Site Study Area**, including all lands within the existing, approved boundaries of the SCRF, as defined by ECA No. A181008, as amended.
- **Local Study Area**, including all lands within a 1 km radius of the Site Study Area boundaries.

A Local Study Area utilizing a 1 km radius is appropriate to assess potential changes to the natural environment as a result of the proposed works.

There are several significant natural landforms within the Local Study Area. The Niagara Escarpment is located in the northwest portion of the Local Study Area. Within the Local Study Area, the Niagara Escarpment is a north-facing cliff, approximately 70 m high, running roughly east west (Jackman Geoscience Inc. 2015). The Eramosa Escarpment is a buried mini escarpment which is located at the north side of Heritage Green Park.

Several natural water features are present within the Local Study Area. Davis Creek crosses a limited area of the western portion of the Local Study Area. Battlefield Creek, an intermittent watercourse, is present immediately northeast of the Site Study Area. An intermittent tributary of Stoney Creek is also shown to occur southeast of the Site Study Area. Davis Creek and Battlefield Creek are both identified as having a warm water thermal regime within and in the vicinity of the Local Study Area.

No Areas of Natural or Scientific Interest (ANSIs), Significant Ecological Areas (SEAs) or Provincially Significant Wetlands (PSWs) are identified to occur within the Site or Local Study Areas.

The terrestrial environment of the Study Areas was assessed and classified using both secondary source resources (e.g. aerial photography, natural features records), and direct Site observations based on a Site visit conducted by GHD on May 18, 2016. Main types of habitat available within the Site Study Area were classified using ELC. Further details on this site visit, is provided in Supporting Document #3.

Several man-made aquatic features are present within the Site Study Area. These include a water taking pond, storm water and groundwater ponds in the northwest corner of the Site Study Area, and drainage ditches along the perimeter of the property, with substrates ranging from sediment to gravel. Aquatic vegetation is generally minimal to absent, with some ponds hosting robust emergent vegetation such as phragmites and cattails around their perimeter.

Incidental observations of wildlife were collected during the May 18 Site visit. No issues or interactions with wildlife as it relates to operations were observed, which was confirmed by Site staff as well.

7.2.2 Built, Social and Economic Environment

Traffic

From a traffic perspective, existing conditions were characterized through the consideration of intersections in the vicinity of the SCRF, and not traffic operations within the approved boundaries of the SCRF. The study area intersections that comprise the Local Study Area and were reviewed include:

1. Upper Centennial Parkway (Highway 20) at Green Mountain Road (signalized)
2. Upper Centennial Parkway (Highway 20) at Upper Centennial Parkway (Highway 20) Access (entrance only)
3. Upper Centennial Parkway (Highway 20) at Mud Street (signalized)
4. Mud Street at First Road West (signalized)
5. First Road West at First Road West Access (entrance and exit)

The following roads provide access to the SCRF:

- **Upper Centennial Parkway (Highway 20)** from Green Mountain Road to Mud Street is a north-south oriented four lane undivided arterial road with a posted speed limit of 70 km/h. It has a rural cross-section with gravels shoulders.
- **Green Mountain Road** from Upper Centennial Parkway (Highway 20) to First Road West is an east-west oriented two lane undivided local road with a posted speed limit of 60 km/h. It has a rural cross-section with gravel shoulders. It should be noted that there are proposed upgrades to Green Mountain Road and First Road that will be considered further in the EA process.
- **Mud Street** from Upper Centennial Parkway (Highway 20) to First Road West is an east-west oriented four lane divided arterial road with a posted speed limit of 70 km/h. It generally has a rural cross-section with gravel shoulders and a wide raised centre median with curb and gutter.
- **First Road West** from Mud Street to Green Mountain Road is a north-south oriented two lane undivided local road with a posted speed limit of 60 km/h. It has a rural cross-section with

gravel shoulders. It should be noted that there are proposed upgrades to Green Mountain Road and First Road that will be considered further in the EA process.

Traffic data was collected at all Local Study Area intersections on Tuesday May 24, 2016, during a.m. and p.m. peak periods. The resulting a.m. and p.m. peak hour volumes are summarized in Supporting Document #3.

The daily maximum number of vehicles depositing residual materials at the Site is restricted to 250 vehicles. As per five-year historical waste vehicle counts at the SCRF, the site received an average of 24,415 vehicles per year, or approximately 90 vehicles per day. Typical conditions at the site see anywhere between 70-80 trucks per day, however in order to be conservative in the future analysis, we have chosen a number of 90 trucks per day to demonstrate that even an incremental increase would not affect the capacity of local intersections.

Based on the results of the existing conditions capacity analysis all intersections and individual movements are expected to be operating very well with ample reserve capacity, low levels of delay, and any queueing is expected to be accommodated within existing auxiliary turn lanes.

It is evident that existing truck traffic volumes servicing the Site are not having any identifiable operational impact on the Local Study Area intersections. Furthermore, the operational impact of truck turning movements at the Site access intersections is expected to be negligible. It is expected that the SCRF accesses could accommodate a substantial increase in truck traffic volumes without operational concerns, although this is not expected to occur.

Land Use, Social and Economic

From a Land Use, Social and Economic perspective, the characterization of existing conditions within the following study areas are appropriate:

- **Site Study Area**, including all lands (41.5 ha (102.5 acres)) within the existing, approved boundaries of the SCRF, as defined by ECA No. A181008, as amended.
- **Local Study Area**, including all lands within 1500 m of the Site Study Area boundaries. An inventory of sensitive uses within 500 m of the Site Study Area is also examined.

The Terrapure SCRF is under the jurisdiction of the Urban Hamilton Official Plan and the City of Stoney Creek Zoning By-law No. 3692-92. The SCRF is also directly adjacent to areas designated under the Rural Hamilton Official Plan. The SCRF falls within the Nash Neighbourhood Secondary Plan Area designated under the Urban Hamilton Official Plan.

The Urban Hamilton Official Plan identifies the Urban Structural Elements, Functional Road Classifications and Urban Land Use Designation comprising the Terrapure SCRF.

The Terrapure SCRF currently conforms to the City of Stoney Creek Zoning By-law No. 3692-92 under Section 9.8.5 'Special Exemptions', as ME-1. In addition to permitted uses under the Extractive Industrial "ME" Zone, lands zoned ME-1 are permitted for operations associated with non-hazardous waste from industrial, commercial, and institutional sources[14].

[14] City of Hamilton, 2015(a). City of Stoney Creek Zoning By-law 3692-92. Accessed: May 20, 2016. Available at: https://www.hamilton.ca/city-planning/official-plan-zoning-by-law/zoning-by-laws-former-communities

Land Uses within 500m of the SCRF include residential, commercial, recreational and institutional uses.

Residential

The nearest residential dwelling is approximately 140 m north of the existing property boundary. There are approximately 500 existing residential dwellings within 500 m of the Site Study Area boundary with the largest concentrations to the south and southwest of the site along Mud Street. An additional subdivision is being constructed to the north of the SCRF. These residential properties are primarily located within the Urban Area, as identified in the Urban Hamilton Official Plan.

Commercial

There are 14 commercial uses within 500 m of the On-Site Study Area boundary.

Recreational

Heritage Green Sports Park and Heritage Green Passive and Off-Leash Dog Park reside within 500 m of the Site Study Area boundary. Both recreational parks are located within the Urban Area.

Institutional

Institutional uses within the 500 m of the Site Study Area boundary include St. James the Apostle Catholic Elementary School, which is approximately 270 m from the Terrapure SCRF, located within the Urban Area.

Secondary Plan Areas

The Local Study Area infringes upon three (3) Secondary Plan Areas within the Stoney Creek Rural Settlement Area. The Stoney Creek Secondary Plan Areas within the Local Study Area include the following:

1. Nash Neighbourhood Secondary Plan
2. West Mountain Area (Heritage Green) Secondary Plan
3. Old Town Secondary Plan

Neighbourhood & Community Character

The existing SCRF Site is located within the community of upper Stoney Creek, squarely in the middle of the City of Hamilton's Ward 9 and within the Federal/Provincial electoral district of Niagara West-Glanbrook. The population of Ward 9 is reported to be 27,171 persons, which is approximately 5.2 percent of the total population of Hamilton[15]. Population projections for Ward 9 show an increase of approximately 57 percent by 2031, coupled with a 44 percent increase in dwelling units from 10,165 in 2006 to 18,020 units in 2031[16].

[15] Statistics Canada, 2011. Niagara West – Glanbrook NHS Profile. Accessed: May 20, 2016. Available at: http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/prof/details/page.cfm?Lang=E&Geo1=FED&Code1=35055&Data=Count&SearchText=Niagara%20West%20-%20Glanbrook&SearchType=Begins&SearchPR=01&A1=All&B1=All&GeoLevel=PR&GeoCode=055&TABID=1

[16] City of Hamilton, 2011. City of Hamilton Ward Profiles - Ward 9. Accessed: May 20, 2016. Available at: https://www.hamilton.ca/sites/default/files/media/browser/2015-06-01/ward-profiles-2011-ward-9.pdf

According to 2011 census data, the age group with the largest representation within Ward 9 is the 50 to 54 cohort, accounting for 8.3 percent of the population. In 2011, 51.2 percent of Ward 9 residents reported having some form of postsecondary certificate, diploma or degree, as compared to 50.9 percent of the total population of Hamilton[16]. As of the 2011 census, the top three ethnicities within Ward 9 included English, Canadian, and Scottish[16]. A total of 22 percent of Ward 9 residents identified as immigrants, of which 1.3 percent were considered recent immigrants in 2011[16].

The nearest residential dwelling is approximately 140 m north of the existing SCRF property boundary. There are approximately 500 existing residential dwellings within 500 m of the property boundary, with the largest concentrations to the south and southwest of the site along Mud Street West. An additional subdivision is being constructed to the north.

Visual

A combination of earth berms, vegetation, and fences has been established around the perimeter of the Site to screen views of the SCRF from the surrounding built-up areas. These features will be maintained throughout the life of the SCRF operation, and will be left in place for as long as practical until the final cover has been constructed. These features will also be upgraded periodically as required to accommodate changes in Site operations or changes to the surrounding land uses.

Local Employment, Labour Supply and Economic Base

In 2011 the total labour force aged 15 years and over within Ward 9 totaled 14,580[16]. The largest portion of the Ward 9 labour force (22.4 percent) was employed in the "sales and service" field in 2011, followed by "business, finance, and administration" (17.5 percent), and "trades, transport, agriculture, and related production" (16.7 percent) [16].

The unemployment rate within Ward 9 was 7.3 percent (as compared to 8.7 percent for Hamilton) in 2011[16].

The SCRF directly employees approximately 13 people on a full-time basis.

The current SCRF site generates the following economic benefits for the wider Hamilton area:

- $29 million per year in total economic activity
- $18 million per year in value-added (GDP)
- Over 50 local jobs created, earning a total of $2.6 million per year in wages
- $2.2 million per year in local taxes, royalties and fees paid by the SCRF facility

7.2.3 Technical Environment

Surface Water

From a surface water environment perspective, the characterization of existing conditions within the following study areas, are appropriate:

- **Site Study Area**, including all lands within the existing, approved boundaries of the SCRF, as defined by ECA No. A181008, as amended.

- **Local Study Area**, includes the roadside swale that starts at First Road West and Green Mountain Road West and conveys stormwater runoff north along the west side of First Road West, eventually discharging into Davis Creek.

The existing surface water conveyance and treatment system for the Site Study Area consists of a set of swales, sumps and forcemains that convey stormwater runoff to a stormwater management pond in the northwest corner of the property for water quality treatment and runoff peak flow control. The drainage swales along the south and west sides of the site are in their final location. All other drainage swales and forcemains are temporary and will be moved as site construction progresses.

Under currently approved final closure conditions, the swales will wrap around the perimeter of the landfill area, as well as the remaining area on the northern portion of the site and convey stormwater runoff from the landfill cap to the stormwater management pond. The stormwater management pond will provide quantity and quality control for site runoff. The outlet for the stormwater management pond is near the southeast corner of First Road West and Green Mountain Drive. The outlet structure discharges into a catch basin/manhole southeast in the intersection of First Road West and Green Mountain Road, then through a sewer into a roadside swale on the west side of First Road West. The outlet structure is equipped with a sluice gate that can be closed in the event of a trigger parameter failing during regular testing. If a trigger parameter fails twice in a row, the gate will be closed and the stormwater management pond will accumulate water until it overflows into the neighbouring leachate collection pond via the emergency overflow weir.

The leachate collection pond is a detention pond located in the northwest corner of the Site, sandwiched between the forebay and main cell of the current stormwater management pond. The detention pond receives water fed from groundwater pumping well M4 of the groundwater collection system and runoff from the truck wash pad. The water in the detention pond is periodically pumped to the leachate equalization pond, west of the SCRF. Any precipitation that falls within an active working area is collected by the leachate collection system and pumped to the equalization pond. The equalization pond flows via a gravity sewer west of the site to a City of Hamilton sanitary sewer on Mistywood Drive, north of Mud Street.

Perimeter berms along the edges of the property direct stormwater runoff away from the working area towards roadside swales surrounding the property. Stormwater runoff from the landfill cap will not come into contact with "clean" stormwater runoff from the edges of the site or off site.

Annual surface water quality monitoring is completed in accordance with the requirements of the Amended ECA and Certificate of Approval for Industrial Sewage Works.

Site Design and Operations

The Facility is currently operating under an ECA that limits the Site to a maximum of 750,000 tonnes of waste per year and a maximum of 250 vehicles entering the site per day. It should be noted that the maximum vehicles per day is much lower, with an average of 70-80 trucks per day.

The Site is only permitted to accept solid, non-hazardous residual material from Industrial, commercial and institutional sources. Organic or municipal solid waste (putrescible) is not permitted at the SCRF.

The ECA for the SCRF mandates that the Site be developed in accordance with the Design and Operations Plan. This reflects development of the approved base liner system in eight major phases with a total footprint area of 41.5 ha. To date, Phases 1 through 7 (out of a total of 8 phases) of the base liner system have been constructed across the southern and central portion of the Site covering a footprint area of approximately 40.5 ha.

Detailed design drawings and specifications for the Phase 8 base liner system are currently pending approval from the MOECC. Contingent on this approval, construction of the Phase 8 base liner system is currently anticipated to occur in late 2016. This will allow Terrapure to continue Site operations while the proposed reconfiguration is under consideration.

The existing on-site infrastructure includes, but is not necessarily limited to, the following:

- Site entrance/exit
- Internal roadways
- Scale/scale house
- Maintenance buildings
- Wheel wash
- Site office
- Stormwater, groundwater, and leachate management systems

7.2.4 Detailed Inventory of the Environment

Existing field studies and data collection are ongoing at the site to assist in the annual monitoring requirements. Supporting Document #3 provides extensive details on the existing conditions as it relates to the environmental components. During the EA, the project team will only collect further information based on the respective work plans (Appendix C), or should the Project Team member require additional data that is not able to be obtained from the existing monitoring reports/requirements.

7.2.5 Community Health Assessment Review

Terrapure commissions an independent annual Community Health Assessment Review, which has consistently concluded that the SCRF poses no scientifically significant or measurable potential impact to human and environmental health. The study reviews the cumulative impacts of ongoing monitoring data of key parameters that could impact the health of the local community, including: air quality, leachate, groundwater and surface water. Given that studies will be completed that are benchmarked against human health parameters, such as air quality and groundwater, Terrapure will continue to complete the Community Health Assessment Review as part of the ongoing operation. The Community Health Assessment Review has (in the past) been reviewed by the City of Hamilton Public Health Services (HPHS), and the HPHS has previously confirmed that it does not believe there is any value in pursuing a community health study after; 1) its review of annual monitoring results; 2)review of evidence that there is no human exposure at a level of concern as a result of

SCRF operations; and, 3) no substantive adverse health outcomes have been reported in association with the current SCRF operations[17].

8. Description of the Assessment and Evaluation Methodology

8.1 Alternative Methods of Carrying out the Undertaking

As described in Section 6.2 of the ToR, the EA will assess and evaluate two footprint options that have been developed as part of the ToR. This section lays out the assessment methodology that will be applied during the EA.

It is important to note that other alternative methods such as the assessment of leachate treatment and landfill gas systems will not be assessed in the EA. Terrapure is required to meet the design and performance standards of O. Reg. 232/98 for leachate collection and given that this is an existing, operating facility, with an established leachate collection system in place, the SCRF will utilize this existing infrastructure for the selected alternative footprint.

With respect to a landfill gas collection system, because the site does not receive putrescible or organic material, very little landfill gas is produced at the SCRF and as such, the facility is not required to have a landfill gas collection system in place. O. Reg. 232/98 requires that a gas recovery system be installed at landfills with a capacity that exceeds 1.5 million m^3 unless it can be demonstrated that the site does not generate significant quantities of landfill gas. In the past, Terrapure successfully applied to the MOECC for an exemption from this requirement. Further details are provided in Section 7.0 of the ToR and the Air Quality & Odour section of Supporting Document #3.

The EA will consider potential effects on the environment associated with the following timeframes:

- Construction
- Operation
- Closure/Post-closure

8.1.1 Assessment of the Alternative Methods

The alternative footprints will be assessed through a "net effects analysis" consisting of the following activities:

1. Develop appropriate evaluation criteria and indicators based on the purpose of the undertaking, existing environmental conditions, and type and scale of potential environmental effects from the alternative footprints.
    - See **Appendix B** for the preliminary criteria and indicators that will be utilized during the EA.
1. Describe the environment potentially affected for each alternative footprint and the potential effects on the environment in relation to the proposed evaluation criteria and indicators.

[17] HPHS letter to the Terrapure CLC Health Sub-Committee, dated February 29, 2012

- Potential effects on the environment will be based on the information contained in the technical discipline existing conditions reports (Supporting Document #3). The evaluation criteria will be applied to each expansion alternative to determine the potential environmental effects. Specifically, this will be accomplished by applying the indicators to each expansion alternative. The results of applying these indicators will be expressed in the context of their corresponding measures, either quantitatively or qualitatively, as appropriate, in the potential effects column of the net effects table.

2. Develop and apply reasonable avoidance, mitigation, and compensation measures. Reasonable measures include those for which there is a reasonable expectation that they can be implemented both technically and economically by Terrapure.

    - Once the potential effects on the environment have been identified for each expansion alternative, the appropriate avoidance/ mitigation/ compensation/ enhancement measures will be developed and documented in the net effects table for each indicator. The intent of these measures is as follows:

        - **Avoidance** – The first priority is to prevent the occurrence of negative effects (adverse environmental effects) associated with implementing an alternative footprint.

        - **Mitigation** – Where adverse environmental effects cannot be avoided, it will be necessary to develop the appropriate measures to remove or alleviate to some degree the negative effects associated with implementing the alternative footprint.

        - **Compensation** – In situations where appropriate mitigation measures are not available, or significant net adverse effects will remain following the application of mitigation, compensation measures may be required to counterbalance the negative effect through replacement in kind, or provision of a substitute or reimbursement.

        - **Enhancement** – Wherever possible, the opportunity should be taken to enhance the positive environmental effects associated with implementing an alternative rather than simply mitigating and/or compensating.

    - With these intentions in mind, the avoidance/ mitigation/ compensation/ enhancement measures will be developed based on the professional expertise of the Project Team reflecting current procedures, historical performance, and existing environmental conditions. These developed measures will be documented in the avoidance/ mitigation/ compensation/ enhancement measures column of the net effects table.

3. Identify net effects on the environment.

    - Once the appropriate avoidance/ mitigation/ compensation/ enhancement measures have been developed and applied to the potential environmental effects for each alternative footprint, the remaining net negative or net positive effect will be determined and documented by the Project Team members in the "net effects" column of the net effects table. In cases where the net negative or net positive effect cannot be addressed through the application of avoidance/ mitigation/ compensation/ enhancement measure(s), the potential net effect will remain unchanged and, therefore, will still be identified as the "net effect."

    - The net effects associated with each expansion alternative will be identified and carried forward to the comparative evaluation of the expansion alternatives

8.1.2 Comparative Evaluation of the Alternative Footprints

The net effects identified for each alternative footprint in the previous step will be compared to one another in order to identify a Recommended Alternative Footprint. The comparison of net effects will be completed using a "Reasoned Argument" or "Trade-off" method.

This method is based on the following two activities:

1. Identify the level of effect ("No", "Low", "Moderate" or "High") associated with each expansion alternative for each indicator.
2. Rank each alternative footprint from most preferred to least preferred based on the identified level of effect from each indicator:
    - Criteria rankings for each expansion alternative
    - Environmental component-specific rankings for each alternative footprint
    - Overall alternative footprint rankings

Under the Reasoned Argument approach, the difference in net effects associated with the alternative footprints is highlighted. Based on these differences, the advantages and disadvantages of each alternative footprint are identified according to the evaluation of trade-offs between the various evaluation criteria and indicators. The relative significance of potential impacts is examined to provide a clear rationale for the selection of a recommended alternative footprint.

The term "trade-offs" is defined as "things of value given up in order to gain different things of value." The alternative footprints will be compared against each other to distinguish relative differences in impacts to the environment, taking into account possible mitigation measures.

8.1.3 Selection of the Recommended Footprint

During the detailed Comparative Evaluation of the alternative footprints, the rankings will be combined (aggregated) for each environmental indicator and criterion into a single preference rating ("No", "Low", "Medium", or "High") for each environmental component. These results will be further aggregated into a single preference rating for each alternative footprint in order to rank the alternative footprints (incorporating trade-offs and professional judgement) and identify a Recommended Alternative Footprint.

8.1.4 Identification of the Preferred Footprint

The Recommended Alternative Footprint identified in the previous step, along with the results of the net effects assessment and comparative evaluation will be presented at a public Open House for review and comment during the EA. The Recommended Alternative Method will be refined based on comments received from agencies, Aboriginal communities and members of the public, which will then become the Preferred Footprint.

8.2 Impact Assessment of the Preferred Footprint

An impact assessment will be undertaken by each technical discipline on the Preferred Footprint. The intent of the impact assessment is to allow for additional details to be developed on the Preferred Footprint from a Design and Operations perspective and to then review the mitigation

measures and resultant net effects described in the Alternative Methods stage within the context of the more detailed design for the Preferred Footprint. If required, further mitigation or compensation measures will be developed that may be more detailed to match the level of detail developed for the design of the Preferred Footprint. Confirmatory environmental investigations may be carried out at this stage, if required. At the completion of the impact assessment of the Preferred Footprint, the advantages and disadvantages to the environment of the Preferred Footprint will be highlighted in a table.

During the impact assessment, Terrapure will review the Preferred Footprint from a climate change adaptation and mitigation perspective as well as the Preferred Footprint and overall Site contributes to reducing Greenhouse Gas emissions.

9. Commitments and Monitoring

9.1 ToR and EA Commitments

As part of preparing this ToR, a number of commitments are being made by Terrapure that will need to be fulfilled during preparation of the SCRF EA. **Appendix D** lists these commitments. If approval of the ToR is granted by the Minister, the list of commitments will be finalized and included in the EA Report, documenting where and how they were dealt with during preparation of the SCRF EA.

Similarly, commitments may be made by Terrapure during preparation of the SCRF EA that will need to be fulfilled if approval of the ToR is granted by the Minister. Where such commitments are made, a comprehensive list of EA commitments will be documented in the EA Report, including where and how they will be dealt with if the proposed ToR is approved.

Additional commitments as part of the Draft proposed ToR include the following:

- Outside of the EA process, conduct workshops/roundtables to discuss the future of the site for a new Community Use through the development of a Closure Plan;
- Continue to provide $1 per tonne of residual material received at the site to the Heritage Green Community Trust and the City of Hamilton (each).

9.2 Environmental Effects and EA Compliance Monitoring

Terrapure is committed to developing a monitoring framework during preparation of the SCRF EA that will address environmental effects and, as applicable, EA compliance. The purpose of the environmental effects monitoring will be to monitor the net effects associated with the construction, operation, and maintenance of the proposed undertaking, as necessary, and implement further mitigation measures, monitoring, and contingency plans, where possible, so that:

1. Predicted net negative effects are not more than expected
2. Unanticipated negative effects are addressed
3. Predicted benefits are realized

The purpose of the EA compliance commitment monitoring will be to track the commitments made by Terrapure during preparation of the SCRF EA, as well as any conditions of EA Act approval, so

that they are followed through as applicable in the construction, operation, and maintenance of the proposed undertaking.

The EA Report will include a strategy on how and when the commitments will be fulfilled and how Terrapure will report on this to MOECC and other regulatory agencies, as appropriate, on compliance.

10. Consultation Plan for the Terrapure SCRF EA

Consultation with interested persons will take place as part of preparing the Terrapure SCRF EA building upon what was done during the preparation of the ToR in accordance with Section 5.1 of the *Act*. With this in mind, the various consultation activities undertaken with review agencies, Aboriginal communities, and the public to obtain their comments for consideration as part of preparing the ToR are documented in the Record of Consultation prepared under separate cover for the ToR.

10.1 Proposed Consultation Activities

Terrapure is committed to sharing as much information as possible with the community, our neighbours and other key stakeholders and answering their questions to ensure everyone clearly understands its proposal. The consultation activities proposed for the Terrapure SCRF EA will include, but will not be limited to, those carried out during preparation of the ToR. The proposed consultation activities are briefly summarized as follows:

- Project-specific website – providing clear and accurate information to participants as well as an opportunity for them to give feedback to the Terrapure Project Team (www.terrapurestoneycreek.com). A dedicated project-specific email account (info@terrapurestoneycreek.com) has also been established as part of the Project website.
- Social media – Terrapure has created SCRF-specific social media pages (facebook and twitter) to provide succinct, accurate information to participants, as well as to provide key updates on the EA.
- Notices – providing information to interested persons about the project and how they can be involved. The notices will be presented through a variety of methods including, but not limited to, the following: ads in local area newspapers (Hamilton Spectator, Stoney Creek News), project website, Canada Post maildrop, and social media (facebook, twitter).
- Individual or group meetings – discussing project-specific issues with review agencies, organizations, the public and Aboriginal communities
- Community Liaison Committee (CLC) – utilizing the existing CLC (a representative group of broadly based interested participants residing within a 1.5 km radius of the SCRF, who understand the site and its operation) to provide a forum for in-depth discussion of project issues and act as a conduit with the local community.
- Public Open House events – seeking a highly participative approach, Terrapure will hold two Open House events during the EA, which will be drop-in style open house events with numerous display materials set-up around the room, with Project Team members available to answer questions and facilitate discussions.

- Presentations to City of Hamilton – providing project status updates as required.

10.2 Obtaining Input from Interested Participants

Obtaining input from all interested participants is a critical component of Terrapure's plans to draft the ToR and undertake the EA. Input will be obtained from interested participants during the SCRF EA through a variety of means specific to each of the following three participant groups:

- Review agencies as applicable (Provincial ministries and agencies, City of Hamilton, conservation authorities, school boards, utilities, etc.)
- Public (includes individuals, groups or associations, property owners, residents, business owners, etc.)
- Aboriginal communities and First Nations as applicable.

Review Agencies

Input from interested review agencies will be received primarily through written correspondence, individual or group meetings (e.g., Government Review Team meetings), and the CLC. A MOECC Hamilton District staff member is a participating member of the CLC.

Public

Input from the public will be received primarily through written correspondence and e-mails, documented telephone calls via the project specific 1-800 number established for the project, verbal discussions held at Public Open House events, CLC meetings and any additional individual or group meetings.

Aboriginal communities and First Nations

Input from interested Aboriginal communities and First Nations groups will be obtained primarily through individual or group meetings and to a lesser extent documented telephone follow-up calls.

10.3 Key Decision-Making Milestones when Consultation will Occur

There are a number of key decision-making milestone points when consultation will occur during preparation of the SCRF EA. These key decision-making milestones have been grouped as follows:

- Alternative Methods
  - Reviewing the generated Alternative Methods (footprints)
  - Confirming the evaluation criteria and indicators to be applied to the Alternative Methods (footprints)
  - Reviewing the recommended Alternative Method (footprint) identified through the comparative evaluation process
- Impact Assessment of the Preferred Alternative Method (footprint)
  - Reviewing the potential environmental effects, recommended impact management measures, proposed monitoring requirements, and proposed approvals/permits required for implementing the undertaking.

- Pre-Submission of the Draft EA Report
    - Reviewing the draft EA Report prior to its finalization and formal submission to the Minister of the Environment and Climate Change for approval.

Notwithstanding these key decision-making milestones, consultation will be ongoing throughout the SCRF EA.

10.4 Proposed Issues Resolution Strategy

Recognizing that there may be issues raised or disputes during preparation of the SCRF EA that may be difficult to resolve, an issues resolution strategy is proposed as part of the ToR. This strategy will benefit all parties potentially involved by providing an agreed to and well understood issues resolution process to ensure that disputes are effectively and appropriately dealt with.

Should an issue or dispute arise during preparation of the SCRF EA, Terrapure will discuss the nature of the issue or dispute with the interested persons and attempt, in good faith, to reach a resolution that is agreeable to both Terrapure and the interested persons.

11. Flexibility of this Terms of Reference

If approval of the ToR is granted by the Minister of the Environment and Climate Change, this ToR will provide the framework for undertaking the SCRF EA and preparing the EA Report.

It is understood that, given the nature of EA ToRs, it is not intended to present every detail of all the activities that will occur when preparing the EA. It is therefore possible that, in carrying out the work contemplated by this ToR, it may become evident that certain modifications are appropriate. It is important to note that the commitments described in this ToR are a minimum that must be met, and that more may be required, if necessary. It is envisioned that such changes may include:

- Additional alternative footprints, or refinements to the two alternative footprints described in this ToR
- Revisions and/or modifications to the identified study area(s)
- Revisions to evaluation criteria/indicators
- Revisions in methodology of the studies referred to in Section 8.0. This may be in response to studies that showed environmental effects to be greater or less than previously estimated.
- Revisions to investigative studies to ensure that the nature and magnitude of potential positive and negative environmental effects are accurately identified and minimized or mitigated.
- Revisions to consultation activities.
- Any other modifications required or available through changes to Acts or Regulations.

This list is not intended to be exhaustive. Rather, it sets out, by example, the types of changes that could be considered within the framework of the ToR without the need to prepare and submit a new ToR to the Minister for approval. Other additions and/or modifications may arise during preparation of the SCRF EA, which would be considered in a similar manner.

12. Other Approvals Required

In addition to approval of the EA under the *EA Act*, applications will be made, as necessary, under a number of provincial statutes for approval to implement the proposed undertaking. The types of approvals that potentially apply may include, but are not limited to:

- Ontario Environmental Protection Act (EPA) - MOECC
- Ontario Water Resources Act (OWRA) - MOECC
- Environmental Bill of Rights (EBR) - MOECC

During the preparation of the EA, any federal agencies that may have interests applicable to the proposed undertaking will be identified by way of consultations with relevant federal agencies and any necessary approvals under federal statutes will be identified. After reviewing the Canadian Environmental Assessment Act 2012 (CEAA 2012) and the associated *Regulation Designating Physical Activities*, the proposed undertaking does not appear on the list of projects under CEAA 2012. This will be confirmed early in the EA with the Canadian Environmental Assessment Agency.

The actual approvals required for the preferred undertaking will be identified during preparation of the SCRF EA and a final list will be provided in the EA Report.

Appendix A

Glossary of Terms

Glossary of Terms

Acronym	Definition
AANDC	Aboriginal Affairs and Northern Development Canada
C of A	Certificate of Approval
C&D	Construction and Demolition
CEAA	Canadian Environmental Assessment Act
D&O	Design & Operations
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EA Act	Ontario *Environmental Assessment Act*
EC	Environment Canada
ECA	Environmental Compliance Approval
EPA	*Environmental Protection Act*
EPR	Extended Producer Responsibility
GHG	Greenhouse Gases
GRT	Government Review Team
HC	Health Canada
IC&I	Industrial Commercial and Institutional
ISWM	Interim Stormwater Management
MIRR	Ontario Ministry of Indigenous Relations and Reconciliation (formerly Ministry of Aboriginal Affairs)
MMAH	Ontario Ministry of Municipal Affairs and Housing
MNRF	Ontario Ministry of Natural Resources and Forestry
MOECC	Ontario Ministry of the Environment and Climate Change
MTCS	Ministry of Tourism, Culture and Sport
MTO	Ontario Ministry of Transportation
OH	Open House
OMAFRA	Ontario Ministry of Agriculture, Food & Rural Affairs
CLC	Citizen Liaison Committee
PPS	Provincial Policy Statement
PSW	Provincially Significant Wetland
PWQMN	Provincial Water Quality Monitoring Network
SAR	Species at Risk
TC	Transport Canada
ToR	Terms of Reference

Unit	Definition
ha	hectare
km	kilometre
L	litre
m	metre
m^3	cubic metres

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
Certificate of Approval	A licence or permit issued by the Ministry of the Environment Climate Change for the operation of a waste management site/facility (now referred to as an Environmental Compliance Approval)

Term	Definition
Construction and demolition (C&D) waste	Solid waste produced in the course of residential, commercial, industrial or institutional building construction, demolition or renovation (e.g., lumber, brick, concrete, plaster, glass, stone, drywall, etc.)
Cover material	Material used to cover the waste in the disposal cells during or following landfilling operations. May be daily, intermediate or final
Design and operations (D&O) plan	A document required for obtaining a Certificate of Approval, which describes in detail the function, elements or features of the landfill site/facility, and how a landfill site/facility would function including its monitoring and control/management systems
Design capacity (Total Disposal Volume)	The maximum 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
Environmental Compliance Approval (ECA)	Technical approval of the Facility issued by MOECC under Sections 9 and 27 of the *Environmental Protection Act* and Section 53 of the *Ontario Water Resources Act*)
Environment	As defined by the Environmental Assessment Act, environment means: (a) air, land or water, (b) plant and animal life, including human life, (c) the social, economic and cultural conditions that influence the life of humans or a community, (d) any building, structure, machine or other device or thing made by humans, (e) any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities, or (f) any part or combination of the foregoing and the interrelationships between any two or more of them (ecosystem approach)
Environmental Assessment	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
Hazardous waste	Any residual hazardous materials which by their nature are potentially hazardous to human health and/or the environment, as well as any materials, wastes or objects assimilated to a hazardous material. Hazardous waste is defined by Ontario Regulation 347 and may be explosive, gaseous, flammable, toxic, radioactive, corrosive, combustive or leachable
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
Industrial, commercial and institutional (IC&I) wastes	Wastes originating from the industrial, commercial and institutional sectors 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
Mitigation	Action(s) that remove or alleviate to some degree the potential negative effects associated with an activity.
Monitoring	A systematic method for collecting information using standard observations according to a schedule and over a sustained period of time.
Net Effects	Positive or negative environmental effects of a project and related activities that will remain after mitigation and impact management measures have been applied.
Non-hazardous waste	Non-hazardous wastes includes all solid waste that does not meet the definition of hazardous waste and includes designated wastes such as asbestos waste

Term	Definition
Ontario Environmental Assessment Act	Legislation that defines a decision making process used to promote good environmental planning by assessing the potential effects of certain activities on the environment. The purpose of the Ontario *EA Act* is the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management in Ontario of the environment.
Potential Effect	An effect that is deemed possible to result from an activity.
Proponent	A person who: (a) carries out or proposes to carry out an undertaking, or (b) is the owner or person having charge, management or control of an undertaking Service life The period of time during which the components of a properly designed and maintained engineered facility will function and perform as designed
Site life	The period of time during which the landfill can continue to accept wastes

Appendix B

Evaluation Criteria

Evaluation Criteria

This appendix to the proposed Terms of Reference (ToR) for the Terrapure Stoney Creek Regional Facility (SCRF) Environmental Assessment (EA) describes the evaluation criteria, indicators and data sources that are proposed to assess the alternative methods of carrying out the project. The outcome of the EA, which will be carried out in accordance with the approved ToR, will include the identification of a preferred alternative method of carrying out the project.

Table B-1 presents the set of evaluation criteria proposed for the EA, which may be broadly grouped into Natural, Built, Social and Economic and Technical categories. Each criterion has indicators that will be used for measurement and data sources.

Table B-1: Proposed Evaluation Criteria, Rationale, Indicators and Data Sources for the EA

	Environmental Component	Evaluation Criteria	Indicators	Data Sources
NATURAL	**Atmospheric Environment**	Air quality	• Predicted off-Site point of impingement concentrations ($\mu g/m^3$) of indicator compounds • Number of off-Site receptors potentially affected (residential properties, public facilities, businesses, and institutions)	• Environment Canada or MOECC hourly meteorological data and climate normals • Site ambient air monitoring, continuous emissions monitoring data • Applicable MOECC guidelines and technical standards (i.e., O.Reg. 419/05 Schedule 2, Schedule 3 and Schedule 6 Standards) • Aerial photographic mapping and field reconnaissance • Off-Site receptors confirmed on recent mapping • Emissions Summary and Dispersion Modelling (ESDM) reports • Available background ambient air data • Waste materials and leachate characterization and sampling data • Proposed facility characteristics • Landfill design and operation data and associated topography

	Environmental Component	Evaluation Criteria	Indicators	Data Sources
		Noise	• Predicted off-Site noise level • Number of off-Site receptors potentially affected (residential properties, public facilities, businesses, and institutions).	• Site-specific equipment noise measurements • Manufacturer provided noise specifications • Applicable MOECC guidelines and technical standards (Noise guidelines for landfill sites, Oct, 1998; NPC-300, August, 2013; NPC-233). • Aerial photographic mapping and field reconnaissance to confirm off-Site receptors • Land Use Zoning Plans • Acoustic Assessment Reports • Proposed facility operational characteristics and scenarios • Landfill design and operation data and associated topography
		Odour	• Predicted off-Site odour concentrations ($\mu g /m^3$ and odour units) • Number of off-Site receptors potentially affected (residential properties, public facilities, businesses and institutions)	• Published odour studies for similar source types • Site specific odour source data and/or ambient odour monitoring data • Environment Canada or MOECC hourly meteorological data and climate normals • Applicable MOECC guidelines and technical standards (i.e., O.Reg. 419/05 Schedule 2, Schedule 3 and Schedule 6 Standards) • Site odour complaints history • Aerial photographic mapping and field reconnaissance • Off-site receptors confirmed on recent mapping • Odour assessment reports • Waste materials and leachate characterization and sampling data • Proposed facility characteristics • Landfill design and operation data and associated topography

	Environmental Component	Evaluation Criteria	Indicators	Data Sources
	Geology & Hydrogeology	Groundwater quality	• Predicted effects to groundwater quality at property boundaries and off-site	• Hydrogeological and geotechnical studies • Water well records • Determination of water well users in the area • Annual Site Monitoring Reports • Proposed leachate control concept designs • Environment Canada Canadian Climate Normals • Leachate generation assessment • Provincial Water Quality Monitoring Network (PWQMN)
		Groundwater flow	• Predicted groundwater flow characteristics	• Hydrogeological and geotechnical studies • Water well records • Determination of water well users in the area • Annual Site Monitoring Reports
	Surface Water Resources	Surface water quality	• Predicted effects on surface water quality on-site and off-site	• Topographic maps • Air photos • Facility layout, drainage maps and figures • Proposed on-site stormwater management concept designs for vertical expansion alternatives • Existing leachate management system • Annual monitoring reports • Interviews and discussions with staff, MOECC, Conservation Authorities, and Environment Canada • Published water quality and flow information from MOECC, Environment Canada and conservation authorities • Site reconnaissance • PWQMN
		Surface water quantity	• Change in drainage areas • Predicted occurrence and degree of off-site effects	
	Terrestrial & Aquatic Environment	Terrestrial ecosystems	• Predicted impact on vegetation communities • Predicted impact on wildlife habitat • Predicted impact on vegetation and wildlife including rare, threatened or endangered species	• Site surveys • Published data sources
		Aquatic ecosystems	• Predicted changes in water quality • Predicted impact on aquatic habitat • Predicted impact on aquatic biota	• Site surveys • Published data sources

	Environmental Component	Evaluation Criteria	Indicators	Data Sources
BUILT, SOCIAL & ECONOMIC	**Traffic**	Effects on airport operations	• Bird strike hazard to aircraft in Local Study Area	• Transport Canada data sources
		Effects from truck transportation along access roads	• Potential for traffic collisions • Disturbance to traffic operations	• Transport Canada data sources • Previous traffic studies • City of Hamilton data
	Land Use	Effects on current and planned future land uses	• Current land use • Planned future land use • Type(s) and proximity of off-site recreational resources within 500 m of the SCRF • Type(s) and proximity of off-site sensitive land uses (i.e., dwellings, churches, cemeteries, parks) within 500 m of the SCRF	• City of Hamilton Official Plan • Aerial photographic mapping and field reconnaissance • Published data on public recreational facilities/ activities • City of Hamilton Zoning • Provincial Policy Statement, 2014
	Social	Visual impact of facility	• Predicted changes in perceptions of landscapes and views	• Alternative footprints • Site grading plans • Aerial mapping and field reconnaissance • Canadian Society of Landscape Architects reference library • Ontario Horticultural Trades Association reference manual
		Effects on Local Residents	• Predicted changes to local residents use of property	• Aerial mapping and field reconnaissance • Census information
	Economic	Effects on the cost of services to customers	• Total optimized site capacity and site life • Distance travelled	• New landfill footprint alternatives • Total volume of residual material received
		Continued service to customers	• Total optimized site capacity and site life	• New landfill footprint alternatives • Total volume of residual material received
		Economic benefit to local municipality	• Employment at site (number and duration) • Opportunities to provide products or services	• New landfill footprint alternatives • Total volume of residual material received

	Environmental Component	Evaluation Criteria	Indicators	Data Sources
TECHNICAL	**Site Design & Operation**	Site design and operational characteristics	• Complexity of Site design • Operational flexibility	• Existing and proposed site environmental control system designs and operational requirements • Alternative footprint options and associated phasing of operations • Potential daily cover and soil/aggregate quantities

Appendix C

Draft Work Plans

1. Introduction

The purpose of this document is to present the proposed work plan for the Terrapure Stoney Creek Regional Facility (SCRF) environmental assessment (EA).

The proposed work plan, which is part of the Terms of Reference (ToR), presents the scope of work required to complete the EA, including the scope of technical studies for each of the environmental components, public consultation, effects assessment, mitigation, EA documentation and submission. Work plans for individual technical disciplines are included in **Attachments 1** to **7** to this document.

2. Environmental Assessment Approach

It is proposed that the EA will be undertaken in three phases as follows:

- Phase 1 – Confirm the characterization of the existing environment as documented in the ToR and predict effects of the proposed alternatives.
- Phase 2 – Identify a recommended alternative method.
- Phase 3 – Prepare and submit EA documentation.

Consultation with public, agencies, Aboriginal communities and other stakeholders will be ongoing throughout the EA process.

2.1 Environmental Components

The environmental components that will be evaluated in the EA are listed in the table below:

- Atmospheric Environment (including Air Quality, Odour and Noise)
- Geology & Hydrogeology
- Surface Water Resources
- Terrestrial & Aquatic Environment
- Traffic
- Land Use, Social & Economic Environment
- Site Design & Operations

A list of the proposed environmental components, indicators and data sources are listed in the attachments to this document.

2.2 Study Areas

Two study areas will be established for preparation of the EA: the Site Study Area and the Local Study Area. The Site Study Area will include all lands within the existing, approved boundaries of the Terrapure SCRF, as defined by Environmental Compliance Approval (ECA) No. A181008, as amended. The Local Study Area will include all lands and waters within a 500m to 1.5 km radius of the Site Study Area boundaries. It should be noted that this is a generic delineation of the Local

Study Area that may be modified during the EA to suit the particular requirements of each environmental component. Each environmental component may modify the Local Study Area, as required, during the EA.

2.3 Time Frame

The EA will consider potential effects on the environment associated with the following timeframes:

- Construction/Operation
- Closure/Post-closure

3. Work Scope

3.1 Phase 1 – Confirm characterization of the Existing Environment as documented in the ToR and Predict Effects of the Proposed Alternatives

This initial phase of the EA comprises the following four tasks:

- **Task 1** – Confirm Characterization of the Existing Environment
- **Task 2** – Confirm Alternative Methods (i.e. Footprint options)
- **Task 3** – Describe the Environment Potentially Affected and Predict Environmental Effects for each Alternative

3.1.1 Task 1 – Confirm Characterization of the Existing Environment

The ToR process has reviewed all previous documentation with respect to the existing site and operations and provided a description of the existing environment. Secondary data was supplemented with primary data, where necessary (i.e., updated traffic counts, ELC, etc.) and the reports within Supporting Document #2 to the ToR will serve as the characterization of the existing environment during the EA. Confirmation of the existing environment will be the first step to ensure any potential alterations/changes on-site are reflected in the EA documentation.

3.1.2 Task 2 – Confirm Alternative Methods (Footprints)

The ToR process has identified 2 conceptual alternative footprint designs at the existing Terrapure SCRF. The reconfiguration of the SCRF will provide approximately 3,680,000 cubic metres (m^3) of air space and will be designed to meet all applicable Ministry of the Environment and Climate Change (MOECC) requirements. During the EA, the project team will describe each alternative footprint and any associated facilities (i.e., stormwater management ponds) to a sufficient level of detail (i.e., conceptual designs) to allow for their assessment by technical discipline leads for further analysis. The characteristics of the existing and proposed site design and engineering requirements, including in-design mitigation measures, can affect the environment. These potential effects will be assessed in the EA. A Conceptual Design Report (CDR), will be prepared that will highlight the key elements of the alternative footprints and ancillary elements, which the Project Team will use to conduct their effects assessment.

3.1.3 Task 3 - Describe the Environment Potentially Affected & Predict Environmental Effects for each Alternative

Following confirmation of the characterization of the existing environmental conditions and confirmation of the alternative methods (footprints), the project team will conduct a preliminary assessment of potential effects of each alternative footprint. The assessment will be done for each environmental component based on the existing environmental conditions and the conceptual designs for each alternative footprint.

3.2 Phase 2 – Identify a Recommended Alternative

The second phase of the EA comprises the following three tasks:

- **Task 4** – Refine Mitigation Measures and Determine Net Effects
- **Task 5** – Comparatively Evaluate Alternatives
- **Task 6** – Identify a Recommended Alternative
- **Task 7** – Complete an Impact Assessment on the Recommended Alternative

3.2.1 Task 4 – Refine Mitigation Measures and Determine Net Effects

Prediction of future environmental conditions associated with each alternative footprint will be undertaken by each the Project Team using modelling and other methods. Assessment of potential effects will be done using appropriate objectives, standards, policies and legislation. Further mitigation measures, beyond those already incorporated into the conceptual designs of the alternatives, if required, will be identified and refined as necessary. The project team will update and revise the conceptual design plans accordingly. The final conceptual designs will be documented in the EA Report. Any predicted effects remaining following application of these final mitigation measures, or "net effects", will be documented in the EA Report.

3.2.2 Task 5 – Comparatively Evaluate Alternatives

The project team may also consider additional alternative footprints that may have been identified by the public or other parties during the EA process. Should any additional alternatives be developed, they would be subjected to the same procedure outlined in Task 3.

Following completion of Task 4, the net effects for each alternative footprint will be comparatively evaluated using a Reasoned Argument (or Trade-off) method as a means of selecting the Recommended Alternative Method. Application of this assessment method will be based on identifying the advantages and disadvantages of each alternative and using them to establish preferences among the alternatives. Each alternative will be compared using the criteria, indicators and data sources presented in the ToR. This analysis will be undertaken by the project team. The information generated through the comparison of the alternative methods will be summarized in a series of tables and documented in the EA Report.

3.2.3 Task 6 – Identify a Recommended Alternative

In this task, the advantages and disadvantages of each alternative will be described based on the comparative evaluation. The outcome of this ranking exercise will be the identification of a recommended alternative.

3.2.4 Task 7 – Conduct an Impact Assessment on the Recommended Alternative

An impact assessment of the recommended alternative will be completed to determine the net effects that will be caused, or that might reasonably be caused, on the environment (i.e., the advantages and disadvantages to the environment). This includes consideration of any mitigation that might be necessary to reduce or eliminate impacts, and the appropriate monitoring, contingency and impact management plans.

3.2.5 Task 8 – Conduct Cumulative Effects Assessment

The assessment of cumulative effects is routinely included in federal environmental assessments, but not typically in an Ontario EA. Terrapure is proposing to conduct this additional analysis, which will consider the combined or cumulative effects on the environment of "net effects" identified previously, with the effects of other projects that occur during the same timeframe and geographic area. For example, the cumulative effects assessment will consider the combined effects of the site's reconfiguration with other projects/activities that are existing, planned and approved or reasonably foreseeable (i.e. new land use developments within the area).

3.3 Phase 3 – Prepare and Submit Environmental Assessment Documentation

The third and final phase of the EA will be the preparation and submission of the EA documentation and will include the following three tasks:

- **Task 9** – Prepare EA Documentation
- **Task 10** – Submit Draft EA Report for Comment
- **Task 11** – Revise & Submit Final EA Report to the MOECC

The EA Report will be based on the results of the individual technical discipline studies and the consultation plan, the full documentation of which will be included as supporting documents to the EA Report.

3.3.1 Task 9 – Prepare EA Documentation

All key information and findings from the studies and consultation reports will be included in the EA Report. Meetings and telephone calls with the MOECC and key agencies will take place throughout the preparation of the EA Report to discuss Project Team studies and findings. Input and comments received from the public, Aboriginal communities, government agencies, municipal officials, and other stakeholders throughout the EA process will be considered in the preparation of the EA Report.

3.3.2 Task 10 – Submit Draft EA Report for Comment

A complete draft of the EA Report will be distributed to the public, MOECC, members of the Government Review Team (GRT), and Aboriginal communities for review and comment. Hard copies of the draft EA Report will be made available for review at various locations accessible to the public and will also be posted on the project website. This is also typically known as the Pre-Submission stage of the EA process. Comments received during the pre-submission comment

period will be compiled by the project team and considered in the finalization of the EA Report. The draft EA Report pre-submission review period will be 5 weeks.

3.3.3 Task 11 – Revise & Submit Final EA Report to the MOECC

The EA Report will be finalized, taking into consideration all comments received on the draft EA Report, and submitted to the MOECC. The EA Report will also be distributed to the GRT and Aboriginal communities; hard copies will be made available for review at various locations accessible to the public; and the complete report will be posted on the project website.

Throughout the MOECC review period, the project team will be available to provide technical support, as required. This will include answering questions and comments received and documenting responses. It is anticipated that comments and responses will be presented in a separate report.

Attachment 1

Atmospheric Environment Work Plan

The atmospheric environment is comprised of three sub-components: air quality, noise and odour. The following tasks will be carried out to characterize existing environmental conditions, predict and assess potential environmental effects, determine mitigation measures (if required) and compare alternative methods of carrying out the undertaking:

- Conduct Site reconnaissance to confirm site information compiled from existing documentation and finalize location and nature of potential off-site receptors.
- Consult with the MOECC and other members of the GRT on the modeling protocols to be used in the assessment.
- Update existing on-site odour sampling to characterize sources of odour and provide data for input to the air quality and odour assessments.
- Update existing noise measurements on-site for environmentally significant mechanical noise sources (stationary and mobile landfill equipment) and off-site measurements as necessary to input into an acoustical model to determine the existing baseline environmental noise levels at potential sensitive points of reception.

Upon collection of data required for the assessment of air quality and odour emissions, embark on the following studies:

- Assessment of Alternatives: This study will assess emissions from the 2 footprint alternatives for the Site. The assessment will focus on the predicted maximum air quality and odour effects associated with each of the alternative footprints. This study will focus on property line and sensitive receptors. Results will be used to assist in ranking of project alternatives.

In support of the air quality and odour studies listed above, the following will be completed:

- The development of an AERMOD atmospheric dispersion model for the site, which will be used to predict effects of the proposed operations. The sources of the data will be reviewed with the MOECC prior to finalization of the modelling dataset.
- Assessment of mitigation measures inherent in the project design and those that may be necessary to improve operations.

Upon collection of data required for the assessment of noise emissions, embark on the following studies:

- Assessment of Alternatives: This study will assess emissions from the 2 footprint alternatives for the Site. Emissions from existing equipment operating at the site will be based on measurements from the existing landfill or data from a database of similar and representative noise sources. This will be followed by the execution of a noise prediction model for each alternative footprint. The results of this study will predict the worst-case, one hour, off-site environmental noise impacts from each of the alternative footprints at the points of reception subject of the study. A point of reception means an MOECC prescribed location on a noise sensitive land use (existing dwelling or zoned land use) where noise from a stationary source is received. The results will be used to assist in the ranking of alternatives.

In support of the noise study listed above, the following will be completed:

- The development of an ISO 9613 prediction model for the Site, which will be used to predict effects of the proposed operations.
- Provide acoustic performance specifications for noise mitigation measures inherent in the project design and those that may be necessary to improve operations and ensure compliance with MOECC noise guidelines.

In support of the atmospheric studies listed above, the following will be completed:

- Generate predictions (air quality, odour and noise).
- Compile and document climate normals for the project site, and document the existing climatic conditions.
- Document the assessments listed above, data sources and assessment results in an Atmospheric Environment Technical Support Document (TSD) that will form an appendix to the EA.
- Participate in meetings with the GRT agencies as required.
- Provide technical support during the review of the draft EA Report by the GRT, Aboriginal communities and the public.

Table 1-1 – Criteria, Rationale, Indicators and Data Sources

Environmental Component	Evaluation Criteria	Indicators	Data Sources
Atmospheric Environment	Air quality	• Predicted off-Site point of impingement concentrations ($\mu g/m^3$) of indicator compounds • Number of off-Site receptors potentially affected (residential properties, public facilities, businesses, and institutions)	• Environment Canada or MOECC hourly meteorological data and climate normals • Site ambient air monitoring, continuous emissions monitoring data • Applicable MOECC guidelines and technical standards (i.e., O.Reg. 419/05 Schedule 2, Schedule 3 and Schedule 6 Standards) • Aerial photographic mapping and field reconnaissance • Off-Site receptors confirmed on recent mapping • Emissions Summary and Dispersion Modelling (ESDM) reports • Available background ambient air data • Waste materials and leachate characterization and sampling data • Proposed facility characteristics • Landfill design and operation data and associated topography
	Noise	• Predicted off-Site noise level • Number of off-Site receptors potentially affected (residential properties, public facilities, businesses, and institutions).	• Site-specific equipment noise measurements • Manufacturer provided noise specifications • Applicable MOECC guidelines and technical standards (Noise guidelines for landfill sites, Oct, 1998; NPC-300, August, 2013; NPC-233). • Aerial photographic mapping and field reconnaissance to confirm off-Site receptors • Land Use Zoning Plans • Acoustic Assessment Reports • Proposed facility operational characteristics and scenarios • Landfill design and operation data and associated topography

Environmental Component	Evaluation Criteria	Indicators	Data Sources
	Odour	• Predicted off-Site odour concentrations (μg /m^3 and odour units) • Number of off-Site receptors potentially affected (residential properties, public facilities, businesses and institutions)	• Published odour studies for similar source types • Site specific odour source data and/or ambient odour monitoring data • Environment Canada or MOECC hourly meteorological data and climate normals • Applicable MOECC guidelines and technical standards (i.e., O.Reg. 419/05 Schedule 2, Schedule 3 and Schedule 6 Standards) • Site odour complaints history • Aerial photographic mapping and field reconnaissance • Off-site receptors confirmed on recent mapping • Odour assessment reports • Waste materials and leachate characterization and sampling data • Proposed facility characteristics • Landfill design and operation data and associated topography

Attachment 2

Geology & Hydrogeology

The geology and hydrogeology environmental component includes two sub-components: groundwater quality and groundwater flow. The following tasks will be undertaken to characterize existing environmental conditions, predict and assess potential environmental effects, determine mitigation measures and compare alternative methods of carrying out the undertaking.

- Conduct site reconnaissance to confirm the information presented in the Geology & Hydrogeology Existing Conditions Report.

Based on the Conceptual Design Report:

- Conduct predictive modelling of contaminating lifespan as per Ontario Regulation 232/98 for each alternative footprint.
- Based on the proposed conceptual design alternatives, in-design mitigation measures and the results of predictive modelling, complete an evaluation of potential effects of each alternative on the hydrogeological environment.
- Compare the degree of potential effects using the criteria and indicators for the geological and hydrogeological component, rank the alternatives, and identify the preferred alternative from the geological and hydrogeological perspective.
- Prepare a groundwater monitoring program for the preferred alternative, and conceptual contingency plan approaches.
- Document the factual information, analysis and comparative assessment in a Geology and Hydrogeology TSD that will form an appendix to the EA.
- Participate in meetings with GRT agencies, as required.
- Provide technical support during the review of the draft EA Report by the GRT, Aboriginal communities and the public.

Table 2-1 – Criteria, Rationale, Indicators and Data Sources

Environmental Component	Evaluation Criteria	Indicators	Data Sources
Geology & Hydrogeology	Groundwater quality	• Predicted effects to groundwater quality at property boundaries and off-site	• Hydrogeological and geotechnical studies • Water well records • Determination of water well users in the area • Annual Site Monitoring Reports • Proposed leachate control concept designs • Environment Canada Canadian Climate Normals • Leachate generation assessment • Provincial Water Quality Monitoring Network (PWQMN)
	Groundwater flow	• Predicted groundwater flow characteristics	• Hydrogeological and geotechnical studies • Water well records • Determination of water well users in the area • Annual Site Monitoring Reports

Attachment 3

Surface Water Resources

The surface water environmental component has two sub-components: surface water quality and surface water quantity. The following tasks will be undertaken to characterize existing environmental conditions, predict and assess potential environmental effects, determine mitigation measures and compare alternative methods of carrying out the undertaking.

- Conduct site reconnaissance to confirm the information presented in the Surface Water Existing Conditions Report.
- Based on the Conceptual Design Report:
  - Predict and assess future surface water runoff and peak flows and quality conditions associated with each of the alternative footprints.
  - Compare these predictions to the existing conditions; determine changes and potential adverse effects on downstream watercourses; determine if mitigation measures are required and, if so, develop conceptual mitigation (i.e., engineered stormwater management measures/facilities).
  - Based on the proposed conceptual design alternatives, in-design mitigation measures and the results of predictive modelling, complete an evaluation of potential effects of each alternative on the surface water environment.
  - Compare the degree of potential effects using the criteria and indicators for the surface water component, rank the alternatives, and identify the preferred alternative from a surface water perspective.
- Document the factual information, analysis and comparative assessment in a Surface Water TSD that will form an appendix to the EA.
- Participate in meetings with GRT agencies, as required.
- Provide technical support during the review of the draft EA Report by the GRT, Aboriginal communities and the public.

Table 3-1 – Criteria, Rationale, Indicators and Data Sources

Environmental Component	Evaluation Criteria	Indicators	Data Sources
Surface Water Resources	Surface water quality	• Predicted effects on surface water quality on-site and off-site	• Topographic maps • Air photos • Facility layout, drainage maps and figures • Proposed on-site stormwater management concept designs for vertical expansion alternatives • Existing leachate management system • Annual monitoring reports • Interviews and discussions with staff, MOECC, Conservation Authorities, and Environment Canada • Published water quality and flow information from MOECC, Environment Canada and conservation authorities • Site reconnaissance • PWQMN

Attachment 4

Terrestrial & Aquatic Environment

The terrestrial and aquatic environmental component has two sub-components: terrestrial ecosystems and aquatic ecosystems. The following tasks will be undertaken to characterize the existing terrestrial and aquatic environmental conditions, predict and assess potential environmental effects, determine mitigation measures and compare alternative methods of carrying out the undertaking.

- Conduct site reconnaissance to confirm the information presented in the Natural Environment Existing Conditions Report
- Based on the Conceptual Design Report:
  - Assess potential impacts of the alternative footprints on the terrestrial and aquatic ecosystem.
  - Determine if mitigation and/or habitat compensation measures are required to avoid or reduce potential adverse impacts and, if so, develop conceptual mitigation.
- Document the factual information, analysis and comparative assessment in a Terrestrial and Aquatic Environment TSD that will form an appendix to the EA.
- Participate in meetings with GRT agencies, as required.
- Provide technical support during the review of the draft EA Report by the GRT, Aboriginal communities and the public.

Table 4-1 – Criteria, Rationale, Indicators and Data Sources

Environmental Component	Evaluation Criteria	Indicators	Data Sources
Terrestrial & Aquatic Environment	Terrestrial ecosystems	• Predicted impact on vegetation communities • Predicted impact on wildlife habitat • Predicted impact on vegetation and wildlife including rare, threatened or endangered species	• Site surveys • Published data sources
	Aquatic ecosystems	• Predicted changes in water quality • Predicted impact on aquatic habitat • Predicted impact on aquatic biota	• Site surveys • Published data sources

Attachment 5

Traffic

The traffic environmental component has two sub-components: airport operations and access roads. The following tasks will be undertaken to characterize the existing environmental conditions, predict and assess potential environmental effects, determine mitigation measures and compare alternative methods of carrying out the undertaking.

- Obtain additional information from the City of Hamilton on:
  - Traffic volumes and mix
  - Vehicular operating speeds
  - Roadway and intersection geometrics (including horizontal and vertical curves; passing zones; turning radii, etc.)
  - Traffic controls as well as regulatory signage and pavement markings
  - Historical collision records
  - Trip generation information from other comparable landfill sites
- Based on additional information from the City augment the Traffic Existing Conditions Report as necessary.
- Based on the Conceptual Design Report, compare the degree of potential effects using the criteria and indicators for the traffic component, rank the alternatives, and identify the preferred alternative from a traffic perspective.
- Document the analysis assumptions, findings and mitigation measures in a Traffic TSD Document that will form an appendix to the EA.
- Participate in meetings with the GRT, as required.
- Provide technical support during the review of the draft EA Report by the GRT, Aboriginal communities and the public.

Table 5-1 – Criteria, Rationale, Indicators and Data Sources

Environmental Component	Evaluation Criteria	Indicators	Data Sources
Transportation	Effects on airport operations	• Bird strike hazard to aircraft in Local Study Area	• Transport Canada data sources
	Effects from truck transportation along access roads	• Potential for traffic collisions • Disturbance to traffic operations	• Transport Canada data sources • Previous traffic study

Attachment 6

Land Use, Social & Economic Environment

The land use, social and economic environmental component addresses effects on current and planned future land uses as well as effects on local residents, visual impact of facility, cost of services to customers, continued service to customers, economic effects on the local municipality, effects on recreational resources and visual impact. The following tasks will be undertaken to characterize the existing environmental conditions, predict and assess potential environmental effects, determine mitigation measures and compare alternative methods of carrying out the undertaking.

Land Use, Social & Economic

- Meet with municipal officials to determine planned development and land use, including any applications for approval currently submitted.
- Define the distance parameters and number of residents within the vicinity of the facility.
- Define existing recreational resources in the study areas, including parks, trails, playing fields and other facilities.
- Define opportunities to provide new recreational resources as part of the Project.
- Define costs of services to customers and economic benefits to local municipality (royalty program)
- Based on the Conceptual Design Report, identify potential adverse effects on current and planned future land use, social & economic environment.
- Compare these predictions to the existing conditions. Determine if mitigation measures are required and, if so, develop mitigation.

Visual Impact

- Define the existing visual conditions of the Site from off-site viewpoints within the Local Study Area and document through written and photographic record.
- Determine the viewpoints (directions, distances) from which the proposed vertical expansion alternatives will be visible and take photographs from those viewpoints.
- Develop strategies to mitigate visual impacts and improve the appearance of the site, as required.
- Compare the degree of potential effects using the criteria and indicators for the land use and social environment component, rank the alternatives, and identify the preferred alternative from a land use and social environment perspective.
- Document the factual information, analysis and comparative assessment in the Land Use and Social Environment Technical Support Document that will form an appendix to the EA.
- Participate in meetings with the GRT, as required.
- Provide technical support during the review of the draft EA Report by the GRT, Aboriginal communities and the public.

Table 6-1 – Criteria, Rationale, Indicators and Data Sources

Environmental Component	Evaluation Criteria	Indicators	Data Sources
Land Use	Effects on current and planned future land uses	• Current land use • Planned future land use • Type(s) and proximity of off-site recreational resources within 500 m of the SCRF • Type(s) and proximity of off-site sensitive land uses (i.e., dwellings, churches, cemeteries, parks) within 500 m of the SCRF	• City of Hamilton Official Plan • Aerial photographic mapping and field reconnaissance • Published data on public recreational facilities/ activities • City of Hamilton Zoning • Provincial Policy Statement, 2014
Social	Visual impact of facility	• Predicted changes in perceptions of landscapes and views	• Alternative footprints • Site grading plans • Aerial mapping and field reconnaissance • Canadian Society of Landscape Architects reference library • Ontario Horticultural Trades Association reference manual
	Effects on Local Residents	• Predicted changes to local residents use of property	• Aerial mapping and field reconnaissance • Census information
Economic	Effects on the cost of services to customers	• Total optimized site capacity and site life • Distance travelled	• New landfill footprint alternatives • Total volume of residual material received
	Continued service to customers	• Total optimized site capacity and site life	• New landfill footprint alternatives • Total volume of residual material received
	Economic benefit to local municipality	• Employment at site (number and duration) • Opportunities to provide products or services	• New landfill footprint alternatives • Total volume of residual material received

Attachment 7

Site Design & Operations

The site design and operations environmental component has the sub-component of site design and operations characteristics. The following tasks will be undertaken to characterize the existing environmental conditions, predict and assess potential environmental effects, determine mitigation measures and compare alternative methods of carrying out the undertaking.

- Develop draft Conceptual Design Report (CDR) for the alternative footprints, including leachate containment and management, final cover system, etc.
- Circulate Conceptual Design Report to each Project Team member for preparation of their individual net effect analyses and comparative evaluations.
- Update the draft Conceptual Design Report based on Project Team feedback.
- Based on the Conceptual Design Report, identify potential adverse effects on site design and operations.
- Compare these predictions to the existing conditions. Determine if mitigation measures are required and, if so, develop mitigation.
- Compare the degree of potential effects using the criteria and indicators for the site design and operations environmental component, rank the alternatives, and identify the preferred alternative from a site design and operations perspective.
- Document the factual information, analysis and comparative assessment in the Site Design and Operations TSD that will form an appendix to the EA.
- Participate in meetings with the GRT, as required.
- Provide technical support during the review of the draft EA Report by the GRT, Aboriginal communities and the public.

Table 7-1 – Criteria, Rationale, Indicators and Data Sources

Environmental Component	Evaluation Criteria	Indicators	Data Sources
Site Design & Operation	Site design and operational characteristics	• Complexity of Site design • Operational flexibility	• Existing and proposed site environmental control system designs and operational requirements • Alternative footprint options and associated phasing of operations • Potential daily cover and soil/aggregate quantities

Appendix D

Proposed Terms of Reference Commitments Table

Draft Proposed Terms of Reference Commitment	How was the Commitment Addressed in the SCRF EA	Where the Commitment is Addressed in the SCRF EA
1. The EA will be prepared in accordance with subsection 6.1(3) of the *EA Act*. *Section 1*		
2. A Record of Consultation will be prepared and submitted to the MOECC, along with the Draft proposed ToR, describing the consultation program during the ToR and its results. *Section 1*		
3. The EA will consist of those items listed in subsection 6.1(2) of the EA Act as described in these ToR, as permitted by subsection 6.1(3) of the Act. *Section 3*		
4. Terrapure intends to follow subsections 6(2)(c) and 6.1(3) to describe the rationale and alternatives within the ToR. *Section 3*		
5. Terrapure will prepare an EA and submit an EA Report for review and approval by the Minister that will contain the following: • A further description of the *purpose* of the undertaking. • A refined *description* of the undertaking based on the consideration of alternative methods and detailed impact assessment. • The *rationale* for the undertaking, as described in Section 5 of the ToR. • The *alternatives to the undertaking*, as described in Section 6 of the ToR. • A description of the *environment potentially affected* by the undertaking. • An assessment of the *alternative methods* of carrying out the undertaking. Terrapure will consider the alternative methods described in Section 6.2 of the ToR. • A description of the *effec*ts that will be caused or that might reasonably be expected to be caused on the environment by the undertaking or the alternative methods. • A description of *mitigation measures* that are necessary to prevent or reduce significant adverse effects on the environment. • An evaluation of the *advantages and disadvantages* to the environment as a result of the undertaking and the alternative methods. • A description of *consultation* undertaken by Terrapure in association with the EA. *Section 3*		

Draft Proposed Terms of Reference Commitment	How was the Commitment Addressed in the SCRF EA	Where the Commitment is Addressed in the SCRF EA
6. The following additional aspects not normally part of the Ontario EA process are proposed for the SCRF EA: • Assessment of the effects of the environment on the project, specifically as it relates to Climate Change Adaptation and Mitigation, as well as how the proposed undertaking may contribute to the reduction of greenhouse gas (GHG) emissions. • Assessment of the cumulative effects of the proposed undertaking and other non-SCRF projects/activities that are existing, planned and approved or reasonably foreseeable. *Section 3*		
7. The purpose of the proposed undertaking will be further refined during the EA. *Section 4.2*		
8. Alternative 3 – Reconfigure the SCRF for additional capacity is Terrapure's proposed undertaking which will be considered further in the EA. *Section 6.1.2*		
9. In accordance with Section 6.1(2) of the *EA Act*, Terrapure will consider alternative methods that are appropriate and reasonable for the company to implement as it relates to the preferred alternative to, which is to "**Reconfigure the SCRF**." *Section 6.2*		
10. The alternative footprints presented in the ToR and Supporting Document #4 are at a conceptual design level and these alternative footprints will be further refined, as appropriate, during the EA. *Section 6.2*		
11. In accordance with Section 6.1(2) of the *EA Act*, the EA must consist of: • A description of and a statement of rationale for the alternative methods of carrying out the undertaking. • A description of: - The environment that will be affected or that might reasonably be expected to be affected, directly or indirectly. - The effects that will be caused or that might reasonably be expected to be caused to the environment. - The action necessary or that may be reasonably be expected to be necessary to prevent, change, mitigate or remedy the effects upon or the effects that might reasonably be		

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expected upon the environment, by the alternative methods of carrying out the undertaking. • An evaluation of the advantages and disadvantages to the environment of the alternative methods of carrying out the undertaking. *Section 6.2*		
12. The above requirements of the *EA Act* will be fulfilled through the generation and evaluation of the Alternative Methods, or 'alternative footprints'. The methodology for generating and evaluating the Alternative Methods is composed of the following four steps: • Step 1 – Generation of the Alternative Methods • Step 2 – Assessment of the Alternative Methods • Step 3 – Comparative Evaluation of the Alternative Methods and Selection of the Recommended Method • Step 4 – Identification of the Preferred Method *Section 6.2*		
13. Buffer areas to the south, east and west are already approved and established and will not be altered as part of this undertaking. Buffer areas to the north (towards Green Mountain Road) will be a minimum of 30 m under the alternative conceptual designs, consistent with the remainder of the site. *Section 6.2.2*		
14. The suitability of a proposed height increase is relative to the subsurface conditions, which will be evaluated in more detail during the EA. *Section 6.2.2*		
15. The proposed footprint alternatives are conceptual in nature and will be reviewed and refined during the EA and through consultation with the public and agencies. *Section 6.2.2*		
16. The suitability of the proposed slopes will be evaluated in more detail during the EA. *Section 6.2.2*		

Draft Proposed Terms of Reference Commitment	How was the Commitment Addressed in the SCRF EA	Where the Commitment is Addressed in the SCRF EA
17. The existing on site infrastructure is required as part of both conceptual alternative footprint designs and any reconfiguration will need to adjust the current location of this infrastructure. This includes, but is not necessarily limited to, the following: • Site entrance/exit • Internal roadways • Scale/scale house • Maintenance buildings • Wheel wash • Site office • Stormwater, groundwater, and leachate management systems *Section 6.2.2*		
18. Typical operating practices relating to nuisance issues that have been implemented at the SCRF will continue and will be common to all conceptual alternative footprint designs (with slight variations). *Section 6.2.2*		
19. An extensive description of the existing environment at the SCRF will be used to assess the potential effects of the various alternatives on the environment reflecting the broad definition of the environment as per the *EA Act*. *Section 7*		
20. It is proposed that the EA will address the following components of the environment that may be affected by the alternative methods of carrying out the undertaking: • Atmospheric (including air quality, odour and noise) • Geology and Hydrogeology • Surface Water • Terrestrial and Aquatic • Transportation • Land Use, Social and Economic • Technical (Site Design and Operation) Given that the site is currently in operation and previously went through an EA, archaeological and		

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built heritage will not be included in the EA. *Section 7*		
21. Due to current off-site operations and construction to the north of Green Mountain Road, the background levels of PM10 off-site have an influence on the overall area. This aspect will be documented and accounted for during the EA. Section 7.2		
22. A combination of earth berms, vegetation, and fences has been established around the perimeter of the Site to screen views of the SCRF from the surrounding built up areas. These features will be maintained throughout the life of the SCRF operation, and will be left in place for as long as practical until the final cover has been constructed. These features will also be upgraded periodically as required to accommodate changes in Site operations or changes to the surrounding land uses. *Section 7.2*		
23. During the EA, the project team will only collect further existing conditions information based on the respective work plans provided in Appendix C to the ToR or should the Project Team member require additional data that is not able to be obtained from the existing monitoring reports/requirements. *Section 7.2.4*		
24. Terrapure commissions an independent annual Community Health Assessment Review, which has consistently concluded that the SCRF poses no scientifically significant or measurable potential impact to human and environmental health. The study reviews the cumulative impacts of ongoing monitoring data of key parameters that could impact the health of the local community, including: air quality, leachate, groundwater and surface water. Given that studies will be completed that are benchmarked against human health parameters, such as air quality and groundwater, Terrapure will continue to complete the Community Health Assessment Review as part of the ongoing operation. *Section 7.2.5*		
25. The EA will assess and evaluate two footprint options that have been developed as part of the ToR. *Section 8.1*		

Draft Proposed Terms of Reference Commitment	How was the Commitment Addressed in the SCRF EA	Where the Commitment is Addressed in the SCRF EA
26. Terrapure is required to meet the design and performance standards of O. Reg. 232/98 for leachate collection and given that this is an existing, operating facility, with an established leachate collection system in place, the SCRF will utilize this existing infrastructure for the selected alternative footprint. *Section 8.1*		
27. The EA will consider potential effects on the environment associated with the following timeframes: • Construction • Operation • Closure/Post-closure *Section 8.1*		
28. The alternative footprints will be assessed through a "net effects analysis" consisting of the following activities: • Develop appropriate evaluation criteria and indicators based on the purpose of the undertaking, existing environmental conditions, and type and scale of potential environmental effects from the alternative footprints. - See **Appendix B** for the preliminary criteria and indicators that will be utilized during the EA. • Describe the environment potentially affected for each alternative footprint and the potential effects on the environment in relation to the proposed evaluation criteria and indicators. - Potential effects on the environment will be based on the information contained in the technical discipline existing conditions reports (Supporting Document #3). The evaluation criteria will be applied to each expansion alternative to determine the potential environmental effects. Specifically, this will be accomplished by applying the indicators to each expansion alternative. The results of applying these indicators will be expressed in the context of their corresponding measures, either quantitatively or qualitatively, as appropriate, in the potential effects column of the net effects table. • Develop and apply reasonable avoidance, mitigation, and compensation measures. Reasonable measures include those for which there is a reasonable expectation that they can be implemented both technically and economically by Terrapure. - Once the potential effects on the environment have been identified for each expansion alternative, the appropriate avoidance/ mitigation/ compensation/ enhancement measures will be developed and documented in the net effects table for each indicator. The intent of		

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these measures is as follows: - Avoidance – The first priority is to prevent the occurrence of negative effects (adverse environmental effects) associated with implementing an alternative footprint. - Mitigation – Where adverse environmental effects cannot be avoided, it will be necessary to develop the appropriate measures to remove or alleviate to some degree the negative effects associated with implementing the alternative footprint. - Compensation – In situations where appropriate mitigation measures are not available, or significant net adverse effects will remain following the application of mitigation, compensation measures may be required to counterbalance the negative effect through replacement in kind, or provision of a substitute or reimbursement. - Enhancement – Wherever possible, the opportunity should be taken to enhance the positive environmental effects associated with implementing an alternative rather than simply mitigating and/or compensating. • With these intentions in mind, the avoidance/ mitigation/ compensation/ enhancement measures will be developed based on the professional expertise of the Project Team reflecting current procedures, historical performance, and existing environmental conditions. These developed measures will be documented in the avoidance/ mitigation/ compensation/ enhancement measures column of the net effects table. • Identify net effects on the environment. - Once the appropriate avoidance/ mitigation/ compensation/ enhancement measures have been developed and applied to the potential environmental effects for each alternative footprint, the remaining net negative or net positive effect will be determined and documented by the Project Team members in the "net effects" column of the net effects table. In cases where the net negative or net positive effect cannot be addressed through the application of avoidance/ mitigation/ compensation/ enhancement measure(s), the potential net effect will remain unchanged and, therefore, will still be identified as the "net effect." - The net effects associated with each expansion alternative will be identified and carried forward to the comparative evaluation of the expansion alternatives *Section 8.1.1*		
29. The net effects identified for each alternative footprint in the previous step will be compared to one another in order to identify a Recommended Alternative Footprint. The comparison of net effects will be completed using a "Reasoned Argument" or "Trade-off" method. This method is based on the following two activities: • Identify the level of effect ("No", "Low", "Moderate" or "High") associated with each expansion		

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alternative for each indicator. - Rank each alternative footprint from most preferred to least preferred based on the identified level of effect from each indicator: - Criteria rankings for each expansion alternative; - Environmental component-specific rankings for each alternative footprint; and, - Overall alternative footprint rankings. *Section 8.1.2*		
30. The alternative footprints will be compared against each other to distinguish relative differences in impacts to the environment, taking into account possible mitigation measures. *Section 8.1.2*		
31. During the detailed Comparative Evaluation of the alternative footprints, the rankings will be combined (aggregated) for each environmental indicator and criterion into a single preference rating ("No", "Low", "Medium", or "High") for each environmental component. These results will be further aggregated into a single preference rating for each alternative footprint in order to rank the alternative footprints (incorporating trade-offs and professional judgement) and identify a Recommended Alternative Footprint. *Section 8.1.3*		
32. The Recommended Alternative Footprint along with the results of the net effects assessment and comparative evaluation will be presented at a public Open House for review and comment during the EA. The Recommended Alternative Method will be refined based on comments received from agencies, Aboriginal communities and members of the public, which will then become the Preferred Footprint. *Section 8.1.4*		
33. An impact assessment will be undertaken by each technical discipline on the Preferred Footprint. At the completion of the impact assessment of the Preferred Footprint, the advantages and disadvantages to the environment of the Preferred Footprint will be highlighted in a table. During the impact assessment, Terrapure will review the Preferred Footprint from a climate change adaptation and mitigation perspective as well as the Preferred Footprint and overall Site contributes to reducing Greenhouse Gas emissions. *Section 8.2*		

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34. As part of preparing this ToR, a number of commitments are being made by Terrapure that will need to be fulfilled during preparation of the SCRF EA. Appendix D lists these commitments. If approval of the ToR is granted by the Minister, the list of commitments will be finalized and included in the EA Report, documenting where and how they were dealt with during preparation of the SCRF EA. Similarly, commitments may be made by Terrapure during preparation of the SCRF EA that will need to be fulfilled if approval of the ToR is granted by the Minister. Where such commitments are made, a comprehensive list of EA commitments will be documented in the EA Report, including where and how they will be dealt with if the proposed ToR is approved. Additional commitments as part of the Draft proposed ToR include the following: • Outside of the EA process, conduct workshops/roundtables to discuss the future of the site for a new Community Use through the development of a Closure Plan; • Continue to provide $1 per tonne of residual material received at the site to the Heritage Green Trust and the City of Hamilton (each). *Section 9.1*		
35. Terrapure is committed to developing a monitoring framework during preparation of the SCRF EA that will address environmental effects and, as applicable, EA compliance. The purpose of the environmental effects monitoring will be to monitor the net effects associated with the construction, operation, and maintenance of the proposed undertaking, as necessary, and implement further mitigation measures, monitoring, and contingency plans, where possible, so that: • Predicted net negative effects are not more than expected • Unanticipated negative effects are addressed • Predicted benefits are realized The purpose of the EA compliance commitment monitoring will be to track the commitments made by Terrapure during preparation of the SCRF EA, as well as any conditions of EA Act approval, so that they are followed through as applicable in the construction, operation, and maintenance of the proposed undertaking. The EA Report will include a strategy on how and when the commitments will be fulfilled and how Terrapure will report on this to MOECC and other regulatory agencies, as appropriate, on compliance. *Section 9.2*		
36. Consultation with interested persons will take place as part of preparing the Terrapure SCRF EA		

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building upon what was done during the preparation of the ToR in accordance with Section 5.1 of the *Act*. *Section 10*		
37. The consultation activities proposed for the Terrapure SCRF EA will include, but will not be limited to, those carried out during preparation of the ToR. The proposed consultation activities are briefly summarized as follows: • Project-specific website – providing clear and accurate information to participants as well as an opportunity for them to give feedback to the Terrapure Project Team (www.terrapurestoneycreek.com). A dedicated project-specific email account (info@terrapurestoneycreek.com) has also been established as part of the Project website. • Social media – Terrapure has created specific social media pages (facebook and twitter) to provide succinct, accurate information to participants, as well as to provide key updates on the EA. • Notices – providing information to interested persons about the project and how they can be involved. The notices will be presented through a variety of methods including, but not limited to, the following: local area newspapers (Hamilton Spectator, Stoney Creek News), project website, Canada Post maildrop, and social media (facebook, twitter). • Individual or group meetings – discussing project-specific issues with review agencies, organizations, the public and Aboriginal communities • Community Liaison Committee (CLC) – utilizing the existing CLC (a representative group of broadly based interested participants, who understand the site and its operation) to provide a forum for in-depth discussion of project issues. • Public Open House events – seeking a highly participative approach, Terrapure will hold two Open House events during the EA, which will be drop-in style open house events with numerous display materials set-up around the room, with Project Team members available to answer questions and facilitate discussions. • Presentations to City of Hamilton – providing project status updates as required. *Section 10.1*		
38. Input will be obtained from interested participants during the SCRF EA through a variety of means specific to each of the following three participant groups: • Review agencies as applicable (Provincial ministries and agencies, City of Hamilton, conservation authorities, school boards, utilities, etc.) • Public (includes individuals, groups or associations, property owners, residents, business owners, etc.)		

Draft Proposed Terms of Reference Commitment	How was the Commitment Addressed in the SCRF EA	Where the Commitment is Addressed in the SCRF EA
• Aboriginal communities and First Nations as applicable. *Section 10.2*		
39. Input from interested review agencies will be received primarily through written correspondence, individual or group meetings (e.g., Government Review Team meetings), and the CLC. A MOECC Hamilton District staff member is a participating member of the CLC. *Section 10.2*		
40. Input from the public will be received primarily through written correspondence and e mails, documented telephone calls via the project specific 1 800 number established for the project, verbal discussions held at Public Open House events, CLC meetings and any additional individual or group meetings. *Section 10.2*		
41. Input from interested Aboriginal communities and First Nations groups will be obtained primarily through individual or group meetings and to a lesser extent documented telephone follow-up calls. *Section 10.2*		
42. There are a number of key decision-making milestone points when consultation will occur during preparation of the SCRF EA. These key decision-making milestones have been grouped as follows: • Alternative Methods - Reviewing the generated Alternative Methods (footprints) - Confirming the evaluation criteria and indicators to be applied to the Alternative Methods (footprints) - Reviewing the recommended Alternative Method (footprint) identified through the comparative evaluation process • Impact Assessment of the Preferred Alternative Method (footprint) - Reviewing the potential environmental effects, recommended impact management measures, proposed monitoring requirements, and proposed approvals/permits required for implementing the undertaking. • Pre-Submission of the Draft EA Report - Reviewing the draft EA Report prior to its finalization and formal submission to the Minister of the Environment and Climate Change for approval.		

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Notwithstanding these key decision-making milestones, consultation will be ongoing throughout the SCRF EA. *Section 10.3*		
43. Recognizing that there may be issues raised or disputes during preparation of the SCRF EA that may be difficult to resolve, an issues resolution strategy is proposed as part of the ToR. This strategy will benefit all parties potentially involved by providing an agreed to and well understood issues resolution process to ensure that disputes are effectively and appropriately dealt with. Should an issue or dispute arise during preparation of the SCRF EA, Terrapure will discuss the nature of the issue or dispute with the interested persons and attempt, in good faith, to reach a resolution that is agreeable to both Terrapure and the interested persons. *Section 10.4*		
44. If approval of the ToR is granted by the Minister of the Environment and Climate Change, this ToR will provide the framework for undertaking the SCRF EA and preparing the EA Report. It is understood that, given the nature of EA ToR's, it is not intended to present every detail of all the activities that will occur when preparing the EA. It is therefore possible that, in carrying out the work contemplated by this ToR, it may become evident that certain modifications are appropriate. It is important to note that the commitments described in this ToR are a minimum that must be met, and that more may be required, if necessary. *Section 11*		
45. In addition to approval of the EA under the EA Act, applications will be made, as necessary, under a number of provincial statutes for approval to implement the proposed undertaking. The types of approvals that potentially apply may include, but are not limited to: • Ontario Environmental Protection Act (EPA) MOECC • Ontario Water Resources Act (OWRA) MOECC • Environmental Bill of Rights (EBR) MOECC During the preparation of the EA, any federal agencies that may have interests applicable to the proposed undertaking will be identified by way of consultations with relevant federal agencies and any necessary approvals under federal statutes will be identified. After reviewing the Canadian Environmental Assessment Act 2012 (CEAA 2012) and the associated Regulation Designating Physical Activities, the proposed undertaking does not appear on the list of projects under CEAA 2012. This will be confirmed early in the EA with the Canadian Environmental Assessment Agency.		

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The actual approvals required for the preferred undertaking will be identified during preparation of the SCRF EA and a final list will be provided in the EA Report. *Section 12*		