



Verification Report

Reserve Project ID: CAR443

South Kent Landfill Gas to Energy Project

3Degrees Group, Inc.

November 29, 2022

GHD

455 Phillip Street, Unit 100A

Waterloo, Ontario N2L 3X2, Canada

T +1 519 884 0510 | **F** +1 519 884 0525 | **E** info-northamerica@ghd.com | **ghd.com**

Printed date	2022-11-29 9:19:00 AM
Last saved date	November 29, 2022
File name	Verification Report
Author	Jason Clarke
Project manager	Jason Clarke
Client name	3Degrees Group, Inc.
Project name	Kent County Landfill Verification
Document title	Verification Report Reserve Project ID: CAR443 South Kent Landfill Gas to Energy Project
Revision version	Rev 05
Project number	12578189

Document status

Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S4	03	Jason Clarke	Michelle Hirst		Gord Reusing		10/24/2022
S4	05	Jason Clarke	Michelle Hirst		Gord Reusing		11/29/2022

© GHD 2022

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

Executive summary

GHD Services Inc. (GHD) was engaged by 3Degrees Group, Inc. (3Degrees) (Project Developer, PD) and the Kent County Department of Public Works and Energy Developments Ltd. (Project Owner) to undertake a verification of the Greenhouse Gas (GHG) Emissions Report (Emissions Report) for the South Kent Landfill Gas to Energy Project (CAR443) under the Climate Action Reserve (the Reserve) Voluntary Offset Program. The Project is located in Byron Center, Michigan (Facility or Site). The Reserve Project ID for the Project is CAR443.

The GHG offset verification services were completed for the Project by GHD pursuant to the Climate Action Reserve's (Reserve) *Landfill Project Reporting Protocol (Protocol)*, Version 5.0 dated April 24, 2019, *Program Manual and associated Summary of Changes* dated November 12, 2019, and *Verification Program Manual and associated Summary of Changes*, dated February 3, 2021.

This verification covers reported emission reductions claimed by the Project Developer during the second crediting period spanning from July 10, 2018 to July 9, 2028. This verification reviews the reporting periods of March 1, 2020 to February 28, 2021, and March 1, 2021 to February 28, 2022, with a zero-credit reporting period established from July 10, 2018 to February 28, 2020, to account for the gap between the end of the first crediting period and the start of the second crediting period.

For the March 1, 2020, to February 28, 2021, reporting period, the Project claimed **121,136 metric tonnes CO₂e** emission reductions in accordance with the Protocol. For the March 1, 2021, to February 28, 2022, reporting period, the Project claimed **116,336 metric tonnes CO₂e** emission reductions in accordance with the Protocol. The Project claimed a total of **237,472 metric tonnes CO₂e** emissions reductions for both reporting periods. GHD completed the verification in accordance with the Protocol and Program Manual. The verification was conducted by GHD to a reasonable level of assurance. The verification criteria were selected per the Protocol and associated guidance documents. GHD determined, with reasonable assurance, that the reported emission reductions are free of offset material misstatement and result in the issuance of a Positive Offset Verification Statement for the emission reductions.

Contents

1.	Introduction	1
2.	Verification Procedures and Methodology	1
2.1	Verification Objective	1
2.2	Verification Standards and Criteria	1
2.3	Verification Team	2
2.3.1	Roles and Responsibilities	2
2.3.2	Team Member Qualifications	2
2.4	Verification Methodology	3
2.4.1	Notification of Verification Activities and COI Form	3
2.4.2	Verification Plan and Project Kick-Off	3
2.4.3	Document Review	3
2.4.4	Site Visit	3
2.4.5	Senior Internal Review	4
2.5	Level of Assurance	4
2.6	Materiality Threshold	4
2.6.1	Quantitative Materiality Threshold	4
2.6.2	Qualitative Materiality Threshold	5
3.	Project Description	5
4.	Eligibility	5
4.1	Location	5
4.2	Project Start Date	5
4.3	Project Crediting Period	6
4.4	Additionality	6
4.4.1	The Performance Standard Test	6
4.4.2	The Legal Requirement Test	6
	Federal Regulations	6
	State and Local Regulations, Ordinances, and Permitting Requirements	7
4.5	Regulatory Compliance	7
4.6	Registration with other Registries	8
5.	Conformance with the Protocol	8
5.1	GHG Assessment Boundary	8
5.2	Quantifying GHG Emission Reductions	8
5.2.1	Baseline Emissions	8
5.2.2	Project Emissions	9
5.3	Project Monitoring	9
5.3.1	Monitoring Requirements	10
5.3.2	Instrument QA/QC	11
5.3.3	Other Monitoring Requirements	13
5.3.4	Data Substitution	14
5.4	Risk Assessment and Sampling Plan	14
5.5	Findings and Basis of Opinion	14

5.5.1	Quantitative Materiality Threshold	14
5.5.2	Qualitative Materiality Threshold	15
5.5.3	Findings and Basis of Opinion	15
6.	Verification Statement and Closing	15

Table index

Table 1	Quantitative Materiality Threshold	4
Table 2	Baseline Calculation Parameters.....	9
Table 3	Instrument Monitoring Requirements.....	10
Table 4	Instrument QA/QC	11
Table 5	Project Developer GHG Reductions Estimation	14
Table 6	GHD GHG Reductions Estimation.....	14

1. Introduction

GHD Services Inc. (GHD) was engaged by 3Degrees Group, Inc. (3Degrees) (Project Developer, PD), and the Kent County Department of Public Works and Energy Developments Ltd. (Project Owner) to undertake a verification of the Greenhouse Gas (GHG) Offset Report for the South Kent Landfill Gas to Energy Project (CAR443) under the Climate Action Reserve's (the Reserve) Voluntary Offset Program. The Project is located in Byron Center, Michigan (Facility or Site). The Reserve Project ID for the Project is CAR443.

The GHG offset verification services were completed for the Project by GHD pursuant to the Climate Action Reserve's (Reserve) *Landfill Project Reporting Protocol (Protocol)*, Version 5.0 dated April 24, 2019, *Program Manual and associated Summary of Changes* dated November 12, 2019, and *Verification Program Manual and associated Summary of Changes*, dated February 3, 2021.

This verification covers two reporting periods occurring within the second crediting period from July 10, 2018 to July 9, 2028. The verification will review the reported emission reductions claimed by the Project Developer during the reporting periods of March 1, 2020, to February 28, 2021, and March 1, 2021 to February 28, 2022. GHD notes that a zero-credit reporting period exists from July 10, 2018 to February 28, 2020. Per Section 7.3.2 of the Protocol "verification periods may cover up to two reporting periods". The crediting period is from July 10, 2018, to July 9, 2028. GHD is an accredited verification body under the Reserve's Voluntary Offset Program.

2. Verification Procedures and Methodology

2.1 Verification Objective

The objective of the verification is to provide 3Degrees and the Reserve with an opinion on whether the facility's reporting period contains any material discrepancies and whether the Climate Reserve Tonnes (CRTs) were determined in accordance with the Reserve requirements detailed in the Protocol and Program Manual (as detailed below).

2.2 Verification Standards and Criteria

The verification was conducted to the standards and criteria set out in ISO 14064 and the following documents:

- ISO 14065:2013 – Greenhouse Gases – Requirements for greenhouse gas validation and Verification Bodies for use in accreditation or other forms of recognition
- ISO 14064 Greenhouse gases - Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions, ISO, April 2019 (ISO 14064-3)
- Reserve Verification Program Manual and corresponding Summary of Changes, Climate Action Reserve, dated February 3, 2021. (Verification Manual)
- Reserve Offset Program Manual and corresponding Summary of Changes, Climate Action Reserve, dated November 12, 2019. (Program Manual)
- Landfill Project Protocol Version 5.0, Climate Action Reserve, dated April 24, 2019 (Protocol)

2.3 Verification Team

2.3.1 Roles and Responsibilities

Lead Verifier – Jason Clarke, P.Eng. – Jason led the verification and was responsible for development of the verification plan. Jason reviewed the risk assessment, recalculation of raw data, data management and draft findings. Jason prepared and signed the verification statement and verification report. Jason conducted a Site visit of the facility.

Verifier – Ben Gerber, MCC – Ben developed and revised the verification plan and sample plan, developed a risk assessment, recalculated raw data, reviewed management of data quality and prepared draft findings.

Senior Internal Reviewer – Michelle Hirst – Michelle conducted a peer review of the verification plan, risk assessment, verification report and findings.

2.3.2 Team Member Qualifications

The team member qualifications are detailed below.

Jason Clarke	Role: Lead Verifier
Professional Summary Jason is a Professional Engineer registered in Ontario and has been with GHD since 2012. Jason has practical and facility-specific experience associated with a range of greenhouse gas (GHG) validation and verification activities. Jason is also Lead Verifier for the verification of a variety of Ontario based facilities under O. Reg. 452/09 and 390/18. Further, Jason has been a validation/verification team member for a variety of GHG Validation and Verification projects registered under ANSI and UNFCCC Clean Development Mechanism (CDM). Jason has been involved in the preparation of GHG Validation and Verification plans, issues logs, draft and final validation/verification reports, and findings assessments for various GHG projects associated with the Ontario Ministry of the Environment and Parks (MECP), ANSI, TCR, Massachusetts Department of Environmental Protection (MassDEP), Verra (VCS), and the UNFCCC CDM. Jason also has experience with the internal and external auditing related to GHG Verification and Validation projects in Ontario, Quebec, Alberta, British Columbia, and Massachusetts. Jason is an ARB accredited Lead Verifier and Offset Project Specialist for livestock and ODS projects, and a CAR accredited Lead Verifier and Landfill Project Specialist. In addition, Jason is a CAR accredited Team Leader under the Climate Forward program.	

Benjamin Gerber	Verification Team Role: Verifier
Professional Summary Ben is a Climate Change Specialist and has been with GHD since 2018. Benjamin has practical experience completing greenhouse gas verifications and other GHG consulting work. Ben has been a member on GHG assurance teams for projects registered under a variety of programs and regulations including the Climate Action Reserve's Climate Forward program, Verra's VCS program, the American Carbon Registry, O. Reg. 390/18, the California ARB's cap-and-trade program, the Government of Canada's Output-Based Pricing System and Alberta's Carbon Competitiveness Incentive Regulation. Additionally, Ben has been a team member on teams conducting studies for provincial governments seeking to implement a carbon offset program within their jurisdiction. Ben's breadth of GHG quantification experience has equipped him with a detailed understanding of GHG quantification processes and major emission sources throughout a jurisdiction, while his academic background studying climate change has provided him with a detailed understanding of expected climate impacts, and associated solutions and resiliency measures.	

Professional Summary | Michelle holds a Master of Science in Environmental Governance from the Albert-Ludwig Universität in Germany and a Bachelor of Environmental Science (Hons.) from The University of Newcastle in Australia. Michelle has held roles in greenhouse gas teams in Germany, Canada, and the USA. Michelle has over 8-years of experience preparing emission reports, as well as verifying offset projects and emission reports. Her capabilities have involved verifying fugitive emissions, ozone depleting substances, forestry, mine methane capture, and livestock offset projects under the ARB, Climate Action Reserve (CAR), American Carbon Registry (ACR), and Verra (formerly Verified Carbon Standard), as well as verifying emission reports submitted under the British Columbia (BC) Reporting Regulation, Alberta Environment and Parks (AEP) Specified Gas Emitters Regulation (SGER), and Ontario Regulation (O. Reg.) 390/18 in Canada, and corporate emission reports submitted under the Global Reporting Initiative.

Michelle is an ARB accredited Lead Verifier and Offset Project Specialist for livestock, mine methane capture and ODS projects, and a CAR accredited Lead Verifier and Landfill Project Specialist. In addition, Michelle is accredited by the Climate Action Reserve as a Team Leader in the Climate Forward program.

2.4 Verification Methodology

2.4.1 Notification of Verification Activities and COI Form

GHD submitted the Notification of Verification Activities and Request for Evaluation for Potential Conflict of Interest (NOVA/COI) form to the Reserve Project Database on April 1, 2022. Approval from the Reserve for verification activities to proceed was provided on April 19, 2022.

2.4.2 Verification Plan and Project Kick-Off

GHD prepared and submitted the Verification Plan on April 19, 2022. The Verification Plan is considered to be a dynamic document that was updated, modified, and adapted to conditions as encountered during the completion of the verification process.

The kick-off call was held on April 20, 2022, and attended by Julie Kelleher (Project Developer), Teresa Fukuda (Project Developer), Jason Clarke (GHD), and Ben Gerber (GHD).

2.4.3 Document Review

The GHD Project Team's document review during the review process included, but was not limited to, an evaluation of whether:

- The documentation was complete and comprehensive and follows the structure and criteria given in the Program Manual, Protocol, and its associated guidance.
- The methodologies were justified and appropriate.
- The assumptions behind the inventory were conservative and appropriate.
- The GHG emission calculations were appropriate and use conservative assumptions for estimating GHG emissions.
- The GHG information system and its controls were sufficiently robust to minimize the potential for errors, omissions, or misrepresentations.
- The Facility GHG calculations were justified and appropriate.

2.4.4 Site Visit

A site visit was conducted by Jason Clarke of GHD on April 27, 2022. As part of the site visit activities, GHD interviewed Project personnel who understand the Project's operations and inspected data management systems. The following personnel were interviewed throughout the verification process as part of the site visit activities and to verify

site conditions; Mike Schaper, Daniel Rose, Ronald Mills, Adam Kamaretsos, Julie Kelleher (Project Manager at 3Degrees), Teresa Fukuda (Associate at 3Degrees) supporting with data collection.

2.4.5 Senior Internal Review

GHD's Senior Internal Reviewer reviewed the Verification Report, Verification Statement, and the List of Findings prior to issuing the Final Verification Report and Verification Statement to the PD or the Reserve.

2.5 Level of Assurance

GHD conducted the verification to a reasonable level of assurance.

2.6 Materiality Threshold

Per the Verification Program Manual, "A *materiality threshold* is used to assess an error, omission, or misstatement that may impact the GHG assertion made by a project developer. This threshold is also known as the "minimum quality standard" and differentiates those errors, omissions, or misstatements that are considered by the Reserve to be significant from those that are insignificant."

The materiality threshold has both a quantitative and qualitative aspect, as outlined below.

2.6.1 Quantitative Materiality Threshold

Table 1 below outlines the quantitative materiality thresholds.

Table 1 Quantitative Materiality Threshold

CRTs registered over a 12-month period	Required accuracy level
≤25,000	>95%
>25,000	>97%
>100,000	>99%

As the verification period is 24 months and longer than 12 months, the quantity of reported CRT's must be pro-rated to determine the appropriate quantitative materiality threshold:

$$CRTs \text{ prorated to a 12-month period} = \frac{237,472 \text{ CRTs}}{24 \text{ months}} \times 12 \text{ months} = 118,736 \text{ CRTs}$$

The Project falls into the first category outlined above (>25,000 CRTs) therefore the required accuracy level for this verification is greater than 99 percent.

Percent error is defined by the following:

$$\% \text{ Error} = \text{abs}\left(\frac{\text{Stated Reductions} - \text{Verified Reductions}}{\text{Verified Reductions}}\right) \times 100$$

The accuracy level is defined by the following:

$$\text{Accuracy} = 100\% - \% \text{Error}$$

These equations are utilized below in the quantification of the accuracy level of the verification to determine if the Project meets the materiality threshold and be issued a positive Verification Statement.

2.6.2 Qualitative Materiality Threshold

Per the Verification Program Manual, “A qualitative non-conformance occurs when a prescriptive protocol requirement (e.g., metering, monitoring, management systems, record-keeping, etc.) is not met.” and “A prescriptive requirement is defined as any specific guidance mandated by the protocol that does not allow for deviation, variance or verifier professional judgement.”

All qualitative non-conformances must be corrected for GHD to be able to issue a positive Verification Statement.

3. Project Description

In 2021, the Project was transferred from the Kent County Department of Public Works to 3Degrees as the CAR account holder. GHD understands 3Degrees is the Project Developer and Kent County Dept of Public Works and Energy is the Project Owner, as Kent County DPW is the owner of the Kent County Landfill. The Project Developer utilizes the Climate Action Reserve Landfill Protocol Version 5.0 methodology titled: “Landfill Project Protocol” dated April 24, 2019.

The South Kent Landfill municipal solid waste facility began accepting waste in 1982. The landfill currently accepts about 175,000 tons of waste per year. The landfill is currently owned by the Kent County Department of Public Works and the engine owned by Energy Developments Ltd. In 2008 the landfill voluntarily installed an active gas collection system with an open flare, authorized under the new source review permit exemption in Michigan Air Pollution Control Rule 285(2)(aa). The landfill gas collection system was initiated with 24 wells and two horizontal connections, with the addition of three horizontal collectors in 2009, eight wells in 2011, and four wells in 2014, the system now consists of 48 wells and 10 horizontal connectors, three of which are active.

The collected landfill gas is destroyed in two Caterpillar model G3520C internal combustion engines to generate electricity and a single open flare that is used as a back-up destruction device. The Project Activity was initiated in July 2008 through the voluntary installation of a gas collection system followed by the installation of the electricity generation engines in April 2009. It is understood that the landfill does not classify as a bioreactor. At the flare/blower compound, the landfill gas is measured for temperature, pressure, and methane content prior to destruction.

4. Eligibility

The following sections outline how the Project meets the eligibility requirements of the Protocol.

4.1 Location

The Project landfill is located in Byron Center, Michigan United States, and therefore eligible under the Protocol. GHD verified the location during the Site Visit on April 27, 2022.

4.2 Project Start Date

GHD reviewed the start date requirements for the Project and confirmed that they are in accordance with the Protocol and associated Reserve requirements. GHD notes that prior to the Project start date it was verified that there was no LFGCCS and associated destruction device installed. The landfill began accepting waste in 1981. In 2008 an LFG collection system was installed, and expansions occurred in 2009, 2011 and 2014. Methane was first destroyed in a Project device post receiving a permit to install in August 2008, as evidenced by a permit to install verification provided by the Michigan Department of Environmental Quality – Air Quality Division on August 7, 2008. GHD verified that the Project has been registered with the Reserve from the initial reporting period to the current reporting period.

4.3 Project Crediting Period

The Project is currently within its second crediting period. The crediting period for the Project is ten (10) years. The initial crediting period began on July 10, 2008 and extended until July 9, 2018. The current crediting period (second crediting period) began on July 10, 2018 and extends through to July 9, 2028. The verification will cover the first 24 months of the second crediting period which have been separated into two distinct reporting periods: March 1, 2020 to February 28, 2021 and March 1, 2021 to February 28, 2022. It is noted that there is a zero-credit period from July 10, 2018 to February 28, 2020, to account for the gap between the end of the first crediting period and the start of the second crediting period.

4.4 Additionality

The following sections demonstrate that GHG reductions are additional to what would have occurred in the absence of a carbon offset market.

4.4.1 The Performance Standard Test

The Project involves the following project activity:

- Installation of a landfill gas collection and control system (LFGCCS) and a new qualifying destruction device at an eligible landfill where landfill gas (LFG) has never been collected and destroyed prior to the project start date.

GHD verified that the landfill did not have a historic LFGCCS prior to the Project start date through interviews with the Project personnel, review of historic documentation (permitting documentation), and review of historic aerial photographs of the Project Site. GHD notes that the Project destroys LFG through a two Caterpillar model G3520C internal combustion engines (1.6 MW each) starting on July 6, 2008.

As a result, GHD determined that the Project meets the applicable requirements of the Performance Standard Test.

4.4.2 The Legal Requirement Test

Federal Regulations

There are several United States Environmental Protection Agency (EPA) regulations for municipal solid waste (MSW) landfills that impact eligibility on this Project as part of the Legal Requirement Test, including the following:

- New Source Performance Standards (NSPS) for MSW Landfills, codified in 40 CFR 60 subpart WWW – Targets landfills that commenced construction or made modifications after May 1991
- New Source Performance Standards (NSPS) for MSW Landfills, codified in 40 CFR 60 subpart XXX
- The National Emission Standards for Hazardous Air Pollutants (NESHAP), codified in 40 CFR 63 subpart AAAA – Regulates new and existing landfills

GHD reviewed the Summary Report for New Source Performance Standards Tier 2 Sampling, Analysis, and Landfill NMOC Emission Estimates applicable to the Project and prepared by SCS Engineers dated December 24, 2019. NSPS regulations state that Tier 2 site-specific NMOC concentration is valid for a period of five years, or until NMOC emissions are estimated to be greater than 50 Mg/year, whichever occurs first. The landfill is subject to the 50 Mg/year threshold as required by the federal New Source Performance Standard (NSPS). GHD confirmed that during the monitoring period the emissions rate was estimated to be 21.9 Mg/year over a period from 2020 through to 2024, based on the Final Tier 2 Report developed by SCS Engineers dated December 24, 2019 and valid through to 2024, and was therefore below the 34 Mg/yr threshold. Therefore, a LFGCCS is not required to be installed and operating, therefore, the Site meets the legal requirement test. Per the Project's Renewable Operating Permit (Permit Number MI-ROP-N1324-2018b), 40 CFR 60 subpart XXX applies to the Project, therefore the NMOC threshold is 34 Mg per year. Based on the information provided and completion of the verification process, GHD understands that the landfill

has not been modified, constructed, or reconstructed since 2014 and therefore the 34 Mg/yr threshold still applies for NMOC emissions.

The Summary Report for New Source Performance Standards Tier 2 Sampling, Analysis, and Landfill NMOC Emission Estimates states a waste design capacity of 6,984,246 short tons, which equates to 6,336,001 megagrams (Mg), which means the landfill is subject to the NSPS or EG rules.

State and Local Regulations, Ordinances, and Permitting Requirements

GHD reviewed the following Michigan regulations associated with landfills along with the permits that were associated with the Project:

- Michigan Department of the Environment, Great Lakes, and Energy (MI EGLE), Materials Management Division (MMD), Part 115, Solid Waste Management of the Natural Resources and Environmental Protection Act, 1994 PA 451 (Act 451)
- MI EGLE, Air Quality Division (AQD), Section 5506(3) of Part 55, Air Pollution Control, of Act 451

Additional local and state regulations were also reviewed to ensure an exhaustive review was completed. Further details regarding regulatory compliance are provided in the following section.

4.5 Regulatory Compliance

GHD has reviewed the Project Developer's Attestation of Regulatory Compliance for the verification period, which was signed by the PD on May 12, 2022. GHD also reviewed the Attestation of Title and Attestation of Voluntary Implementation for the verification period, both signed on May 12, 2022. GHD verified that each of the forms were uploaded to the Reserve registry for the Project.

GHD verified that the Attestation of Regulatory Compliance, Attestation of Title, and Attestation of Voluntary Implementation have been completed correctly for the verification period of March 1, 2020 to February 28, 2021 and March 1, 2021 to February 28, 2022, and signed by a representative (Nick Facciola) from 3 Degrees Group Inc.

The following permits were provided to GHD for review:

- Michigan Department of the Environment, Great Lakes, and Energy (MI EGLE), Materials Management Division (MMD) under Part 115, Solid Waste Management of the Natural Resources and Environmental Protection Act, 1994 PA 451 (Act 451), Renewable Operating Permit (License Number: 9625), issued Oct 22, 2020, expires Oct 22, 2025.
- MI EGLE, Air Quality Division (AQD), under section 5506(3) of Part 55, Air Pollution Control, of Act 451, Renewable Operating Permit (Permit Number: MI-ROP-N1324-2018b), issued Feb 26, 2018, expires Feb 26, 2023
- MI EGLE, AQD, Permit to Install, dated August 7, 2008
- MI EGLE, AQD, under section 5506(3) of Part 55, Air Pollution Control, of Act 451, Renewable Operating Permit (Permit Number: MI-ROP-N1324-2007), issued Oct 22, 2007, expired Oct 22, 2012

In addition to confirming regulatory compliance at the state level, GHD performed a search of the US Environmental Protection Agency Enforcement and Compliance History Online (ECHO) database on June 16, 2022 and identified there was a series of Compliance Status violations noted under Quarterly Noncompliance Report History pertaining to the Clean Water Act (CWA), Source ID MI000000000000N1324 for the reporting period. GHD reviewed the violations and identified that the violation is considered a high-priority violation which has been active since June 2012, however it has been identified in the ECHO database as being "Addressed – State". Per the Project Developer and Owner communications with the MI EGLE (formerly the Michigan Department of Environmental Quality) circa Feb 21, 2017:

"The information in ECHO regarding the enforcement action has not changed and will not until the Consent Order is terminated. In June 2012, a violation was cited for a failure to conduct an initial performance test at the Granger

engine plant located at South Kent Landfill. In June 2013, a Consent Order was signed and penalty assessed. At this time the consent order has not been terminated.

ECHO reflects that the violations have been addressed, but EPA does not consider the violations resolved until the Consent Order has been terminated. However, the DEQ, Air Quality Division considers the violation resolved up entry into the Consent Order. Termination of the Consent Order will have to come at the request of the company.”

Upon discussion with the Project Developer and documentation provided by the Project Owner, it is understood that the violation has been resolved in June 2013 via a Consent Order. Per the Project Developer and Owner, the ECHO database will not consider the violation as resolved until the Consent order has been terminated. The MI EGLE considers this issue resolved.

GHD notes that there are no components of the Project that have a direct impact on surface water effluent and therefore GHD determined that the violations identified in the ECHO database do not fall within the boundary of the Project and associated compliance. The violations reviewed also do not warrant EPA/state review. While this is considered a High Priority Violation, the issue has been reviewed at a state level and found to be within compliance.

Through review of the provided permits, the ECHO database review, and discussions held during the site visit, GHD can confirm that the Project met the regulatory compliance requirements associated with the Project.

4.6 Registration with other Registries

GHD performed an internet search of the American Carbon Registry (ACR), the Verified Carbon Standard/Verra (VCS), the Gold Standard (GS), and the Social Carbon project databases and confirmed that the Project is not currently registered in any other carbon offset registry or program. GHD notes that this type of project activity can only be registered under the above noted programs based on the Project type and location.

5. Conformance with the Protocol

5.1 GHG Assessment Boundary

GHD understands the GHG assessment boundary for the Project must conform to Table 4.1 of the Protocol. During the site visit and the document review, GHD confirmed that all sources, sinks, and reservoirs included in Table 4.1 of the Protocol were accounted for and quantified in the GHG emission reduction calculations.

5.2 Quantifying GHG Emission Reductions

5.2.1 Baseline Emissions

Baseline emissions include the following:

- Emissions from waste breakdown in landfill (CH₄)
- Emissions from project LFG destruction – open flare (calculated in reference to destruction efficiency) (CH₄)
- Emissions from project LFG destruction – lean-burn internal combustion engine (calculated in reference to destruction efficiency) (CH₄)

Table 2 below outlines the calculation parameters used in the calculation of the baseline emissions.

Table 2 *Baseline Calculation Parameters*

Calculation Parameters	Value Applied	Justification
Discount Factor (DF)	0	No discount factor applied as project uses a continuous methane monitor/
Oxidation Discount Factor (OX)	0.1	No synthetic liner, per the Protocol and based on Project conditions
Open Flare	0.96	Per the Protocol (Table B.2)
Lean-Burn Internal Combustion Engine	0.936	Per the Protocol (Table B.2)

5.2.2 Project Emissions

Project emissions include the following:

- Emissions from gas collection system [pilot fuel and operation] (propane and electricity, respectively) (CO₂e)

GHD confirmed the consumption values were appropriate through review of invoices and internal data management, and ensured the calculations were performed in accordance with the Protocol.

5.3 Project Monitoring

GHD has reviewed the Monitoring Plan developed by the Project Developer which outlines the monitoring and reporting responsibilities for the Project.

LFG flow to the destruction devices (flare and engines) is continuously monitored every two minutes. For the flare, temperature data is measured continuously a Pyromation T440 Temperature Transmitter (S/N A800E0). LFG flow is monitored via Fluid Components Intl (FCI) Flow Meter ST-98 at the flare inlet (S/N 292819) which monitors flow prior to the flare and the engines. No temporary flow meters were used during calibration events. The FCI flow meters compensate for temperature and pressure by normalizing the flow to 70 degrees Fahrenheit and 14.7 psia. The standard temperature and pressure required by the Protocol is 60 degrees Fahrenheit and 1 atm, therefore the data is corrected using Equation 5.2 by the Project Developer in the emission reduction calculations to meet the Protocol requirements.

Flow to the engines is monitored by a Yokogawa digital YEWFLOW DY150 flow meter (S/N 8423B017) which is placed at the header of the two engines. This flow meter works with the Yokogawa EJ530A differential pressure transmitter (S/N 91H967145U), with static pressure measured by a Yokogawa EJA530A (S/N U1P303649) and temperature by a Pyromation T440 temperature transmitter (S/N A800E0). Flow readings are collected and computed based on 70 degrees Fahrenheit and 14.7 psia, before being adjusted using Equation 5.2 by the Project Developer to standardize to 60 degrees Fahrenheit and 1 atm per the Protocol requirements.

Flow data to the destruction devices is collected from a Yokogawa data recorder. The data is downloaded by Site staff monthly and provided to the Project Developer on a monthly basis.

Through the reporting periods a Siemens Ultramat 23 continuous gas analyzer (S/N RD-0994) is used to collect continuous methane concentrations at a point within the vacuum collection system which feeds both the flare and engines. Data is recorded on the Yokogawa data loggers alongside gas flow and temperature. GHD verified that methane monitoring device is detailed in the Monitoring Plan. A backup Elkins Envision methane analyzer (S/N 1609201) was used temporarily during calibration events. As the methane analyzer continuously monitors methane concentrations, no discount factor was applied to the calculations.

Invoices for propane and electrical consumption were retained for the monitoring period and used in the calculations.

5.3.1 Monitoring Requirements

The Project Developer collects the following monitoring data for the Site pursuant to Table 6.1 of the Protocol. Calculated or reference parameters specified in Table 6.1 of the Protocol were determined and used at the frequency specified based on operating data records. Table 3 outlines the instrument monitoring requirements for the Project.

Table 3 *Instrument Monitoring Requirements*

Instrument	Unit	Measurement Frequency	Measurement Temperature and Pressure	Operating Parameters
Flow Meter - Flare	Fluid Components Intl (FCI) ST98 thermal mass flow meter (S/N 292819)	Measured continuously, recorded every 2 minutes	70°F and 1 atm (Corrected to 60°F)	Thermocouple readings >500°F and engine run time
Flow Meter - Engines	Yokogawa digital YEWFLOW meter DY150 (S/N 8423B017)	Measured continuously, recorded every 2 minutes	70°F and 1 atm (Corrected to 60°F)	Thermocouple readings >500°F and engine run time
Differential Pressure Transmitter - Engines	Yokogawa Differential Pressure Transmitter, EJ530A (S/N 91H967145U)	Measured continuously, recorded every 2 minutes	N/A	N/A
Static Pressure Transmitter - Engines	Yokogawa Static Pressure Transmitter, EJA530A (S/N U1P303649)	Measured continuously, recorded every 2 minutes	N/A	N/A
Temperature Transmitter – Engines	Pyromation T440 (S/N A800E0)	Measured continuously, recorded every 2 minutes	N/A	N/A
Continuous Gas Analyzer - Engines	Siemens Ultramat 23 Continuous Gas Analyzer (S/N RD-0994)	Measured continuously, logged at 4 minute intervals	N/A	N/A
Continuous Gas Analyzer – Flare	Elkins Envision (S/N 1003014)	Measured continuously	N/A	N/A
Continuous Gas Analyzer – Backup	Elkins Envision (S/N 1609201)	Measured continuously - as applicable	N/A	N/A

5.3.2 Instrument QA/QC

Table 4 below outlines the monitoring instruments for the project, the model and serial numbers, the relevant dates of manufacturer calibrations, and the field checks performed on the instruments throughout the reporting period.

Table 4 *Instrument QA/QC*

Instrument, Model, and S/N	Date of Calibration	Field Checks
Methane Analyzer (Continuous) - Engines Siemens Ultramat 23 S/N RD-0994	The Siemen's Ultramat Operator's Manual states a that equipment should be calibrated internally every "six to twelve months, depending on ambient conditions". The project monitoring plan records a calibration with a known calibration gas should be performed at least annually, with factory calibration occurring every five (5) years. The gas analyzer was found to be calibrated by HI Controls LLC, a third-party operator, on April 7, 2022 and by Ideal Calibrations August 25, 2020. Both calibration events found the equipment to be operating within the tolerance threshold ($\pm 5\%$).	The Project Developer noted that analyzers are cleaned and inspected regularly by field staff. As the operators manual does not specify a frequency for cleaning and inspection, therefore this meets the standards as per the Protocol.
Methane Analyzer (Continuous) - Flare Elkins Envision s/n 1003014	The Envision Operator's Manual states the gas analyzer should be returned to the factory at a minimum once per year for inspection and factory calibration. The monitoring plan identifies calibration by a certified calibration service annually with a field check and calibration for accuracy performed within the last 2 months of each reporting period. This is the primary gas analyzer that is used for the flare. The gas analyzer was calibrated annually. The meter was calibrated by Elkins Earthworks (third-party) on January 29, 2020, January 26, 2021, and February 9, 2022. As found/as left conditions were recorded for each of the calibration events. In this case conditions were all very similar, within $\pm 1\%$.	Per the Monitoring Plan, the Elkin Envision methane analyzers are to be regularly inspected and cleaned. As the operators manual does not specify a frequency for cleaning and inspection, therefore this meets the standards as per the Protocol. In addition, a monthly calibration to a field gas takes place Per the Protocol, field checks must be performed for continuous analyzers "at the end of – but no more than two months prior to or after – the end of the reporting period" (Section 6.2). For primary the continuous methane analyzer (S/N 1003014) a calibration event took place on January 26, 2021 (end of first reporting period) and February 9, 2022 (end of second reporting period). GHD found that this satisfies the requirements per the Protocol, as both calibration events found the analyzer to be operating within $\pm 1\%$ of the tolerance limit.
Methane Analyzer (Continuous) - Back-up Elkins Envision s/n 1609201	The Envision Operator's Manual states the gas analyzer should be returned to the factory at a minimum once per year for inspection and factory calibration. The monitoring plan identifies calibration by a certified calibration service annually with a field check and calibration for accuracy performed within the last 2 months of each reporting period. This is a backup gas analyzer that is used when primary analyzers are out for calibration. The gas analyzer was calibrated annually. The meter was calibrated by Elkins Earthworks (third-party) on February 14, 2020 and February 22, 2021. As found/as left conditions were recorded for each of the calibration events. In this case	

Instrument, Model, and S/N	Date of Calibration	Field Checks
	conditions were all very similar, within $\pm 1\%$.	
Flow Meter - Flare Fluid Components Intl ST98 SN. 322620-A	The Installation, Operation and Maintenance Manual for the Fluid Components Intl (FCI) equipment recommends calibration every 18 months at a minimum. The monitoring plan identifies calibration by a certified calibration service every 18 months or every 2 years, with quarterly pitot tube checks with a field check and calibration for accuracy performed within the last 2 months of each reporting period. The meter was calibrated by APTIM on February 23, 2021 and April 14, 2022. During the February 23, 2021 calibration the meter was found to be outside of the tolerance ranges ($\pm 5\%$) for two of the three measured flow readings. The maximum exceedance for this device was 10.5%. Per Section 6.2 of the Protocol "For calibrations that indicate over-reporting (higher flow rates, or higher methane concentration), the metered values must be adjusted based on the greatest calibration drift recorded at the time of calibration." As a result, the flow data was adjusted from the period of April 1, 2020 to February 22, 2021 by 10.5% to account for this drift.	It is noted in Monitoring Plan that the flow meter is cleaned and inspected with logs detailing the cleaning and inspection details (date, time, name of technician, condition of device before inspection and cleaning, all procedures of inspection and cleaning performed, and condition as left). A field check was performed on April 14, 2022 and took place within two months of the end of the first reporting period and confirmed as found values within $\pm 5\%$. The operator's manual does not mandate a frequency for cleaning and inspection of this equipment. Cleaning and inspection of the flow meter occurs on a regular basis as per the Monitoring Plan, which follows Protocol guidance.
Flow Meter – Engines Yokogawa digitalYEWFLOW meter DY150 S/N: 8423B017	The Yokogawa digitalYEWFLOW User's Manual, no factory calibration schedule was outlined and thus the Project Developer set a calibration schedule of at least once every 5 years. GHD found that this is in line with the Protocol requirements, Section 6.2. The flow meter was calibrated by APTIM (third-party contractor) on February 5, 2021 and checked on January 7, 2022. The calibration events found that the equipment was operating within the tolerance limit of $\pm 5\%$.	Per Protocol guidance, a field check for accuracy will be performed within 2 months of the end of each reporting period by a 3rd party contracted service. A calibration check by APTIM, a third-party contractor, was found to have taken place on January 7, 2022 and all equipment was operating within the tolerance limit of $\pm 5\%$. The operator's manual does not mandate a frequency for cleaning and inspection of this equipment. Cleaning and inspection of the flow meter occurs on a regular basis as per the Monitoring Plan, which follows Protocol guidance.
Differential Pressure Transmitter Yokogawa EJ530A S/N: 91H967145U	Per the Monitoring Report, a third-party calibration of the differential pressure, static pressure, and temperature transmitters is slated to occur annually. The differential pressure transmitter was calibrated by APTIM (third-party contractor) on February 5, 2021 and January 7, 2022. All values were found to be within the tolerance range for this equipment ($\pm 5\%$).	

Instrument, Model, and S/N	Date of Calibration	Field Checks
Static Pressure Transmitter Yokogawa EJA530A S/N: U1P303649	Per the Monitoring Report, a third-party calibration of the differential pressure, static pressure, and temperature transmitters is slated to occur annually. The static pressure transmitter was calibrated by APTIM (third-party contractor) on February 5, 2021 and January 7, 2022. All values were found to be within the tolerance range for this equipment ($\pm 5\%$).	
Temperature Transmitter Pyromation T440 S/N: A800EO	Per the Monitoring Report, a third-party calibration of the differential pressure, static pressure, and temperature transmitters is slated to occur annually. The temperature transmitter was calibrated by APTIM (third-party contractor) on February 5, 2021 and January 7, 2022. All values were found to be within the tolerance range for this equipment ($\pm 5\%$).	

GHD confirmed the information presented above is consistent with the monitoring procedure presented in the Monitoring Plan.

GHD reviewed the historic and current calibration details along with the results of the field checks and determined that the meters used to measure methane concentrations and gas flow were within tolerance during the reporting periods, apart from the FCI flow meter at the flare and Yokogawa digital YEFLOW meter at the engines. During the February 23, 2021 flare flow meter calibration it was determined that the meter was operating outside of the tolerance limits of $\pm 5\%$, with the maximum drift being 10.5%. Using guidance in the Protocol Section 6.2, the Project Developer adjusted flow data from March 1, 2020 until February 22, 2021 to account for this drift. Subsequent field checks found that the meter was recording flow values within the tolerance limit for the rest of the duration of the reporting periods.

It was found that the continuous methane analyzers have a manufacturer recommended calibration frequency that is annual and consistent with the Monitoring Plan. Through review of the calibration documentation and the field checks it was determined that the calibration activities associated with the portable methane analyzer were completed annually in accordance with the manufacturer's requirements. The analyzers were found to be within tolerance during the reporting period.

It is noted that for calibration certificates, some certificates were not readily available to GHD from the Project Developer but were provided to GHD for review as part of the verification. It is expected that documents be retained in accordance with Protocol guidance and in alignment with the Monitoring Plan and can be readily provided to GHD upon request. While there is no current variance or issue associated with this finding, it is noted as a potential source of inherent risk for this Project and should be monitored for future verifications.

5.3.3 Other Monitoring Requirements

GHD reviewed the Monitoring Plan for the Project and did not identify any issues.

Electronic records of continuous methane fraction, flow data and flare temperature (as a proxy for flare operating hours) are initially stored in the memory of the data logger and downloaded monthly and stored for the long-term on the local office servers of the Project Developer and Owner. All records related to flow data, factory calibrations, field checks, and general maintenance, service, and repair are maintained on site for at least 7 years and are also sent to the Project Developer on a semi-annual basis where they are maintained on internal and online servers for at least 7 years. The Project Developer has confirmed all information required by the Protocol will be retained for a period of 10 years after the information is generated or 7 years after the last verification in accordance with the Protocol.

GHD confirmed the following personnel were properly trained for their roles:

- Ms. Julie Kelleher – Individual responsible for managing and reporting GHG emissions

GHD also reviewed the third-parties that performed the calibration checks for the flow meters and methane analyzers (FCI, Elkin Earthworks, and APTIM) and determined that they were competent to be performing the associated calibrations, monitoring, and inspections, as applicable.

5.3.4 Data Substitution

GHD confirmed that no data substitutions were made for this reporting period.

5.4 Risk Assessment and Sampling Plan

GHD developed a risk assessment to determine risk and magnitude of potential errors, omissions, or misrepresentations. The final risk assessment was revised, as needed, throughout the verification and is presented in the Final Verification Plan.

GHD developed a Sampling Plan at the outset of the verification which determined the course of the verification. The final sampling plan was revised, as needed, through the verification and is presented in the Final Verification Plan. GHD performed a complete recalculation of the Project emission reductions based on the received data and information.

5.5 Findings and Basis of Opinion

5.5.1 Quantitative Materiality Threshold

Table 6 and Table 7 below outline the Project Developer's and GHD's GHG Reductions Estimation, respectively.

Table 5 Project Developer GHG Reductions Estimation

Vintage	Baseline Emissions	Project Emissions	GHG Reductions/Removals (CRTs)
2020 – 2021	121,139	2	121,136
2021 – 2022	116,342	6	116,336
Total	237,481	8	237,472

Table 6 GHD GHG Reductions Estimation

Vintage	Baseline Emissions	Project Emissions	GHG Reductions/Removals (CRTs)
2019 - 2020	121,139	2	121,137
2020 - 2021	116,342	6	116,336
Total	237,481	8	237,473

The required accuracy level for this verification is greater than 97 percent. Percent error is defined by the following:

$$\% \text{ Error} = \text{abs}\left(\frac{\text{Stated Reductions} - \text{Verified Reductions}}{\text{Verified Reductions}}\right) \times 100$$

The accuracy level is defined by the following:

$$\text{Accuracy} = 100\% - \% \text{ Error}$$

Based on GHD's verified reduction and the stated reductions, the percent error and accuracy level for the Project is as follows:

$$\% \text{ Error} = \text{abs}\left(\frac{237,472 - 237,473}{237,473}\right) \times 100$$

$$\text{Accuracy} = 100\% - 0.24\% = 99.99\%$$

Therefore, the Project meets the quantitative materiality threshold and be issued a positive Verification Statement.

5.5.2 Qualitative Materiality Threshold

GHD did not identify qualitative material misstatements associated with the Monitoring Report.

5.5.3 Findings and Basis of Opinion

Based on the findings discussed above, GHD will be issuing a positive verification statement. In issuing a Positive Verification Statement, GHD asserts the following:

- The Project meets all eligibility requirements
- The Project was conducted in accordance with all monitoring and record-keeping requirements
- There is no existing material non-conformances or misstatements in the reported data

6. Verification Statement and Closing

For the March 1, 2020 – February 28, 2021 reporting period and the March 1, 2021 – February 28, 2022 period, the Project claimed total **237,472 metric tonnes CO₂e** of GHG reductions in accordance with the Protocol. A zero-credit reporting period was established from July 10, 2018 – February 28, 2019, to account for the gap between the end of the first crediting period and the start of the second crediting period. GHD completed the verification in accordance with the Protocol. GHD completed the work to provide a reasonable level of assurance. The verification criteria were selected per the Protocol and associated guidance documents. GHD determined with a reasonable assurance that the reported emission reductions are free of an offset material misstatement and resulted Positive Offset Verification Statement for emission reductions.

The Offset Verification Statement will be submitted to the Reserve, in alignment with this Verification Report.

All of Which is Respectfully Submitted,

GHD



Jason Clarke, Lead Verifier



Michelle Hirst, Senior Internal Reviewer

