



Verification Report for

Erie County Landfill
CAR444

Reporting Period:
June 9, 2020 to June 8, 2021

Climate Action Reserve
Landfill Project Protocol, Version 5.0

November 16, 2021

Report Prepared for

Renewable Energy Services of
Ohio, LLC
2025 George St,
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USA

Report Prepared by

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Project Verification Report

Summary

The Renewable Energy Services of Ohio, LLC engaged NSF Certification, LLC (NSF) to verify its destruction of landfill gas (LFG) from the Erie County Landfill (herein referred to as the “Project”) defined in accordance with the requirements of the Climate Action Reserve Landfill Project Protocol, Version 5.0 (April 24, 2019). The project is comprised of a landfill gas collection and combustion system comprised of two engines and one flare at the Erie County Landfill in Milan, Ohio. This verification report submitted to the Reserve for the Project report period of June 9, 2020 to June 8, 2021.

The project reduced emissions into the atmosphere by 59,296 metric tons CO₂-e.

1. Introduction

1.1 Objective

The objective of this verification audit was to determine, with reasonable assurance, that Renewable Energy Services of Ohio, LLC (RESO) had quantified, monitored, and fairly reported to the Climate Action Reserve its emission reductions from the destruction of landfill gas and to determine that the Project conformed to the requirements of the verification criteria set in Section 1.3 of this report, including its continuing eligibility. This project is listed as CAR444.

1.2 Scope

The scope of the engagement included verification of the quantification, monitoring and reporting of greenhouse gas emission reductions from the Project for the period June 9, 2020 to June 8, 2021. It also included verification of the calculated project emissions associated with combustion of fossil fuel in the flare and engine/generator, vehicle fuel use and indirect emissions attributed to electricity consumption from project-related activities.

1.3 Criteria

NSF verified reported project emission reductions against the following criteria:

- Reserve Offset Program Manual (March 12, 2021),
- Landfill Project Protocol, Version 5.0 (April 24, 2019) (the Landfill Project Protocol),
- Climate Action Reserve Verification Program Manual (February 3, 2021) and

NSF conducted the verification in accordance with ISO 14064:2006 Part 3, *Greenhouse gases – Specification with guidance for the validation and verification of greenhouse gas assertions*.

1.4 Materiality

In accordance with the Verification Program Manual, emission reduction reports are considered fairly stated if they vary by no more than 3% from a complete statement of the project’s emission reductions because the total annual emission reductions are less than 100,000 tCO₂e and greater than 25,000 tCO₂e.

Project Verification Report

1.5 Level of Assurance

This verification engagement was performed at the reasonable level of assurance.

2. Verification Approach

2.1 Team Appointment and COI Review

This verification was performed by Tina Sentner, NSF Lead Verifier, and reviewed by Mike DeBusschere, NSF Internal Reviewer. Conflict of Interest inquiries were completed for NSF and for the verification team and a finding of low COI risk was confirmed by the Climate Action Reserve.

2.2 Document Review

The verification team conducted a document review to inform the planning process in advance of performing on-site verification activities. Documents reviewed included RESO's project documentation submitted to the Climate Action Reserve, the basis for emission reduction calculations, project design documentation, procedures, regulatory information, and project reporting period raw data provided by RESO.

2.3 Planning

NSF's verification approach is risk-based. It draws upon our understanding of risks to fair statement of reported emissions and the operation of controls to reduce such risks. As a result of the document review and preliminary conversations with project management personnel at RESO, a verification plan and a sampling plan were developed for this engagement. NSF retains all verification documentation for a minimum of 10 years.

2.4 Site Visit

Per Landfill Protocol 5.0, a site visit was required for this report period. The project submitted and was granted an Extenuating Circumstances Determination by the Climate Action Reserve allowing for a remote site visit due to the Covid-19 pandemic. NSF conducted a virtual site visit on October 19, 2021 using information and communications technology (ICT).

- NSF was able to conduct a full assessment of the implementation and operation of the project activity through the virtual site visit.
- NSF was able to request a full walk through of the facility and was able to verify all Landfill Verification Items as they are presented in Section 8.5 of the Protocol through interviews, evidence sampled in screen sharing mode in accordance with the verifier's sampling plan, and a walkthrough of the project activities.
- NSF adhered to all the requirements for virtual site visit as they were described in the email connected to the determination.

As a result, NSF concluded the use ICT for the remote site visit activities was just as effective as a standard visit and that reasonable assurance was able to be achieved.

Project Verification Report

2.5 Verification Activities

During this verification, verification activities were conducted during the kickoff call and desk review and included the following:

- Confirmation of the project continued eligibility, ownership of LFG reductions, and quantification of project emission reductions at the landfill site with RESO personnel;
- Review of the control environment, information management systems and monitoring plans at offices and facilities operated by RESO;
- Review of compliance with relevant environmental regulatory requirements at the landfill facility. The primary focus of inquiry at the landfill facility was compliance with Clean Air Act requirements and solid waste handling and water discharge facility requirements of the Ohio Environmental Protection Agency-Division of Air Pollution Control (OEPA);
- Review of the system for monitoring flow and methane concentration of collected LFG and monitoring equipment calibration and operating performance at the landfill;
- Verification that the Project's monitoring program and data management system addressed and recorded the Landfill Project Protocol required monitoring parameters for the reporting period to produce accurate, reliable and reproducible data and information. Recalculation was conducted for samples of calculated variables as presented in the Reporter's calculation spreadsheet.
- Verification that the Project's records management system contains procedures for acquisition and retention of all Landfill Project Protocol required information, including data substitution periods, and that such procedures have been implemented.
- Determination of RESO's conformity in all material respects with the requirements of the Landfill Project Protocol.

3. Verification Findings

3.1 Project Description

The Erie County landfill facility operates under a solid waste disposal permit from the Ohio Environmental Protection Agency, Core ID: 13359. The site includes a permitted disposal area of 60.63 acres on a parcel of 116 acres of property. The total permitted airspace for waste disposal is 5.23 million cubic yards and consists of eight contiguous landfill cells. The Erie County Landfill is not considered a bioreactor according to US EPA.

On June 09, 2008, the Landfill began operation of a voluntary active landfill gas collection and control system to facilitate the destruction of methane contained in the landfill gas, by combustion via an open flare. In April 2010, a Caterpillar Engine with a Caterpillar SR4B

Project Verification Report

Generator was installed at the site to generate electricity for delivery into the local power grid. In 2014, an additional Caterpillar engine and generator set was added to the project. The engines effectively took the place of the flare as the new destruction device and the flare is only used as a back up in the event an engine goes down. No emission reductions are accounted for this period for the flare.

During this reporting period, there were no changes to the project equipment, personnel or wellfield. Therefore, the project diagram remains up to date on the Reserve web site.

3.2 Eligibility and Title

Project Location. The landfill is located in Milan, Ohio within the United States. NSF confirmed the location through the site visit on August 6, 2019.

Project Start Date: The Project was originally listed on the Climate Action Reserve website on 30 April 2009. The Project's listing indicated the Project Proponent began installation of the landfill gas collection and conveyance system (GCCS) in 2007 and began flaring gas on June 9, 2008. NSF reviewed the Flare Commissioning Report provided by Shaw LFG Specialties; LLC dated June 28, 2008. The Project was considered eligible at the time of the initial start.

Lastly, the project submitted a new listing form for the second credit period on July 24, 2019. NSF concluded that the project remains eligible.

Crediting Period. This is the second ten-year crediting period for the Project. The second crediting period started June 9, 2018 and extends to June 8, 2028. NSF has concluded that the reporting period verified in this report is within the second crediting period for this Project.

Zero Credit Reporting Periods. There were no zero credit reporting periods during the verification engagement.

3.3 Additionality

Project Proponents must indicate that reductions are above and beyond business as usual. In order to do so, the Project must pass a Performance Standard test and the Legal Requirement test.

Performance Standard Test

For the Performance Standard test, a project developer may meet eligibility under four possible performance threshold scenarios. The following scenario applied to the Erie County Landfill:

Scenario 2: Installation of a new qualifying destruction device at an eligible landfill where landfill gas is currently collected and vented but has never been destroyed in any manner prior to the project start date.

The Erie County Landfill had passively vented LFG beginning in 2004, but no destruction device was utilized until the project start date, with the exception of two short pump tests

Project Verification Report

using rental flares. These flares were utilized to determine the capability of the well field. The pump tests were conducted February 4, 2004 through February 27, 2004 and October 25, 2007 through December 11, 2007. NSF confirmed these flares were only used for testing purposes prior to the project and were not operational after the testing periods noted above, as such they are not considered in the Project eligibility.

The project startup documentation and Title V permit confirmed that no other destruction devices were permanently located at the Landfill until the candlestick flare was installed in 2007.

Limits on Credit Stacking

Credit stacking is defined as receiving both offset credits and other types of mitigation credits for the same activity on spatially overlapping areas (i.e., in the same landfill). Per interviews with the landfill regulatory compliance personnel and RESO, the Project has not received offset credits and other types of mitigation credits for the same activity.

Legal Requirement Test

A regulatory review of the Project and the landfill were conducted by the verification team.. There are no laws, statutes, regulations, court orders, environmental mitigation agreements, permitting conditions, or other legally binding mandates requiring the destruction of landfill gas. RESO has also developed a procedure in the monitoring plan to ascertain and demonstrate that the project passes the legal requirement test at all times. The verification team reviewed the Plan, the Title V Air Permits for both the landfill and RESO, and the Municipal Solid Waste Permit and found no requirements to install a gas collection system.

In addition, Erie County Landfill has conducted a non-methane organic compound (NMOC) Threshold review. The Erie County Sanitary Landfill is subject to NSPS regulation requiring the facility to conduct Non-Methane Organic Compound (NMOC) emission rate testing. The most recent Tier II NMOC Emission Rate Report for the Landfill was conducted in June 2018 with a calculated NMOC level of 20.38 Mg/yr for 2020 and 20.71 Mg/yr for 2021. NSF confirmed the landfill had not undergone an expansion or upgrade during the reporting period and therefore, both years are less than the 40 CFR 60 applicability threshold of 50 Mg/yr.

Lastly, NSF reviewed the Attestation of Voluntary Implementation, signed on September 22, 2021 by an eligible signatory to attest for the Project. RESO has affirmed that the Project was established and implemented voluntarily and continues to operate as such. Based on this evidence, NSF concludes the Project passes the legal requirements test.

3.4 Regulatory Compliance.

Project Verification Report

NSF reviewed the Attestation of Regulatory Compliance completed by Renewable Energy Services of Ohio, LLC. In addition, NSF conducted a review of the regulatory compliance of the landfill facilities operated by the Project. NSF reviewed annual inspection reports for the reporting period with no violations noted. NSF also reviewed the EPA Enforcement & Compliance History Online database (ECHO), the Title V Semi-annual Compliance Certifications, Ohio public compliance records along with various other environmental reports. NSF found one instance of noncompliance during the reporting period. Further details regarding the compliance status of the facility can be found in the list of findings. Lastly, NSF noted the Project's monitoring plan contained procedures for maintaining and monitoring regulatory compliance and that the procedures are being properly followed. Through its review, NSF confirmed that the Project was in material compliance with all applicable laws during the reporting period.

3.5 Ownership

Renewable Energy Services of Ohio, LLC (RESO) owns and operates the energy plant and associated destruction devices. Erie County Landfill (ECL) is the owner and operator of the Landfill and gas collection system. RESO and ECL entered into an agreement whereby RESO contracted for the rights to any landfill gas generated at the landfill, including all carbon and other environmental attributes. NSF confirmed RESO was the Project Developer of the Project through a review of regulatory permits issued from the Ohio EPA, as well as a review of the agreements between ECL and RESO. Though the landfill and gas collection wells are owned and operated by ECL, NSF confirmed that RESO retains full, legal, and beneficial title to the carbon offset credits being issued as a result of the collection and combustion of methane at the landfill facility. Element Markets has an agreement with RESO to sell the carbon credits.

Lastly, NSF reviewed the Attestation of Title signed by the Managing Director of RESO, dated September 22, 2021 concerning ownership of landfill gas emission reduction credits for the reporting period. This document asserts that the project applicant has legal rights to any emission reduction credits to be issued by the Climate Action Reserve. From this evidence, NSF has concluded that the project developer, Renewable Energy Services of Ohio is entitled to receive the emission reduction credits that may be issued by the Climate Action Reserve for methane destroyed during this project period.

3.6 Project Boundaries and Emission Sources

The Project included all emission sources from the operation of the landfill gas collection system to the ultimate destruction of the landfill gas. The sources of GHG emissions reviewed in the Erie County Landfill Project were as follows.

GHG sources, sinks, and reservoirs associated with the baseline scenario:

- CH₄ vented to the atmosphere,
- CO₂ from the oxidation of CH₄ by soil bacteria. As the landfill was partially covered with a synthetic liner, the Climate Action Reserve Landfill Project Protocol Version 5.0

Project Verification Report

assumption that 10% of the methane produced would be naturally oxidized by soil bacteria has been applied.

The GHG sources, sinks, and reservoirs associated with the project:

- CH₄ from the incomplete combustion of CH₄ in the internal combustion engines and open flare (not operating this period).
- CO₂ from the combustion of fossil fuels used during operation and maintenance activities for the project activity.
- CO₂ resulting from the consumption of imported electricity.

The gases reviewed include CO₂ and CH₄. All gases have been converted to CO₂-equivalents.

3.7 Performance Against Project Protocol/Methodology

The Project was implemented in conformity with the Climate Action Reserve Landfill Project Protocol Version 5.0.

Monitoring and Operations Plan

In accordance with the Landfill Project Protocol requirements, RESO has established a monitoring and operations plan described in a document entitled “Erie County PDD 2020-2021”. This document addressed frequency of data acquisition, flow and methane concentration monitoring, facility and data management systems, QA/QC provisions of monitoring instrumentation, roles of individuals responsible for monitoring activities, a project diagram, a record keeping plan and describes how relevant parameters required by the Landfill Project Protocol Table 6.1 are to be collected and reported.

Monitoring Equipment

The primary data gathered for the Project is landfill gas flow, pressure, temperature, and methane content of the landfill gas. A Sage Thermal Mass Flow Meter Model SRP-05-18-AC115-LFG continuously monitored landfill gas flow after the blower and a knockout prior to combustion in the engines. The position of the flow meter was adequate to ensure laminar flow. This meter was last factory calibrated on 25 January 2017. The Manufacturer’s specifications indicate the meter can be field checked by a zero calibration self-check that is performed by onsite personnel on a quarterly basis at a minimum, otherwise there are no factory calibration or cleaning and inspection requirements. The flow meter was inspected, cleaned and field checked for calibration accuracy on a quarterly basis with the as found/as left conditions of the flow meter documented. All calibrations show that the flow meter read within a +/- 5% margin of error during the reporting period. This meter’s motherboard malfunctioned on 4/2/2021 and stopped recording data. A new Sage same like kind model meter was installed 04/30/2021. This meter was factory calibrated on 04/23/2021. The new meter was field checked within 2 months of the end of the reporting period by a certified third party. NSF confirmed the flow meter was calibrated to a range of flow rates corresponding to the flow rates expected at the landfill. The calibration results for the flow meter were as follows.

Project Verification Report

Table 1. Flow Meter Field Calibration Check Results

Quarter	Cleaning & Inspection	Field check Dates	Service Provider
Q3 2020	Monthly	Monthly	RESO
Q4 2020	Monthly	Monthly	RESO
Q1 2021	Monthly	Monthly	RESO
Q2 2021	Monthly	06/14/2021	FC Services

The Landfill also employed a ABB Easyline continuous gas analyzer, Model # EL3040. The analyzer was cleaned and inspected on a monthly basis by Project personnel. The ABB analyzer was installed on July 15, 2010 and was factory calibrated prior to installation. The manufacturer recommends that the analyzer be calibrated with test gases on an annual basis. The last calibration of the analyzer was conducted within two months of the end of the reporting period on 06/14/ 2021 by a certified third party with the as left/as found conditions documented. The gas analyzer was field inspected and cleaned monthly by RESO personnel. All calibration field checks show that the methane analyzer read within +/-5% throughout the reporting period. NSF confirmed the flow meter was calibrated to a range of conditions corresponding to the methane rates expected at the landfill. The calibration results for the methane analyzer meter were as follows.

Table 2. Gas Analyzer Field Calibration Check Results

Quarter	Quarterly Inspection and field check Date	Service Provider
Q3 2020	Monthly	RESO
Q4 2020	Monthly	RESO
Q1 2021	Monthly	RESO
Q2 2021	Monthly	RESO
Field Check	06/14/2021	FC Services

Hours of operation are continuously monitored by Kw hour produced by the engines via a PLC and recorded on a SCADA system every one minute.

The ABB analyzer and the Sage flow meter are measured on the same basis and connected to a dataTaker data logger, Model # DT28e, which downloads data every 60 seconds at the RESO facility. The generator control system downloads a variety of data for electric generation including the current load, the totalized load, voltage and frequency among other options. The data logger stores data for about 30 days, but is generally manually downloaded by both ECL and RESO staff weekly.

A project monitoring plan, also referred to as a Project design document (PDD) has been created for the Project. The contents of the PDD were thoroughly reviewed and observed to include the monitoring plan which met the requirements of the Landfill Gas Project Protocol. NSF also

Project Verification Report

confirmed the project was in conformance with the PDD. The monitoring plan records are kept for a minimum of ten years when the information is first generated or seven years after the last verification as stated in the current version of the project's PDD.

3.8 Project Management System

NSF verified the Project's management system during document review and during the on-site visit at the Project. NSF interviewed executive management in addition to the personnel with specific responsibility for implementing the emission reduction project during this reporting period. NSF found a sufficient control environment for the project, including information management, authorizations for key activities, management reviews, and recordkeeping. In particular, NSF reviewed for adequacy the following elements:

- Definition and maintenance of an appropriate control environment by landfill management and personnel;
- Training and competence of landfill project managers and operating personnel, including contractors;
- Identification and management of legal requirements related to landfill operations;
- Identification and maintenance of records required by the landfill project;
- Landfill site and gas collection and combustion equipment specifications;
- Quantification methods and calculations of project emissions;
- Checking and corrective action mechanisms.

3.9 Calculation of GHG Emission Reductions

The Erie County Landfill Project emission reductions were calculated per the formula defined in the Climate Action Reserve Landfill Gas Protocol Version 5.0. The basic formula was:

Landfill gas destroyed

- the portion of methane oxidized by soil bacteria (as the landfill is not covered with a synthetic liner, the Landfill Project Protocol assumption that 10% of the methane produced would be naturally oxidized by soil bacteria has been applied)
 - carbon dioxide emissions from fossil fuel consumption
 - indirect carbon dioxide emissions from the use of electricity from the grid
 - discount factor to account for uncertainties associated with the project monitoring equipment. (a 0% monitoring discount factor was applied)
 - Pre-Project adjustments for the prior use of passive solar torches
- = Project Emission Reductions.

NSF verified the calculated project emission reductions on a sampling basis from information in the Project spreadsheets by checking the Excel spreadsheet formulas and retracing spreadsheet inputs back to the raw data flow from the flare and engine separately. Similarly, NSF checked the total claimed flow for each aggregated monthly summary to verify the correct totals for each month were used in the project spreadsheet equations. NSF also checked the methane concentration equations in the project's spreadsheets for accuracy.

Project Verification Report

NSF verified gas flow was recorded at 70 deg and 1 ATM, however, the Project adjusted to standard temperature and pressure of 60°F and 1atm as required by the Landfill Project Protocol. For data control and quality purposes, any measurements when the engines recorded below zero kWhs or were not recorded by the SCADA system, were excluded from emission reduction calculations. NSF also confirmed data was excluded during the period the meter went down. NSF also confirmed the project applied a 0.936 destruction efficiency for the engines.

NSF verified the correct calculation of project emissions based upon evidence of fossil fuel consumption (propane as supplemental fuel for the flare or as fuel for the emergency generator), and minor indirect CO₂ emissions from the use of electricity from the grid.

As a result of NSF's verification process, we conclude Renewable Energy Services of Ohio, LLC's emission reductions are fairly quantified and without material error.

3.10 Corrective Action Requests/Recommendations

All requests for corrective action raised by NSF during this reporting period were addressed to NSF's satisfaction and closed. These findings are detailed in our List of Findings, a private document.

3.11 Missing data

There was no missing data procedures applied during the reporting period.

3.12 Approved Variances or Deviations

There were was one approved variance for the report period. The protocol requires that all gas flow meters are field checked for calibration accuracy by a third-party technician with the percent drift documented within two months of the end of the reporting period.

RESO requested a variance for Erie County Landfill to use regular cleanings, inspections, and calibrations conducted by site personnel, as well as a factory-calibrated flow meter installed in April 2021, in lieu of the flow meter third-party calibration required within two months of the end of the reporting period. The Reserve granted this variance pursuant to the following conditions:

- The verifier confirms that all calibrations conducted by Erie County Landfill were within the +/- 5% threshold.
- The verifier confirms that readings affected by the failing flow meter were zeroed out from the last successful inspection/calibration (4/2/2021) until a new flow meter was installed (4/30/2021).

NSF verified that the Project met all the requirements of the Variance and flow meter readings were zeroed out as noted within the emission reduction calculations.

4. Verification Results

4.1 Verification Team Recommendation

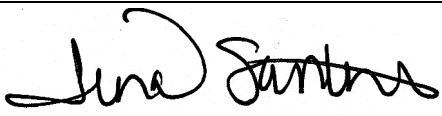
Project Verification Report

Based on the verification activities described above, the verification team has concluded that the Erie County Landfill project had quantified, monitored, and accurately reported to the Climate Action Reserve its emission reductions from the destruction of landfill gas and the Project conformed to the requirements of the verification criteria set in Section 1.3 of this report. NSF verified the Project has achieved the following emission reductions:

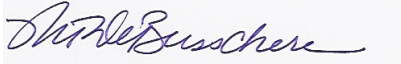
Reductions/Removals the Reporting Period	June 9, 2020 to June 8, 2021 Metric tons CO ₂ -e
Project baseline	59,304
- Project emissions	8
- Project adjustments (NQ _{discount})	0
= Net project emission reductions/removals	59,296

Final values Rounded for simplicity

4.2 Verification Audit Summary

Project Developer	Renewable Energy Services of Ohio, LLC 2025 George St. Sandusky, OH 44870 USA
Project Location	Erie County Landfill 10102 Hoover Road Milan, Ohio, 44846 USA
Project Type	Destruction of Landfill gas
Project Period	June 9, 2020 – June 8, 2021
Protocol/Methodology	Climate Action Reserve, Landfill Project Protocol, v. 5.0
Emissions/Removals Verified	Vintage 2020: 30,379 metric tons CO ₂ -e Vintage 2021: 28,917 metric tons CO ₂ -e
Verification Conclusion	Based upon the verification activities described above, NSF has concluded with reasonable assurance that the Renewable Energy Services of Ohio, LLC's reported emission reductions of 59,296 metric tons CO ₂ -e reported to the Climate Action Reserve for the period June 9, 2020 to June 8, 2021, are, in all material respects, fairly stated.
Lead Verifier	 Tina Sentner, December 7, 2021

Project Verification Report

Internal Reviewer	 Michael DeBusschere, December 7, 2021
<i>This verification statement is valid when signed and dated by an NSF internal reviewer.</i>	