

Verification Report for the Seneca Meadows Landfill Expansion Project Seneca Falls, New York

American Carbon Registry

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1. Introduction

This report is provided to Seneca Meadows, Inc. (SMI) as a deliverable of the American Carbon Registry (ACR) project verification process. This report covers the verification of the Seneca Meadows Landfill Expansion Project (the Project) for the period from May 1 through July 31, 2010. First Environment, Inc. (First Environment) conducted the verification from August to December 2010. During the verification process, First Environment validated aspects of the GHG Project Plan that are relevant to the current reporting period. Components of the GHG Project Plan that are not assessed in this report should be validated during the verification of subsequent reporting periods for the Project.

2. Objectives

The purpose of this verification was, through review of appropriate evidence, to establish that:

- the Project conforms to the requirements of the verification criteria discussed in Section 4 of this report; and
- the data reported are accurate, complete, consistent, transparent, and free of material error or omission.

3. Verification Scope

Specific scope metrics for the verification are outlined in the table below:

Geographic Boundaries	Seneca Meadows Landfill Seneca Falls, New York, USA
Greenhouse Gases Verified	Emissions reductions (expressed in units of Carbon Dioxide equivalents (CO ₂ -e) resulting from methane destruction; Project emissions of CO ₂ , CH ₄ , N ₂ O from purchased electricity and fossil fuel combustion
Reporting Period	May 1, 2010 through July 31, 2010
Data Sources	Metered Data and Emissions Reduction Calculations

4. Standards Used to Verify Emissions (Criteria)

The following table outlines the guidance and protocols used to conduct this verification:

Standard of Verification	American Carbon Registry Standard, Version 2.0, February 2010 (ACR Standard); Climate Leaders Greenhouse Gas Inventory Protocol Offset Project Methodology for Project Type: Landfill Methane Collection and Combustion, Version 1.3, August 2008 (Climate Leaders Protocol)
Verification Process	American Carbon Registry Verification Guidelines for GHG Projects, Version 1.0, July 2010
Level of Assurance	Reasonable assurance
Materiality	Misstatements greater than five percent of the Project's emission reductions assertion are considered material; Qualitative non-conformities with the verification criteria are also considered material

5. Overview of the Verification Process

To review the Project's GHG information, the following verification process was used:

- conflict of interest review;
- selection of Audit Team;
- initial interaction and kickoff meeting with primary SMI contact;
- development of the verification plan;
- site visit;
- review and evaluation of raw data and calculations for period under review;
- follow-up interaction with SMI contact for corrective action or supplemental data as needed; and
- final statement and report development.

The verification process was utilized to gain an understanding of the Project's emission sources and reductions, to evaluate and verify the collection and handling of data, the calculations that lead to the results, and the means for reporting the associated data and results.

5.1 *Conflict of Interest Review*

Prior to beginning any verification project, First Environment conducts an evaluation to identify any potential conflicts of interest associated with the Project. No potential conflicts were found for this Project. A project-specific conflict of interest form was also filed with ACR.

5.2 *Audit Team*

First Environment's Audit Team consisted of the following individuals who were selected based on their verification experience, as well as familiarity with landfill operations.

Lead Verifier – Michael Carim
Verifiers – Ross MacWhinney
Internal Reviewer – James Wintergreen

5.3 *Audit Kick-off*

The verification audit was initiated with a kick-off meeting on August 10, 2010 with the primary SMI contacts. The meeting focused on confirming the scope, schedule, and data required for verification.

5.4 *Development of the Verification Plan*

The team formally documented its verification plan as well as determined the data-sampling plan. The verification plan was developed based on the discussion of key elements of the verification process during the kick-off meeting. SMI was afforded the opportunity to comment on the key elements of the plan for verification. Based on items discussed and agreed upon with SMI, the plan identified the First Environment project team members, project level of assurance, materiality threshold, and standards of evaluation and reporting for the verification. It also provided an outline of the verification process, established project deliverables, and presented a data-sampling plan designed to review all project elements in areas of potentially high risk of inaccuracy or non-conformance.

5.5 *Site Visit*

Ross MacWhinney conducted a site visit on August 11, 2010 to assess the Project's data management systems and interview personnel relevant to the project.

5.6 *Emissions Reduction Data and Calculation Assessment*

This assessment used information and insights gained during the previous steps to evaluate the collected data and the reported emissions reduction quantities, and identify if either contained material or immaterial misstatements.

5.7 *Corrective Actions and Supplemental Information*

The team made requests for corrective action and clarification during the verification process. SMI provided sufficient responses to all corrective action and clarification requests. These requests and SMI's responses are described in detail in Section 7 of the report.

5.8 *Verification Reporting*

Verification reporting, represented by this report, documents the verification process and identifies its findings and results. Verification reporting consists of this report for SMI.

6. Project Conformance with Verification Criteria

6.1 *Project Description*

The Seneca Meadows landfill is owned and operated by Seneca Meadows, Inc. and is located the Town of Seneca Falls, New York. The Project consists of the installation of a gas collection and control system at the landfill. The Project collects landfill gas (LFG) generated from solid waste and combusts it in engines to produce electricity or in auxiliary flares. This process results in a permanent reduction in CO₂-equivalent emission through the destruction of methane in LFG during combustion.

Although the landfill is subject to NSPS regulations regarding LFG emissions, gas collection and destruction is not mandated in expansion cells of the landfill for the first five years from the initial placement of waste in the cell or after two years from the time the cell reaches final grade, whichever is sooner. The Project collects and combusts LFG from the voluntary expansion of the gas collection and control system into new cells of the landfill before they become subject to NSPS requirements.

The baseline scenario is defined as the unmitigated release of LFG from the landfill to the atmosphere. Combustion of LFG controlled by the project destroys the methane in the gas, resulting in a reduction in CO₂-e emissions.

The GHG Project Plan provides additional details about the Project.

6.2 Eligibility

The Project meets the eligibility requirements set forth in the ACR Standard and Climate Leaders Protocol. Project boundaries are consistent with those identified in the GHG Project Plan and were confirmed during the site visit.

The project is located within the United States and has a start date after January 1, 2000. The Project occurs in several phases as the landfill is expanded into new cells, therefore, each cell has its own start date and crediting period. The crediting period for each expansion begins tolling with the first placement of waste in the cell.

The current reporting period only includes gas collected from the Southeast Bumpout (SBO) cell of the landfill. Waste was first placed in this cell on December 17, 2008, therefore, this serves as the start date for the crediting period for this cell. The start date for this cell was confirmed in correspondence with the New York State Department of Environmental Conservation. It was also confirmed during the site visit that gas collection activities in this cell only collect eligible gas.

The GHG Project Plan describes the process that SMI will employ to identify and address negative community or environmental impacts. No negative impacts were recorded during the current reporting period.

6.3 Offset Title

SMI owns and operates both the landfill and gas collection system. Innovative Energy Systems, the operator of the LFG-to-energy plant that destroys LFG, has stated they will not claim credit for GHG emission reductions from the Project. Therefore, SMI is entitled to emission reduction credits associated with the Project.

6.4 Additionality

The Project satisfies the requirements for the demonstration of additionality specified by the ACR Standard by passing an approved performance standard and a regulatory additionality test.

The project consists of the voluntary expansion of a landfill gas collection and combustion system that collects LFG and destroys it in engines to produce electricity or in an enclosed flare and therefore exceeds the performance standard defined by the Climate Leaders Protocol.

Because the Project occurs at expansion cells at an NSPS site, gas collected is not subject to control requirements until five years from the first placement of waste in an expansion cell or two years after it reaches final grade. During the current reporting period, the project involves collection of LFG from the SBO. Waste was first placed in this cell on December 17, 2008 and gas collection activities began in 2010. Based on the dates of expansion into the SBO, LFG collected and combusted during the current reporting period is considered additional.

No state or local laws mandate the collection and destruction of landfill gas prior to the timelines established by federal NSPS regulations.

6.5 Project Monitoring and Management System

The project was implemented in conformity with the GHG Project Plan. Significant elements of the project's monitoring plan are discussed below.

Total LFG destroyed by the project is measured continuously using a Magnetrol Thermo Model TA2 mass flow meter. The site owns two meters and operates one with the other meter swapped in when calibrations occur. One meter corrects ambient flow conditions to a standard temperature and pressure of 60°F and one atmosphere, while the other corrects to 80°F and one atmosphere. The meter that corrects to 60°F was in use for the entire reporting period from May 1 through July 31. Flow data is downloaded through a SCADA system and downloaded electronically.

Methane concentration in LFG is measured using a GEM-2000 handheld instrument. Measurements are taken each business day of operations and logged in field computers by site personnel. Data is later downloaded from field PCs into electronic spreadsheets. The instrument is calibrated in the field prior to each use using a reference gas of known concentration and every six months by the manufacturer. Relative to the current reporting period, the instrument was calibrated by the manufacturer on February 22, 2010.

Because combustion devices destroy gas from both eligible and ineligible cells of the landfill, gas flow and methane measurements must be taken prior to any comingling of these gas streams. The flow meter and point of measurement are both located along the header pipe for the SBO prior to tie-in to larger headers that carry gas from other sections of the landfill. Therefore, all gas metered by the project for the current reporting period is eligible for crediting.

Both gas flow and methane concentration measurements are taken on a wet basis. Because the points of measurement on the header pipe completely isolate gas flow and methane data from the SBO, no additional measurements are necessary to capture eligible project data.

Engine and flare operation are monitored through electrical output and flame temperature, respectively.

Activity data for purchased electricity and fossil fuel consumption are monitored according to the GHG Project Plan. Monthly quantities of purchased electricity for project equipment are obtained from meter reads by project personnel. Fuel consumption during project construction and propane consumed for flare assistance is logged on field forms.

The monitoring approach described in the GHG Project Plan and implemented on site meets the requirements of the Climate Leaders Protocol and the ACR Standard.

6.6 Emissions Reduction Calculation Assessment

As part of the emissions reduction calculation assessment, the Project's assumptions and calculations were reviewed.

Emission reduction calculations were reviewed to ensure accuracy in the formulas used and the raw data used as inputs. The formulas were tested to ensure they were consistent with the calculation methodology described in the Climate Leaders Protocol and GHG Project Plan. A 10 percent methane soil oxidation factor was applied in emission reduction calculations in accordance with the Climate Leaders Protocol. A destruction efficiency of 98.34 percent is assigned to all combustion devices within the project boundary. This value was obtained from research performed by the Solid Waste Industry for Climate Solutions and was approved in the GHG Project Plan. Because this value is lower than the 99 percent destruction efficiency specified by the Climate Leaders Protocol, it is conservative to apply it to all combustion devices.

The amount of methane destroyed was calculated from metered data for landfill gas collected. Totalized flow was calculated from data obtained in 60-second intervals from the SCADA system. Flows are aggregated into weekly totals. As described in Section 6.1, gas collection from the SBO does not capture any ineligible gas from adjacent cells subject to NSPS regulations. Therefore, the radius of influence calculation described in the GHG Project Plan is not required for the current reporting period. The fraction of methane in landfill gas during a given interval was determined by averaging all measurements taken in a given week.

The total volume of methane destroyed by the Project is computed using Equation A from the Climate Leaders Protocol. No independent correction of the pressure and temperature of LFG flow totals is required because the flow meter corrects to standard conditions of 60°F and one atmosphere, which are consistent with the assumptions of the Climate Leaders Protocol.

Project emissions were subtracted from total volume of methane destroyed and quantified using Equation B from the Climate Leaders Protocol. Project emissions were calculated by multiplying activity data by an appropriate emission factor. Project emissions sources consisted of purchased electricity to power project equipment, propane used to start flares, and mobile combustion of gasoline and diesel from project-related construction activities.

There are no leakage emissions associated with the Project, therefore, these are assigned a value of zero in emission reduction calculations in Equation C of the Climate Leaders Protocol.

Total emission reductions were computed using Equation D from the Climate Leaders Protocol. All emission sources within the project boundaries are properly accounted for in calculations.

Copies of the raw data used in the calculations, including flow data and methane content data, were compared with the data used in the final calculations and tested for transcription or mathematical errors. First Environment performed recalculations of emission reductions for the entire reporting period to assess whether they were free of material misstatement.

7. Audit Results

SMI provided good documentation for its emissions estimates, as well as its procedures surrounding the data collection process. To complete the verification process, First Environment requested corrective action and additional clarification for several items.

Through communications with the Audit Team, SMI was able to resolve all corrective action and clarification requests made by First Environment during the validation process.

The following tables summarize the corrective action and clarifications requested, as well as SMI's response:

ID	Corrective Action Request	Summary of Participant Response	Verification Conclusion
1	The description of monitoring parameters provided in Table 1 of the GHG Project Plan does not address project energy consumption.	An Addendum to the GHG Project Plan was provided that adequately addressed monitoring of energy consumption, including activity data related to purchased electricity and fossil fuels.	Response is acceptable.
2	<p>The GHG Project Plan does include the following:</p> <ul style="list-style-type: none"> Ex ante projection of estimated GHG emission reductions and removal enhancements, stated in metric tons of CO₂e. Identification of risks that may substantially affect GHG reductions Roles, responsibilities, or contact information for Project Proponent, other participants, relevant regulators, entities holding land title. Relevant outcomes from any stakeholder consultations and mechanisms for ongoing communication, as applicable. Statement whether the project has applied for GHG emission reduction or removal credits through any other GHG emissions trading system and success of any of these applications. 	An Addendum to the GHG Project Plan was provided that addressed all items raised in the corrective action request and is consistent with requirements of the ACR Standard.	Response is acceptable.
3	The GHG Project Plan does not describe how project will monitor all regulatory requirements or changes in regulation that might affect the project's eligibility.	SMI provided an Addendum to the GHG Project Plan that identified several sources that will be reviewed on a semi-annual basis to identify any regulatory changes that may affect project eligibility.	Response is acceptable.

ID	Corrective Action Request	Summary of Participant Response	Verification Conclusion
4	The GHG Project Plan does not provide an assessment of uncertainty associated with emission reduction calculations.	An Addendum to the GHG Project Plan was submitted that identifies and assesses the magnitude of various parameters that may introduce uncertainty into project monitoring and emission reduction calculations. Other measures designed to minimize uncertainty are also discussed.	Response is acceptable.
5	Please provide justification for the missing data procedures described in Section 5.1 of the GHG Project Plan, and where applicable, specify the length of time over which substitution may be performed.	An Addendum to the Project Plan was submitted that elaborated Missing data procedures to applied.	Response is acceptable. Because the initial project plan received Certification from ACR, the inclusion of missing data procedures in the GHG Project Plan is deemed acceptable.

ID	Clarification Request	Summary of Participant Response	Verification Conclusion
1	Please provide written description of schedule for moving metering points for each phase of the expansion project. Include the following for each stage: <ul style="list-style-type: none"> Approximate date or range of dates for first waste in place Approximate date or range of dates that the stage will be capped Approximate date that the site will become overlapped with non-NSPS waste. Location of metering equipment for each stage. 	Evidence was provided for the date of the first waste in place for the landfill cell involved in the current reporting period. Engineering diagrams were provided to show the current design of the gas collection system and location of project metering equipment. SMI explained that the location and layout of metering equipment and data measurement points will change in future reporting periods due to expansion of the landfill and that these aspects of project monitoring should be assessed once implemented.	Information provided is sufficient to confirm eligibility of current project phase; future expansions will be assessed in subsequent verifications.
2	Please clarify why there are no methane concentration measurements reported for July 14 th and 16 th .	Data was not collected on these dates due to the significant amount of rainfall during this time period which made employee access unsafe on the side-slope where access is required.	Response is acceptable.
3	In Appendix D of the GHG Project Plan, identify where the manufacturer specifications for the Magnetrol Thermoel model TA2 mass flow meter state that there is no periodic calibration requirement for the instrument.	SMI provided evidence from the manufacturer to confirm that there is no periodic calibration requirement for the instrument. The project will perform calibrations in two year intervals, consistent with other GHG reporting activities.	Response is acceptable.

ID	Clarification Request	Summary of Participant Response	Verification Conclusion
4	Please clarify how the activity data for diesel and gasoline consumption during the construction of the project was determined and provide supporting evidence, as appropriate.	SMI records the fueling of vehicles and equipment used for all construction. In order to estimate the fuel used during the construction of the gas collection system of the Southeast Bump-Out during the verification period, the Seneca Meadows Landfill Gas Foreman and the third party Construction Quality Assurance (CQA) inspector reviewed the construction field logs for the time period, the number of vehicles and equipment used (trucks, welders, and equipment) for the duration of time when landfill gas system construction was being constructed, and summarized the typical gasoline and diesel fuel consumption rates for those pieces of equipment. Seneca Meadows has subsequently developed separate spreadsheets solely for tracking fuel consumption for landfill gas system construction.	Response is acceptable.
5	Please clarify whether any of the wells used to collect eligible landfill gas in the current reporting period are subject the radius of influence calculation described in Section 3.8 the GHG Project Plan.	During the entire reporting period of May 1, 2010 through July 31, 2010, a structural berm acted as a physical barrier between the Southeast Landfill and the Southeast Bumpout Landfill. As of July 31, 2010, there was no overlapping of waste from the Southeast Bumpout Landfill (containing non-NSPS waste) onto the Southeast Landfill (containing waste subject to NSPS requirements). Therefore, the radius of influence of the wells in the Southeast Bumpout Landfill did not extend into the Southeast Landfill and the radius of influence calculation was not necessary.	Response is acceptable.

Verified results show 34,739 metric tonnes of CO₂e from Vintage 2010 from the reporting period from May 1, 2010 to July 31, 2010 eligible for registration with the American Carbon Registry.

8. Verification Conclusion

First Environment was retained to provide verification services for the Project's GHG emission reductions assertion based on the following fundamentals:

- *Level of assurance:* Reasonable assurance;
- *Objectives of verification:* To assure project conformance with the verification criteria and ACR requirements;

- *Verification criteria:* American Carbon Registry Standard, Version 2.0, February 2010; Climate Leaders Greenhouse Gas Inventory Protocol Offset Project Methodology for Project Type: Landfill Methane Collection and Combustion, Version 1.3, August 2008;
- *Definition of materiality:* Misstatements of greater than five percent of the GHG reduction assertion and qualitative non-conformities with verification criteria are considered material;
- *Scope, including:*
 - *Boundaries of the assertion:* Seneca Meadows landfill operations;
 - *The physical infrastructure, facilities, and activities within the assertion:* LFG collection and destruction operations;
 - *GHG sources, sinks, and reservoirs included within the assertion:* CH₄ emissions from anaerobic decomposition of waste; CO₂, CH₄, and N₂O emissions from combustion of fossil fuels; and CO₂, CH₄, and N₂O emissions from purchased electricity
 - *The time period for the assertion:* May 1, 2010 through July 31, 2010.

Based on the assessments performed and the historical evidence collected, First Environment concludes that the Project GHG emissions reductions, due to the capture and combustion of methane gas for the period May 1, 2010 through July 31, 2010, can be considered with a reasonable level of assurance:

- consistent with the GHG Project Plan and identified verification criteria,
- without material discrepancy, and
- meeting the minimum level of accuracy of at least 95 percent.

Verified results show:

Reporting Period: May 1, 2010 through July 31, 2010	Total
Baseline Emissions (m.t.CO ₂ e)	35,131
Project Emissions (m.t.CO ₂ e)	392
Emissions Reductions (m.t.CO ₂ e)*	34,739

*as measured and calculated in accordance with the Project Methodology

9. Lead Verifier Signature



Michael M. Carim
Associate

10. Independent Internal Review Signature

A handwritten signature in black ink, appearing to read "Jay Wintergreen", with a stylized, flowing script.

James Wintergreen
Senior Associate