

Verification Report for Sustainable Energy Solutions, LLC Eagle Point Landfill Project—CAR 476

Climate Action Reserve

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1. Introduction

This report is provided to Sustainable Energy Solutions, LLC (SES) as a deliverable of the Climate Action Reserve (CAR) project verification process. This report covers the verification of the Eagle Point Landfill – CAR 476 (the Project) for the period from July 1 through December 31, 2010. First Environment, Inc. (First Environment) conducted the verification from January to March 2011.

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	Eagle Point Landfill, Ball Ground, Georgia
Greenhouse Gases Verified	Emissions reductions (expressed in units of Carbon Dioxide equivalents (CO ₂ -e) resulting from methane destruction; Project emissions of CO ₂ from purchased electricity and fossil fuel combustion
Reporting Period	July 1, 2010 - December 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	Climate Action Reserve's Landfill Project Protocol, Version 3.0, December 2009; Climate Action Reserve Landfill 3.0 Errata & Clarifications, January 4, 2011; Climate Action Reserve Program Manual March 2010
Verification Process	Climate Action Reserve's Landfill Project Protocol, Version 3.0, December 2009, Section 8; Climate Action Reserve Verification Program Manual, June 2009; ISO14064-3: Specification with guidance for the validation and verification of greenhouse gas assertions, 2006
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 SES contact;
- development of the verification plan;
- site visit;
- review and evaluation of raw data and calculations for period under review;
- follow-up interaction with SES 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.

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. First Environment also received determination of a low risk of conflict of interest from CAR in a notification dated December 20, 2010.

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 – Ellen Reid, Ross MacWhinney, Jeff Daley
Senior Internal Reviewer – Jay Wintergreen

Audit Kick-off

The verification audit was initiated with a kick-off meeting on January 5, 2011 with the primary SES contact. The meeting focused on confirming the scope, schedule, and data required for verification.

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 project verification process during the kick-off meeting. SES was afforded the opportunity to comment on the key elements of the plan for verification. Based on items discussed and agreed upon with SES, 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.

Site Visit

Ellen Reid conducted a site visit on January 18, 2011 to assess the Project's data management systems and interview personnel relevant to the project.

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.

Corrective Actions and Supplemental Information

The Audit Team made requests for clarification during the verification process. SES provided sufficient responses to all clarification requests. No requests for supplemental information were necessary.

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 SES, a verification opinion, and a list of findings to be submitted to the Climate Action Reserve.

6. Project Conformance with Verification Criteria

6.1 Project Description

The Eagle Point Landfill is an active municipal landfill located at 8880 Old Federal Road, Ball Ground, Georgia. The landfill started accepting waste in 2002 and currently consists of the following cells:

- MSW Cells: Cells 1A, 1B, 2A, 2B, 5, 6, 7, 8, 9, and 10
- C & D Cells: Cells 3A, 3B, and 4

In the future, the landfill will be expanded into Cells 11 through 16.

The project collects and combusts landfill gas in an open flare. No combustion devices existed on site prior to the initiation of the project activity. The baseline scenario, defined as the total release of LFG to the atmosphere, was verified during the project's initial reporting period.

6.2 Eligibility

The Eagle Point Landfill meets the eligibility requirements set forth in the CAR Protocol. The project is located within the United States and has a project start date after January 1, 2001. The project start date of the project was October 1, 2009. The project's start date was confirmed during the verification of the project's initial reporting period.

Ownership of emission reduction credits generated by the project was verified through a review of the emission reduction purchase agreement between SES and the landfill. SES has also completed the CAR Attestation of Title for the reporting period. First Environment confirmed that the form is on file with CAR and was completed correctly.

First Environment reviewed the applicable air and solid waste permits for the Eagle Point Landfill to assess compliance with relevant laws and regulations. This cursory review of permits and other applicable regulatory requirements indicated that the site was in compliance and no violations of permits occurred during the reporting period. Additionally, SES has completed the CAR Attestation of Regulatory Compliance for the reporting period. First Environment confirmed that the form is on file with CAR and was completed correctly; the Attestation indicates no dates of material non-compliance during the reporting period.

6.3 *Additionality*

The Project consists of a voluntarily installed landfill gas collection system and a new qualifying destruction device at a landfill where landfill gas has never been collected and destroyed prior to the project start date, consistent with the criteria in the first performance standard defined in Section 3.4.1 of the CAR Protocol. Therefore, the project gas collection system and combustion system passes the CAR Protocol's Performance Standard.

The Eagle Point Landfill is also subject to NSPS rules requiring the facility to conduct Non-Methane Organic Compound (NMOC) emission rate testing. The most recent Tier II Test was conducted on May 28, 2009, with the NMOC emission rate results calculated to be 32.9 Mg/yr, below the 50 Mg/yr threshold that would require the installation of a gas collection and control system.

To further inform the assessment of regulatory additionality, First Environment performed a cursory review of the landfills operating permits and relevant Georgia Department of Natural Resources regulations for municipal solid waste landfills. This cursory review indicated that the project is not required by regulation; therefore, the Project passes the CAR Protocol's Legal Requirements Test.

In order to establish regulatory additionality and the project's eligibility under the CAR Protocol, First Environment also relied on the Attestation of Voluntary Implementation completed by SES for the current reporting period. First Environment confirmed that the form is on file with CAR and was completed correctly.

6.4 *Project Performance Against Protocol/Methodology and Project Management System*

The project was implemented in conformity with the CAR Landfill Project Reporting Protocol, Version 3.0 and the project monitoring plan.

The Eagle Point Landfill monitoring system consists of a flow meter, gas analyzer, and a thermocouple. A Rosemount Mass ProBar flow meter continuously measures differential pressure, temperature, and pressure of the gas stream. The meter standardizes flow readings to a pressure of one atmosphere and a temperature of 60°F. A Siemens Ultramat 23 Continuous Gas Analyzer measures gas composition for methane, oxygen, and carbon dioxide content. The candlestick flare incorporates a Pyromation thermocouple that is designed to shutdown the flare when the flare temperature drops below the set point of 400°F. A PLC

system continuously records gas flow, methane concentration, and flare temperature on a Yokogawa digital chart recorder.

On August 17, 2010, the flow meter was replaced with a new meter of the same make and model due to underreporting of flow by the original meter used by the project. Replacement of the flow meter was performed by Shaw LFG Specialties, the vendor who constructed the flare skid and installed all monitoring instruments. The accuracy of the meter was also checked after installation and confirmed that it was operating accurately.

SES provided evidence of quarterly inspections and cleaning of all project monitoring equipment during the reporting period.

A flow verification event was performed on November 19, 2010 for the Rosemount flow meter using a Pitot tube. First Environment reviewed evidence of the flow verification which indicated the meter was operating accurately with reported drift within the five percent threshold established by the CAR Protocol. The gas analyzer performs an auto-calibration function on a daily basis and is field tested using a handheld instrument on a monthly basis. The gas analyzer was calibrated on December 16, 2010 by a third party using calibration gas. First Environment reviewed evidence of the gas analyzer calibration which indicated the analyzer was operating accurately.

A GEM2000 portable gas analyzer is also used to take methane measurements at a minimum frequency of once per week. The instrument is calibrated prior to each use with reference gas of known concentration. The instrument is also calibrated by the manufacturer bi-annually.

First Environment determined the monitoring system to meet the protocol requirements based upon observations made during the January 2011 site visit and review of relevant project documentation.

There are two sources of project emissions identified within the project boundaries. Indirect emissions of CO₂ occur from purchased electricity used to power project equipment. Activity data is obtained from monthly utility invoices. Additionally, the site uses a propane tank to assist in reigniting the flare should it become extinguished. The site archives propane purchase records in order to estimate project emissions from this source.

SES developed and implemented a monitoring plan to track relevant project parameters and data sources. The Monitoring Plan was reviewed to determine compliance with the protocol requirements. First Environment found the monitoring plan to meet the requirements set forth by the CAR Protocol.

6.5 Emissions Reduction Calculation Assessment

The 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 CAR Protocol. Because the landfill is still receiving waste and is not capped, a 10 percent oxidation factor was applied to account for methane oxidation in the cover soil. A 96 percent destruction efficiency is assigned to the project's open flare. The destruction efficiency is applied accordingly in emission reduction calculations.

During the verification period, there were several periods during which methane data from the Ultramat gas analyzer was not available due to routine maintenance of the instrument. Measurements taken with the GEM200 instrument were used to take manual methane readings during these periods of down time. In accordance with the CAR protocol, a 10 percent discount was applied for any days when GEM readings were used in place of continuous data.

The amount of methane destroyed was calculated from metered data for landfill gas collected. Totalized flow was calculated from data obtained in approximately 30-second intervals from the PLC system, which continuously records the flow rate corrected for temperature and pressure. Total flow in a given interval was computed by multiplying the flow rate by the length of the interval. For continuously monitored methane data, the fraction of methane in landfill gas during a given interval was calculated from data obtained in approximately 30-second intervals and the total volume of methane destroyed was calculated daily. For periods where weekly methane concentration data is used, the total volume of methane destroyed is calculated weekly.

Because the Rosemount Mass Probar flow meter corrects gas flow recorded at ambient conditions to one atmosphere of pressure at 60°F, no further adjustment of flows is performed for the purposes of quantifying emission reductions. Measurements with a corresponding flare temperature recorded below 500°F were excluded from emission reduction calculations. The total volume of methane destroyed by the Project is computed in daily intervals and converted to a mass flow using the density of methane at 60°F and one atmosphere of pressure.

Project emissions were subtracted from total volume of methane destroyed. Project emissions were calculated by multiplying activity data by an appropriate emission factor. Project emission sources consisted of purchased electricity to power the gas collection system and combustion of propane.

Copies of the raw data used in the calculations including flow data, methane content data, and utility and other fossil fuel invoices, were compared with the data used in the final calculations and tested for transcription or mathematical errors. All raw data sources and calculations over the entire verification period were reviewed. First Environment found the emission reduction calculations to be free of material misstatement.

6.6 *Approved Variance or Deviations*

SES did not request any variances or deviations from the CAR protocol for the verification period.

6.7 *Changes Due to Errata & Clarification Document*

The issuance of the Errata and Clarification to the Landfill Project Protocol, Version 3.0 document on June 25, 2010 resulted in a change to the attestation forms that the project developer submitted to the Reserve. First Environment reviewed the Attestation of Voluntary Implementation and the Attestation of Regulatory Compliance forms and confirmed that these forms were completed correctly and are on file with the Reserve.

7. *Audit Results*

SES 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 clarification from SES. The responses given by SES were sufficient to resolve the issues raised by the Audit Team.

Verified results show 87,817 metric tonnes of CO₂e from Vintage 2010 from the project reporting period of July 1 to December 31, 2010 eligible for registration with the Climate Action Reserve.

8. Verification Conclusion

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

- consistent with the Project Methodology,
- without material discrepancy, and
- meeting the minimum level of accuracy of at least 95 percent.

Verified results show:

Reporting Period: July 1, 2010 to December 31, 2010	Total
Baseline Emissions (tCO ₂ e)	87,909
Project Emissions (tCO ₂ e)	92
Emissions Reductions (tCO ₂ e)	87,817

*as measured and calculated in accordance with the Project Methodology

9. Lead Verifier Signature



Michael M. Carim
Associate

10. Senior Internal Reviewer Signature



James T. Wintergreen
Senior Associate