



Verification Report for

City of Garland Landfill Carbon Project
Rowlett, Texas
USA

CAR545, Climate Action Reserve

Landfill Project Protocol Version 2.1

November 1, 2012

Report Prepared for

Garland Power and Light
217 N. Fifth Street, 4th Floor
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Report Prepared by

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Summary

Garland Power and Light (GPL) engaged NSF International Strategic Registrations, Ltd. (NSF-ISR) through a third party to verify its methane emission reductions from the City of Garland Landfill Carbon Project reported to the Climate Action Reserve for the reporting period June 10, 2011 to June 9, 2012. The City of Garland Landfill Carbon Project (the Project) is listed in the Reserve's database with the identification number CAR545.

Garland Power and Light's methane emission reductions during the cited period resulted from the collection and destruction of landfill gas in a single open flare at the C.M. Hinton Jr. Regional Landfill facility located in Rowlett, Texas (herein referred to as the "the landfill"). .

The Project reduced emissions into the atmosphere by 81,806 metric tons CO₂-e for the reporting period.

1. Introduction

1.1 Objective

The objective of this verification audit was to determine, with reasonable assurance, that Garland Power and Light had quantified, monitored, and fairly reported to the Climate Action Reserve its landfill gas emission reductions at the C.M. Hinton Jr. Regional Landfill in accordance with all applicable requirements of the Climate Action Reserve Landfill Project Protocol Version 2.1, including eligibility.

1.2 Scope

The scope of the engagement included project eligibility, quantification, monitoring, and reporting of greenhouse gas project emission reductions associated with the operation of a flare at the C.M. Hinton Jr. Regional Landfill from June 10, 2011 to June 9, 2012.

1.3 Criteria

Garland Power and Light implemented its methane emission reduction project in accordance with the requirements of the Climate Action Reserve's Landfill Project Protocol Version 2.1, and the Landfill Project Protocol Version 2.1 Errata and Clarifications (August 16, 2012). In addition, the Climate Action Reserve Program Manual (October 26, 2011) was also utilized. NSF-ISR conducted its verification of the reported emission reductions in accordance with the, the Climate Action Reserve Landfill Project Verification Protocol 2.0, the Climate Action Reserve Verification Program Manual (December 20, 2010), and ISO 14064:2006 Part 3, *Greenhouse gases – Specification with guidance for the validation and verification of greenhouse gas assertions*.

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1.4 Materiality

In accordance with the Climate Action Reserve Verification Program Manual (December 20, 2010), emission reduction reports were considered fairly stated if they varied by no more than 3% from a complete statement of the project's methane emission reductions for projects registering more than 25,000 Climate Reserve Tons (CRTs) but less than 100,000 CRTs in a calendar year. In addition, qualitative misstatements, where the emission reduction project implementation does not conform to the requirements of the CAR program and protocols were also considered material. For 2011 and 2012, emission reductions were pro-rated to annual estimated emission reductions to determine appropriate materiality thresholds of 3%.

1.5 Level of Assurance

This 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-ISR Lead Verifier. Conflict of Interest inquiries were completed for NSF-ISR, for the verification team, and for Mike DeBusschere, NSF-ISR's internal reviewer. 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 verification activities. The document review took this change into consideration. Documents reviewed this period included Garland Power and Light project documentation submitted to the Climate Action Reserve, project reports, gas flow meter and methane analyzer data, calibration documentation, a project monitoring plan, regulatory compliance attestations and supporting documents, and equipment information related to monitoring equipment.

2.3 Planning

NSF-ISR'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 Garland Power and Light personnel based in Garland, Texas, a verification plan and a sampling plan were developed for this engagement.

2.4 Verification Activities

NSF-ISR conducted a site visit of the Garland Power and Light methane gas collection and destruction project operation in Rowlett, Texas, on August 8, 2012. The purpose of the site visit was to confirm the project design and installation equipment and assess the capability of Garland Power and Light's management system and procedures to produce accurate, reliable, and

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reproducible data and information from project activities. The nature of verification activities conducted included:

- Verification of the continued eligibility of the Garland Power and Light's landfill gas project to report emission reductions in accordance with the Climate Action Reserve Landfill Project Protocol Version 2.1;
- Verification of evidence presented by Garland Power and Light to demonstrate its ongoing knowledge of and assertion of compliance with environmental regulatory requirements applicable to the project. 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 subject to permitting, inspection, and enforcement by the Texas Commission of Environmental Quality (TCEQ); Verification of applicable methane and carbon dioxide emission sources within the project boundary and their quantification as defined by the Climate Action Reserve Landfill Project Protocol Version 2.1
- 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 or intermediary as presented in the Project's calculation spreadsheet.
- Review of the system for monitoring flow and methane concentration of collected LFG and monitoring equipment calibration and operation at the landfill;
- Verification that the Project's records management system contained procedures for acquisition and retention of all Landfill Project Protocol required information, and that such procedures have been implemented,
- Determination of the Project's conformity in all material respects with the requirements of the Landfill Project Protocol; and
- Reviewing the basis for and results achieved from the calculated methane emission reductions from its landfill gas collection and destruction project.

3. Verification Findings

3.1 Project Description

The C.M. Hinton Jr. Regional Landfill is a municipal solid waste facility operated by the City of Garland in Rowlett, Texas. The landfill began accepting waste in 2002 and has an expected lifespan of fifty years. During the project period covered by this report, landfill gas was collected and subsequently combusted in a single open flare. The project may install a generator in future phases of the project. The landfill gas collection system consisted of 34 extraction wells in currently active landfill areas. The project well field and flare was operated by Garland Power and Light. The landfill is not considered a bioreactor as defined by the U.S. EPA.

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3.2 Eligibility

NSF-ISR considered evidence to establish the eligibility of the City of Garland Landfill Carbon Project previously under the Landfill Gas Protocol Version 2.1. The project continues to meet the eligibility requirements.

Location. The project is located within the United States of America in Rowlett, Texas. NSF-ISR previously confirmed the location through the site visit on August 16, 2011 and most recently on August 8, 2012.

Project Start Date. The project start date was listed as June 10, 2009, the day the open flare became operational. NSF previously verified in the first reporting period in August of 2011. Garland Power and Light provided various documents to support the evidence of construction of the landfill gas project such as the third party construction reports for the installation of the Gas Collection and Conveyance System, the GCCS design drawings, well field drilling logs for the first phase of well installation, initial data logger reports and a start up service order from SHAW LFG Specialties for the installation of the flare skid. NSF-ISR concluded these documents confirmed the project start date of June 10, 2009

Crediting Period. The crediting period for landfill projects is 10 years from the project start date. The crediting period for the City of Garland Landfill Carbon Project extends to June 9, 2019. NSF-ISR has concluded that the reporting period verified in this report is within the first crediting period of the Project.

3.3 Additionality

Legal Requirement Test. During the site visit, Garland Power and Light affirmed that the City of Garland Landfill Carbon project continued to be implemented voluntarily. The C.M. Hinton Jr. Regional Landfill's design mass threshold exceeds 2.5 million MG of Municipal Solid Waste and was therefore, 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 C.M. Hinton Jr. Regional Landfill was conducted on Feb 1-2, 2012 with a result of 13.30 Mg/yr NMOC. The test results indicated that the C.M. Hinton Jr. Regional Landfill is not expected to reach an NMOC level of 50 Mg/year until well beyond the project crediting period. During the previous verification, NSF-ISR reviewed the Solid Waste Permit, Title V Permit, and Flare Permit letter from the Texas Commission of Environmental Quality dated September 2008. There was no evidence observed requiring a mandatory installation of a gas collection and conveyance system. During this reporting period, a legal and regulatory review of the C.M. Hinton Jr. Regional Landfill was conducted by the project proponent. The results of the review indicated the landfill is in compliance with Federal, State, and Local regulations and that there are no laws, statutes, regulations, court orders, environmental mitigation agreements, permitting conditions, or other legally binding mandates requiring the destruction of landfill gas. Lastly, NSF-ISR reviewed an attestation of voluntary implementation signed by the Director of Garland Power and Light on August 6, 2012 for the period from June 10, 2011 through June 9, 2012. From this review NSF-ISR has concluded that the project implementation remains voluntary.

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Performance Standard Test. NSF-ISR determined during its first verification site visit that the C.M. Hinton Jr. Regional Landfill had not collected and destroyed any landfill gas prior to the implementation of the Project. Interviews with the site manager confirmed there were no solar flares devices connected to the leachate riser system or previous qualifying destruction devices installed onsite. NSF-ISR did not observe evidence of a solar flare or pre-existing destruction devices or identify pre-existing destruction devices on historical project drawings. In addition, NSF-ISR reviewed the Solid Waste Permit and the Title V Permit for C.M. Hinton Jr. Regional Landfill and no evidence of a pre-existing destruction device was observed or required of the site. The project proponent meets the performance standard threshold under option 1: “Installation of a landfill gas collection system and a new qualifying destruction device at an eligible landfill where landfill gas has never been collected and destroyed prior to the project start date.” According to the Protocol, a project developer who has once passed the performance standard test remains eligible to register reductions for the lifetime of the project crediting period, as long as the project is not otherwise determined ineligible due to regulatory changes that impact the project’s voluntary implementation. NSF-ISR has concluded from these facts that the project has met the performance standard test.

Regulatory Compliance. NSF-ISR reviewed the Attestation of Regulatory Compliance signed by the Director of Garland Power and Light affirming the project’s compliance status throughout the project reporting period of June 10, 2011 through June 9, 2012. During the site visit and desk review activities, NSF-ISR reviewed the regulatory review of the C.M. Hinton Jr. Regional Landfill conducted by the project proponent. In addition, NSF-ISR interviewed the landfill and project managers regarding legal and regulatory compliance tracking systems and reviewed recent inspections for the landfill. From a sample of inspections reports reviewed over the reporting period of the project, there were no notices of violations observed. In addition, the Project’s monitoring plan was observed to contain procedures for maintaining and monitoring ongoing legal and regulatory compliance. From this evidence, NSF-ISR has concluded that the Project and the C.M. Hinton Jr. Regional Landfill remain in material compliance with applicable laws and regulations during the reporting period.

3.4 Ownership

The City of Garland owns both the C.M. Hinton Jr. Regional Landfill and Garland Power and light as divisions within the city. During the previous verification, NSF-ISR reviewed the legal description of the landfill showing the City of Garland as sole owner of landfill. Ownership was further confirmed through review of organizational documents and various regulatory permits issued from Texas Commission of Environmental Quality such as the Solid Waste and Title V Operating permits. During the current reporting period, NSF-ISR confirmed there were no changes to ownership and reviewed the Attestation of Title dated August 6 concerning ownership of landfill gas emission reduction credits for the period June 10, 2011 through June 9, 2012. This document asserts that the project applicant had legal rights to any emission reduction credits to be issued by the Climate Action Reserve. From this evidence, NSF-ISR has concluded that the project developer, Garland Power and Light, is entitled to receive the emission reduction credits that may be issued by the Climate Action Reserve for methane destroyed during the project period.

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3.5 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 at an open flare. The sources of GHG emissions reviewed in the City of Garland Landfill Carbon 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 not covered with a synthetic liner, the Climate Action Reserve Landfill Project Protocol Version 2.1 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 flare.
- 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.

3.6 Performance Against Project Protocol/Methodology

The Project was implemented in conformity with the Climate Action Reserve Landfill Project Protocol Version 2.1.

Monitoring and Operations Plan. In accordance with the Landfill Project Protocol requirements, Garland Power and Light has established a monitoring and operations plan which is described in a document entitled “Garland Power and Light Monitoring Plan - Final_060112”. This document addresses flow and methane concentration monitoring, facility, and data management system operations and describes how relevant parameters required by the Landfill Project Protocol Table 6.1 are to be collected and reported. In addition, Missing Data calculation procedures were reviewed for consistency with the Landfill Project Protocol requirements and the protocol’s Errata and Clarifications document. No discrepancies with requirements were found. The monitoring plan records are kept for a minimum of ten years when the information is first generated. NSF-ISR concluded that the project met the monitoring requirements in version 2.1 of the Landfill Project Protocol.

Monitoring Equipment. Flare layout and related monitoring equipment were reviewed for conformity with the LF Protocol requirements. The primary data gathered for the project was landfill gas flow, pressure, temperature, and methane content of the landfill gas. Two Fluid Components Intl (FCI) thermal mass flow meters were utilized for the project and used alternatively to ensure uninterrupted metering during quarterly calibration events. The FCI flow

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meters continuously monitored flow after the blower and a knockout prior to combustion in the candlestick flare. The FCI Thermal Instrument measurement device is configured to measure flow at 70 deg F and 1 ATM; however the project has appropriately adjusted flow to 60 degrees and 1 ATM in the emission reduction calculations. The position of the flow meter was adequate to ensure laminar flow. The FCI meter was removed and replaced by the alternate meter on a quarterly basis and sent to the factory for calibration, inspection and cleaning. These calibrations occurred on April 28, 2011 (however, not installed until July 14, 2011), October 31, 2011, January 26, 2012, and April 19, 2012 showing the activities performed and the as left/as found condition of the instrument documented. The factory calibration of the meter conducted on October 31, 2011 and April 19, 2012 indicated the meter had drifted resulting in over reporting. NSF confirmed the emission reductions were properly adjusted to account for drift during these instances. The calibration conducted during January, 2012 found the instrument to be within +/- 5% threshold tolerances. While the FCI instrument in place was calibrated within two months of the end of the verification period (April 19, 2012), the project provided an additional calibration record on September 20, 2012 to confirm this instrument was within the tolerances until the end of the verification period. Based on this review, NSF-ISR concludes the project reported accurate flow data.

Methane concentration is measured continuously with a Siemens Ultramat 23 methane concentration analyzer. The Siemens Ultramat 23 instrument was factory calibrated on May 29, 2009. The Ultramat 23 was quarterly inspected, cleaned, and calibrated in the field by a third party and found to be within tolerance thresholds. These events occurred on July 21, 2011, October 19, 2011, January 10, 2012 and April 17, 2011 within two months of the end of the reporting period. In addition, self-calibration checks to a cylinder of mixed nitrogen, carbon dioxide, and methane were performed automatically on a periodic basis. Calibration procedures and logs for the flow meter and gas analyzer demonstrated consistency with the requirements of the Protocol calibration requirements.

Temperature and hours of operation are continuously monitored via two thermocouples mounted within the shroud of the candlestick flare. The flare operations are programmed to automatically alert project individuals via phone if the flare system goes down. It will automatically initiate a re-start of the system three times and if unsuccessful, the system will shutdown automatically eliminating flow to the flare if the flame is extinguished.

Operation and Performance. Raw data from the FCI Thermal Mass flow meter instrument, Ultramat 23 gas analyzer and temperature thermocouples is continuously collected every two (2) minutes automatically onsite by a Yokogawa data acquisition device. Once a month, raw data is downloaded from the Yokogawa recorder by Garland Power and Light. The raw data is stored for recordkeeping retention and emission reduction calculations. For data control and quality purposes, any measurements when flare temperature recorded below 500°F were excluded from emission reduction calculations. Data is generally stored indefinitely by the project; however at a minimum the data is stored for a period of 10 years after the information is generated or 7 years after the last verification.

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3.7 Project Management System

NSF-ISR verified the Project's management system during document review and during the on-site visit at the Project. NSF-ISR interviewed Garland Power and Light management in addition to the personnel with specific responsibility for implementing the emission reduction project during this reporting period. In particular, NSF-ISR 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; and
- Checking and corrective action mechanisms.

NSF-ISR found a sufficient control environment for the project, including information management, authorizations for key activities, management reviews, and recordkeeping.

3.8 Calculation of GHG Emission Reductions

NSF-ISR verified the calculated project emission reductions on a sampling basis from information derived from the Yokogawa data acquisition device for the reporting period. The verification team reviewed data downloaded into excel spreadsheets for the various vintage years. NSF-ISR verified data for completeness, scanned the data for data gaps and for out-of-range values, reviewed spreadsheet formulas for consistency with protocol equations, and recalculated emission reductions. The verification team also verified the correct calculation of project emissions based upon evidence of fossil fuel consumption, and indirect CO₂ emissions from the use of electricity from the grid. The City of Garland Landfill Carbon Project emission reductions were calculated per the formula defined in the Climate Action Reserve Landfill Gas Protocol Version 2.1. The basic formula was:

Landfill gas destroyed

- the portion of methane oxidized in the baseline scenario (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 was applied),
 - carbon dioxide emissions from fossil fuel consumption,
 - methane emissions from incomplete destruction of natural gas, if applicable,
 - indirect carbon dioxide emissions resulting from the use of electricity from the grid,
 - pre-project adjustment for methane destruction in the baseline scenario (not applicable),
 - the discount factor to account for uncertainties associated with the project monitoring equipment (not applicable),
- = Project Emission Reductions.

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NSF-ISR verified gas flow was adjusted from 70 degrees F and 1 ATM to standard temperature and pressure of 60 degrees F and 1ATM as required by the Landfill Project Protocol. For data control and quality purposes, any measurements when flare temperature recorded below 500°F were excluded from emission reduction calculations.

NSF-ISR verified the correct calculation and emission factors used for project emissions based upon evidence of fossil fuel consumption (propane as supplemental fuel for the flare, and gasoline for vehicles), and indirect CO₂ emissions from the use of electricity from the grid.

NSF-ISR verified Missing Data calculation procedures were reviewed for consistency with the Landfill Project Protocol requirements and the application Errata and Clarifications document. There were no instances of missing data observed during the reporting period.

As a result of NSF-ISR's verification process, we conclude Garland Power and Light's emission reductions are fairly quantified and without material error.

3.9 Corrective Action Requests

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

3.10 Approved Variances or Deviations

No variances were requested or deviations approved for the Project.

4. Verification Results

4.1 Verification Team Recommendation

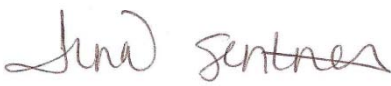
Based on the verification activities described above, the verification team has concluded that the project has achieved the following emission reductions:

Reductions/Removals during the current reporting period in Metric tons CO ₂ -e	10 June to 31 December 2011	01 January to 09 June, 2012
Landfill gas destroyed	45,798	36,067
- Project emissions	32	27
- Project adjustments (explain)	0	
= Net project emission reductions/removals	45,766	36,040

The numbers listed above are summary data, with significant figures shortened for the purpose of providing an overview within this report."

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4.2 Verification Audit Summary

Project Developer	Garland Power and Light 217 N. Fifth Street, 4 th Floor Garland, Texas 75040
Project Location	C.M. Hinton Jr. Regional Landfill 3175 Elm Grove Rd. Rowlett, Texas 75089
Project Type	Landfill gas collection and destruction
Project Period	June 10, 2011 – June 9, 2012
Protocol/Methodology	Climate Action Reserve Landfill Project Protocol Version 2.1
Emissions/Removals Verified	Vintage 2011: 45,766 metric tons Vintage 2012: 36,040 metric tons
Verification Conclusion	Based upon the verification activities described above, NSF-ISR has concluded that Garland Power and Light's reported 2011 and 2012 vintage methane emission reductions of 81,806 metric tons reported to the Climate Action Reserve for period of June 10, 2011 – June 9, 2012, are, in all material respects, fairly stated.
Lead Verifier	 Tina Sentner, November 1, 2012
Internal Reviewer	 Mike DeBusschere, November 6, 2012
<i>This verification statement is valid when signed and dated by an NSF-ISR internal reviewer.</i>	