

Verification Report for

Rio Grande Valley Landfill
Donna, Texas, USA
USA

Climate Action Reserve
Project ID CAR 512

Landfill Project Protocol, Version 2.1

09 September 2012

Report Prepared for:

BFI Waste Systems of North America, LLC
18500 North Allied Way
Phoenix, Arizona 85054

Report Prepared by:

NSF International Strategic
Registrations, Ltd.
789 Dixboro Road
Ann Arbor, Michigan 48105

Summary

BFI Waste Systems of North America, LLC engaged NSF International Strategic Registrations, Ltd. (NSF-ISR) to verify its destruction of methane gas from the Rio Grande Valley Landfill Gas Project (CAR 512) reported to the Climate Action Reserve for the reporting period 28 December, 2010 through 27 December, 2011.

BFI Waste Systems of North America, LLC is a project developer as described by NAICS code 562212. BFI Waste Systems of North America's, LLC's reductions during the cited project reporting period resulted from the collection and destruction of landfill gas in a single flare from the Rio Grande Valley Landfill located at Farm to Market 493 and Mile 12 Road, Donna, Texas 78753, Hidalgo County, USA. Verified emission reductions for the reporting period listed above are detailed in Section 4 of this report.

1. Introduction

1.1 Objective

The objective of this verification audit was to determine, with reasonable assurance, that the Project Developer, BFI Waste Systems of North America, LLC, had met eligibility requirements and had quantified, monitored and fairly reported to the Climate Action Reserve its landfill gas emission reductions at the Rio Grande Valley Landfill in accordance with all applicable requirements of the Climate Action Reserve's Landfill Project Protocol version 2.1.

1.2 Scope

The scope of the engagement included verification of the quantification, monitoring and reporting of greenhouse gas emission reductions from the project at the Rio Grande Valley Landfill for the reporting period of 28 December, 2010 through 27 December, 2011.

The scope included verification of the calculated project-related emissions associated with combustion of fossil fuel in a single flare and indirect emissions attributed to electricity consumption from project-related activities. And finally, the scope of this verification covered a review of all eligibility rules for this project per the requirements in the Landfill Project Protocol.

1.3 Criteria

BFI Waste Systems of North America, LLC implemented its methane reduction in accordance with the requirements of the Climate Action Reserve's Landfill Project Protocol, Version 2.1, Errata and Clarifications, Version 2.1, August 16, 2012 and the Climate Action Reserve Program Manual, October 26, 2011. NSF-ISR conducted its verification of the reported emission reductions in accordance with the requirements of the Climate Action Reserve's Verification Program Manual, December 20, 2010, the Reserve's Landfill Project Verification Protocol Version 2.0 and to 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 guidelines in the Verification Program Manual, emission reduction assertions were considered fairly stated if they varied by no more than 3% for the reporting period. This percentage is based on the volume of emission reductions reported for this project on an annual basis per the criteria in the Climate Action Reserve's Verification Program Manual, December 20, 2010. Thresholds of materiality allowed verifiers of emission reduction reports to consider as immaterial discrepancies less than the stated percentage for the reporting period mentioned above. In addition, deviations from the protocol are considered material.

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 Mark Lutz, NSF-ISR Lead Verifier and reviewed by Michael DeBusschere, NSF-ISR Senior Internal Reviewer. Conflict of Interest inquiries were completed for NSF-ISR, the Lead Verifier and the Senior Internal Reviewer. A finding of low COI risk was confirmed by the Climate Action Reserve on 19 January, 2012.

2.2 Document Review

The Lead Verifier conducted a document review to inform the planning process in advance of performing on-site verification activities. Documents reviewed included Rio Grande Valley Landfill's project documentation submitted to the Climate Action Reserve, documentation prepared for the project by Element Markets (contracted by BFI Waste Systems of North America, LLC to assist them in this project), including a project monitoring plan entitled "Project Design Document: Rio Grande Valley Landfill" (July 23, 2012), raw output data, aggregated and calculated data on Excel spreadsheets and other project records and data.

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 Element Markets personnel a verification plan and a sampling plan were developed for this reporting period.

2.4 Verification Activities

NSF-ISR conducted a site visit at Rio Grande Valley Landfill in Donna, Texas. The site visit was conducted July 11, 2012.

Verification activities included:

- Confirmation of continuing eligibility, ownership of the project, and quantification of project emission reductions;

Project Verification Report

- Review of the project's continuing eligibility details under NSPS Emission Guidelines for MSW Landfills;
- Confirmation of the continued control environment, information management systems and monitoring plans of this project.
- Review, on a sampling basis, of compliance with relevant environmental regulatory requirements at the Rio Grande Valley Landfill for the 28 December, 2010 through 27 December, 2011 reporting period.
- Selecting locations and processes within the scope of the Rio Grande Valley Landfill to visit based on an assessment of risks to fair reporting;
- Reviewing the basis for and results achieved from the calculated methane emission reductions from its landfill gas collection and destruction project;
- Verification that the Rio Grande Valley Landfill's monitoring program and data management system addressed and recorded Protocol monitoring parameters during the last project period; and
- Verification that Rio Grande Valley Landfill's records of its management system contains procedures for acquisition and retention of all Protocol required information, and that such procedures have been implemented.

3. Verification Findings

3.1 Project Description

The project consisted of methane collected from a landfill that included 64 LFG vertical extraction wells, associated piping and a blower/flare skid. The LFG was combusted in one open flare. The landfill consists of 134.5 acres with a total permitted footprint of 92.1 acres. There are eight cells on this landfill, all of which are constructed.

Rio Grande Valley Landfill controls leachate by a collection system that uses collection piping to drain all leachate into sumps located within the waste mass. From there the leachate is collected and stored in a 155,000 gallon storage tank and is re-circulated under Rio Grande Valley Landfill's municipal waste permit. The landfill is not considered a bioreactor per the EPA guidelines, because no additional liquids are added to the waste mass.

3.2 Eligibility and Title

Project Location: The project was located near Donna, Texas – located entirely within the U.S. and continues to be eligible as a landfill project under the Climate Action Reserve Protocol.

Project Start Date: The project start date of 21 February, 2005 was confirmed by the original verification of this landfill, conducted by NSF-ISR, January 6 through January 7, 2011.

Crediting Period: The crediting period established is from 21 February 2005 (the project start date) to 20 February 2015. NSF-ISR has concluded that this reporting period, of 28 December, 2010 through 27 December, 2011, is within this crediting period.

3.3 Additionality

Legal Requirement Test: The New Source Performance Standard (NSPS) for MSW landfills requires that landfills that began receiving waste after May 30, 1991, with a design capacity greater than 2.5 Mg to control emissions of non-methane organic compounds (“NMOC”) when the estimated NMOC emissions exceed 50 Mg per year. Based upon the results of the Tier II Report conducted by Weaver Boos Consultants, LLC- Southwest during the week of July 13, 2009, RGLF’s NMOC emissions were less than 50 Mg/yr in 2011 (46.7 Mg) and will continue to be less than 50 Mg/yr through 2013.

NSF-ISR had previously examined a “Tier I Operating Air Permit Application for LFG Utility” report prepared by Weaver Boos Consultants, LLC-Southwest; dated June, 2005. It stated that the facility is a Type 1 MSW landfill and was not subject to 40 CFR Part 70 requirements, but required that a permit was needed for the operation of the flare. NSF-ISR confirmed during this site visit that this permit is still current and continues to conclude that Rio Grande Valley Landfill is not required to capture and destroy landfill gas under federal (NSPS, EG or NESHAP) regulations.

During the site visit for this reporting period, NSF-ISR also reconfirmed that Rio Grande Valley Landfill continues to not be required to manage its landfill gas under both the Texas Commission of Environmental Quality (TCEQ) and local regulations.

NSF-ISR examined the Attestation of Voluntary Implementation signed by James Van Weelden, Senior Vice-President of Environmental Development and Compliance, BFI Waste Systems of North America, LLC, on 6 July 2012, attesting that there were no regulatory requirements that required capture and destruction of landfill gas at Rio Grande Valley Landfill, and found the document to be free from defect. On the basis of all the evidence considered, NSF-ISR has concluded that Rio Grande Valley Landfill has met the Legal Requirements Test.

Performance Standard Test: Per the protocol, projects must pass the Performance Standard Test – a standard of performance applicable to all landfill projects. NSF-ISR had previously confirmed during the last site visit there was no landfill gas ever destroyed, actively or passively, prior to the project and there was no evidence of a previous flare(s) onsite. The previous site visit and an interview with the Landfill Manager connected with the site confirmed as-built drawings and engineering specifications /construction documents, showing the installation of new collection and destruction equipment as of the dates specified in the documents.

As a result, NSF-ISR verification activities show evidence that the site was not collecting and destroying landfill gas prior to the project start date, and the project is considered “additional” under “Scenario 1” of the protocol – i.e. *“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.”*

Regulatory Compliance: NSF-ISR reviewed regulatory compliance documents for the Rio Grande Valley Landfill site from the Texas Commission on Environmental Quality (“TCEQ”), including a Municipal Solid Waste Operating Permit (MSW-1984a issued January 10, 2002), an Air Permit (#\$73250 issued October 1, 2004) and other permits. These permits included, as applicable, inspection

frequencies, sampling frequencies and reporting requirements. NSF-ISR verified that these permits continued to be current.

In addition, NSF-ISR reviewed the processes in place at Rio Grande Valley Landfill for on-going monitoring of regulatory compliance to Federal, State and local regulations and related permit requirements. This was done through a review of the regulatory monitoring plan described in Rio Grande Valley Landfill's "Project Design Document"; interviews with Rio Grande Valley Landfill's Landfill Manager and Element Market's Project Manager for this landfill. NSF-ISR took a sample of these actions and verified the regulatory requirements had been performed and found that there were acceptable controls in place for monitoring regulatory requirements during the project reporting period.

NSF-ISR reviewed the EPA's publicly available Office of Enforcement and Compliance History database (ECHO), and found no Notices of Violation had been recorded in the database in this reporting period under the CAA, National Pollution Discharge Elimination System, or Resources Recovery and Reclamation Act.

And finally, NSF-ISR examined the Attestation of Regulatory Compliance completed by BFI Waste Systems of North America, LLC (James Van Weelden, Senior Vice President of Environmental Development and Compliance, 6 July 2012) on file in the Reserve's database and found it to be free from apparent defect.

Based on the above, NSF-ISR's regulatory review indicated the landfill was in compliance with Federal, State and Local regulations during the reporting period from 28 December 2010 through 27 December, 2011. On this basis, NSF-ISR has concluded that this landfill operated per applicable regulatory requirements.

3.4 Ownership

BFI Waste Systems of North America, LLC is a subsidiary of Republic Services, Inc. A review was conducted of permits: A Storm Water Permit, Operating Permit and an Air Operating Permit – all from the Texas Commission of Environmental Quality. All three permits showed BFI Waste Systems of North America, LLC's continued ownership and operation of the Rio Grande Valley Landfill.

NSF-ISR had previously considered in the first verification as evidence the "Carbon Credit Development and Management Agreement" that BFI Waste Systems of North America, LLC had executed with Element Markets. This agreement stated that Element Markets would work together with the project developer to, among other things, assist with monitoring, verification and issuance of carbon credits that may be generated by this project. Both the Landfill Manager of Rio Grande Valley Landfill and a representative from Element Markets verbally confirmed that this agreement has not been amended and is still in effect.

We examined a "Project Developer's Attestation of Title" completed by BFI Waste Systems of North America, LLC (James Van Weelden, Senior Vice President of Environmental Development and Compliance, 6 July 2012) on file in the Reserve's database and found it to be free from defect.

From the above evidence, we concluded that BFI Waste Systems of North America, LLC owns and operates the Rio Grande Valley Landfill and also there is no evidence that the gas rights and/or carbon credits have been sold or contracted to another party.

3.5 Project Boundaries and Emission Sources

NSF-ISR reviewed the project Flow Diagram against equipment and operations at the site on June 11, 2012. We found that the project boundaries meet the requirements of the protocol and found that the assessment boundaries correctly begin with the project landfill gas collection system (gas wells and lateral collectors) in the well field leading to a blower/flare skid and associated valves and instrumentation and ending with the flare itself. NSF-ISR found that there were no engines, turbines, boilers or other devices and that the flare was the sole destruction device.

GHG sources, sinks and reservoirs associated with the baseline scenario (the pre-project state of the landfill) was verified as a landfill where no previous collection or destruction took place prior to the project start date.

Sources, Sinks and Reservoirs: The Project accounted for the following sources, sinks and reservoirs identified in the Landfill Project Protocol: Waste Breakdown; Gas Collection; Supplemental Fuel and CH₄ emissions from the Project LFG Flare Destruction. Landfill Project Protocol default destruction efficiencies were correctly applied to account for the incomplete combustion of methane by the flare. Specific sources included the following:

- CO₂ from the oxidation of CH₄ by soil bacteria. As the landfill is not covered by a synthetic liner, the Landfill Project v. 2.1 Reporting Protocol's assumption that 10 percent of the methane produced would be naturally oxidized by soil bacteria has been correctly applied.
- Uncontrolled GHG released from the landfill.

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

During the site visit, a review of the project greenhouse gas management system was conducted with the project developer. This review included a detailed look at the project data handling and processing procedures, recordkeeping and data storage and the quality control and assurance procedures. The following is the result of this review.

NSF-ISR reviewed Rio Grande Valley Landfill's Project Design Document: "Project Design Document: Rio Grande Valley Landfill" Version 1, (last updated July 23, 2012) written by Element Markets LLC for this reporting period. NSF-ISR reviewed this document both in the document review stage of our verification process and on site to verify monitoring activities and records against this document.

During the reporting period, the operation of the flare was continuously monitored using a thermocouple located within the flare shroud connected to a digital data logger to sense temperature and providing information for calculating the operation times of the flare.

Project Verification Report

LFG flow was measured continuously, averaged and recorded every eight minutes using a Thermal Instruments Thermal Mass Flow Meter connected to a digital data recorder. The Flow Meter is configured and calibrated to measure scfm of flow at 60 degrees F and 14.7 psia per protocol requirements. NSF-ISR sampled the raw data spreadsheets at various points to verify that there were no flow adjustments made throughout the reporting period.

This project now utilizes cellular telemetry to remotely monitor the operation of the system and automatically transfer data from the digital recorder to Element Market's internal server. The files were automatically converted and stored in Element Markets' internal server. The data was processed and stored in a Microsoft database. From this database, the data was queried and downloaded into Excel files to aggregate amounts and to calculate total emission reductions.

Raw data samples and weekly data samples were taken during the verification per a sampling plan. Each sample was examined for periods where there were no data, data reported as "0", any periods of sudden variation, periods where methane concentrations temperatures or flows were missing and other anomalies. These periods were correlated through interviews with personnel and logbooks with times where the flare was down due to equipment issues, weather-related, electrical outages, maintenance, etc. The samples showed that the Excel spreadsheets were filtering out the data per the parameters stated above and no emission reductions were claimed during those periods.

NSF-ISR reviewed flow meter calibration and maintenance records that indicated that the flow measurement equipment was cleaned and inspected on a quarterly basis with documented reports. In addition, records indicated that the flow meter was field-checked for calibration accuracy by a third-party technician on-site on a quarterly basis.

NSF-ISR confirmed that the gas flow meter was field-checked for calibration accuracy within two months of the end of the reporting period (December 09, 2011), by a certified third party per protocol requirements and that factory calibration schedules continue to adhere to the manufacturer's guidance. Calibration records indicated that accuracy on these checks were not within the protocol guidelines of $\pm 5\%$, with the largest drift being 31.7% at the last field check which showed that the flow meter was over-reporting. The protocol requires that if a field check on a piece of equipment reveals accuracy outside of the threshold, calibration by the manufacturer or a certified service provider is required. Although this was done January 4, 2012, this was not done until there were several field checks that showed a drift beyond the threshold.

Per protocol requirements "For calibrations that indicate over-reporting (higher flow rates, or higher methane concentration), the metered values must be adjusted based on the greatest calibration drift recorded at the time of calibration." Because of the above, all flows were scaled back by 31.7% for the reporting period.

For methane analyzers: Methane concentrations were measured continuously, recorded every 15 minutes and averaged at least daily. With data information seen on the monitoring equipment during our site survey and with the inspection of samples of the raw data and spreadsheet calculations, NSF-ISR concluded that methane was measured continuously and recorded and averaged per protocol requirements. This continuous gas analyzer was connected to a digital data recorder and was the system used throughout the reporting period to monitor methane.

Project Verification Report

NSF-ISR verified by records that the continuous gas analyzer was inspected, cleaned as needed and field checked for calibration accuracy on a quarterly basis and the last check was performed within two months of the end of the reporting period. None of the calibrations showed a drift that was beyond the $\pm 5\%$ threshold per protocol requirements. NSF-ISR also confirmed that the continuous gas analyzer was calibrated by a certified third party in December, 2011, and that factory calibration schedules continue to adhere to the manufacturer's guidance.

The following table shows as summary of all of the cleanings, inspections and calibrations verified for both the flow meter and the continuous methane analyzer:

Quarter	Cleaning/Inspections, Flow meter Calibrations	Cleaning/Inspections, Methane Gas Analyzer Calibrations
1	3/18/2011 ¹	3/18/2011 ¹
2	6/28/2011 ¹	6/28/2011 ¹
3	9/27/2011 ¹	9/27/2011 ¹
4	12/09/2011 ²	12/09/2011 ¹
N/A	1/04/2012 ³	-----

¹ Cleaning, Inspection, Calibration Check date.

² All inspections where a field check for calibration accuracy occurred show that the flow meter was reading outside the $\pm 5\%$ margin of error during the reporting period. As a result, the carbon credit calculation takes the highest reported drift during the reporting period (31.7% for 12/09/2011) as a discount on the credit calculation per protocol rules.

³ Latest manufacturer's calibration date of flow meter.

3.7 Project Management System

The project management system was described "Project Design Document: Rio Grande Valley Landfill" Version 1, July 23, 2012 written by Element Markets. This plan included a description of the project, a description of the relationship/ responsibilities of all parties connected with the project, calculation methodologies and a monitoring plan to track emission reductions. In addition, the plan included monitoring details of landfill gas delivered to the flare, the monitoring of flare temperatures to ensure complete destruction of methane, the monitoring of the percent of methane content and calibration details of the flow meter and gas analyzer. This document was verified to address the requirements of Version 2.1 of the Landfill Project Protocol.

The plan outlined procedures that described what records would be kept, by whom and for how long. In general, records are stored for a period of 10 years after the information was generated or 7 years after the last verification.

The Monitoring Report also outlined how applicable local, state and national regulations and permit requirements were monitored on an ongoing basis.

NSF-ISR found an adequate control environment per the documented project management system for the Project for the reporting period, including a record-keeping plan, monitoring of landfill regulations, the

role of individuals performing specific monitoring activities and QA/QC provisions to ensure that data acquisition and meter calibrations were carried out consistently and with precision.

3.8 Calculation of GHG Emission Reductions

Monitoring Plan data calculation procedures were reviewed for consistency with the Landfill Project Reporting Protocol v. 2.1 requirements as part of this verification. NSF-ISR independently calculated the data based on the calculations in the Protocol and found that Rio Grande Valley Landfill's claimed emission reductions were immaterial from our calculations for both 2010 and 2011 after corrective actions were completed.

NSF-ISR independently verified calculated project emission reductions for the years 2010 and 2011 from information on data calculation spreadsheets. Landfill Gas Destruction Project emission reductions were calculated per the formula defined in the Climate Action Reserve Landfill Protocol version 2.1. The formula for determining GHG emission reductions of the project activity during the reporting period was:

- Baseline emissions (in tonnes CO₂e) – Project emissions (in tonnes CO₂e)

The formula for determining Baseline emissions was:

- The total Methane destroyed
- Methane destroyed (above) converted to CO₂e
- Less the oxidation factor
- Less the default destruction efficiency of the open flare (.96)

The formula for determining Project emissions was:

- The fossil fuel emissions used for the project, converted to CO₂ (in this case, the propane used for flare start ups.)
- The total annual electricity consumed by the project landfill gas project (with conversion factors to convert from MWh to CO₂, and then conversion of lb/CO₂ to tonnes of CO₂.)

= Project Emission Reductions.

Note: For this project, there was no supplemental natural gas utilized, apart from propane used for flare start-ups, nor were there any pre-project destruction devices, so there was no need to calculate these reductions. NSF-ISR further verified the data for accuracy, based on its sampling plan, the trail of data beginning from the raw data outputs to the spreadsheets capturing this data to the final calculations. NSF-ISR independently calculated the destruction amounts based on the calculations in the Protocol and found Rio Grande Valley Landfill's claimed emission reductions were fairly stated.

There were no flow rates or methane data substitutions for missing data during the reporting period..

3.9 Corrective Action Requests/Recommendations

NSF-ISR issued corrective actions and a recommendation for improvement for this project. All material and immaterial issues were resolved. Details on the corrective actions and clarifications requested were provided to the Project Developer and to the Reserve in a List of Findings, a private document.

3.10 Approved Variances or Deviations

There were no requested variances or approved deviations for this project.

4. Verification Results

4.1 Verification Team Recommendation:

Based on the verification activities described above, the verification team has concluded that the Rio Grande Valley Landfill's project has achieved the following emission reductions:

Vintage Year :	Baseline Emissions	- Project Emissions	- Adjustments	= Metric tons CO ₂ -e Removals (net)*
2010	456.61	.90	0	455
2011	29,526.23	67.94	0	29,458

* Rounded Down

4.2 Verification Audit Summary:

Project Developer	BFI Waste Systems of North America, LLC 18500 North Allied Way Phoenix, Arizona 85054
Project Location	Rio Grande Valley Landfill Farm to Market 493 and Mile 12 Road Donna, Texas 78753 Lat: 26° 13' 31.58" N/ Long: 98° 01' 54.93" W
Project Type	Collecting and Destroying Methane from Landfills
Project Period	28 December 2010 through 27 December 2011
Protocol Methodology	Climate Action Reserve, Landfill Project Protocol, Version 2.1
Emission Removals Verified	Vintage 2010: 455 metric tons of CO ₂ -e Vintage 2011: 29,458 metric tons of CO ₂ -e
Verification Conclusion	Based upon the above, NSF-ISR has concluded that Rio Grande Valley Landfill's 2010 vintage methane emission reductions of 455 metric tons (CO ₂ -e) and 2011 vintage methane reductions of 29,458 metric tons (CO ₂ -e) reported to the Climate Action Reserve are, in all material respects, fairly stated.
Lead Verifier	 Mark Lutz, 2012-09-09

Project Verification Report

Internal Reviewer	 Michael DeBusschere, 2012-09-20
<i>This verification statement is valid when signed and dated by an NSF-ISR internal reviewer.</i>	