

LANDFILL GAS PROJECT VERIFICATION REPORT

Verification under the Climate Action Reserve (CAR)

Erie County Landfill Project

Project Developer: Element Markets

Contact: John McDougal

<http://www.elementmarkets.com/index.php>

Project ID
CAR 444
Reporting Period
January 1, 2013 to December 31, 2013
Site Visit Date
February 21, 2014
Report Date
March 24, 2014

Prepared By:

Rori Cowan | Program Manager

Greenhouse Gas Verification Division

+1.510.452.8000

rcowan@scsglobalservices.com

SCSglobal
SERVICES

Setting the standard for sustainability™

2000 Powell Street, Ste. 600, Emeryville, CA 94608 USA

+1.510.452.8000 main | +1.510.452.8001 fax

www.SCSglobalServices.com

Table of Contents

Summary	1
Introduction	2
Verification Details	2
Verification Objectives.....	2
Verification Scope and Criteria	2
Level of Assurance	3
Treatment of Materiality	3
Verification Process	3
Verification Summary.....	3
Verification Team	4
CAR Landfill Project Requirements	4
Project Description	5
Project Eligibility	5
Location	5
The GHG Assessment Boundary	7
Review of Project GHG Management Systems.....	8
Quantitative Review of Carbon Reductions and Removals.....	10
Verification Results.....	12
Recommendation	13
Appendix I	14

Summary

This report presents the findings of the verification assessment of the Erie County Landfill Project (“the Project”) developed by Element Markets and the Erie County Landfill (“the Project Proponent”). This assessment covers the Erie County Landfill Project’s greenhouse gas emission reductions reported to the Climate Action Reserve (the Reserve or CAR) for the verification period January 1, 2013 through December 31, 2013. The verification was undertaken to evaluate the Project Design Document and assess whether the compiled data conforms to the Climate Action Reserve Landfill Project Protocol, Version 3.0, dated December 2, 2009.

The evaluation was undertaken using the Climate Action Reserve Landfill Project Protocol, 3.0, dated December 2009 as well as the verification methodology developed by SCS for carbon offset projects submitted to the Reserve.

In the course of the verification assessment, the SCS verifiers developed findings which included New Information Requests (NIRs), Non-Conformity Reports (NCRs) and Opportunities for Improvement (OFIs). All New Information Requests and Non-Conformity Reports have been adequately responded to, resulting in their closure.

On the basis of the information provided and the analyses completed, SCS was able to reach a decision on the emissions reduction reported by the Project Proponent to the Climate Action Reserve. SCS verified the adequacy of the information provided in the Project Design Document (“the PDD”), confirming that this document meets the requirements of the Climate Action Reserve standards. Further, SCS was able to reach a positive opinion on the claimed emission reductions and removals presented in the Project Design Document and on the Reserve website by Element Markets. Thus, SCS has verified 47,094 metric tonnes of CO₂e reductions and removals from the Erie County Landfill Project for the reporting period of January 1, 2013 through December 31, 2013.

Introduction

SCS Global Services (SCS), formerly Scientific Certification Systems, is a global leader in third-party certification, auditing, testing services, and standards. Established as an independent third-party certification firm in 1984, our goal is to recognize the highest levels of performance in environmental protection and social responsibility in the private and public sectors, and to stimulate continuous improvement in sustainable development. SCS is currently accredited to ISO 14065 for GHG Validation and Verification by the American National Standards Institute (ANSI) and offers verification under the Verified Carbon Standard (VCS) and the Climate Action Reserve (CAR). SCS also offers verification services for the American Carbon Registry (ACR) and the Climate, Community and Biodiversity (CCB) standards.

SCS was commissioned by Element Markets to undertake the sixth annual project verification of the Erie County Landfill Project (CAR 444). The project consists of the collection of landfill gas (LFG) from the Erie County Landfill in Milan, OH, and subsequent destruction through combustion in a lean burn engine for electricity generation. This report covers the verification period of January 1, 2013 through December 31, 2013 as a project deliverable into the Climate Action Reserve.

Verification Details

Verification Objectives

The objective of the verification is to:

- Evaluate conformance with the Landfill project as defined in the criteria stated below.
- Determine with a reasonable level of assurance whether the Project has resulted in the GHG emissions reductions and/or removals as stated in the project documents.
- Evaluate the project planning information and documentation including the determination of project eligibility, project design, baseline and project emissions determination, management systems supporting the project, and methodologies employed for the calculation of GHG emission reductions.

Verification Scope and Criteria

The scope of the verification is defined as an independent and objective review of the project description document, the project's baseline study, monitoring plan and emissions reductions calculations. The information in these documents is reviewed against the following criteria:

- CAR Landfill Project Protocol Version 3.0, December 2009
- Errata and Clarification LPP Version 3.0, January 21, 2014
- CAR Verification Program Manual, December 20, 2010
- CAR Program Manual, October 26, 2011
- All Verification activities carried out by SCS will follow the requirements of ISO 14064-3 (Specification with guidance for the validation and verification of GHG assertions)

Level of Assurance

The level of assurance applied to this verification assessment is Reasonable Assurance as required by the Climate Action Reserve.

Treatment of Materiality

In consideration of the required level of assurance, the needs of the intended user and the requirements of the Climate Action Reserve Program, SCS applied a materiality threshold of **3%**. The data reviewed was considered to meet the principles of accuracy, completeness, transparency and is free of material error or omission.

Verification Process

Verification Summary

The verification process consisted of the following:

- 1. Project listed with the Climate Action Reserve:**
The Erie County Landfill Project is listed on the Climate Action Reserve (CAR) website. Element Markets selected SCS as their verification body.
- 2. Conflict of Interest Review.**
A Notification of Verification Activities/ Conflict of Interest (NOVA/COI) form was submitted to CAR. The COI assessment was conducted to identify any potential conflicts interests with the verification/project. No conflicts were identified and a determination of low potential for conflict of interest was received from the Climate Action Reserve prior to the commencement of verification activities in a determination letter dated January 9, 2014.
- 3. Introductory Meeting:**
A kickoff meeting was conducted between the verification team, Element Markets, Renewable Energy Services of Ohio, LLC (RESO), and Erie County Landfill (ECL) personnel on January 27, 2014. The purpose of the kickoff meeting was to review the timeline of audit; confirm verification criteria; determine any changes in the site, sources, GHG management systems or personnel, and to begin gathering information.
- 4. Desk Review**
SCS received and reviewed the Project Design Document, CAR submittals, and supporting documentation to assess initial conformance with the data requirements of the CAR Landfill Project Protocol. A risk assessment was conducted to identify key factors that impact the reported emission reductions and removals. A Verification Plan was created to focus on the critical elements presenting potential risk for errors with the project. The Audit/Verification Plan can be found in Appendix I.
- 5. Site Visit**
Following the desk review, the audit team conducted an on-site audit of the project area on February 21, 2014. The purpose of the site visit is to verify the project equipment, location and eligibility, to review and evaluate the project GHG management systems, data collection and

handling, and emission reduction calculations and procedures in place, and to finalize the risk assessment and sampling plan.

6. Quantitative Review

An assessment of the emission reduction calculation inputs and procedures was performed to review the quantitative analyses undertaken by the Project Proponent to convert the raw inventory data into emission reduction estimates.

7. Findings

Throughout the verification, there is an iterative exchange between SCS and the Project Proponent to gather additional information for review and examination. This exchange includes Findings—New Information Requests (NIR), Non-Conformity Reports (NCR) and Opportunities for Improvement (OFI)—that are issued by SCS to the Project Proponent. The Project Proponent must respond to NIRs and NCRs in order for SCS to render a verification opinion. At this time, all Findings have been appropriately addressed by Client Name and subsequently closed by SCS.

8. Draft Report and Statement

This step in the verification process includes a final review of the submitted data, completion of the Verification Report, and drafting of the Verification Statement. A draft Verification Report and Statement are completed based on the results of the verification assessment.

9. Technical Review

The draft report was presented to an SCS lead verifier, independent of the verification, who determined the Verification Statement to be justified given the evidence presented. The Verification Report and Verification Statement were then presented to Element Markets, RESO & ECL for review and comment.

10. Final Report and Statement

Once the client approved these documents, SCS uploaded them to the Reserve website for administrative review by CAR. Given a positive review, CAR will register the emissions reductions for the landfill gas project and issue carbon tonnes for a reporting period of January 1, 2013 through December 31, 2013.

11. Exit meeting with client:

The exit meeting entails a review of the verification process, summary of the verification findings and to initiate scheduling for the next verification period.

Verification Team

The verification was undertaken by Rori Cowan, Lead Verifier and the Technical Review was performed by Mark Lutz, Contract Lead Verifier of SCS.

CAR Landfill Project Requirements

SCS verified the Erie County Landfill Project against the requirements of the Climate Action Reserve Landfill Project Protocols. The following sections detail the most essential aspects of the verification of the Project.

Project Description

The landfill facility operates under a solid waste disposal permit from the Ohio Environmental Protection Agency, Core ID: 13359. The site includes a permitted disposal area of 60.63 acres on a parcel of 116 acres of property. The total permitted airspace for waste disposal is 5.23 million cubic yards and consists of eight contiguous landfill cells. The site is currently receiving an average of about 100,000 tons of waste per year.

Leachate is directed to two-15,000 gal storage tanks and from there the leachate is pumped via force main to the sewer system, which was extended to the landfill during 2011. Currently, the leachate is conveyed to the Plum Brook Lift Station where it is diverted to the City of Sandusky POTW, Sandusky, OH, or to the Sawmill Creek POTW, Huron, OH for treatment. The Erie County Landfill is approved to recirculate leachate, however it was confirmed during the site visit that the landfill is not a bioreactor.

On June 9, 2008, the Landfill began operation of a voluntary active landfill gas collection and control system to facilitate the destruction of methane, a Greenhouse Gas (GHG) contained in the landfill gas, by combustion at a flare. In April 2010, a G3520C Caterpillar Engine with a Caterpillar SR4B Generator was installed at the site to generate electricity for delivery into the local power grid. The generator effectively took the place of the flare as the new destruction device.

Project Eligibility

There are three eligibility rules the Project must meet in order to register reductions with the Climate Action Reserve.

Location

The project is a U.S. based landfill located in the town of 10102 Hoover Rd., Milan, OH 44846, Erie County, Ohio, USA and therefore meets this eligibility requirement.

Project Start Date

As stated in the Landfill Gas Reporting Protocol, pre-existing projects must have a start date on or after January 1, 2001 and must be listed with the Reserve twelve months from the effective date of the protocol (Landfill Project Protocol, Version 3.0, December 2009). The start date is defined as the date at which a qualifying destruction device becomes operational

Element Markets listed the Project on the Climate Action Reserve website on April 30, 2009. The Project's listing indicated the Project Proponent began installation of the landfill gas collection and conveyance system (GCCS) in 2007 and began flaring gas on June 9, 2008. Element Markets provided various documents to support the evidence of construction of the landfill gas project such as the Flare Commissioning Report provided by Shaw LFG Specialties, LLC. dated June 28, 2008. The project start date was previously verified by SCS during the previous reporting period. Review of these documents confirmed the project start date of June 9, 2008 and the project is within its ten year crediting period.

Additionality

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

Performance Standard

For the Performance Standard test, a project developer may meet eligibility under three possible performance threshold scenarios. Scenario 2, as noted below, applies to the Erie County Landfill Project.

Scenario2: Installation of a new qualifying destruction device at an eligible landfill where landfill gas is currently collected and vented, but has never been destroyed in any manner prior to the project start date.

The Landfill had passively vented LFG beginning in 2004, but no destruction device was utilized until the project start date, with the exception of two short pump tests using rental flares, which were conducted to determine the capability of the well field. The pump tests were conducted February 4, 2004 through February 27, 2004 and October 25, 2007 through December 11, 2007.

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

Legal Requirements

For the Legal Requirements Test, Project Proponents must ensure that emission reductions achieved by the Project would not have occurred in the baseline case due to federal, state, or local regulations.

There are no laws, statutes, regulations, court orders, environmental mitigation agreements, permitting conditions, or other legally binding mandates requiring the destruction of landfill gas, which was confirmed during the site visit through interviews and a review of the current NPDES permit, issued on June 4, 2013 and the Title V permits for both ECL and RESO, issued December 9, 2013 and April 15, 2011, respectively. During the site visit, it was confirmed that ECL personnel are in charge of monitoring any changes to state and local regulations and are aware that any changes to laws and/or regulations should be communicated immediately to Element Markets.

In addition, the Landfill has conducted a non-methane organic compound (NMOC) Threshold review. The Erie County Landfill is not subject to NSPS regulation requiring the facility to conduct Non-Methane Organic Compound (NMOC) emission rate testing. The most recent Tier 2 NMOC Emission Rate Report for the Landfill was conducted in June of 2013 which revised the previous estimates. For 2013, the Tier 2 test resulted in a predicted NMOC level of 4.02 Mg/yr and a projected NMOC level of 4.20 Mg/yr in 2014. This is well below the 50 Mg/yr threshold and therefore the landfill is not required to install a gas collection and conveyance system during the reporting period. The next Tier II test is scheduled for 2018 and at that time, the NMOC threshold will be reviewed again to determine if a gas collection and conveyance system is required, however the landfill expects that it will not reach or exceed the NMOC threshold limit of 50 Mg/yr for another 20 years.

Lastly, SCS reviewed the Attestation of Voluntary Implementation, signed on February 20, 2014 by an eligible signatory to attest for the Project. Element Markets has affirmed that the Project was established and implemented voluntarily and continues to operate as such. Based on this evidence, SCS concludes the Project passes the legal requirements test.

Regulatory Compliance

SCS reviewed the Attestation of Regulatory Compliance submitted by Element Markets dated February 20, 2014 affirming the Project's compliance status throughout the project reporting period. During the site reconnaissance and desk review activities, SCS was able to confirm to a reasonable level of assurance that the Project was in compliance with local, state and Federal regulations and had no material regulatory non-conformance events. SCS reviewed the EPA's Enforcement and Compliance History Online database and the Title V permits for the reporting period. There was 1 minor violation noted throughout the reporting period pertaining to visible emissions from the Landfill's paved roads caused by speeding dump trucks. The violation has been addressed and resolved by the Landfill and in no way impacted the emission reductions generated by the Project. The audit team's review indicates that the Landfill has otherwise been in compliance with all applicable requirements of their permit. During the site visit, SCS interviewed Robert Sennish, the County's landfill coordinator, regarding regulatory compliance for the destruction devices operated by the Erie County Landfill and found only the aforementioned instances of noncompliance.

Ownership

Erie County Landfill (ECL) is the owner of the Landfill; Renewable Energy Services of Ohio (RESO) maintains the beneficial use project per an agreement between ECL and RESO; and Element Markets has an agreement with RESO for the rights to the carbon credits. Ownership was confirmed through a review of regulatory permits issued from the Ohio EPA, as well as a review of the agreements between ECL, RESO and ECL. Though the landfills and gas collection wells are owned and operated by ECL, the gas collection plant and associated destruction devices are owned and operated by RESO. SCS confirmed that Element Markets retains full, legal, and beneficial title to the carbon offset credits being issued as a result of the collection and combustion of methane at the landfill facility. Lastly, SCS reviewed the Attestation of Title signed by the Senior Vice President of Element Markets, dated February 20, 2014 concerning ownership of landfill gas emission reduction credits for the reporting period. This document asserts that the project applicant has legal rights to any emission reduction credits to be issued by the Climate Action Reserve. From this evidence, SCS has concluded that the project developer, Element Markets, is entitled to receive the emission reduction credits that may be issued by the Climate Action Reserve for methane destroyed during this project period.

The GHG Assessment Boundary

The Project includes all emission sources from the operation of the landfill gas collection system to the ultimate destruction of the landfill gas. The sources of GHG emissions reviewed include:

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

- CH₄ vented to the atmosphere.
- CO₂ from the oxidation of CH₄ by soil bacteria. As the landfills are not covered with a synthetic liner, the CAR Landfill Project Reporting Protocol assumption that 10 percent of the methane produced would be naturally oxidized by soil bacteria has been applied.

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

- Un-combusted CH₄ from Landfill gas in the internal combustion engines.
- CO₂ from the combustion of fossil fuels used during operation and maintenance activities for the project activity.

The gases reviewed include CO₂ and CH₄. All gases are converted to CO₂ equivalents.

Review of Project GHG Management Systems

During the site visit, a review of the Project's greenhouse gas management systems was detailed with the Project Proponent. This review included a detailed look at the Project's data handling and processing procedures, recordkeeping and data storage, and the quality control and assurance procedures. The following is the result of this review:

It should be noted that during this reporting period, the flare originally installed at the Landfill has been decommissioned and was not in use for any part of 2013.

The primary data gathered for the Project is landfill gas flow, pressure, temperature and methane content of the landfill gas. A Sage Thermal Mass Flow Meter, Model # SRP-05-18-AC115-LFG continuously monitors flow after the blower and a knockout prior to combustion in to the generator. The position of the flow meter is adequate to ensure laminar flow. This meter was factory calibrated prior to installation on May 26, 2010 with the standard condition set to 60 degrees and 1 atmosphere.

Per the manufacturer's specifications, the meter can be calibrated by a zero calibration self-check that is performed by onsite personnel on a quarterly basis at a minimum. During the desk review, it was confirmed by reviewing the Sensor Functionality and Zero Calibration Self Check Procedures that the field inspections were sufficient to meet the quarterly field check requirements of Section 6.2. Additionally, the flow meter is not required to be sent to the manufacturer for calibration so long as ECL and RESO personnel follow the Zero Calibration Self Check Procedures. The Project does have the flow meter serviced by a certified third-party annually, fulfilling the calibration requirements of section 6.2 of the Protocol. The field inspection/calibration results for the reporting period were reviewed for this verification period and indicate the instrument is reporting accurate data (see Table 1).

ECL personnel cleaned and inspected the flow meter on a quarterly basis at a minimum and the final field check was conducted by Southwest Controls, a third-party technician. Both ECL and Southwest Controls documented the as found/as left conditions. Element Markets provided a copy of the field check logs, which were also reviewed and found to be in conformance with Section 6.2.

Inspection Date	Performed By	Meter (mW)	Baseline (mW)	% Drift
1/29/2013	ECL	83	80	3.8
3/4/2013	ECL	82	80	2.5
4/4/2013	ECL	82	80	2.5
5/3/2013	ECL	81	80	1.3
6/7/2013	ECL	82	80	2.5
7/1/2013	ECL	81	80	1.3
8/7/2013	ECL	81	80	1.3
9/6/2013	ECL	81	80	1.3
10/9/2013	ECL	83	80	3.8
11/7/2013	ECL	83	80	3.8
12/19/2013	Southwest Controls	81	80	1

Table 1. Flow Meter Field Calibration Check Results

The Landfill utilizes an ABB Eazyline continuous gas analyzer, Model # EL3040. Methane content is recorded every one (1) minute for the ECL project. Due to file size considerations, raw gas analyzer data recorded during the 1 minute interval period has been aggregated every eight minutes, extracting maximum, minimum and average values within eight minute intervals.

The ABB analyzer was installed on July 15, 2010 and was factory calibrated prior to installation. The manufacturer does not require or suggest a factory calibration frequency, so Element Markets uses the recommended calibration frequency required by the Landfill Project Protocol of every 5 years. This indicates that the analyzer is well within the calibration requirements. The gas analyzer was field inspected and cleaned monthly or bi-monthly with the as found/as left conditions documented and Southwest Controls performed the final field inspection of the reporting period, meeting the calibration requirements of Section 6.2. The field inspection results can be found in Table 2.

Inspection Date	Performed By	Meter (%)	Ideal (%)	% Drift
1/29/2013	ECL	50.1	50	0.2
3/4/2013	ECL	49.9	50	-0.2
4/4/2013	ECL	49.5	50	-1.0
5/3/2013	ECL	50.8	50	1.6
6/3/2013	ECL	50.0	50	0.0
6/7/2013	ECL	49.8	50	-0.4
6/14/2013	ECL	49.7	50	-0.6
6/27/2013	ECL	49.0	49	0.0
7/1/2013	ECL	48.8	49	-0.4
7/5/2013	ECL	48.7	50	-2.6
7/22/2013	ECL	49.9	50	-0.2
8/7/2013	ECL	48.2	50	-3.6
8/27/2013	ECL	50.3	50	0.6
9/6/2013	ECL	49.9	50	-0.2
9/24/2013	ECL	50.3	50	0.6
9/30/2013	ECL	49.7	50	-0.6
10/9/2013	ECL	49.3	50	-1.4
10/30/2013	ECL	51.0	50	2.0
11/7/2013	ECL	49.9	50	-0.2
12/19/2013	Southwest Controls	48.0	50	-4.0

Table 2. Gas Analyzer Field Calibration Check Results

**The metered value has been rounded up in this instance. The percent drift was verified by the audit team and has been correctly applied.*

The generator is expected to run 24/7, but from time to time during the reporting period, the generator system does shut down. The generator is not subject to the 500 degree F threshold the flare is, however all data points have been deleted where kW output is equal to zero in the emission reduction calculations, which was verified during the desk review. This ensures that all landfill gas destruction data used in the emission reduction calculations account for LFG flow that is properly destroyed by the generator and that the Project's emissions do not exceed the baseline emissions when the generator is not running.

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

A project design document (PDD) has been created for the Project. The contents of the PDD were thoroughly reviewed and observed to meet the requirements of the Landfill Gas Project Protocol. The monitoring plan records are kept for a minimum of ten years when the information is first generated or seven years after the last verification as stated in the current version of the project's PDD.

Quantitative Review of Carbon Reductions and Removals

SCS devoted a portion of the verification assessment to the review of the manner and propriety by which Element Markets quantified their net GHG reductions and removals. This assessment included a review of the baseline determination, review of project assumptions, raw data inputs and accuracy of calculations. The formulas and raw data inputs used to determine emission reduction calculations as described in the Project Design Document and the calculation spreadsheets were first reviewed for compliance with the Landfill Project Reporting Protocol. The main parameters in the Landfill Project Protocol equations were verified as follows:

Total Annual Methane Emissions Destroyed By The Project Landfill Gas Collection And Destruction System ($CH_4 Dest_{PR}$)

EXAMPLE: The amount of methane destroyed is calculated from the continuously metered landfill gas data (i.e. gas flow and methane concentration as per equation 5.4). During the reporting period gas flow, methane concentration and temperature data was electronically aggregated every 8 minutes and then totalized on a daily basis for the purpose of the calculations of emissions reductions. The main monitored parameters needed to calculate the amount of methane destroyed are:

$LFG_{i,t}$	= total quantity of landfill gas fed to the destruction device and
$PR_{CH_4 i,t}$	= the average methane fraction of the landfill gas in time interval t as measured

Daily flow is calculated by summing the flow to the generator for each interval period to produce a daily total. The incremental methane destroyed flow is calculated based on average methane concentration by the daily total of landfill gas with temperature and pressure taken into consideration. Total daily destroyed methane is carried forward into further calculations for the generator to determine emission reductions for the project.

Adjustment For Landfill Gas Flow Metering Equipment For Temperature And Pressure

The project flow meter automatically corrects for the temperature and pressure of the landfill gas to 60 degrees and 1 atmosphere. No additional calculations are completed to correct for temperature and pressure.

Default Methane Destruction Efficiency For Device (De_i)

The value applied was 0.936 for the lean burn engine, as prescribed by the protocol. The flare was not in use for during this reporting period.

Factor For The Oxidation Of Methane By Soil Bacteria (OX)

The project does not incorporate a synthetic liner in its cover system; therefore a 10% methane soil oxidation factor was applied to the baseline scenario.

Discount Factor to Account For Uncertainties Associated With the Project Monitoring Equipment (DF)

As per the methodology, DF equals to zero if using continuous methane monitor with no missing data and all calibration tests are within a 5% margin of error. It was verified that measurement readings are continuous and that calibration certificates indicated that instruments were within the thresholds for permissible error (see section above: Review of Project GHG Management Systems).

Adjustment to Account for Pre-Project LFG Destruction Device (PRE_{discount})

An adjustment to the project baseline was not necessary because no pre-project destruction device existed prior to the project start date.

Total Annual Indirect Carbon Dioxide Emissions from the Consumption of Electricity from the Grid (EL_{CO2}) and Total Annual Carbon Dioxide Emissions from the Destruction of Fossil Fuel (FF_{CO2})

No CO₂ emissions resulted from consumption of electricity to power project equipment and activity data due to the fact that the all buildings and equipment associated with the project are powered by the electricity generated by the project itself. Direct CO₂ emissions result from natural gas combusted by the lean burn engine. This activity data is taken from invoices from Columbia Gas of Ohio, the local municipality. The emission factor and associated calculations for natural gas were verified and no material errors were found.

Project emissions consist of direct emissions from natural gas use are subtracted from the total amount of methane destroyed. The values are presented in the final Calculation Spreadsheets for the verification period.

Missing Data/Data Substitution Procedures

No missing data calculation procedures were applied during this reporting period.

Verification Results

The verification of the Erie County Landfill Project focused on the accurate collection of data and quantification of emission reductions as implemented by the Erie County Landfill in accordance with the Landfill Project Protocol. A sample set of raw flow data (consisting of landfill gas flow, and temperature) and methane concentration was selected and reviewed in order to identify material misstatements due to transcription mistakes, mathematical errors or malfunction of instruments. The emission reduction calculations were recalculated by the audit team and found to be conformance with the Landfill Project Protocol.

The following provides a summary of the verification results (all emissions listed are in metric tonnes CO₂e):

Emissions Verified	2013 CRTs
Baseline Emissions	47,105
Project Emissions	11
Total Emissions Reductions	47,094

Throughout the verification process, SCS made several supplemental documentation requests in the form of New Information requests, Non Conformances and Opportunities for Improvements. These requests provided clarification regarding the project. The Findings from the verification of the Project Name are compiled in a separate “List of Findings” and are available under separate cover. The List of Findings is only shared between the Project Proponent and verifier and is not publicly available.

During this verification, non-conformity reports were issued; new information requests and opportunities for improvement were identified. All non-conformity reports and new information requests were adequately addressed in order to satisfy the standard and issue a positive verification opinion.

Recommendation

The Lead Verifier recommends that SCS Global Services issue a verification opinion for the following:

Name & Address	Element Markets 3555 Timmons Lane, Suite 900, Houston, TX 77027
Scope of Verification	Emission Reductions resulting from the capture and destruction of landfill gas methane via combustion in a lean burn engine for electricity generation. Gases reviewed include CO ₂ and CH ₄ . All gases should be converted to CO ₂ equivalents.
Reporting Period	January 1, 2013 to December 31, 2013
Total GHG Emission Reductions Verified	47,094 metric tonnes CO ₂ e
GHG Protocol(s) Used for Verification	CAR Landfill Project Protocol Version 3.0, December 2009 Errata and Clarification LPP Version 3.0, January 21, 2014 CAR Verification Program Manual, December 20, 2010 CAR Program Manual, October 2011 All Verification activities carried out by SCS will follow the requirements of ISO 14064-3 (Specification with guidance for the validation and verification of GHG assertions)
Lead Verifier's Approval	 Rori Cowan, March 24, 2014
Technical Reviewer's Approval	Mark Lutz, -----
Date of Verification	The Verification Statement is to be dated when the technical reviewer accepts the recommendation to issue the statement.

Appendix I

Verification Audit Agenda

Erie County Landfill Erie County Landfill Project

Time	Process, Department or Function	Comments
February 21, 2014		
9:00 am	Opening Meeting (To be held at the offices of the Landfill in Milan, OH)	
9:05 am	Introductions ▪ Presentation of SCS Global Services (the company and the audit team) ▪ Discussion of ISO Accreditation ▪ Brief explanation of the verification procedure and process ▪ Presentation of project by client personnel ▪ Review and finalize the audit itinerary	
9:15 am	Site Inspection Inspection to include but not limited to the following: ▪ Safety Briefing ▪ Field review of physical delineation of the project boundary ▪ Cross check of equipment described in the Project design documents ▪ Interviews with landfill employees and project developer's staff ▪ Visual inspection and confirmation of how the monitoring plan and practices have been implemented ▪ Monitoring report discussions	Please provide a layout of the site indicating the location of project activity equipment and meters in order to facilitate audit inspection. Please ensure that all staff, employees, and operators related to the CAR project activity are available on site.
10:00 am	Review Project Eligibility ▪ Eligibility Review ▪ Regulatory review ▪ Project Compliance Review and procedures for ongoing compliance	Please confirm if the company can provide an office or meeting room where the auditor(s) can review the documentation

10:30 am	GHG Management Systems & Document Review - Data gathering, handling, and management procedures - Staff training and competencies - Project Quality Control and Quality assurance procedures - Cross check monitoring plan/report and data to other sources (i.e. log books, inventories, purchase records, calibration certificates, OEM documents, etc...)	Please refer to Appendix I of this audit plan in order to have all documents requested available for review.
11:00 am	Inventory Verification Review emission reduction spreadsheets including review of calculations and assumptions made in determining the GHG data and assertions. Begin sampling of data.	
11:30 am	Auditor Internal Review The audit team will review notes and questions internally	
12:00 pm	Closing Meeting Wrap-up and summary, including presentation of preliminary findings	SCS Team and Project Personnel
12:30 pm	Adjourn	

Notes to Client:

- Times are approximate and will be confirmed at the opening meeting prior to commencement of the audit. SCS auditors reserve the right to change or add to the elements listed before or during the audit depending on the results of the on-site investigation
- A private place for preparation, review and conferencing is requested for the auditor's use
- Please provide a light working lunch on-site during the site visit
- Your contract and Verification Plan with SCS is an integral part of this audit plan and details confidentiality arrangements, verification objectives, criteria and scope, information on follow up activities and any special reporting requirements in addition to the complaints and appeals process

Verification Audit Scope

Scope of Services	Erie County Landfill Project
Geographical Boundary	10102 Hoover Rd., Milan, OH 44846, Erie County, Ohio, USA
Physical Boundary	The project involves the capture and destruction of landfill gas through a generator.
Reporting Period	January 1, 2013 to December 31, 2013
GHG Included in Review	mission Reductions resulting from the capture and destruction of landfill gas methane via an engine generating electricity. Gases reviewed include CO ₂ and CH ₄ . All gases should be converted to CO ₂ equivalents.
Sources of GHG Emissions	The GHG sources, sinks, and reservoirs associated with the baseline scenario are: ▪ CH₄ vented to the atmosphere. ▪ CO₂ from the oxidation of CH₄ by soil bacteria. As the landfill is not covered with a synthetic liner, the CAR Landfill Project Reporting Protocol 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 are: ▪ Un-combusted CH₄ from Landfill gas in the flare. ▪ CO₂ from the combustion of fossil fuels used during operation and maintenance activities for the project activity.
Audit Objective	To confirm that the management system has been established and implemented in accordance with the requirements of the audit criteria. To verify the accuracy of the estimation of the emission reductions claimed for the selected period.
Verification Criteria	CAR Landfill Project Reporting Protocol 3.0, December 2009 Errata and Clarification LPP Version 3.0, January 21, 2014 CAR Program Manual (October 2011) CAR Verification Program Manual (December 2010) Principles of ISO 14064-2:2006 Greenhouse Gases – Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emissions reductions or removals.
Level of Assurance	SCS will perform the core verification activities to a Reasonable Level of assurance as required by the Climate Action Reserve for each project. Reasonable assurance allows SCS the ability to “verify without qualification” and attest to the accuracy of the number of CRTs being issued to each project.

Materiality	SCS will apply a materiality threshold of 3%; meaning, the reported emissions submitted to the Reserve must be free of material misstatements, achieving a level of at least 97% accuracy for each project based on the number of tonnes claimed at the time of verification.
Audit Team	Lead Verifier: Rori Cowan, Qualified CAR Landfill Lead Verifier Technical Review: Mark Lutz, Qualified CAR Landfill Lead Verifier