
Verification Report for CommonWealth Bethlehem Energy, LLC North Country LFG Utilization Project Bethlehem, New Hampshire

American Carbon Registry

March 2011

Prepared by: First Environment, Inc.
91 Fulton Street
Boonton, New Jersey 07005



TABLE OF CONTENTS

1.	Introduction	1
2.	Objectives	1
3.	Verification Scope	1
4.	Standards Used to Verify Emissions (Criteria)	1
5.	Overview of the Verification Process	1
5.1	Conflict of Interest Review	2
5.2	Audit Team	2
5.3	Audit Kick Off	2
5.4	Development of Verification plan	2
5.5	Site Visit	3
5.6	Emissions Reduction Data and Calculation Assessment	3
5.7	Corrective Actions and Supplemental Information	3
5.8	Verification Reporting	3
6.	Project Conformance with Verification Criteria	3
6.1	Project Description	3
6.2	Eligibility	4
6.3	Data Collection and Monitoring Processes	5
6.4	Emissions Reduction Calculation Assessment	6
7.	Audit Results	7
8.	Verification Conclusion	7
9.	Lead Verifier Signature	8
10.	Independent Internal Review Signature	8

1. Introduction

This report is provided to Commonwealth Bethlehem Energy LLC (CBE), a wholly owned subsidiary of Commonwealth Resource Management Corporation (CRMC), as a deliverable of the American Carbon Registry (ACR) project verification process. This report covers the verification greenhouse gas (GHG) emission reductions at the North Country LFG Utilization Project (the Project) for the period of July 1 through December 31, 2010. First Environment, Inc. (First Environment) performed the verification from January through March 2011.

2. Objectives

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

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

3. Verification Scope

The scope of the verification is outlined in the table below:

Geographic Boundaries	North Country Environmental Systems Landfill, Bethlehem, NH, USA
Greenhouse Gases Verified	Emissions Offsets (expressed in units of Carbon Dioxide equivalents (CO ₂ -e)) resulting from the capture and destruction of methane
Reporting Years	July 1, 2010 through December 31, 2010
Data Sources	Metered Data and Emissions Offset Calculations

4. Standards Used to Verify Emissions (Criteria)

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

Verification Process	The American Carbon Registry Verification Guideline, Version 1.0, July 2010
Standard of Verification	Monitoring, Reporting and Verification Protocol (MRV CBE 2005 15), May 2009 and The American Carbon Registry Standard (ACR Standard), Version 2.1, October 2010
Level of Assurance	Reasonable assurance
Materiality	Misstatements greater than five percent of the GHG assertion are considered material; Qualitative non-conformities with the verification criteria are also considered material

5. Overview of the Verification Process

The verification process for the Project was as follows:

- conflict of interest review;
- selection of Audit Team;
- kick-off meeting with CBE representatives to discuss objectives, scope, criteria, and timeframes;
- development of verification and sampling plan;
- review and evaluation of raw data, calculations, and supporting documentation for the period under review;
- follow-up discussions with site staff to fill in data gaps, if any;
- completion of data verification; and
- reporting and statement.

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

5.1 Conflict of Interest Review

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

5.2 Audit Team

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

Lead Verifier – Iris Caldwell
Verifiers – Heather Moore, Natali Ganfer, Jeff Daley
Internal Reviewer – James Wintergreen

5.3 Audit Kick Off

The verification audit was initiated with a kick-off conference call on January 21, 2011 between First Environment and the primary CBE contact, Thomas Yeransian. The communication focused on confirming the verification scope, objectives, criteria, schedule, and the data required for the verification.

5.4 Development of Verification plan

The team formally documented its verification plan as well as determined the data-sampling plan. The verification plan was developed based on discussion of key elements of the verification process during the kick-off meeting and review of the MRV CBE 2005 15. CBE was afforded the opportunity to comment on key elements of the plan for verification. Based on items discussed and agreed upon with CBE, the plan identified the First Environment team members, project level of assurance, materiality threshold, and standards of evaluation and reporting for the verification. It also provided an outline of the verification process, established

project deliverables, and presented a data-sampling plan designed to review all project elements in areas of potentially high risk of inaccuracy or non-conformance.

5.5 Site Visit

First Environment performed a site visit on May 5, 2010 as part of the previous verification process. The site visit included review of site operations, data collection processes, and information management systems, as well as interviews with key project personnel. CBE stated during the kick-off meeting that only one of the two flares has been operational for this crediting period (the open flare) and that no other operational or data management changes had occurred since the last verification site visit; therefore, a repeat site visit for this reporting period was deemed unnecessary.

5.6 Emissions Reduction Data and Calculation Assessment

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

5.7 Corrective Actions and Supplemental Information

The Audit Team issued requests for clarification and corrective action during the verification process, as discussed in further detail in Section 7. Through communications with the Audit Team, CBE was able to adequately resolve all requests.

5.8 Verification Reporting

Verification reporting, represented by this report, documents the verification process and identifies its finding and results. Verification reporting consists of this report for CBE and a separate verification statement.

6. Project Conformance with Verification Criteria

6.1 Project Description

The North Country Environmental Systems Landfill (the Landfill) contains a network of vertical and horizontal wells, laterals, and header pipes to actively extract landfill gas (LFG). The original LFG collection system was installed in 1998 and has since been expanded multiple times with the addition of a leachate evaporation facility and condensate evaporation system. Per the MRV CBE 2005 15, the Project is defined as the capture and destruction of LFG from the original active collection system and all subsequent expansions.

The Project includes two flares – an enclosed flare that was used to generate the heat energy for the leachate and condensate evaporation system and an open flare used as backup. Although the evaporation system is still in place, the evaporation of leachate and condensate was discontinued in March 2007. Only the open flare was in use during the current reporting period.

The Landfill is owned by North Country Environmental Systems, Inc. (NCES). NCES granted CRMC Bethlehem, LLC the right to extract and utilize the LFG per an agreement dated September 10, 1998. CRMC Bethlehem, LLC subsequently entered into a LFG purchase

agreement with CBE on September 8, 2000 whereby CBE was given the right to claim emission reductions from the destruction of LFG. First Environment reviewed these agreements in order to confirm ownership of offsets associated with the Project.

The Landfill has a design capacity of greater than 2.5 million megagrams. The most recent non-methane organic compound (NMOC) sampling conducted at the Landfill in 2009 indicated a NMOC emission rate less than 50 megagrams per year; therefore, the Landfill is not subject to the New Source Performance Standard (NSPS) requirements to collect and control LFG. First Environment reviewed the latest emission rate report dated June 8, 2010 in order to confirm the Landfill's regulatory status.

The MRV CBE 2005 15 provides additional details regarding the Landfill and the gas collection and control system.

6.2 Eligibility

The ACR Standard outlines specific eligibility criteria that the Project must meet in order to qualify for offsets. The following table lists these requirements and summarizes First Environment's verification conclusions:

<i>Criterion</i>	<i>Project Conformance</i>
Start Date	While the Project's start date is prior to January 1, 2000, this deviation from the ACR Standard was approved by ACR for this reporting period. ¹
Crediting Period	While the Project's current crediting period under the MRV CBE 2005 15 has exceeded seven years, this deviation from the ACR Standard was approved by ACR for this reporting period. ¹
Real	Emission reductions are only claimed for methane destroyed during the reporting period – July 1, 2010 through December 31, 2010 – using actual monitored data, i.e., emission reductions are calculated ex post.
Direct Emissions	CBE owns and operates the gas collection and destruction system, as demonstrated by the air operating permit and other regulatory records.
Offset Title	As described in Section 6.1 above, CBE has title to offsets generated by the Project.
Land Title	CBE does not hold title to the land where the Project is located; however, CBE has clear, unique, and uncontested title to the offsets as noted above.
Additional	First Environment reviewed NMOC emissions testing results, facility inspection reports, permits, and the Landfill's operating plan in order to confirm that the Project exceeds regulatory requirement. ACR approved the use of the MRV CBE 2005 15 as an acceptable performance standard for this reporting period. ¹
Project Baseline Scenario	The baseline emissions are calculated according to the ACR-approved MRV CBE 2005 15.
Permanent	Emission reductions claimed by the Project are permanent and there is no risk of reversal.
Net of Leakage	There are no significant sources of leakage.
Independently Validated and Verified	The MRV CBE 2005 15 was approved by ACR and emission reductions been independently verified by First Environment. ¹
Community and Environmental Impacts	While the MRV CBE 2005 15 does not directly address community and environmental impacts, ACR has approved this deviation from the ACR Standard for this reporting period since CBE has formally attested to these impacts during project registration. ¹

¹ Per email from Lauren Nichols, ACR Technical Manager, to First Environment dated March 17, 2011.

The MRV CBE 2005 15 document outlines additional project-specific requirements that the Project must meet in order to be verified. The following table lists these requirements and summarizes First Environment's verification conclusions:

<i>Criterion</i>	<i>Project Conformance</i>
Project Boundaries	The project boundaries are consistent with those described in the MRV CBE 2005 15.
Additionality & Leakage	First Environment reviewed NMOC emissions testing results, facility inspection reports, permits, and the Landfill's operating plan – all of which indicated that the regulatory additionality arguments presented in the MRV CBE 2005 15 are still valid and the Project is not mandated by local, state, or federal regulations. No significant leakage emissions outside the project boundaries were identified.
Baseline	Consistent with the MRV CBE 2005 15, the baseline scenario is the unmitigated release of all methane.
Monitoring, Data Collection, & Methodology	The monitoring procedures were consistent with the MRV CBE 2005 15, as discussed in greater detail in previous sections of this report.
Quality Control, Reporting, Documentation, & Uncertainties	Quality control, reporting, and documentation procedures followed were consistent with the MRV CBE 2005 15.

6.3 Data Collection and Monitoring Processes

The Audit Team discussed the following topics with project personnel during the site visit on May 5, 2010, performed during the previous verification of the Project, and confirmed the information during the current verification process:

- the data collection process to generate reports, and
- internal documents and protocols that set guidelines for the data collection process.

The information gathered during these discussions was used to assess the Project's management systems and its controls for sources of potential errors and omissions. The primary aspects of the Project's monitoring plan are described below.

The LFG from the header pipes passes through a knock-out tank to remove condensate and then through a blower to the flare. There is a Thermal Instrument Model 62-9 flow meter located after the blower, which continuously measures flow to the open flare. The flow meter corrects to standard conditions of 68°F and one atmosphere of pressure. Flow data is recorded using a Honeywell chart recorder. Circle charts are changed weekly and stored on site. Totalizer readings are also taken approximately weekly and recorded in the well monitoring reports.

The flow meter is field checked for calibration accuracy at least quarterly using a pitot tube. During this reporting period, field checks were performed on July 1, August 19, September 23, October 21, October 28, November 18, and December 23, 2010. The results of the pitot tube

tests indicated the flow meters were operating within plus or minus 5 percent of their readings, except for the field check performed on October 21, which indicated the flow meter was over-reporting by approximately 12 percent. The field technician calibrated the flow meter on October 21 and performed a field check the following week in order to confirm that the flow meter was operating accurately during the reporting period.

Methane content readings are taken approximately weekly using a Landtec GEM-2000 portable gas analyzer. The sample port is located immediately before the blowers. The methane content readings are recorded in the well monitoring reports.

The Landtec GEM-2000 portable gas analyzer is checked against a gas of known concentration prior to each use, as indicated on the Well Balancing Calibration Log. Additionally, the analyzer is factory calibrated semi-annually. The Landtec GEM-2000 analyzer was factory calibrated on July 29 and September 29, 2010. The calibrations indicated the instrument was operating accurately during the reporting period.

Operation of the open flare is monitored by a thermocouple. If the flare temperature drops below 100°F, the blowers automatically shut down and an automatic valve prevents LFG flow from passing through the flow meters.

6.4 Emissions Reduction Calculation Assessment

As part of the emissions reduction calculation assessment, the Project's assumptions and calculations were reviewed. Consistent with the MRV CBE 2005 15, the baseline scenario is defined as the unmitigated release of methane from the Landfill.

Total LFG flow sent to the open flare was determined on a weekly basis by taking the difference between totalizer readings at the beginning and end of the week, as noted in the well monitoring reports. The quantity of flow between September 23 and October 21 was adjusted by 12 percent based on the October 21 field check, which indicated over-reporting. Total methane destroyed by the Project was calculated by multiplying the weekly LFG flow total by the average methane content over the same period. The conversion factors applied in the calculations were consistent with the MRV CBE 2005 15. A 98 percent flare destruction efficiency was applied to total methane destroyed over the reporting period.

The calculations were reviewed to ensure accuracy in the formulas used and the raw data used as inputs. The formulas were tested to ensure they were consistent with the calculation methodology described in the MRV CBE 2005 15. Copies of the raw data were compared with the data used in the final calculations and tested for transcription and mathematical errors. All of the weekly well monitoring reports were reviewed during the raw data assessment. First Environment performed an independent recalculation of the emissions reductions for the entire reporting period. Minor calculation differences were observed, but these had an immaterial impact on the overall emission reduction total. First Environment found the emission reduction calculations to be free of material misstatement.

7. Audit Results

CBE provided good documentation for its emissions estimates as well as its procedures surrounding the data collection process. To complete the verification process, First Environment requested clarification and corrective action. The responses provided by CBE were sufficient to resolve the issues raised by the Audit Team. First Environment's requests and CBE's responses are summarized in the table below:

ID	Clarification (CL)	Participant Response	Verification Conclusion
CL-1	Please clarify what actions were taken as a result of the flow meter accuracy check on October 21, which indicated that the flow meter was over reporting by 12%	The flow meter was field calibrated on October 21 after acknowledging the differences in the readings	Response is acceptable.

ID	Correct Action Request (CAR)	Participant Response	Verification Conclusion
CAR-1	Flow data between September 23 and October 7 have not been corrected based on the results of the October 21 flow meter calibration event.	The flow data between September 23 and September 30 was corrected by 12%. The data between September 30 and October 7 was already corrected consistently with the October 21 flow meter calibration event	Response is acceptable.

The calculations were consistent with the MRV CBE 2005 15 methodology. CBE has adequate management and operational systems in place with respect to monitoring and reporting, as determined through observation during the previous site visit and the desktop review of project documentation from the current reporting period.

Verified results show 69,825 metric tonnes of CO₂ equivalents eligible for registration with the ACR.

8. Verification Conclusion

Based on the assessment performed and the evidence collected, First Environment concludes that the Project's GHG emissions reductions due to the flaring of LFG during the period of July 1 through December 31, 2010, can be considered:

- consistent with the MRV CBE 2005 15 and the ACR Standard;
- without material discrepancy; and
- meeting the minimum level of accuracy of at least 95 percent.

First Environment provides reasonable assurance as to the accuracy of the emissions reduction estimates for this period.

9. Lead Verifier Signature



Iris Caldwell
Engineer II

10. Independent Internal Review Signature



James Wintergreen
Senior Associate

American Carbon Registry Attestation Statement

As an officer of Commonwealth Bethlehem Energy LLC (CBE), I hereby certify that the emissions reductions reported in connection with methane capture and combustion have been calculated according to the methods and procedures as outlined and described in the MRV Protocol and are a true representation of the emission performance of the Project.

Thomas Yeransian
Name

Principal of CRMC, the sole member of CBE
Title


Signature

Date: March 22, 2011