

**Verification Report for the North Country  
Landfill Gas Utilization Project  
Bethlehem, New Hampshire  
Environmental Resources Trust/CCX**

**April 2008**

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



## 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 Chicago Climate Exchange's (CCX) and Environmental Resources Trust, Inc.'s (ERT) project verification processes. This report covers the verification of landfill gas (LFG) destruction emissions reduction estimates for the period from July 1, 2007 through December 31, 2007 for the North Country LFG Utilization Project (the Project). First Environment, Inc. (First Environment) conducted the verification in April of 2008.

## 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 6; 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:

<b>Geographic Boundaries</b>	North Country Environmental Systems Landfill, Bethlehem, NH
<b>Greenhouse Gases Verified</b>	Carbon Dioxide Emissions Offsets resulting from the capture and destruction of methane
<b>Reporting Years</b>	July 1, 2007 through December 31, 2007
<b>Data Sources</b>	Metered Data and Emissions Offset Estimates

## 4. Standards Used to Certify Emissions

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

Verification Process	CCX® Rulebook: Environmental Audits and Offset Project Verification, 2004
Standard of Verification	CCX® Project Guidelines: Landfill Gas Version 1, February 2, 2004 ERT Monitoring, Reporting and Verification Protocol, MRV CBE 2005 12, December 2005
Level of Assurance	95 percent accuracy (i.e., material misstatement is <5 percent of total reported emissions)
De Minimis	Less than 5 percent of total emissions

## 5. Overview of the Verification Process

The verification process for the Project was as follows:

- conflict of interest review,
- selection of audit team,
- initial interaction with the CBE contact,
- development of the verification plan,
- review of the data collection process,
- review of the raw data and calculations for the data period under review
- follow-up interaction with the CBE contact for corrective action or supplemental data as needed, and
- final statement and report development.

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

### ***Conflict of Interest Review***

Prior to beginning any verification project, First Environment conducts an evaluation to identify any potential conflicts of interest associated with the project. No potential conflicts were found for this Project either in the initial verification in 2006 or in this verification.

### ***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. In addition, members of the audit team had specific experience verifying GHG reductions from the Project on four prior occasions.

B. Tod Delaney, Ph.D., P.E., BCEE – Senior Reviewer  
Christina M. Magerkurth, P.E. – Lead Auditor  
Eric Ripley – Auditor

Resumes for the audit team are included in Attachment A.

### ***Audit Kick-off***

The verification audit was initiated with an exchange of emails between First Environment and the primary CRMC contact, Thomas Yeransian. The communication focused on confirming the scope and schedule, confirming that no changes have occurred in operations at the Site since First Environment's initial visit in 2006, and the data required for the verification.

Emissions reduction credits from this Site had previously been verified by First Environment in September 2006 and February, May, and October 2007. The audit team reviewed evidence of the project start date and credit ownership to confirm project eligibility. Additionally, because no changes in operation occurred since the first site visit and the site confirmed that no changes to the process or equipment had occurred, an additional site visit was not conducted.

### ***Development of the Verification Plan***

Based on the information provided in the ERT Monitoring, Reporting, and Verification Protocol for the North Country LFG Utilization Project (Project Protocol), the team formally documented its verification plan as well as determined the data-sampling plan.

### ***Emissions Reduction Data and Calculation Assessment***

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

### ***Corrective Actions and Supplemental Information***

The team was prepared to request corrective actions and supplemental information as needed. A minor corrective action was requested. More detail on the corrective action request is provided in section 7.

### ***Verification Reporting***

Verification reporting, represented by this report and additional audit statements, documents the verification process and identifies its finding and results. Verification reporting consists of this report and a project attestation for Environmental Resources Trust, as well as this report and a verification statement and attestation to be submitted to the Chicago Climate Exchange.

## **6. Site's Conformance with Verification Protocols**

### ***Site Overview***

As outlined in previous reports, the North Country project collects landfill gases that are used to produce heat energy for a leachate and condensate evaporation facility at the Site. The site audit focused on two elements of the landfill gas to energy calculation: landfill gas flow rate and methane gas concentration. The completion of construction and commencement of operation of the leachate evaporation project occurred in 2001 and included an expansion of the original landfill gas collection system installed in 1998. The portion of the project that completed construction in 2001, and expansions thereafter, corresponds to the portion of the landfill gas that will be verified for emissions reduction credits in accordance with the CCX approved methodology discussed below.

There are two flares located at the Site. One is an enclosed flare used to generate the heat energy for the leachate and condensate evaporation system. The second is not enclosed and is used as a backup to the enclosed flare. The landfill gas passes through a knock-out tank to remove the condensate, passes through a blower, and moves to the flares. An Allen Bradley Programmable Logic Controller continuously monitors operations in the flare. A primary flow meter records the landfill gas flow continuously on circle charts that are changed

weekly and stored on the Site. A totalizer is also present and is used to calculate flow quantities on a weekly basis as well. A second back-up flow meter is present at the Site as well. Methane readings are obtained from a sample port near the flow meter and are taken approximately weekly using a Landtec GEM-2000/500 portable meter. The totalizer readings and methane content measurements are recorded and sent to CBE in a monitoring report. This data is then transferred to the final spreadsheet for calculations.

### ***Data Collection and Monitoring Processes***

The audit team discussed the following topics with site staff during the initial site visit and confirmed the information during this verification process:

- The data collection process to generate reports,
- 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 GHG information system and its controls for sources of potential errors, omissions, and misrepresentations.

The data collection process has several checkpoints to ensure accuracy. Operators collect readings at least weekly and verify that readings appear to be normal. In addition, CBE personnel review monitoring reports prior to use in the calculations.

The Site has operational protocols that cover the management of the facility, data collection, and calibration. The flow meter was calibrated at the kick-off of the project in March 2001 and is calibrated quarterly using a pitot tube. During the period covered by this report, the flow meter was calibrated on September 14th, December 11th and December 24th, 2007. The calibration results showed the flow meter was always within five percent of the calibrated quantity so only minor adjustments were made. The GEM-2000/500 is calibrated prior to each use. It is also sent to the manufacturer twice per year to obtain a factory calibration.

### ***Emissions Reduction Calculation Assessment***

As part of the emissions reduction calculation assessment, the Project's assumptions and calculations were reviewed. The additionality arguments presented in the ERT Project Protocol were reviewed and found to be valid based on the information and evidence provided by CBE. The Project meets the eligibility dates set forth in the CCX guidelines. The Project used justifiable assumptions when defining the baseline scenario as the unmitigated release of methane from the landfill according to the Project Protocol and included the pre-2001 system for baseline calculation according to the CCX guidelines (1998 is the baseline year for purposes of the CCX calculations).

The calculations themselves, provided in Attachment B, were tested for accuracy. Copies of the raw data used in the calculations were provided by CBE and compared with the data used in the final calculations. Because of the short timeframe being verified, a sampling approach was not used. The calculations for the entire period were reviewed.

It should be noted that a small number of readings provided by the primary flow meter during the verification timeframe were found by CBE operators to be outside of the "normal" range. This required a correction to the data, and also provided evidence that the internal data checks in place at the site are functioning appropriately. To accomplish the correction, CBE

used data from the backup flow meter to correct the primary flow meter data. This process was conservative as the total flow was lowered by this adjustment, resulting in fewer emissions reductions being claimed. The problem with the primary flow meter was rectified upon determination that the sensor in the meter probe needed replacement. The previously discussed flow meter calibrations occurred after the replacement and provided additional evidence that the meter was working properly.

### **CCX® Project Standards**

The Chicago Climate Exchange provides project guidance for landfill gas offset and early action credit projects. This guidance document, CCX® Project Guidelines: Landfill Gas Version 1, outlines specific requirements that acceptable projects must meet in order to qualify for credits. The following table lists these specific requirements and identifies how this site meets those requirements:

	<b>Guideline Requirement</b>	<b>Site Compliance</b>	<b>Comments</b>
<i>LFG Flow Rate</i>			
	Measurement at control device not individual wells	Yes	--
	Flow meter type and date of installation		The flow is measured using a Thermo Instruments 62-9 model flow meter.
	Flow meter upstream of control device and downstream of blower	Yes	Placement is sufficient to ensure laminar gas flow through the orifice plate.
	Records on flow meter calibration	Yes	The first calibration of the flow meter occurred at Project startup and records are kept on and off-site. The flow meter was calibrated using a pitot tube attached to a manometer that is inserted into the LFG flow near the flow meter. The flow meter was calibrated three times on September 14, 2007, and once each on December 11 and December 24, 2007
	Capable of recording flow every 15 min.	Yes	Flow data is monitored continuously and data is captured on circle charts and monitoring reports produced by the operators.
	Shutdown hours recorded and flow data adjusted	Yes	A log is kept to record shutdowns. The flow totalizer only captures actual flow.
	Monthly tabulations of daily LFG flow rate	Yes	Site equipment continuously records LFG flow, and a weekly report is produced that captures

	Guideline Requirement	Site Compliance	Comments
			the LFG flow for the period.
<i>Methane Concentration</i>			
	LFG Concentration measured	Yes	The methane concentration is measured near the same point as LFG flow, using a GEM-2000/500 gas analyzer.
	Concentration measured on monthly basis	Yes	The LFG concentration of methane is measured approximately weekly.
	Measuring instrument calibrated	Yes	The GEM-2000/500 is calibrated prior to each use and is sent for factory calibration twice per year. No records are available showing the calibrations performed in 1998. However, standard operating procedures as well as an attestation from the operations manager during that period indicate that the calibrations were performed.

#### ***ERT Protocol MRV CBE 2005 14***

The MRV CBE 2005 14 document outlines specific requirements that the project must meet in order to be verified. The following table lists these requirements and identifies how this Site meets them:

Project Boundaries:	The project boundaries are consistent with those described in the MRV protocol.
Additionality & Leakage:	The emission reductions were verified to be additional, given existing regulatory requirements. No leakage of emissions outside the project boundaries was identified.
Baseline:	The baseline is unmitigated release of all methane.
Monitoring, Data Collection, & Methodology:	In general, procedures were in keeping with the MRV protocol. These procedures were discussed in greater detail in previous sections of this report.
Quality Control, Reporting, Documentation, & Uncertainties:	Quality control, reporting, and documentation procedures followed were in keeping with the MRV protocol.

## 7. Audit Results

CBE provided good documentation for its emissions estimates as well as its programs around the data collection process. An immaterial calculation error was identified and was rectified by CBE following a corrective action request. Sufficient evidence of project additionality was provided by CBE.

After correction, the calculations on the spreadsheet were consistent with the CCX<sup>®</sup> and MRV CBE 2005 14 protocols. In addition, the methodology used to allocate pre-1999 system emissions and post-1999 system emissions was consistent with the approved CCX allocation methodology. The 1998 landfill gas flow was used as a baseline and subtracted from all future years to determine the additional landfill gas flows attributable to the system expansion.

Verified results show 72,680 mT of CO<sub>2</sub>e eligible for registration with the Environmental Resources Trust and 42,967 mT of CO<sub>2</sub>e eligible for registration with the CCX<sup>®</sup>.

## 8. General Conclusion

Based on the assessments performed and the evidence collected, First Environment concludes that the Project GHG emissions reductions due to the flaring of landfill gas for the period of July 1, 2007 through December 31, 2007, can be considered:

- Consistent with the CCX<sup>®</sup> Project Guidelines for Landfill Gas projects and Environmental Resources Trust, Inc. Monitoring, Reporting and Verification Protocol, MRV CBE 2005 14,
- 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 numbers for this period.



## CCX<sup>®</sup> Methane Project Reporting Form

CCX Project Owner: CommonWealth Bethlehem Energy LLC

Reporting Period:			
Location	Confirmation	Column 1	Column 2
CCX <sup>®</sup> Registered Methane Project Site Name and Address	Site Meets CCX <sup>®</sup> Project Eligibility Rules	Total Metric Tonnes of Methane Combusted During Period	CCX Early Action Credit Issuance
North Country Environmental Systems Landfill, Bethlehem, NH	Yes	2354 <b>Metric Tonnes CH<sub>4</sub></b>	430 <b>Hundred Metric Tonnes CO<sub>2</sub></b>

CCX<sup>®</sup> Approved Verifier Name:

First Environment, Inc.



Signature of Verified Representative:

Name and Contact Number:

B. Tod Delaney, 973-334-0003

Methane Project Attestation by CCX® Project Owner

Reporting period: July 1, 2007 through December 31, 2007

Reporting facility: North Country Environmental Services Landfill, Bethlehem, NH

I hereby warrant:

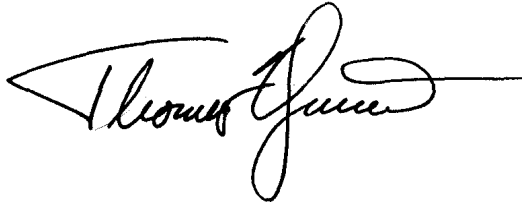
that the methane collection and combustion facilities identified in this filing caused the collection and combustion of methane in the quantities reported by First Environment, Inc. (verifier);

that the methane collection and combustion facilities identified in this filing meet CCX eligibility rules for such Projects – e.g., the facility was exempt from NSPS requirements during the reporting period;

that CommonWealth Bethlehem Energy LLC (Project Owner) continues to hold full legal title to the Greenhouse Gas mitigation rights associated with the capture and combustion of methane at the facility noted above - i.e., they have not gone into contracts with any other firm for their sale.

Signed and attested by a duly authorized representative of:

Project Owner: CommonWealth Bethlehem Energy LLC



Signature: \_\_\_\_\_

Print Name: Thomas Yeransian

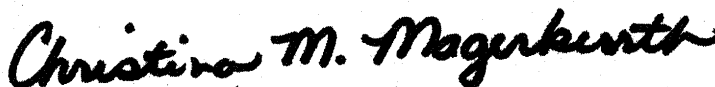
Title: Principal, CommonWealth Resource Management Corporation  
Sole Member, CommonWealth Bethlehem Energy LLC

Date: April 21, 2008

Verified by First Environment, Inc.

Name: Christina M. Magerkurth, P.E.

Signature:



## ***ERT Attestation Statement***

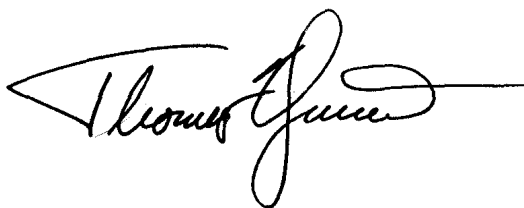
As an officer of CommonWealth Bethlehem Energy LLC (CBE), I hereby certify that the emissions reductions reported in connection with methane capture and combustion have been calculated according to the methods and procedures as outlined and described in the MRV Protocol and are a true representation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

Thomas Yeransian

Name

Principal of CRMC, the sole member of CBE

Title

A handwritten signature in black ink, appearing to read 'Thomas Yeransian', written over a horizontal line.

April 21, 2008

Signature

Date

## ATTACHMENT A

**Service Area: GREENHOUSE GAS MANAGEMENT**

**Name: B. TOD DELANEY, PH.D., P.E., BCEE**

**Firm Employed:** First Environment, Inc.

**Years of Relevant Experience:** 30+

**Degrees/Majors:** Ph.D., Environmental Health Engineering -- The University of Texas at Austin

M.B.A., Business Administration -- Pepperdine University

M.S., Chemical Engineering -- University of New Mexico

B.S., Chemical Engineering -- University of New Mexico

**Professional Licenses and/or  
Certifications**

Professional Engineer: New York, New Jersey, Florida,  
Mississippi, Georgia, Texas, Iowa, Ohio, Illinois, Pennsylvania,  
Connecticut, Alabama, Indiana, Nebraska, South Carolina,  
Colorado

Chairman of the Board: Business Council for Sustainable  
Energy

Certified Principal Environmental Auditor: Institute of  
Environmental Management and Assessment (IEMA), England

Certified Lead Auditor: California Climate Action Registry

Conservation Commission Appointee: Town of Cornwall, New  
York

Chair of the Environmental Division: American Institute of  
Chemical Engineers (AIChE), 1998

**Specific Experience:** A Chemical and Environmental Health Engineer, Dr. Delaney draws on over 30 years of diverse experience in advising clients on a range of environmental concerns, from greenhouse gas management and air quality assistance, to litigation support and expert testimony. Over the course of his career, he has worked for and consulted to hundreds of clients, taught graduate and undergraduate college courses in chemical and environmental engineering, and authored numerous reports, presentations and publications.

As president of First Environment, Dr. Delaney provides strategic oversight on all of the firm's GHG management, strategy and verification projects.

**Experience Relevant to GREENHOUSE GAS MANAGEMENT**

- **Business Council for Sustainable Energy (BCSE).** In 1997, Dr. Delaney joined BCSE, a trade group organization created by senior executives in the energy efficiency, electric utility, renewable energy, independent power and natural gas industries in the United States. Dr. Delaney, who now serves as the chairman of the Board of Directors of BCSE, has consistently attended COP meetings to represent the interests of U.S. clean energy companies at the UNFCCC talks.
- **ISO 14000 Series of Standards Participation (Life Cycle Assessment).** In 1995, Dr. Delaney actively participated in the development of the ISO 14000 Series of Standards as a member of the U.S. Technical Advisory Group's (US TAG) to ISO's Technical Committee 207 (TC207). Through this participation, he was integrally involved in the development of life cycle interpretation guidelines. He was elected to serve as the United States expert representative on life cycle assessment, and, in that capacity, has consistently represented the interests of the United States at ISO International Meetings all over the world.

- **ISO 14000 Series of Standards Participation (Climate Change).** Dr. Delaney served as the American National Standards Institute's representative to the Ad Hoc Group on Climate Change of International Organization for Standardization's Technical Management Board and the Chairman of ANSI's Virtual Technical Advisory Group on climate change. In addition, he was appointed as Co-Chair to the ISO's US TAG Climate Change Taskforce. He represented the U.S. in this position at the 2002 Meeting of ISO's TC207 on Environmental Management standards in Johannesburg, South Africa. In October of 1999, Dr. Delaney briefed the U.S. Department of State's Climate Change Team on how to use the ISO 14000 Standards to promote international conformity in the clarification, verification and certification of emissions, before the team left to negotiate in Bonn, Germany.
- Most recently, Dr. Delaney served as a technical expert for the U.S. team regarding ISO 14064, a standard for emission measurement, verification and reporting. He was the international coordinator and a technical expert for the team concerning ISO 14064 Part I, which focused on *entity* emission measurement, verification and reporting. He was also the lead expert for the U.S. on the portion of the standard that deals with *project* emission measurement, verification and reporting. He was the as-needed co-facilitator for Working Group 5 at international meetings about Part 2. Dr Delaney currently serves as one of two experts for the portion of the standard that deals with accreditation.
- **Confidential Major Oil and Gas Company (strategy).** Assisted with a formal review and assessment of GHG management strategy. Analyzed the organization's decisions and understanding of GHG management issues. Developed the company's corporate GHG Inventory Protocol. Advised the team that worked on the development of this corporate level guidance document. This protocol was designed to drive the corporation toward the creation of a robust data collection system that ensures consistency, comparability and transparency throughout the organization. This protocol is also intended to be an effective communication tool to inform interested stakeholder groups of the company's policies, practices and methodologies for GHG data collection.
- **Georgia Pacific (verification).** As the leader of the verification team, Dr. Delaney helped conduct an in-depth assessment of the company's greenhouse gas inventory protocol design and implementation. Along with the verification team, he also evaluated the preliminary year 2000 GHG inventory report conducted under the guidance of the protocol.
- **Bentley Prince Street (verification).** Served as Senior Internal Reviewer for First Environment's certification of the client's 2002 through 2005 GHG reports to the California Climate Action Registry. Verifications have included addressing the company's onsite solar electricity generation, purchases of RECs, and emissions from its sales staff vehicle fleet.
- **Eastman Kodak (verification).** Served as Senior Internal Reviewer for First Environment's verification of Kodak's 2002, 2003, 2004, and 2005 California Climate Action Registry GHG reports covering its U.S. operations as well as a reports of GHG emissions from non-U.S. operations.
- **Waste Management, Inc. (verification).** Served as lead verifier for numerous verification reports that were provided to Waste Management as a deliverable of the Chicago Climate Exchange's project verification process.
- **Air Emissions Measurement and Estimation.** Dr. Delaney began his career primarily in the air emissions field. His work has included the development and execution of extensive field data collection programs (ambient and stack as well as associated meteorological data); atmospheric dispersion modeling; and the conceptual, preliminary, and final designs of air emissions control equipment. Dr. Delaney has executed extensive emission stack testing programs for automobile manufacturers, sugar refineries, electrical utilities, cement kilns, cogeneration facilities, and many other industrial establishments.

- **Large Petroleum Company**, Dr. Delaney had responsibility for the measurement of emissions and development of emission factors for refinery and chemical plant pumps and valves. He also performed dispersion modeling to evaluate the effects of releases from refinery safety valves. He served as a member of an American Petroleum Institute Committee and had responsibility for the development of a test program and a data analysis program to evaluate tanker emissions during all phases of operations, including loading and unloading. Prior to his involvement with air emissions in the petroleum industry, he also worked in oil field and refinery operations.
- **Consultant for the Air Force**. Dr. Delaney was a member of a team that developed a dispersion model to simulate airbase emissions. Sources modeled included jet aircraft, fueling, operations, fueling storage tanks, support vehicles, and maintenance. He was also part of the team that collected field emissions to calibrate the model. Along with this work, he developed a three-dimensional model, which simulates the downward transport and dispersion of an aircraft's exhaust products during climbout and approach. Also in connection with his Air Force consulting, he drafted a field data collection manual for gathering the required input data for the airbase model.
- **Auditor Certification Board of Registered Accreditation member**. Dr. Delaney is an experienced EMS Lead Auditor. He led and directed the project team that performed the EMS audit for a division of a large Northeast utility. He has also developed and presented EMS auditor training courses for Government Institutes, as well as training internal auditors for companies to which First Environment provides EMS implementation services. This EMS auditing experience is strengthened by 30 years of practice as an industrial site auditor and as an environmental regulatory compliance auditor. In recognition of his knowledge and experience in environmental and management systems auditing, Dr. Delaney was recently made a member of the Auditor Certification Board of Registered Accreditation, the primary accreditation body of quality and environmental systems auditors.

## **Service Area: GREENHOUSE GAS MANAGEMENT**

**Name:** Christina Magerkurth, P.E.  
**Firm Employed:** First Environment, Inc.  
**Years of Relevant Experience:** 10  
**Degrees/Majors:** M.Eng. Environmental Management – Cornell University  
B.S. Engineering and Applied Science – Environmental Engineering – California Institute of Technology  
**Professional Licenses and/or Certifications:** Licensed Professional Engineer  
**Specific Experience:** Ms. Magerkurth is experienced in assisting clients with climate change strategies, developing greenhouse gas emissions baseline inventories and auditing greenhouse gas emissions reductions as well as developing, implementing and auditing management systems. Her work primarily focuses on environmental management systems, corporate sustainability, environmental compliance, greenhouse gas management, environmental regulatory support and marketing at both a technical and project management level. Ms. Magerkurth offers her extensive systems, regulatory compliance, and business experience to First Environment's Team.

### **Experience Relevant to GREENHOUSE GAS MANAGEMENT**

**Various Local Governments (Inventory and verification).** Provided technical assistance or verification services to a variety of municipalities and authorities in support of their inventory development and offset project quantification or verification. Offset projects have been developed or verified in accordance with Chicago Climate Exchange, Environmental Resources Trust, ISO 14064-2, and Voluntary Carbon Standard protocols. Selected clients include: Atlantic County Utility Authority, NJ; Cape May County Utility Authority, NJ; Solid Waste Authority of Central Ohio, OH; Development Authority of the North Country, NY; Steuben County, NY; East Central Solid Waste Commission, MN

**Chicago Climate Exchange (verification strategy).** Provides technical assistance to the Chicago Climate Exchange in reviewing existing landfill greenhouse gas emissions reduction verification protocol and developing alternatives as appropriate based on project specifics. Reviews requests for variances from protocol and provides recommendations to the Offsets Committee on the technical merits of the proposed methodologies.

**Waste Management (verification).** Provided verification services for over 15 landfills that have registered landfill greenhouse gas emissions reduction credits with the Chicago Climate Exchange or sold credits directly to buyers. Verification included the site visit, review of raw data and calculation compared to the Chicago Climate Exchange protocol or other selected protocol, and review of technical reports supporting data and calibration records for sites located throughout the United States.

**Landfill Waste to Energy Developer (verification).** Provided verification services for two sites that have sold landfill greenhouse gas emissions reduction credits on the Chicago Climate Exchange, Environmental Resources Trust and GE-AES. Verification included the site visit, review of data, and review of a newly approved allocation methodology.

**Major Financial Corporation (strategy and inventory).** Assisted a major financial corporation with developing responses for the Carbon Disclosure Project questionnaire. In addition, provided assistance in developing a base GHG emissions inventory and plans for improving and refining the inventory in subsequent years.



**Major International Financial Corporation (strategy and inventory).** Assisted an international financial corporation with developing documentation for reductions associated with projects, an overall inventory, and responses for the Carbon Disclosure Project questionnaire.

**Major Aluminum Manufacturer (verification).** Conducted site visits and data review for GHG verification for several facilities. Site visits allowed an opportunity to review data collection and roll-up methodologies to ensure completeness and accuracy. Data reviews included a review of assumptions made and calculations. The audits were performed under the Framework Agreement on Voluntary Greenhouse Gas Reduction in Québec.

**Madison Gas and Electric (strategy and inventory).** Participated in First Environment's team that provided assistance to the utility with a report to stakeholders communicating the company's understanding and actions addressing the issue of climate change. Drafted section discussing the company's environmental management system (EMS) and approach for monitoring and setting goals related to greenhouse gas emissions. As part of the development of the EMS, assisted in the detailed identification of GHG sources throughout their coal fired power plant and participated in discussion regarding potential sources throughout the company. Provided review and support for their air emission quantification process.

**Wisconsin Public Service Resources (EMS).** Led team in developing EMS for the entire organization and piloting the EMS at a coal fired power plant. Assisted site with the identification of activities, aspects, and impacts for Wisconsin Public Service's coal burning power plant. Special emphasis was placed on those activities that generate air emissions from greenhouse gases.

**AES Southland, LLC (verification).** Served as lead certifier and project manager for First Environment's certification of the organization's 2006 GHG reports to the California Climate Action Registry. Included the evaluation of the data management system, assessment of emissions calculations, and reporting of certification activities as well as oversight for conducting five site visits to representative facilities.

**USG Corporation (verification).** Served as lead certifier and project manager for First Environment's certification of the organization's 2004, 2005 and 2006 GHG reports to the California Climate Action Registry. Included the evaluation of the data management system, assessment of emissions calculations, and reporting of certification activities. The scope of the project was revised to include verification of every emissions source at every facility.

**Renewable Energy Developer (inventory and strategy).** Providing technical support to an organization developing landfill gas to energy facilities and other renewable projects. Reviewing design documents, developing monitoring plans and project documentation to demonstrate the emissions reductions associated with the projects.

**First Environment & U.S. EPA Climate Leaders (inventory).** Developed internal protocol regarding transportation related emissions quantification and tracking. As a former Management Representative for First Environment's environmental management system, assisted in the coordination of all data needed to support the annual reports.

**Metal Finishing Company (compliance and inventory).** Developed a software application for a metal finishing company to track paint and thinner usage. Assisted in the development of air emissions compliance reports and internal tracking reports.

## **Service Area: Greenhouse Gas Management**

**Name:** Eric Ripley  
**Firm Employed:** First Environment, Inc.  
**Years of Relevant Experience:** 1  
**Degrees/Majors:** Master of Professional Studies in Environmental Science and Policy, 2007, State University of New York-College of Environmental Science and Forestry

Master of Business Administration, 2007, Syracuse University

Bachelor of General Studies (concentrating in Social and Environmental Studies), 1999, Indiana University

**Specific Experience:** Mr. Ripley is an environmental specialist with experience in greenhouse gas inventories, carbon offset projects, and finance. He is familiar with various protocols including the Voluntary Carbon Standard, ISO 14064, the WRI/WBCSD Greenhouse Gas Protocol, the California Climate Action Registry's General Reporting Protocol, and the Chicago Climate Exchange's Landfill Methane Gas Guidelines. His background is in environmental science, policy and management with a focus on environmental markets.

### **Experience Relevant to: GREENHOUSE GAS MANAGEMENT**

- **Landfill Gas Emissions Reduction Verifications.** Conducted verifications of methane destruction projects at various landfills across the United States. Verified landfill greenhouse gas emissions reduction credits against the Chicago Climate Exchange and Environmental Resources Trust protocols. Verifications included review of raw data and calculations in accordance with the applicable protocol, review of technical reports supporting data and calibration records, and drafting of verification reports.
- **Landfill Gas Emissions Reduction Project Development.** Provided technical assistance to landfill gas project proponents seeking to earn and register emissions reduction credits. Utilized knowledge of emissions reduction protocols to guide clients through the project development process and registration of carbon credits under programs such as the Voluntary Carbon Standard.
- **GHG Project Evaluation and Methodology Development.** Responsibilities include research and evaluation of carbon credit potential, data review, and participation in the development of a new greenhouse gas reduction methodology.
- **National Nonprofit Environmental Organization.** Provided data management, emissions calculations, and report drafting support for 2007 GHG inventory developed in accordance with ISO 14064-1 and the California Climate Action Registry's General Reporting Protocol.
- **Global Food/Beverage Manufacturer.** Providing data collection and evaluation, and general data management support for the 2007 corporate GHG inventory. The inventory is being developed in accordance with ISO 14064-1 and the California Climate Action Registry's General Reporting Protocol.

- **Carbon Disclosure Project (CDP) Response Development.** Conducting the data collection, review, and 2007 inventory development for a major telecommunications firm. This work will lead to the development of the corporate response for the CDP6.
- **Environmental Protection Agency, Region 2 Environmental Finance Center.** Worked as an intern responsible for researching GHG emissions trading schemes. This research led to the writing of a report focusing on the history, theory and design of emissions trading schemes as well as an evaluation of various company experience in GHG markets such as the Chicago Climate Exchange.

## ATTACHMENT B

EXHIBIT 1				
CommonWealth Bethlehem Energy LLC				
North Country LFG Utilization Project				
Bethlehem, New Hampshire				
Calculation of Verified Emission Reduction Credits in CO2 equivalent tons				
<b>Key parameters used in calculations</b>				
<b>Parameter</b>		<b>ERT assumptions</b>		<b>CCX assumptions</b>
Methane oxidation efficiency electricity generation		99.9%		100.0%
Methane oxidation efficiency LFG flaring		98.0%		100.0%
Molare weight methane		16		16
Pounds per metric ton		2,205		2,205
Gas constant		385		385
Global Warming Potential (GWP) methane		21		18.25
<b>Summary results</b>				
	<b>Unit</b>	<b>Value with ERT Formula</b>		<b>Value with CCX Formula</b>
<b>Flaring</b>				
Start date		1-Jul-07		1-Jul-07
End date		1-Jan-08		1-Jan-08
Methane delivered	scf	187,377,729		187,377,729
Emission Reductions	metric tons CO2e	72,680		64,617
Baseline	metric tons CO2e	74,163		
Emissions	metric tons CO2e	1,483		

EXHIBIT 2 Commonwealth Bethlehem Energy LLC 4/21/2008																		Calculation of Verified Emission Reduction Credits in CO2 equivalent tons per the ERT Protocol, 2005																		EXHIBIT 3 Calculation of Verified Emission Reduction Credits in CO2 equivalent tons per the CCX Formula																	
Begin period date	End period date	Totalizer reading end period	Totalizer reading start period	Methane content end period	Methane content start period	Methane delivered to flare	Methane delivered cumulative	Flare efficiency	Molar weight methane	Pounds to tons conversion	Gas constant	Mass methane destroyed in the period	Mass methane destroyed cumulative	Global warming potential methane	Emission reduction cumulative	Emission reduction metric tons	Baseline cumulative	Emissions cumulative	Begin period date	End period date	Molecular weight of methane	Conversion to tons	Gas Constant	Conversion Factor	Methane Destroyed in Flare	Global warming potential methane	CO2 equivalent	CO2 equivalent cumulative																									
mm/dd/yy	mm/dd/yy	scf	scf	%	%	scf	scf	%	Pounds per metric ton	Pounds per ton	scf per pound mole	metric tons	metric tons	tons CO2 equivalent per ton methane	CO2 equivalent metric tons	CO2 equivalent metric tons	CO2 equivalent metric tons	CO2 equivalent metric tons	mm/dd/yy	mm/dd/yy	g/mole	MT/ton	metric tons	L/ct	Metric Tons	tons CO2 equivalent per ton methane (as allowed by CCX)	Metric tons	Metric tons																									
1-Jul-07	3-Jul-07	144,014,250	138,447,852	42.90%	42.70%	2,382,414	2,382,414	98%	16	2,205	385	44	44	21	924	924	943	19	1-Jul-07	3-Jul-07	16.04	1,000,000	0.041959734	28.32	45.02	18.25	822	822																									
1-Jul-07	3-Jul-07	151,365,700	144,014,250	45.90%	42.90%	3,264,044	5,646,462	98%	16	2,205	385	60	104	21	1,266	2,190	2,235	45	3-Jul-07	6-Jul-07	16.04	1,000,000	0.041959734	28.32	61.598	18.25	1,128	1,947																									
6-Jul-07	11-Jul-07	164,803,500	151,365,700	46.30%	45.70%	6,181,388	11,827,850	98%	16	2,205	385	114	218	21	2,398	4,588	4,681	94	6-Jul-07	11-Jul-07	16.04	1,000,000	0.041959734	28.32	116.80	18.25	2,132	4,079																									
11-Jul-07	20-Jul-07	189,200,500	164,803,500	42.20%	45.20%	10,661,489	22,489,339	98%	16	2,205	385	197	415	21	4,135	8,723	8,901	178	11-Jul-07	20-Jul-07	16.04	1,000,000	0.041959734	28.32	201.46	18.25	3,677	7,755																									
20-Jul-07	1-Aug-07	225,137,250	189,200,500	43.90%	42.40%	13,234,163	35,723,502	98%	16	2,205	385	353	665	21	5,172	13,866	14,179	284	20-Jul-07	1-Aug-07	16.04	1,000,000	0.041959734	28.32	282.60	18.25	4,256	12,354																									
1-Aug-07	3-Aug-07	225,310,505	220,102,385	45.50%	43.90%	2,328,030	38,151,532	98%	16	2,205	385	43	705	21	903	14,798	15,100	302	1-Aug-07	3-Aug-07	16.04	1,000,000	0.041959734	28.32	43.99	18.25	803	13,156																									
3-Aug-07	10-Aug-07	242,037,055	225,310,505	41.10%	45.50%	7,242,996	45,394,128	98%	16	2,205	385	134	838	21	2,809	17,607	17,967	359	3-Aug-07	10-Aug-07	16.04	1,000,000	0.041959734	28.32	136.85	18.25	2,498	15,654																									
10-Aug-07	22-Aug-07	269,125,351	242,037,055	45.20%	41.10%	11,688,600	57,082,728	98%	16	2,205	385	216	1,054	21	4,534	22,141	22,593	452	10-Aug-07	22-Aug-07	16.04	1,000,000	0.041959734	28.32	229.86	18.25	4,031	19,685																									
22-Aug-07	31-Aug-07	290,123,619	269,125,351	43.90%	45.20%	9,387,250	66,470,978	98%	16	2,205	385	204	1,034	21	4,387	26,529	26,981	528	22-Aug-07	31-Aug-07	16.04	1,000,000	0.041959734	28.32	269.86	18.25	3,627	22,832																									
31-Aug-07	4-Sep-07	299,033,619	290,123,619	43.60%	45.45%	3,068,639	69,539,617	98%	16	2,205	385	73	1,051	21	1,535	27,318	27,875	558	31-Aug-07	4-Sep-07	16.04	1,000,000	0.041959734	28.32	74.80	18.25	1,365	24,287																									
4-Sep-07	7-Sep-07	307,964,119	299,033,619	41.50%	43.60%	3,800,779	74,223,344	98%	16	2,205	385	70	1,371	21	1,474	28,792	29,380	589	4-Sep-07	7-Sep-07	16.04	1,000,000	0.041959734	28.32	71.82	18.25	1,311	25,598																									
7-Sep-07	13-Sep-07	324,401,719	307,964,119	40.20%	40.20%	6,607,915	80,831,259	98%	16	2,205	385	263	1,493	21	2,563	31,965	32,460	640	7-Sep-07	13-Sep-07	16.04	1,000,000	0.041959734	28.32	124.86	18.25	2,279	27,876																									
13-Sep-07	14-Sep-07	327,311,219	324,401,719	41.00%	40.20%	1,181,257	82,018,517	98%	16	2,205	385	22	1,515	21	458	31,813	32,462	649	13-Sep-07	14-Sep-07	16.04	1,000,000	0.041959734	28.32	22.32	18.25	407	28,284																									
14-Sep-07	28-Sep-07	360,320,019	327,311,219	40.20%	41.00%	13,401,573	95,420,090	98%	16	2,205	385	248	1,762	21	5,198	37,011	37,767	756	14-Sep-07	28-Sep-07	16.04	1,000,000	0.041959734	28.32	253.23	18.25	4,621	32,905																									
28-Sep-07	1-Oct-07	366,763,989	360,320,019	40.90%	40.60%	2,634,068	98,054,157	98%	16	2,205	385	28	1,021	21	38,033	1,022	38,033	776	28-Sep-07	1-Oct-07	16.04	1,000,000	0.041959734	28.32	49.77	18.25	988	33,814																									
1-Oct-07	5-Oct-07	376,796,819	366,763,989	38.00%	40.90%	3,860,101	102,004,258	98%	16	2,205	385	73	1,884	21	1,832	30,565	30,787	618	1-Oct-07	5-Oct-07	16.04	1,000,000	0.041959734	28.32	74.84	18.25	1,362	35,176																									
5-Oct-07	18-Oct-07	400,811,469	376,796,819	37.20%	37.50%	12,330,934	114,335,193	98%	16	2,205	385	228	2,112	21	4,783	44,348	45,253	905	5-Oct-07	18-Oct-07	16.04	1,000,000	0.041959734	28.32	233.00	18.25	4,252	39,428																									
18-Oct-07	1-Nov-07	445,387,969	400,811,469	38.70%	37.20%	13,493,692	127,828,884	98%	16	2,205	385	249	2,361	21	5,234	40,582	50,594	1,012	18-Oct-07	1-Nov-07	16.04	1,000,000	0.041959734	28.32	294.97	18.25	4,653	44,081																									
1-Nov-07	2-Nov-07	445,240,609	445,387,969	37.20%	38.70%	1,089,962	128,918,846	98%	16	2,205	385	38	702	21	5,025	1,021	5,025	1,021	1-Nov-07	2-Nov-07	16.04	1,000,000	0.041959734	28.32	22.30	18.25	376	45,457																									
2-Nov-07	9-Nov-07	467,954,519	445,240,609	38.30%	38.60%	7,584,051	136,502,897	98%	16	2,205	385	140	2,521	21	2,942	52,947	53,022	1,081	2-Nov-07	9-Nov-07	16.04	1,000,000	0.041959734	28.32	143.31	18.25	2,615	47,073																									
9-Nov-07	16-Nov-07	498,066,969	467,954,519	40.20%	39.10%	7,986,631	144,449,729	98%	16	2,205	385	147	2,668	21	3,082	56,029	57,172	1,143	9-Nov-07	16-Nov-07	16.04	1,000,000	0.041959734	28.32	150.16	18.25	2,740	49,813																									
16-Nov-07	23-Nov-07	506,974,419	498,066,969	38.90%	40.20%	7,311,952	151,761,681	98%	16	2,205	385	135	2,801	21	58,666	1,201	58,666	1,201	16-Nov-07	23-Nov-07	16.04	1,000,000	0.041959734	28.32	138.16	18.25	2,522	52,335																									
23-Nov-07	29-Nov-07	522,366,019	506,974,419	41.70%	37.10%	6,064,290	157,825,971	98%	16	2,205	385	112	2,915	21	2,352	61,217	62,467	1,249	23-Nov-07	29-Nov-07	16.04	1,000,000	0.041959734	28.32	114.59	18.25	2,091	54,426																									
29-Nov-07	3-Dec-07	532,675,219	522,366,019	46.90%	41.70%	4,566,976	162,392,947	98%	16	2,205	385	84	2,999	21	1,771	62,889	64,274	1,280	29-Nov-07	3-Dec-07	16.04	1,000,000	0.041959734	28.32	86.30	18.25	1,575	56,001																									
3-Dec-07	11-Dec-07	552,601,919	532,675,219	37.90%	46.90%	8,448,521	170,841,867	98%	16	2,205	385	156	3,156	21	3,277	66,266	67,618	1,352	3-Dec-07	11-Dec-07	16.04	1,000,000	0.041959734	28.32	159.65	18.25	2,914	58,918																									
11-Dec-07	14-Dec-07	560,049,919	552,601,919	40.60%	37.90%	2,623,340	173,465,207	98%	16	2,205	385	54	3,220	21	1,134	67,400	68,524	1,376	11-Dec-07	14-Dec-07	16.04	1,000,000	0.041959734	28.32	55.24	18.25	1,008	60,022																									
14-Dec-07	17-Dec-07	566,271,399	560,049,919	39.40%	40.10%	2,473,038	176,238,246	98%	16	2,205	385	46	3,255	21	959	68,359	69,754	1,395	14-Dec-07	17-Dec-07	16.04	1,000,000	0.041959734	28.32	46.73	18.25	853	60,775																									
17-Dec-07	28-Dec-07	589,666,193	566,271,399	39.20%	39.40%	9,194,465	185,432,710	98%	16	2,205	385	170	3,425	21	3,566	71,925	73,393	1,483	17-Dec-07	28-Dec-07	16.04	1,000,000	0.041959734	28.32	173.74	18.25	3,171	63,946																									
28-Dec-07	1-Jan-08	594,616,139	589,666,193	39.40%	39.20%	1,945,078	187,377,729	98%	16	2,205	385	36	3,461	21	754	72,680	74,163	1,468	28-Dec-07	1-Jan-08	16.04	1,000,000	0.041959734	28.32	38.32	18.25	671	64,617																									
																		TOTAL for 2nd Half 2007 = 3,541																																			

	EXHIBIT 4						
	ALLOCATION OF METHANE EMISSION REDUCTIONS TO POST-1999 SYSTEM						
	A	B	C	D	E		
	Year	Total methane reductions, metric tons	System methane reductions, metric tons	System methane reductions, metric tons	System CO2 Equivalent Offsets, Metric Tons		
	Second Half 2007	3,541	1,186	2,354	42,967		
A	Portion of Calendar Year						
B	Total annual measured quantity of methane collected from the Landfill.						
	Destruction assumed to be 100 percent per CCX Project Guidelines for LFG.						
C	The 2,373 metric tons per year of methane collected from the Pre-1999 System, which is assumed to remain the same quantity as measured at the Pre-1999 System peak for 1998.						
	One-half year is 1,186 metric tons of methane.						
D	Column C subtracted from Column B.						
E	Column D multiplied by the net rate of 18.25 tons of CO2 for each						