

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

**CCX/American Carbon Registry**

**Verification Period: January 1, 2009 to June 30, 2009**

**August 2009**

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 American Carbon Registry's (ACR) project verification processes. This report covers the verification of landfill gas (LFG) destruction emissions reduction estimates for the period from January 1, 2009 through June 30, 2009 for the North Country LFG Utilization Project (the Project). First Environment, Inc. (First Environment) completed the verification in August of 2009.

## 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>	Emissions Offsets (expressed in units of Carbon Dioxide equivalents (CO <sub>2</sub> -e)) resulting from the capture and destruction of methane
<b>Reporting Years</b>	January 1, 2009 through June 30, 2009
<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 ISO 14064-Part 3
Standard of Verification	CCX® Project Guidelines: Landfill Gas Version 1, February 2, 2004 as amended (see Attachment A) ACR Monitoring, Reporting and Verification Protocol, MRV CBE 2005 15, May 2009
Level of Assurance	Reasonable assurance
Materiality	Misstatements greater than five percent of the GHG assertion are 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,
- kickoff conference call with the CBE/CRMC 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/CRMC 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.

### ***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 prior occasions.

B. Tod Delaney, Ph.D., P.E., BCEE – Senior Management Oversight  
Jay Wintergreen - Independent Internal Reviewer  
Alicia Chin – Lead Auditor  
Greg Kozak – Auditor

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

The verification audit was initiated with a conference call between First Environment and the primary CBE/CRMC contact, Thomas Yeransian, on July 28, 2009. The communication focused on confirming the verification scope and schedule, revisions to the MRV, confirming that no changes have occurred in operations at the Site since First Environment's initial site visit in 2006, and highlighting the data required for the verification.

First Environment has previously verified emissions reduction credits from this site on several past occasions. Since the site confirmed that no changes in operation and no changes to the

process or equipment had occurred since the first site visit, an additional site visit was not conducted.

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

Based on the information provided in the ACR Monitoring, Reporting, and Verification Protocol for the North Country LFG Utilization Project (Project Protocol), the team formally documented its verification plan and determined the data-sampling plan. The plans were provided to CBE on July 31, 2009.

### ***Site Visit***

Due to the fact that there were no changes to the gas collection and combustion system and monitoring procedures since the last verification, a site visit was deemed unnecessary.

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

This assessment used information and insights gained during the previous steps to evaluate the collected data, the reported emissions reduction quantities, and to 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. No corrective actions were requested for the period under review.

### ***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 the American Carbon Registry, 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 gas that is used to produce heat energy for a leachate and condensate evaporation facility at the Site. The verification 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. Although the evaporation system is still in place, the evaporation of leachate and condensate was discontinued in March 2007. The enclosed flare continues to operate to destroy landfill gas. 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.

In September 2000, CBE contracted to purchase and take ownership of the landfill gas and associated environmental attributes. Evidence of ownership is included in Attachment B.

### ***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, 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 GHG information system and its controls for sources of potential errors, omissions, and misrepresentations.

As described above, a totalizer and circle chart recorder are used to determine total flow to the flare and a GEM 2000 or GEM 500 is used to record methane concentration. The data collection process has several checkpoints to ensure accuracy. Operators collect totalizer and methane concentration 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 field checked at least quarterly using a pitot tube. During the period covered by this report, the flow meter was field checked on February 27, March 3, April 8, May 27, June 25, and June 30, 2009, as shown in Attachment C. The results of the pitot tube test on February 27 showed the totalizer was reading minus 14 percent and the test on June 25 revealed the totalizer was reading minus 13 percent. The calibration results for the circle chart reader, however, revealed a difference of within plus or minus five percent, as evidenced in Attachment D. Therefore, for the period of January 9, 2009 through February 26, 2009 and the period of June 1, 2009 through June 30, 2009, circle chart readings were used. The circle chart readings were checked with adjusted totalizer readings to verify the appropriate total flow. The other pitot tube checks throughout the verification period showed the totalizer to be within plus or minus five percent.

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; during this verification period it was calibrated on March 25, 2009, as shown in Attachment E.

### **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 ACR Project Protocol were reviewed and found to be valid based on the information and evidence provided by CBE. A formal federal, state, and local regulatory file review was not conducted as part of the verification process. 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). CCX has approved the amount of emission reductions that are to be accounted for in the baseline system and deducted from the total amount of project emission reductions.

Total methane destroyed was calculated by multiplying the difference of flow between the totalizer readings by the average of the methane readings from the beginning and end of the period.

The calculations provided in Attachment F 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, all raw data was reviewed. The calculations for the entire period were reviewed.

### **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 flow meter.
	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 field checked using a pitot tube attached to a manometer that is inserted into the LFG flow near the flow meter. The flow meter

	Guideline Requirement	Site Compliance	Comments
			was calibrated on February 27, March 3, April 8, May 27, June 25, and June 30, 2009.
	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 the LFG flow for the period.
<b>Methane Concentration</b>			
	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. During this period, it was calibrated March 25, 2009. 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.

### **ACR Protocol MRV CBE 2005 15**

The MRV CBE 2005 15 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 ACR MRV protocol.
Additionality & Leakage:	First Environment verified that the project is not required by NSPS regulations. All other additionality assertions made by the project were verified by ACR and are outlined in the MRV. 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 ACR 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 ACR MRV protocol.

## 7. Audit Results

CBE provided good documentation for its emissions estimates as well as its programs around the data collection process. Sufficient evidence of project additionality was provided by CBE.

The calculations on the spreadsheet were consistent with the CCX<sup>®</sup> and MRV CBE 2005 15 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 52,447 mT of CO<sub>2</sub>e eligible for registration with the American Carbon Registry and 28,611 mT of CO<sub>2</sub>e eligible for registration with the CCX<sup>®</sup>.

## 8. General Conclusion

Based on the assessment 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 January 1, 2009 through June 30, 2009, can be considered:

- consistent with the CCX<sup>®</sup> Project Guidelines for Landfill Gas projects and American Carbon Registry Monitoring, Reporting and Verification Protocol, MRV CBE 2005 15;
- 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 emission reduction estimates for this period.



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

CCX Project Owner: CommonWealth Bethlehem Energy LLC

<b>Reporting Period: January 1, 2009 through June 30, 2009</b>			
<b>Location</b>	<b>Confirmation</b>	<b>Column 1</b>	<b>Column 2</b>
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	1,362 <b>Metric Tonnes CH<sub>4</sub></b>	286 <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: January 1, 2009 through June 30, 2009

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);

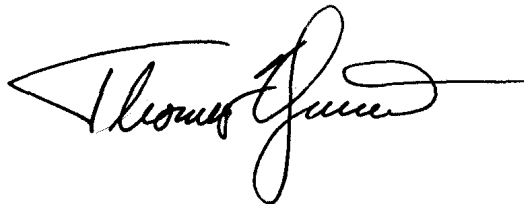
that the methane collection and combustion facilities identified in this filing meet CCX eligibility rules for such Projects – e.g., the facility was exempt from NSPS requirements during the reporting period;

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:

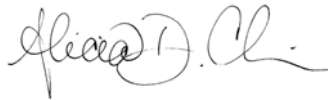


Print Name: Thomas Yeransian

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

Date: August 19, 2009

Verified by First Environment, Inc.



Name: Alicia Chin

## **American Carbon Registry Attestation Statement**

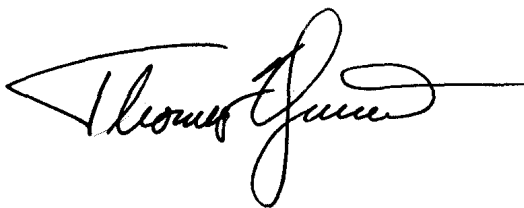
As an officer of CommonWealth Bethlehem Energy LLC (CBE), I hereby certify that the emissions reductions reported in connection with methane capture and combustion have been calculated according to the methods and procedures as outlined and described in the MRV Protocol and are a true representation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

Thomas Yeransian

Name

Principal of CRMC, the sole member of CBE

Title

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

Signature

Date: August 19, 2009

## ATTACHMENT A



Chicago Climate Exchange

## **CCX Advisory 2008 - 15**

MEMO TO: CCX Members

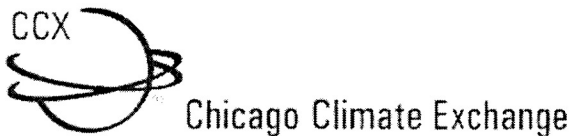
FROM: Nathan Clark, Director – Emission Offsets

DATE: October 2, 2008

### **Re: Revisions to CCX Rulebook Chapter 9**

Chicago Climate Exchange (CCX) has recently made several changes and clarifications to Chapter 9 of the CCX Rulebook. These rule changes are effective as of September 9, 2008. The following is a summary of those modifications:

- Entities with emissions greater than 10,000 metric tons of CO<sub>2</sub> equivalent per year during their most recent complete calendar year must enroll in CCX as an emitting Member and commit to the CCX reduction schedule in order to be eligible to earn CCX Offsets. Entities with emissions less than 10,000 metric tons CO<sub>2</sub> equivalent per year may register offsets with CCX without committing to the reduction commitment. (Reference: Rulebook section 9.1)
- The project accounting approach has been amended for methane capture and destruction projects where project related CO<sub>2</sub> emissions from the combustion of methane are biogenic in nature. As a result, the emission reductions for affected project types increases from 18.25 to 21 metric tons CO<sub>2</sub> per metric ton of methane captured and destroyed. (Reference: Rulebook section 9.7.1)
- At this time hydropower projects are ineligible in CCX. A methodology to address eligibility, sustainability and project accounting for hydro-electric power projects was considered by CCX. Included in the methodology for hydropower projects was a requirement for a sustainability assessment. With a view to adopting a sustainability protocol with broad acceptance, CCX continues to monitor the stakeholder consultation efforts of the International Hydropower Association. CCX will notify members should a determination on the eligibility of hydropower projects be made.
- The scope of eligible projects for the capture and destruction of Ozone Depleting Substances (ODS) has been expanded to include ODS from any country where production of ODS is phased out, importation is not allowed, and destruction is not required by law. These requirements match the existing circumstances found in the U.S. (Reference Rulebook section 9.13.1)
- The crediting rate for renewable energy generation projects has been changed from a standard value of 0.4 metric tons per MWh to region-specific values as determined by



the U.S. EPA's Emissions and Generation Resource Integrated Database (eGRID) tool. (Reference Rulebook section 9.12.5)

- The rule regarding issuance of offsets produced by eligible facilities using renewable fuel along with, or in place of, non-renewable fuel has been clarified to establish a methodology for determining emission reductions on an energy equivalent basis. (Reference Rulebook section 9.12.3.1)
- In reference to CDM project and methodology eligibility, the following project types are not eligible to be registered on CCX unless the project also satisfies the CCX project methodologies:
  - Hydro power
  - Forestry
  - Other CDM-approved projects or methodologies that result in net increases in emissions to the atmosphere relative to the pre-project period.(Reference Rulebook section 9.6.1.4)
- The rulebook now contains revised language on the eligibility requirements for the capture of methane at active and abandoned coalmine operations (Reference Rulebook section 9.7.3), and a correction of the listing of fallow-eligible counties in Montana (Reference Rulebook section 9.3A)
- Finally, CCX added/amended language in certain rules or their related footnotes to provide clarification. (Reference: Rulebook section 9.1, 9.7.1.1 and 9.12.2)

The CCX Rulebook is available to Members in their registries and Chapter 9 is also posted on the CCX [webpage](#).

## ATTACHMENT B

## **LANDFILL GAS SALE AND PURCHASE AGREEMENT**

THIS LANDFILL GAS SALE AND PURCHASE AGREEMENT, dated as of September 8, 2000 ("Agreement"), is by and between CRMC Bethlehem LLC, a Delaware limited liability company ("Seller"), and Commonwealth Bethlehem Energy LLC, a Delaware limited liability company ("Buyer").

### **BACKGROUND**

A. Seller owns and operates a landfill gas collection and production system at the Landfill (as defined herein) from which Seller collects, compresses, filters, measures and produces landfill gas available for sale.

B. Buyer desires to purchase landfill gas produced by Seller from the Landfill for the purpose of securing a long-term supply of fuel for production facilities of Buyer to be constructed by Buyer.

C. Seller desires to sell and the Buyer desires to buy landfill gas in the quantities and upon the terms and conditions set forth herein.

NOW, THEREFORE, for and in consideration of the premises and the mutual covenants herein, the parties hereto agree as follows:

### **ARTICLE I. DEFINITIONS**

The capitalized terms used in this Agreement shall have the meanings specified in Annex A hereto.

### **ARTICLE II. COLLECTION SYSTEM; BUYER'S FACILITY**

2.1 Seller's Facilities. Seller has certain contractual responsibilities with respect to the collection and disposition of Landfill Gas at the Landfill. Each obligation of Seller hereunder is conditioned on the consistency of such obligation with Seller's obligations with respect to the collection of Landfill Gas at the Landfill. Subject to the terms hereof, Seller shall in its sole discretion exercise, manage, preserve and amend Seller's interest and rights in and to Seller's Facilities and its Landfill Gas extraction rights, and all related rights, titles and interests of Seller.

2.2 Authorized Sales. Buyer and Seller shall make all necessary filings and diligently seek to obtain all Governmental Authorizations necessary to provide for and continue the sale and delivery of Landfill Gas to the Delivery Point. The parties shall cooperate with each other in connection with such filings and shall keep each other advised regarding their progress toward obtaining the necessary authorizations.



12.13 Currency and Payments. All payments under this Agreement shall be made in immediately available funds and in U.S. currency by wire transfer to the bank account specified by the payee in writing to the payor.

12.14 Specific Performance. If a party to this Agreement breaches or threatens to breach any provision of this Agreement, the non-breaching party shall have the right to have such provision specifically enforced by any court having equity jurisdiction, it being acknowledged and agreed that any such breach or threatened breach shall cause irreparable injury to the non-breaching party and that money damages will not provide adequate remedy, which right shall be in addition to, and not in lieu of, any other rights and remedies available to a non-breaching party under this Agreement, at law or in equity, all of which shall be independent of the other and severally enforceable.

12.15 Time is of the Essence. Time is of the essence with respect to all dates and time periods set forth in this Agreement.

12.16 Emissions Credits. For the term of this Agreement, Buyer and its affiliates, successors and assigns shall be entitled, *vis-a-vis* Seller and its affiliates, successors and assigns to claim the value of any emissions credits or values (including but not limited to environmental credits, "green tags" or similar credits; but excluding Section 29 Credits) which arise or are allocable to the generation, collection, production, sale, destruction or use in any process, by any Person, of Landfill Gas from the Landfill.

12.17 Lenders' Rights. Annex C is made a part hereof as if the provisions thereof were set forth in this Agreement.

**[SIGNATURE PAGE FOLLOWS]**

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their duly authorized undersigned officers as of the date first set forth above.

CRMC BETHLEHEM, LLC

By: Montauk Energy Capital, Inc., its sole member

By: John L. Smith  
Title: VP - Finance

COMMONWEALTH BETHLEHEM  
ENERGY LLC

By: \_\_\_\_\_  
Title: \_\_\_\_\_

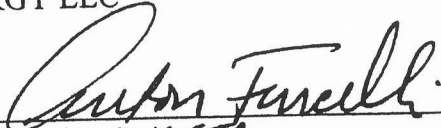
IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their duly authorized undersigned officers as of the date first set forth above.

CRMC BETHLEHEM, LLC

By: Montauk Energy Capital, Inc., its sole member

By: \_\_\_\_\_  
Title: \_\_\_\_\_

COMMONWEALTH BETHLEHEM  
ENERGY LLC

By:   
Title: MANAGER

## ATTACHMENT C

## LFG FLOW CALIBRATION

NCES Landfill, Bethlehem, New Hampshire

## Landfill Gas Flow Calculation

[illegible]

<b>NCES Landfill, Bethlehem, NH</b>						
<b>Landfill Gas Flow Measurements</b>						
<b>Field Data</b>						
Measurements by	SM	SM	TY/SM	TY/SM	TY/SM	SM
Date	27-Feb-09	3-Mar-09	8-Apr-09	27-May-09	25-Jun-09	30-Jun-09
Time	10:40 AM	12:30 PM	1:00 PM	1:00 PM	3:00 PM	9:30 AM
Drive # (LFG blower)	1 & 3	1&3	3	3	3	1
Drive Speed (1 to 10)	9.5 & 10	9&10	10	10	10	10
Drive RPM (VFD readout)	3560 & 3580					
Flares operating	Both	Both	EF	OF	OF	Both
Pre-Calibration Reading						
Meter Reading (Baker)	1,350	1,500	1,013	1,250	1,100	1,180
Post-Calibration Reading						
Meter Reading (Baker)	1,540	1,574	1,000	1,250	1,246	1,180
Ambient Temperature, F	41	29	40	43	70	61
Barometric Pressure, In Hg	30.00	30.37	29.57	29.97	28.29	29.63
Blower Inlet Temperature, F	72	72	68	68	68	78
Blower Outlet Temperature, F	118	116	90	90	100	120
Blower Inlet Pressure (SP), In H2O	-50	-52	-50	-48	-40	-46
Blower Outlet Pressure, In H2O	6.7	6.5	5.0	4.4	8.3	5.0
Velocity Pressure (dP)						
Point						
1	0.52	0.55	0.21	0.32	0.36	0.33
2	0.52	0.52	0.21	0.32	0.34	0.33
3	0.48	0.52	0.21	0.32	0.34	0.28
4	0.53	0.54	0.21	0.32	0.35	0.28
5	0.58	0.55	0.21	0.33	0.37	0.28
6	0.62	0.56	0.21	0.38	0.38	0.34
7	0.58	0.70	0.22		0.43	0.35
8			0.22		0.38	0.37
Average	0.55	0.56	0.21	0.33	0.37	0.32
LFG Composition						
Methane	34.8%	34.8%	51.5%	44.2%	46.7%	45.5%
Carbon dioxide	32.2%	30.3%	41.5%	35.8%	37.9%	38.3%
Oxygen	2.8%	3.0%	0.9%	2.0%	0.6%	1.1%
Balance	30.1%	31.4%	6.1%	18.0%	14.5%	15.3%
Molecular weight, lb/lb-mole wet	29.66	29.66	29.00	29.17	29.88	29.36

## ATTACHMENT D

FROM :

FAX NO. :

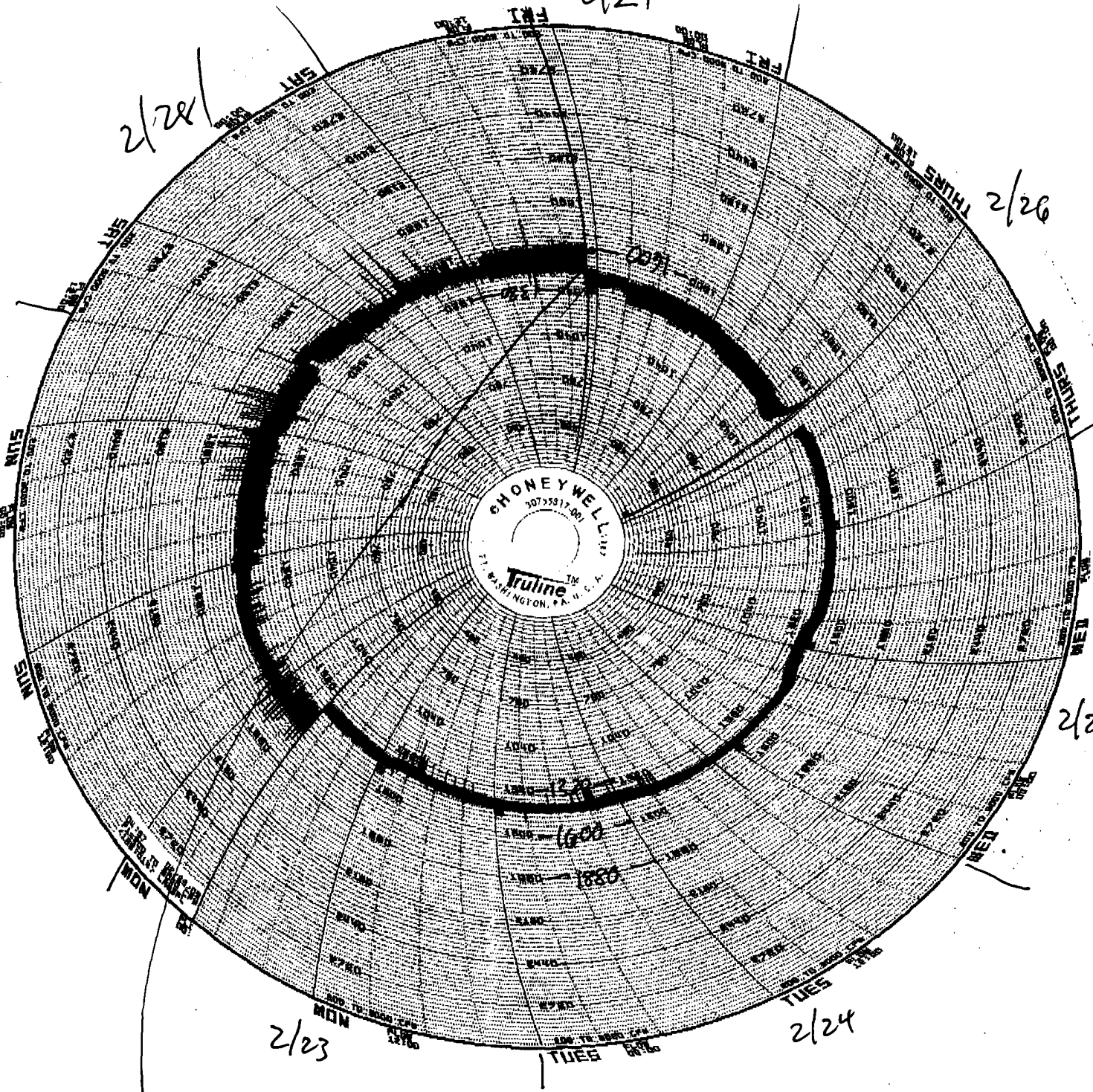
Mar. 02 2009 08:34AM P2

2/27

2/28/

2/26

3/1



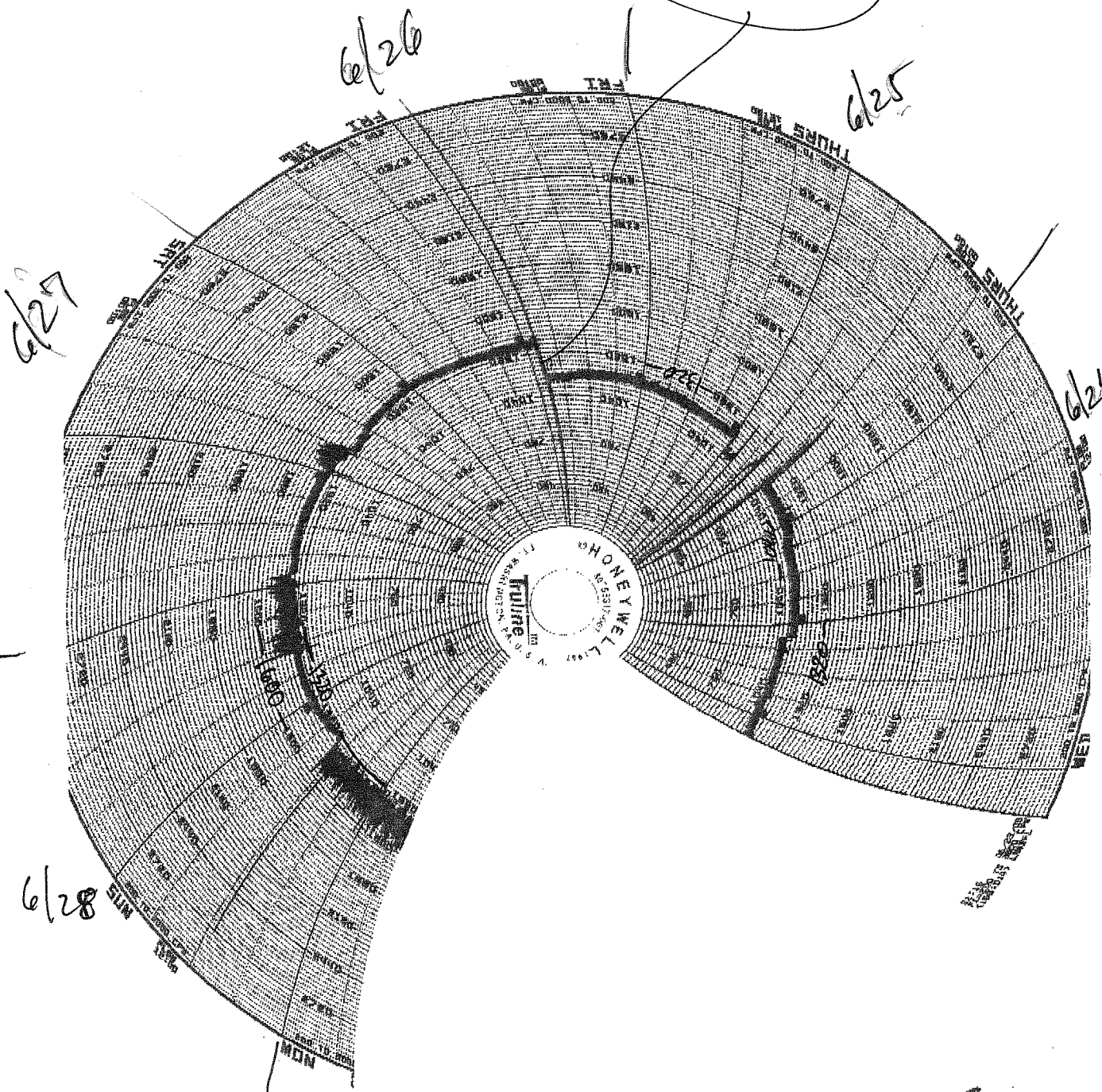
Calibration	Post	1540	14% higher
	Pre	1350	

N CES  
2/23/09



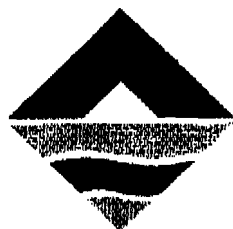
$$\frac{1350}{1160} = 1.17$$

Col. 6/24/09



NCES  
6/23/09

## ATTACHMENT E



# LANDTEC

## CERTIFICATE OF CALIBRATION

Certificate number:

GM11140\_2/1848

Date of check:

Wednesday, March 25, 2009

Product:

GEM2000Plus

Serial number:

GM11140

Calibration checked at:

77.9°F to 96.8°F

### Primary Gas Channels

Methane (CH4)		Carbon Dioxide (CO2)	
Certified Gas (%)	Reading (%)	Certified Gas (%)	Reading (%)
50.06	49.3	49.94	50.0
15.09	15.0	14.90	14.4
4.99	4.9	5.01	4.7

Oxygen (O2)	
Certified Gas (%)	Reading (%)
20.99	21.0

Additional Gas Cells		
Gas	Certified Gas (ppm)	Reading (ppm)
CO	500.0	496.0
H2S	100.0	100.2

Barometer	
Certified (mb / "/hg)	Reading (mb / "/hg)
978 / 28.89	978 / 28.89

Approved by:

(Name)

All gases are traceable to certified National Standards

(Signature)

This unit must be serviced at regular 6 monthly intervals by a Landtec approved service facility.



## Quality Control Check List

### Options

Software Version: ☒  
 Key 3 Cold Start: ☐  
 Key 8 Options: ☐  
 Service Date: ☒

### Display

Function: ☒  
 Contrast Adjustment: ☒  
 Company Name: ☒  
 'Ex' Warning Screen: ☐

### Time/Date

Current Time: ☐  
 Current Date: ☒  
 Date Format: ☒

### Display

Cal Cert Figure Check: ☒  
 Baro. Press. Reading: ☒  
 Temp Reading: ☒  
 Gas Pod Registers: ☒  
 Flow Pod Registers: ☐  
 CH4 Zero: ☒  
 Raw Values CH4 CO2: ☒

### Gas Check

O2 Air: ☒  
 O2 5%: ☒  
 O2 0%: ☒  
 0.5% CH4/CO2: ☒  
 5.0% CH4/CO2: ☒  
 15.0% CH4/CO2: ☒  
 80.0/40.0% CH4/CO2: ☒  
 (GEM Only) Balance%: ☒

Model No.: GEM-2K+

Serial No.: 11140

RA No.: 23820

Technician: dhll

Date: 3/26/2009

Repair Tech: amoreno

Time: 9:50 AM

### Transducer Check (GEM Only)

Differential Leak Test: ☒  
 Static Leak Test: ☒  
 Differential Press. Test: ☒  
 Static Pressure Test: ☒  
 Side To Side: ☐

### Memory Comms.

Store Readings: ☒  
 Reading View: ☒  
 Down Load: ☒  
 Memory Clear: ☒

### MK II Batt. & Charger

MKII Charging: ☐  
 MKII Off Current: ☐  
 MKII On Current: ☐  
 MKII Display: ☐  
 Battery Voltage Correct: ☐

Completed? ☒N/A ☐

### Physical Condition

Case: ☒  
 Membrane: ☒  
 Case Fittings: ☒  
 Case Back Fitting: ☒  
 Lemo Plug: ☒  
 Carrying Strap: ☐  
 Inlet Filter: ☒  
 Housings Secure: ☒

### Labels

Unit Label: ☒  
 Serial Number: ☒  
 Battery Warning: ☐  
 GI (UK): ☐  
 Void Labels: ☒  
 'CE' Label: ☒  
 Case Screen Printing: ☐

### Flow

Vacuum: ☒  
 Flow > 300cc: ☒  
 200cc Check: ☐  
 Flow fail Occurs: ☒  
 Affect on Baro. Press: ☐  
 Calibration Certificate: ☒

Western Region/Corporate Offices  
 850 South Via Lata, Suite 112, Colton, California 92324  
 Telephone: (909) 783-3636 Fax: (909) 825-0591  
 WWW.CES-LANDTEC.COM

## ATTACHMENT F



	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		
	First Half 2009	2,548	1,186	1,362	28,611		
A	Portion of Calendar Year						
B	Total measured quantity of methane collected from the Landfill during period.						
	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 21 tons of CO2 for each						