

Verification Report for the Development Authority of the North Country (DANC) Landfill Gas Destruction Project Rodman, New York

Climate Action Reserve Landfill Project Reporting Protocol, Version 1.0

February 2010

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



1. Introduction

This report is provided to EcoSecurities International Limited (EcoSecurities) as a deliverable of the Climate Action Reserve (CAR) project verification process. This report covers the verification of the DANC Landfill Gas Destruction Project (the Project) for the period from October 1, 2008 to September 30, 2009 at Development Authority of the North Country Solid Waste Management Facility (DANC). First Environment, Inc. (First Environment) conducted the verification from September 2009 to February 2010.

First Environment had previously verified emission reductions for the Project for registration with CAR for the reporting period from January 1, 2008 to September 30, 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 4 of this report; and
- the data reported are accurate, complete, consistent, transparent, and free of material error or omission.

3. Verification Scope

Specific scope metrics for the verification are outlined in the table below:

Geographic Boundaries	DANC Solid Waste Management Facility, Rodman, NY
Greenhouse Gases Verified	Emissions reductions (expressed in units of Carbon Dioxide equivalents (CO ₂ -e)) resulting from methane destruction; Project emissions of CO ₂ from purchased electricity and fossil fuel combustion
Reporting Period	October 1, 2008 through September 30, 2009
Data Sources	Metered Data and Emissions Reduction Calculations

4. Standards Used to Verify Emissions (Criteria)

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

Standard of Verification	California Climate Action Registry Landfill Project Reporting Protocol, Version 1.0, November 2007 (CCAR Protocol),
Verification Process	Climate Action Reserve Landfill Verification Protocol, Version 2.0, November 2008; Climate Action Reserve Project Verification Manual, June 2009
Level of Assurance	Reasonable assurance
Materiality	Misstatements greater than five percent of the Project's emission reductions assertion are considered material

5. Overview of the Verification Process

To review the Project's GHG information, the following verification process was used:

- conflict of interest review;
- selection of Audit Team;
- initial interaction and kickoff meeting with primary EcoSecurities contact;
- development of the verification plan;
- site visit;
- review and evaluation of raw data and calculations for period under review;
- follow-up interaction with EcoSecurities 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, 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. First Environment also received confirmation of COI approval from CAR in an email notification dated September 11, 2009.

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 - Michael Carim
Verifiers – Heather Moore, Ross MacWhinney
Internal Reviewer - Jay Wintergreen

Audit Kick-off

The verification audit was initiated with a kick-off meeting on September 25, 2009 with the primary EcoSecurities contact. The meeting focused on confirming the scope, schedule, and data required for verification.

Development of the Verification Plan

The team formally documented its verification plan as well as determined the data-sampling plan. The verification plan was developed based on the discussion of key elements of the verification process during the kick-off meeting. EcoSecurities was afforded the opportunity to comment on the key elements of the plan for verification. Based on items discussed and agreed upon with the EcoSecurities, the plan identified the First Environment project 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.

Site Visit

Michael Carim conducted a site visit on September 25, 2009 to assess the Project's data management systems and interview personnel relevant to the project.

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 made one corrective action and one clarification request during the verification process. EcoSecurities responded appropriately to both the corrective action and clarification request. No requests for supplemental information were necessary.

Verification Reporting

Verification reporting, represented by this report, documents the verification process and identifies its findings and results. Verification reporting consists of this report for EcoSecurities, a verification statement, and a list of findings to be submitted to the Climate Action Reserve.

6. Site's Conformance with Verification Criteria

Site Overview

The DANC Solid Waste Management Facility (DANC) is an active municipal landfill located in Rodman, New York. It started accepting waste in 1992 and by the end of 2008 had approximately 3,864,266 tons of waste in place.

DANC installed a landfill gas collection system and began flaring gas on March 28, 2001. First Environment reviewed evidence to confirm the project's start date during the verification process. Electricity generation was added in October of 2008.

The project currently consists of the gas collection where it is delivered to either of the two candlestick flares or one of the three generator sets.

In order to establish regulatory additionality and the project's eligibility under the CCAR Protocol, First Environment relied on the Attestation of Regulatory Compliance signed by the EcoSecurities, provided in Attachment A. Additionally, First Environment reviewed evidence of the site's NMOC emission rate during the verification process to confirm that the landfill is not subject to NSPS regulations requiring it to collect and combust landfill gas. The site's permit from the New York State Department of Environmental Conservation Part 360 permit was also reviewed to confirm regulatory compliance. The cursory review of permits showed that the site was in compliance and no violations of permits occurred during the reporting period.

First Environment confirmed that EcoSecurities owns rights to emission reductions credits to be registered with CAR through a review of the voluntary emission reductions purchase agreement executed between DANC and EcoSecurities. First Environment also relied upon the Attestation of Title completed by EcoSecurities, provided in Attachment B.

Data Collection and Monitoring Processes

The Audit Team discussed the following topics with site staff during the verification site visit in September 2009:

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

Information gathered during these discussions was used to assess the Project's information system and its controls for sources of potential errors and omissions.

Total landfill gas flow sent to each flare and the gen sets is monitored continuously by three Veris Verabar V100 flow meters. All gas monitoring equipment is sufficiently placed to ensure laminar flow at the points of measurement. A SCADA system compiles two-second data information into a database for both gas flow and flare temperature. The site's Environmental Coordinator exports data in roughly 11-minute intervals from the SCADA system to a *.DAT file format on a monthly basis. The Environmental Coordinator conducts quality checks and transfers data files to EcoSecurities each month. Data recorded by the SCADA system is then aggregated into weekly flow totals by EcoSecurities.

Veris Verabar V100 flow meter instruments are calibrated by the manufacturer prior to delivery. All flow meters were also inspected and calibrated on a quarterly basis by a third party during the reporting period and found to be operating properly.

Methane content is measured on a weekly basis using one of two portable gas analyzers owned by DANC. Site personnel manually record the methane content measured at the header pipe prior to gas being diverted to either the gen sets or flares. During the verification process, First Environment reviewed evidence to confirm that the methane measurement procedure includes calibration of the gas analyzer against a reference gas of known concentration prior to each week's readings. Additionally, First Environment reviewed evidence of twice-annual calibrations by the manufacturer in both gas analyzers. Calibration procedures for the gas analyzers are consistent with the requirements of the CAR protocol.

Project emissions for DANC consisted of indirect emissions of CO₂ from electricity consumption and direct emissions of CO₂ from diesel and propane combustion. Activity data is obtained from utility invoices, fuel purchase records, and equipment operating run-time.

Emissions Reduction Calculation Assessment

As part of the emissions reduction calculation assessment, the Project's assumptions and calculations were reviewed. The Project used justifiable assumptions when defining the baseline scenario as the partial or total release of LFG to the atmosphere.

The emission reduction calculations, summarized in Attachment C, 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 CCAR Protocol.

In accordance with the CCAR Protocol, a 10 percent discount is applied to the emission reduction calculations because the site employs weekly methane monitoring, and a 10 percent oxidation factor was applied to account for methane oxidation in the cover soil. A 96 percent destruction efficiency is assigned to the project's two open flares; a 93.6 percent destruction efficiency is assigned to the project's three generation engines. All destruction efficiencies are applied accordingly in emission reduction calculations. Although open flares are considered an ineligible combustion device under Version 1.0 of the CCAR Protocol, a variance allowing the Project to employ an open flare was granted by CAR. Evidence of approval of this variance is provided in Attachment D

The amount of methane destroyed was calculated from metered data for landfill gas collected. Totalized flow was calculated from data obtained in approximately 11-minute intervals from the SCADA system, which continuously records the LFG flared, the LFG combusted in the power plant, and the presence of flare flame. Total flow in a given interval was computed by multiplying the flow rate by the length of the interval.

The fraction of methane in landfill gas during a given interval was determined by averaging the two nearest weekly gas quality measurements taken before and after that interval. This volume is converted to a mass flow using the density of methane at 60°F and one atmosphere of pressure. Total volume of gas flow during a given interval metered by the Veris flow meter was corrected from a temperature of 59°F and one atmosphere of pressure to 60°F and one atmosphere of pressure. The total volume of methane destroyed by the Project is computed in weekly intervals.

Project emissions were subtracted from total volume of methane destroyed. Project emissions were calculated by multiplying activity data by an appropriate emission factor.

For data control and quality purposes, any measurements when flare temperature was recorded below 200°F or gas flow rate fell below 197 standard cubic feet per minute for the 10-inch flare or 72 standard cubic feet per minute for the 6-inch flare were excluded from emission reduction calculations. Additional quality assurance checks were performed to ensure that emission reductions were not claimed during periods where the thermocouple temperature reading was stuck on a constant temperature.

Copies of the raw data used in the calculations, including flow data, methane content data, and utility and other fossil fuel invoices, were compared with the data used in the final calculations and tested for transcription or mathematical errors. All raw data sources and calculations over the entire verification period were reviewed. First Environment performed recalculations of emission reductions for the entire reporting period to assess whether they were free of material misstatement.

7. Audit Results

EcoSecurities provided good documentation for its emissions estimates, as well as its procedures surrounding the data collection process. The verification process focused on verifying the data and quantification methodology that was used by EcoSecurities to calculate the emissions reductions, as shown on the spreadsheets in Attachment D.

To complete the verification process, First Environment requested one corrective action and additional clarification for one item. The responses given by EcoSecurities were sufficient to resolve the issues raised by the Audit Team.

Verified results show 42,396 metric tonnes of CO₂e from Vintage 2008 from the project period of October 1, 2008 to December 31, 2008 and 111,901 metric tonnes of CO₂e from Vintage 2009 from the project period of January 1, 2009 to September 30, 2009 are eligible for registration with the Climate Action Reserve.

8. Verification Conclusion

Based on the assessments performed and the evidence collected, First Environment concludes that the Project GHG emissions reductions, due to the capture and combustion of methane gas for the period of October 1, 2008 to September 30, 2009, can be considered with a reasonable level of assurance:

- consistent with the Project Methodology,
- without material discrepancy, and
- meeting the minimum level of accuracy of at least 95 percent.

Verified results show:

Reporting Period: October 1, 2008 to December 31, 2008	Total
Baseline Emissions (tCO ₂ e)	42,428
Project Emissions (tCO ₂ e)	32
Emissions Reductions (tCO ₂ e)	42,396

Reporting Period: January 1, 2009 to September 30, 2009	Total
Baseline Emissions (tCO ₂ e)	111,989
Project Emissions (tCO ₂ e)	88
Emissions Reductions (tCO ₂ e)	111,901

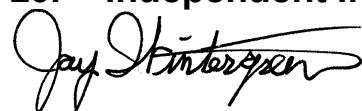
*as measured and calculated in accordance with the Project Methodology

9. Lead Verifier Signature



Michael Carim
Associate

10. Independent Internal Review Signature



James T. Wintergreen
Senior Associate

ATTACHMENT A

Project Developer's Regulatory Attestation

Reference is made to the Terms of Use (the "Terms of Use") by and between [EcoSecurities International Ltd.], a [carbon development co.] (the "Project Developer"), and the Climate Action Reserve, a California nonprofit public benefit corporation (the "Reserve"), with respect to [DANC Landfill Gas Destruction Project] (the "Project") located at [23400 NYS Route 177, Rodman, NY] the "Property"). The undersigned, [PJ BROWNE], in [his/her] capacity as an officer of the Project Developer, in the name and on behalf of the Project Developer, hereby attests, certifies, represents and warrants to the Reserve, as of the date set forth below, and for the reporting period October, 1st 2008 (beginning Month, Day, Year) to September, 30th 2009 (ending Month, Day, Year) as follows:

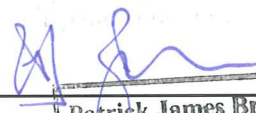
1. The Project was implemented and established voluntarily and, at all times thereafter, has been operated and conducted voluntarily. None of such implementation, establishment, operation or conduct of the Project are or at any time have been required by any law, statute, rule, regulation, ordinance, court order, governmental agency action, enforcement action, or other legally binding mandate, including without limitation any of the foregoing issued, enacted or otherwise rendered effective by any federal, state, local or foreign governmental or regulatory agency, commission, department, board, court or other authority having jurisdiction over the Project ("Law").
2. Except as otherwise expressly permitted under the protocol developed by the Reserve that applies to the Project, the Project was not established or implemented and has not at any time been operated or conducted in anticipation of, or to avoid or satisfy the anticipated requirements of, any Law that would require or would have required the Project Developer to use the Property in the manner contemplated by the Project.
3. The Project is in material compliance with all Laws.
4. The Project Developer has disclosed to the Project Verifiers in writing any and all instances of non-compliance of the Project with any Law. For purposes hereof, "Project Verifiers" shall mean any and all third party verifiers approved by the Reserve and assigned to the Project.
5. The undersigned is the duly elected, qualified and acting [DIRECTOR] of the Project Developer and is authorized to execute and deliver this Attestation in the name and on behalf of the Project Developer, thereby rendering this Attestation binding on the Project Developer.

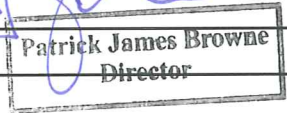
The Project Developer recognizes, acknowledges and agrees that (i) this Attestation may be relied upon by the Reserve and/or any user of the Climate Action Reserve program of the Reserve (the "Program"), and each of their successors and assigns (including, without limitation, reliance in connection with the issuance and transfer of CRTs (as defined in the Terms of Use) in respect of the Project); (ii) the statements set forth in paragraphs 1 through 5 hereof shall, for all purposes of the Terms of Use, be deemed to be additional representations and warranties made thereunder by the Project Developer to the Program; (iii) in the event of any breach of any of any paragraphs 1 through 5 hereof, the Reserve shall be entitled to pursue any rights and remedies available at law or in equity (including, without limitation, rights to indemnification pursuant to the Terms of Use) in any court of competent jurisdiction; and (iv) if at any time the Reserve determines, in its sole discretion, that any such breach has occurred, the Reserve shall have the right to immediately close the Project Developer's account on the Program.

[Signatures on Next Page]

IN WITNESS WHEREOF, the undersigned, in the name and on behalf of the Project Developer, has executed this Attestation this [11th] day of [FEBRUARY], 20[10].

PROJECT DEVELOPER¹

By: 

Name: 

Title:

Address: 40 DAWSON ST, DUBLIN 2, IRELAND

¹ If the Project Developer is a corporation, partnership or other legal entity, this Attestation must be executed by an officer of the Project Developer. If the Project Developer is an individual, this Attestation must be executed by the individual and revised accordingly.

ATTACHMENT B

Project Developer's Attestation of Title

The undersigned, on behalf of EcoSecurities International Limited, (the "Project Developer"), represents and warrants to the Climate Action Reserve (the "Reserve"), as of the date set forth below, and throughout the period during which the Climate Reserve Tonnes ("CRTs") related to DANC Landfill Gas Destruction Project (the "Project") are posted on the Climate Action Reserve program of the Reserve (the "Program") that:

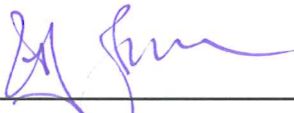
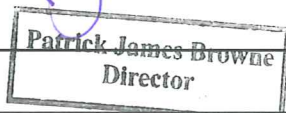
1. it is the owner of full, unencumbered legal and beneficial title to CRTs registered in its name;
2. it has the right to sell and shall convey good title to the CRTs and will transfer the CRTs to a buyer via the Program only;
3. it agrees that all emission reductions related to the Project that are submitted for registration on the Program will be independently verified by a Reserve accredited third party verification body ("Verifier"), and will meet all the Reserve's requirements and protocols;
4. it has not made or provided knowingly false, fraudulent or misleading statements or information to the Verifier or the Reserve;
5. the Project has not been implemented and maintained as the result of any law, statute, regulation, court order, or other preexisting legally binding mandate;
6. for all vintage years that the Project is registered with the Program by the Project Developer, any CRTs issued by the Reserve for the Project, or the greenhouse gas emission reductions or removals associated with the CRTs issued for the Project, have not been, nor will be, registered with or claimed by other registries or under a different project title or location or previously sold to any third party prior to registration with the Program; and
7. for all vintage years that the Project is registered with the Program by the Project Developer, it has not, and will not in the future, retire, sell, claim, represent elsewhere, or use to satisfy obligations outside of the Program any of the CRTs issued by the Reserve for the Project or the greenhouse gas emission reductions or removals associated with the CRTs issued for the Project that would create the relevant CRTs unless retired through the Program for that purpose.

The following attestations apply to projects that: (a) have previously been registered with other registries, registry entities or similar systems; or (b) have generated emission reductions that were previously sold to a third party:

8. it will complete and sign the Project Transfer Form.
9. it agrees that the Project and all emission reductions must be verified by a Verifier per the relevant Reserve project protocol in order to be registered on the Program.

I declare that all statements contained herein are true and correct, to the best of my knowledge, and are made with full knowledge that the Reserve and all users of the Reserve rely upon the truth of the statements contained in this attestation. I am authorized to make this declaration on behalf of Project Developer. I understand and acknowledge that if any of the above representations made by or on behalf of the Project Developer in or pursuant to this Attestation of Title is false in any material respect when made or deemed repeated upon the making of each request for the CRTs to be issued for the Project or posted on the Reserve, Project Developer may be subject to penalties and potential indemnification damages under the Terms of Use, and that the Reserve would have the right to close Project Developer's account on the Reserve.

PROJECT DEVELOPER¹

Signature: 
Name: 
Title: _____
Address: 40 Dawson St, Dublin 2, Ireland
Date: 01/02/2010

¹ If Project Developer is a corporation, partnership or other legal entity, this Consent must be executed by a company officer of the Project Developer. If Project Developer is an individual, this Consent must be executed by the individual.

ATTACHMENT C

Equation 1: Project GHG Emission Reductions			Data Source
CH ₄ DEST _{PR}	9,078	tCH ₄ /yr	From Equation 2
GWP	21	-	IPCC
OX	0.90	%	Partially capped
Radius of Influence (EROI _{discount})	0	ft ³ CH ₄ /ft ³ LFG	No pre-existing collection
Discount Factor (DF)	0.9	-	Weekly methane reading
Fossil Fuel Emissions (FFCO ₂)	15.9	tCO ₂ /yr	Diesel & Propane
Total Fossil Fuel Consumed (FF _{diesel})	1,417	gal	Diesel generator
Fuel Emission Factor (EF _{diesel})	10.15	kgCO ₂ /gal	GRP V. 3.1, Appendix C, Table C.3
Total Fossil Fuel Consumed (FF _{propane})	266	gal	Propane pilot
Fuel Emission Factor (EF _{propane})	5.74	kgCO ₂ /gal	GRP V. 3.1, Appendix C, Table C.3
Electricity Emissions (ELCO ₂)	104.4	tCO ₂ /yr	Calculated from C13 and C14
Annual Electricity Consumption (EL _{PR})	319	MWh	Invoices
Emission Factor for Electricity (EF _{EL})	0.327	tCO ₂ /MWh	eGRID2007 v1.1: NYUP
Emission Reductions (ER_Y)	154,297	tCO ₂ e/yr	Calculated

Equation 2: Total Annual Methane Emissions Destroyed			Data Source
Flare			
Total Quantity of Gas (LFG _{flare})	165,456,146	ft ³	Continuous Monitoring
Ave Methane Fraction (PR _{CH4})	52.42%	ft ³ CH ₄ /ft ³ LFG	Continuous Monitoring
Density of Methane (D _{CH4})	0.000019	tCH ₄ /ft ³ CH ₄	CAR Protocol, V.2
Destruction Efficiency (DE)	0.96	%	CAR Protocol, V.2
Incomplete Combustion (FF _{CH4})	0	tCH ₄ /yr	N/A
CH₄DEST_{flare}	1,599	tCH₄/yr	Calculated
Electricity			
Total Quantity of Gas (LFG _{electricity})	786,770,406	ft ³	N/A
Ave Methane Fraction (PR _{CH4})	52.88%	ft ³ CH ₄ /ft ³ LFG	Weekly Monitoring
Default Destruction Efficiency (DE)	0.936	%	N/A
CH₄DEST_{electricity}	7,479	tCH₄/yr	Calculated
Thermal			
Total Quantity of Gas (LFG _{thermal})	0	ft ³	N/A
Destruction Efficiency (DE)	0.98	%	N/A
CH₄DEST_{thermal}	0	tCH₄/yr	Calculated
Pipeline			
Total Quantity of Gas (LFG _{upgrade})	0	ft ³	Continuous Monitoring
Destruction Efficiency (DE)	0.98	%	CCAR Protocol, V.2
CH₄DEST_{pipeline}	0	tCH₄/yr	Calculated
Total Project			
CH ₄ DEST _{flare}	1,599	tCH ₄ /yr	Calculated
CH ₄ DEST _{electricity}	7,479	tCH ₄ /yr	Calculated
CH ₄ DEST _{thermal}	0	tCH ₄ /yr	Calculated
CH ₄ DEST _{pipeline}	0	tCH ₄ /yr	Calculated
CH₄DEST_{PR}	9,078	tCH₄/yr	Calculated

Equation 2a: Emissions from Incomplete Combustion of Natural Gas			Data Source
Natural Gas Combusted (FF_x)	N/A	ft^3/yr	N/A
Ave Methane Fraction (FF_{GCH_4})	N/A	$\text{ft}^3 \text{CH}_4/\text{ft}^3 \text{FPG}$	N/A
Density of Methane (D_{CH_4})	N/A	$\text{tCH}_4/\text{ft}^3 \text{CH}_4$	N/A
Methane Destruction Efficiency (DE_x)	N/A	%	N/A
Incomplete Combustion (FF_{CH_4})	0	tCH_4/yr	Calculated

Equation 3: Adjustment for Overlap of LFG Collection Well Effective Radius of Influence			Data Source
Pre Project LFG (LFG_{OR1})	N/A	ft^3/yr	N/A
Pre Project Methane Fraction ($OR1_{CH_4}$)	N/A	$\text{ft}^3 \text{CH}_4/\text{ft}^3 \text{LFG}$	N/A
Density of Methane (D_{CH_4})	N/A	$\text{tCH}_4/\text{ft}^3 \text{CH}_4$	N/A
Post Project LFG (LFG_{OR2})	N/A	ft^3/yr	N/A
Post Project Methane Fraction ($OR2_{CH_4}$)	N/A	$\text{ft}^3 \text{CH}_4/\text{ft}^3 \text{LFG}$	N/A
Overlap Adjustment (ERO_{discount})	0	$\text{ft}^3 \text{CH}_4/\text{ft}^3 \text{LFG}$	Calculated

ATTACHMENT D



Variance Approval

The California Climate Action Registry (California Registry) received a request for variance in September 2008 for the Development Authority of North County (DANC) Landfill Gas Destruction Project and the Granger Decatur Landfill Gas Destruction Project. The two landfill projects are using Version 1 of the Landfill Project Reporting Protocol (Landfill Protocol) which does not allow for the use of open flares in the project activity. At the time of the variance request the California Registry was in the process of updating the Landfill Protocol to allow for the use of open flares with a default methane destruction efficiency of 96%.

The California Registry granted a variance for the DANC and Granger Decatur Landfill Gas Destruction Projects allowing for the use of open flares under Version 1 of the Landfill Protocol with the application of a 96% destruction efficiency, contingent on the adoption of this project activity under Version 2 of the Landfill Protocol.

The California Registry board of directors adopted Version 2 of the Landfill Protocol in November 2008. The use of open flares with a default methane destruction efficiency of 96% is allowed for in Version 2 of the Landfill Protocol. The California Registry approved the variance for the DANC and Granger Decatur Landfill Gas Destruction Projects in December 2008.

Signed:

Derek Markolf
Senior Policy Manager, California Registry

Date: December 18, 2008

