



DET NORSKE VERITAS

Verification Report Gaston County Landfill Gas Destruction Project

Verification Period:

December 4, 2008 to July 31, 2009

Submitted to the Climate Action Reserve

November 11, 2009

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1. INTRODUCTION

Det Norske Veritas Certification, Inc. (DNV) has been contracted by EcoSecurities International Ltd. to verify the Gaston County Landfill Gas Destruction Project (Gaston Project) according to the standards of the Climate Action Reserve (the Reserve) Landfill Project Reporting Protocol – Collecting and Destroying Methane from Landfills, Version, 2.0 (CAR LFPRP 2.0) for the verification period of December 4, 2008 to July 31, 2009.

1.1 Verification Objective

As specified in the CAR LFPRP 2.0, prior to issuance of Climate Reserve Tonnes (CRTs) the Reserve requires third-party verification of all carbon offset projects. CRTs are issued by the Reserve upon approval of the Verification Report and Verification Opinion submitted by the verification body, attesting to the accuracy of the emission reductions.

DNV is accredited by the Reserve as a third-party verification body qualified to provide independent verification of greenhouse gas (GHG) emission reduction projects producing emission reductions through the collection and destruction of methane generated by landfills. As an accredited body, DNV conducted an independent assessment of EcoSecurities' GHG attestation using defined verification criteria of the Reserve Landfill Project Verification Protocol, Version 2.0. (CAR LFPVP 2.0)

In accordance with the standards of the CAR LFPVP 2.0, DNV's primary role as the verifier of the Gaston Project is to ensure that:

- data employed to estimate baseline and project GHG emissions are accurate;
- the supporting information used to substantiate GHG estimates meets the eligibility requirements of the CAR LFPRP 2.0;
- emission reduction estimates (CRTs) adhere to the 5% materiality threshold; and
- the Gaston Project satisfies the performance standard and regulatory tests of additionality.

As an accredited verification body, qualified DNV personnel must complete the four core verification activities contained in the CAR LFPVP 2.0. These include determining project eligibility, identifying emission sources, reviewing GHG management systems as well as estimation methodologies, and verifying emission estimates.

1.2 Verification Team and Roles

Between August 15th and September 30th, 2009, DNV's five-person verification team completed the core verification activities for the Gaston Project. The verification team and the corresponding roles of each individual are listed in Table 1.

Table 1: DNV Verification Team

Team Member	Role
David DeVooght	Lead Verifier
Weidong Yang	Senior Internal Reviewer
Dr. John Warmerdam	Technical Expert

Team Member	Role
Richard Bratcher	Senior Corporate Reviewer
Barbara Toole O'Neil	Corporate Quality Assurance Reviewer

2. PROJECT INFORMATION

2.1 Landfill Description

Gaston County Landfill (GCL), the site of the emission reduction project, is located at 3155 Philadelphia Church Rd., Dallas, Gaston County, North Carolina. Since opening in 1986, GCL receives municipal solid waste (MSW), and construction and debris waste at a rate of approximately 108,168 tons per year. As of July 1, 2008 the total waste in place was 2,229,500 tons. The total site design capacity for GCL is 6,129,300 tons and the current permitted design capacity is 2,380,700 tons /7/. The GCL has an active recycling center and administrative offices on site.

GCL is owned and operated by the Gaston County Department of Public Works (GCDPW). The facility covers 130.5 acres and consists of three primary waste storage units /3/. Areas C & D are unlined, partially closed cells. They are currently permitted to receive construction and debris waste /4/. Units I and II are actively receiving MSW and construction and debris waste for Gaston County. Units I and II are each fully lined with leachate recovery systems and leachate storage.

2.2 Project Activities and Implementation

Upon closure of Areas C & D in 1998, a passive gas venting system consisting of nine wells was installed along the northeastern side of the unit to vent landfill gas (LFG) to the atmosphere. Until 2008, LFG infrastructure operating at the GCL was limited to this system. In 2008, the GCDPW began implementation of a two-phase LFG capture and combustion system, referred to in this report as the Gaston Project. Currently, the Gaston Project consists of sixty-one LFG capture wells, gas piping for transporting the captured LFG, and an open type utility flare used to combust the methane in the LFG.

Phase 1 of the Gaston Project:

In an effort to determine the potential of the GCL to generate carbon credits from LFG capture and combustion, GCDPW personnel began testing and monitoring of LFG flow and concentration at the nine passive wells in 2008. Data gathered from this exercise were used to determine potential LFG production capacity at the site and the optimal placement of LFG capture wells in Phase 2 of the project activities.

Phase 2 of the Gaston Project:

In the fall of 2008, the nine existing passive vents were converted to capture LFG and forty-six new LFG capture wells were installed in Areas C & D. Additionally, six LFG capture wells were installed in the Unit I area. During the same time period, the GCDPW purchased and installed a portable flare skid, consisting of a condensate knockout pot, a blower, LFG flow and content measuring equipment, a flame arrestor, and an 8" Perennial Stand Alone Flare Stack for LFG destruction (Table 2) /23/.

LFG collected from the fifty-five wells in Areas C & D is transported via 6" and 8" pipes into a main 12" pipe that feeds into the portable flare skid. LFG collected from the six remaining wells is transported to the same 12" main pipe via a 12" pipe circling the perimeter of Unit I that also functions as a leachate recovery system.

The Project became fully operational on December 4, 2008, combusting the continuous flow of LFG from the sixty-one wells installed on the project site.

Table 2: LFG Destruction Devices

Specifications	Descriptions	Means of Verification (MOV) and Reference Document(s)
Model	PEI Landfill Gas Candlestick Flare	Manufacturer specifications /23/.
Invoice number	EPS-GC-073008-1	Product was purchased used /12/.
Maintenance procedures	No scheduled maintenance procedures needed	Site visit interviews confirmed there is no need for routine maintenance.
Quantity of CH ₄ sent to device	2,220 tonnes	Emission reduction calculations and maintenance logbooks /2/ /25/.
CH ₄ destruction efficiency	96%	CAR LFPRP 2.0.
Use of supplemental NG or propane	37.5 gallons	Fuel invoice for propane /24/.
Hours of operation	hours	Hours of operation are monitored by LFG monitor

2.3 Project Parameters

Project Owner – The GCL and the Gaston Project capture, combustion, and monitoring equipment are owned and operated by the GCDPW

Project Developer – EcoSecurities and the GCDPW have entered into a verified emission reduction purchase agreement for the verification period of December 4, 2008 to July 31, 2009. Gaston County has agreed to “transfer, with full legal and beneficial title guarantee, to EcoSecurities International Ltd.” all emission reductions generated from the GCL /1/. EcoSecurities wholly owns CRTs generated through the Gaston Project activities and is, therefore, the project developer.

Verification Period – December 4, 2008 to July 31, 2009.

3. VERIFICATION ACTIVITIES

The CAR LFPVP 2.0 verification process requires:

- project eligibility determination;
- identification of emission sources; and
- review of GHG management systems and estimation methodologies.

The individual tasks required to meet the Reserve requirements and complete the verification are shown in Table 3.

Table 3: Verification Tasks and Completion Dates

Task	Task Description	Completion Date
1	Conflict of Interest form approved by the Reserve	August 17, 2009
2	Verification kick-off meeting	August 20, 2009
3	Desk review	August 25 – 26, 2009
4	Site visit	August 27, 2009
5	Quality assurance review	September 17, 2009
6	Submission of verification report to EcoSecurities	October 6, 2009
7	Verification opinion uploaded to CAR project site	October 23, 2009

3.1 Desk Review

During the desk review phase of verification, DNV reviewed and assessed the following documents provided by EcoSecurities: the monitoring plan /5/; the project description /7/; emission reduction estimate spreadsheet /2/; proof of title for emission reductions /1/; operating permits /4/ and /6/; LFG capture well design /3/; and the project site design /8/. From the initial document assessment, DNV identified areas posing the greatest risk for material misstatements in estimating emission reductions. Additionally, DNV prepared and submitted to EcoSecurities a detailed site visit agenda and a list of follow-up items identified during the initial assessment of the Gaston Project against the requirements of the CAR LFPRP 2.0.

3.2 Site Visit

On August 27, 2009 the DNV lead verifier met with EcoSecurities, GCDPW, and Olver Incorporated (outside consultant) personnel at the Gaston Project site (GLC) in Dallas, North Carolina. DNV conducted a tour of Areas C & D and the portable blower flare skid area. While touring the facility, personnel responsible for system operation provided a detailed description of LFG capture and combustion equipment, and demonstrated LFG flow and CH₄ concentration monitoring procedures.

Additionally, while on site the DNV lead verifier:

- interviewed personnel responsible for monitoring LFG flow and CH₄ concentration, environmental compliance and emission reductions estimates (Table 10);
- reviewed and collected operation permits, calibration certificates, and other supporting documentation; and
- reviewed and discussed quality assurance and quality control procedures related to the operation of the LFG collection and combustion systems. This included a review of the logbooks employed by GCDPW personnel to record daily monitoring and maintenance procedures.

4. PROJECT ELIGIBILITY

The CAR Landfill Protocol establishes that a project must satisfy three eligibility rules to meet the definition of a GHG emission reduction project. DNV can confirm the Gaston Project is in conformance with these three eligibility requirements for the verification period of December 4, 2008 to July 31, 2009.

4.2 Eligibility Rule I – Project Location

On August 27, 2009, a qualified DNV lead verifier conducted a site visit at the GCL in Dallas, North Carolina. DNV can confirm that the GCL visited on August 27, 2009 is the site of the “Gaston County Landfill Gas Destruction Project” seeking registration of emission reductions in the Reserve.

4.3 Eligibility Rule II – Project Operation Start Date

Landfill methane capture and destruction projects that began operating on or after January 1, 2001 are eligible as a GHG emission reduction project in the Reserve. The start date is defined as the date a qualifying destruction device becomes operational.

Logbooks reviewed on-site indicate for the month of November, 2008 and the first week of December, 2008, the flare (destruction device) was operating intermittently, with sporadic LFG flow data. Under the requirements of the CAR LFPRP 2.0, the Gaston Project's start date is November 18, 2008, the first day the flare became operational.

DNV, through the review of air permits /6/ /14/ and logbooks /25/, verified that the Gaston Project became fully operational after January 1, 2001 and is, therefore, in conformance with Project Eligibility Rule II of the CAR LFPRP 2.0.

4.4 Eligibility Rule III – Additionality

The CAR LFPRP 2.0 requires GHG emission reduction projects to pass a two-tiered additionality test, consisting of a Performance Standard Test and a Regulatory Test. DNV verified that the Gaston Project is additional and in conformance with Project Eligibility Rule III.

Performance Standard Test:

Eligible GHG reduction projects must meet the program-wide performance threshold or Performance Standard Test. DNV verified that the Gaston Project passes this test under Scenario 1, in that, prior to implementation of the current LFG capture and destruction system, GCL was not collecting and destroying LFG /6/ /14/.

Regulatory Test:

1. GCL is subject to New Source Performance Standards (NSPS) for uncontrolled release of non-methane organic compounds (NMOC). Based upon the results of the 2008 Tier II Report /26/, the estimated NMOC emission rate for GCL is 32.2 Mg per year. Under the NSPS, the threshold NMOC release rate requiring the installation of a LFG management system is set at 50 Mg/year.

DNV has reviewed the Tier II Report and concluded the estimated NMOC emission rate for the GCL is below the threshold level requiring the installation of an LFG management system.

2. For the verification period, the GCL is not mandated under compliance obligations to install an LFG capture and destruction system, as confirmed by the

EcoSecurities Attestation of Regulatory Compliance /21/ submitted to the Reserve and the GCL Permit to Operate /4/.

3. Submitted records indicate that the Gaston Project is in compliance with all applicable state and local environmental regulations /4/ /6/ /14/.
4. All provided permits were reviewed. The permits are current as noted above. In addition the EPA Enforcement Compliance History Online (ECHO) database was reviewed. The site has not had any enforcement actions in the last five years /32/.

4.5 Project Monitoring and GHG Management Systems

DNV personnel reviewed the monitoring plan /5/ and the CRT monitoring report /22/ for the verification period, and verified that the Gaston Project monitoring mechanisms and GHG management systems are in conformance with the CAR LFPRP 2.0 requirements. The Gaston Project's monitoring of continuous data is fully electronic and free of material misstatements. All monitoring equipment for the verification period has been calibrated to manufacturer specifications and meets the calibration requirements of the Reserve.

GHG monitoring systems are fully automated with manual backup, in the form of logbooks /25/. Staff responsible for maintaining the GHG monitoring systems have been trained to operate monitoring equipment and record the results in manual and electronic form. Staff roles and procedures are fully documented in the monitoring manual /5/.

4.5.1 Operation of the Flare

The flame temperature is monitored through the use of a thermocouple encased in the flare wind shield /23/. For the verification period, when flame temperature fell below 200°F during a time interval, the data for that time period was not included in the total flow. /2/.

DNV verified that the monitoring mechanism for the operation of the flare is in accordance with Reserve requirements.

4.5.2 LFG Monitoring

The Gaston Project measures LFG flow to the flare through the use of a thermal mass flow meter. Positioned within an 8" pipe located on the mobile flare unit skid, the thermal mass flow meter continuously measures the flow of LFG to the destruction device from all sixty-one wells. The meter operates using a constant temperature system that employs two RTD sensors: one for sensing temperature and one for sensing flow /15/. The calibrated LFG flow monitoring range for the thermal mass flow meter for an 8" pipe is between 0 (minimum) standard cubic feet per minute (SCFM) to 1000 SCFM (maximum) /16/.

For the verification period, the project owners calibrated the device three times. The first calibration was a factory calibration completed two days prior to installation /16/. The second /17/ and third /18/ calibrations occurred in the first and second quarters, respectively.

DNV verified that the LFG monitoring equipment for the Gaston Project is in conformance with Reserve requirements for monitoring frequency and calibration procedures (see Table 4).

Table 4: LFG Continuous Monitoring Device

LFG Monitoring Equipment	Value	Means of Verification
Manufacturer	Thermal Instrument Company	Calibration certificate /16/.
Model	62-9/9500	Calibration certificate /16/.
Serial	2007273	Calibration certificate /16/.
Calibration frequency	Quarterly	1. 12/02/2008 /16/. 2. 04/22/2009 /17/. 3. 06/09/2009 /18/.
Monitoring frequency	Continuous	Manufacturer specifications /11/ and emission reduction estimates /1/.
Discount factor (portable analyzers only)	N/A	N/A
Temperature of LFG	N/A	Manufacturer specifications-equipment is a thermal mass flow meter that directly measures the mass flow of gas /11/.

4.5.3 CH₄ Monitoring

The CH₄ concentration of LFG entering the destruction device for the verification period was measured through the use of a portable gas analyzer and a continuous gas analyzer.

Due to equipment failure of the continuous gas analyzer, the Landtec Gem2000 portable gas analyzer was used to monitor CH₄ concentration between December 4, 2008 and February 8, 2009. Measurements were taken twice daily at a port located on the mobile flare skid. During the site visit, GCDPW personnel demonstrated the use of the Landtec Gem2000 portable gas analyzer for measuring CH₄ and LFG flow to the mobile flare destruction unit.

Starting February 9, 2009, the Gaston Project began using the Siemens Ultramat 23 Continuous Gas Analyzer to measure CH₄ content of the LFG entering the flare. The Ultramat 23 is a continuous gas analyzer capable of measuring four gas components at once. See Figure 2 in the Gaston Monitoring Manual for graphical illustration of the location of the Siemens Ultramat 23 on the flare skid /5/.

DNV verified that the portable gas analyzer and continuous gas analyzer were calibrated and operated in accordance with manufacturer specifications. Furthermore, DNV

verified these procedures meet the requirements of the CAR LFPRP 2.0. (see Table 5 and 6)

Table 5: Portable CH₄ Monitoring Equipment

CH₄ Monitoring Equipment		Means of Verification
Manufacturer	Landtec	Calibration certificate /13/.
Model	GEM2000	Calibration certificate /13/.
Serial	GM11459	Calibration certificate /13/.
Calibration frequency	1. Weekly field calibration 2. Semi-annual factory calibration	1. Daily logbooks /25/. 2. 09/11/2008 3. 02/11/2009 /13/.
Monitoring frequency	Twice daily	On-site log books /13/.
Discount factor (portable analyzers only)	0.10	Emission reduction estimates /2/.

Table 6: Continuous CH₄ Monitoring Equipment

CH₄ Monitoring Equipment		Means of Verification
Manufacturer	Siemens	Calibration certificate /19/.
Model	Ultramat 23	Calibration certificate /19/.
Serial	W9-177	Calibration certificate /19/.
Calibration frequency	Quarterly	1. 12/11/2008 /19/.* 2. 06/09/2009 /20/.
Monitoring frequency	Continuous	Manufacturer specifications /11/.
Discount factor (portable analyzers only)	N/A	N/A

* Equipment purchased, stored in December, 2008. Installed onsite on February 8, 2009

4.5.4 GHG Management Systems

DNV has reviewed the Gaston Project's GHG management systems and verified that that these systems conform to CAR LFPRP 2.0 requirements.

For the verification period, as required by the CAR LFPRP, the Gaston Project GHG management systems tracked and monitored four GHG emission sources or parameters (Table 7). On-site data aggregation methods for the four emission sources are fully electronic, with manual backup. GCDPW staff roles for data aggregation are clearly defined and were demonstrated on-site.

All GHG management data gathered on-site was forwarded electronically to EcoSecurities personnel for use in the creation of GHG emission reduction estimates for the verification period.

Table 7: Monitored Parameters and Data Aggregation Procedures

Emission Source	Description & Data Unit	Data Aggregation Procedures
LFG _{flare}	Amount of landfill gas flared (ft ³).	Tracked using a thermal mass flow meter that accounts for temperature (T _{LFG}) and pressure (P _{LFG}). The meter records the LFG flow (SCFM), in four minute intervals, onto a portable data disk. On a weekly basis, GCDPW staff removes and replaces the portable data disk on the mobile flare skid. Data are then uploaded to a computer, stored, and transmitted to EcoSecurities.
PR _{CH4}	Methane fraction of the LFG (%).	Landtec GEM2000 – Twice daily, GCDPW staff electronically record CH ₄ concentrations using built-in software. Recordings are uploaded to a computer and stored. Additionally, readings are manually recorded in a logbook, transferred to electronic format and transmitted to EcoSecurities.
		Siemens Ultramat 23 – Data are recorded in four minute intervals onto a portable data disk. On a weekly basis, GCDPW staff removes and replaces the portable data disk on the mobile flare skid. Data are then uploaded to a computer, stored, and transmitted to EcoSecurities.
EL _{PR}	Total amount of electricity required to meet project requirement (MWh).	Electricity use totals from Duke Energy invoices /9/ are transferred to emission estimate spreadsheets /2/.
FF _{PR}	Total amount of fossil fuel required to meet project requirement (gallons).	Gallons total from Blu-gas invoices /24/ are transferred to emission estimate spreadsheets /2/.

4.5.5 Missing Data

DNV verified that the data substitution methods for LFG flow and CH₄ concentration conform to published guidelines of the Reserve. EcoSecurities has fully documented such procedures in the CRT monitoring report /22/ and accurately applied the calculations in the emission estimate spreadsheet /2/.

4.6 GHG Emission Reduction Estimates

DNV verified that EcoSecurities has properly adapted CAR LFPRP 2.0 emission reduction equations for the Gaston Project emission reduction estimates /2/.

CH₄ for the period of December 4, 2008 to February 8, 2009 was averaged daily for use in emission reduction estimates. CH₄ for the period of February 9, 2009 to July 31, 2009 and LFG flow for the entire verification period were continuously recorded for use in the emission reduction estimates. Emission reductions are calculated from monthly averages for both parameters /2/.

The fixed parameters and corresponding values applicable to the Gaston Project are listed in Table 8.

Table 8: Emission Reduction Estimates Fixed Parameters

Parameter	Description	Value	Justification
OX	Factor for the oxidation of methane by soil bacteria	0.10	Areas C & D are not covered by a synthetic liner.
DF	Discount factor to account for uncertainties associated with the project monitoring equipment.	0.10	Between December 4, 2008 and February 9, 2009 the CH ₄ concentration was adjusted to reflect the use of a portable measuring device.
EF _{FF}	Carbon emission factor for propane.	5.74 kgCO ₂ /gal	California Climate Action Registry General Reporting Protocol Version 3.1: "Reporting Entity-Wide GHG Emissions" Appendix C.3.
EF _{EL}	Carbon emission factor for electricity.	1,134.88 lbs./MWh	California Climate Action Registry General Reporting Protocol Version 3.1: "Reporting Entity-Wide GHG Emissions" (eGrid region SRVC).
DE	% destruction efficiency	96%	CAR LFPRP 2.0

4.7 Data Sampling and Risk Assessment Results

LFG flow rates and CH₄ concentrations account for the calculation of over 99% of GHG emissions from the Gaston Project. Therefore, DNV concluded that the GHG management systems and monitoring mechanisms for these two parameters posed the greatest risk for uncertainty and material misstatement in the Gaston Project emissions profile.

Following the standards of the CAR LFPVP 2.0, DNV developed a two-sided t-test to determine if there was a statistical difference between the reported real-time values for CH₄ concentration data in the emission estimate spreadsheet and the twice-daily values collected with a portable analyzer and recorded in the logbook. This comparison enabled DNV to assess the validity of emission reductions estimated for the period of December 4, 2008 to February 8, 2009, when the twice-daily values recorded in the logbook were the only supporting data used to estimate emissions reductions. The comparison performed by DNV indicated that the mean values were significantly different at the 95% confidence level for both the February and July data.

DNV then compared the average concentrations collected using each method during these two months. The mean CH₄ concentrations in February and July for the continuous real-time data are 43.4% and 47.6%, respectively. The mean CH₄ concentrations in February and July for the twice-daily data are 45.0% and 50.1%, respectively. According to the CAR LFPRP 2.0, using a portable gas analyzer to estimate emission reductions requires the application of a 10% discount factor. This results in effective CH₄ concentrations in February and July for the twice-daily data of 40.5% and 45.1%, which are less than those calculated for the real-time data. Therefore, the use of the twice daily values collected with a portable analyzer and the subsequent application of a 10% discount factor results in a conservative estimate of GHG emissions for the period of December 4, 2008 through February 8, 2009.

5. CONCLUSIONS

5.1 Project Emission Sources and Total Emission Reductions

Gaston Project GHG emissions are limited to two sources: CO₂ emitted from the combustion of propane in the flare pilot; and indirect CO₂ emissions from electricity powering the LFG capture and monitoring systems. These two sources, propane combustion and electricity use, account for less than 1% of total emissions.

Table 9: Summary of Emission Reductions for Verification Period

CAR Parameter	Description	Unit	Value
CH ₄ Dest _{PR}	Total methane emissions destroyed by the project landfill gas collection and destruction equipment system.	tCH ₄	2,200
GWP	Global warming potential of methane	N/A	21
OX	Oxidation factor to account for oxidation of methane by soil bacteria	N/A	0.10
DF	Discount factor for periodic methane measurements	N/A	0.10

CAR Parameter	Description	Unit	Value
	(only applied when methane measurements were not continuous from 4 Dec 2008 until 9 Feb 2009)		
ELCO ₂	Total indirect carbon dioxide emissions from the consumption of electricity from the grid.	tCO ₂	1.56
FFCO ₂	Total carbon dioxide emissions from the destruction of fossil fuel.	tCO ₂	0.22
ER _y	Total emission reductions for the verification period	tCO ₂ e	40,773

5.2 Material Misstatements

Material misstatements are the discrepancies identified during the verification that result in greater than +/- 5% difference between EcoSecurities' total project emissions reduction estimate and the independent estimate developed by DNV. When the misstatements are reported, it becomes the responsibility of EcoSecurities to modify emission reduction estimates and meet the Reserve requirements. Failure to adjust estimates would result in a negative verification opinion.

DNV verified that EcoSecurities' GHG emission reduction estimates for the verification period of December 4, 2008 to July 31, 2009 are free of material misstatements.

6. VERIFICATION OPINION

In accordance with the requirements of the Climate Action Reserve “Landfill Project Verification Protocol Version 2.0: Capturing and Destroying Methane from Landfills,” Det Norske Veritas Certification, Inc. has performed a verification of the GHG emission reductions reported for the Gaston County Landfill Gas Destruction Project managed by EcoSecurities International Ltd. for the period of December 4, 2008 through July 31, 2009.

In Det Norske Veritas Certification, Inc.’s opinion the project meets the verification criteria of the Reserve and the GHG emission reductions reported are fairly stated and calculated in accordance with the requirements of the Climate Action Reserve Landfill Project Reporting Protocol Version 2.0: “Collecting and Destroying Methane from Landfills.”

Det Norske Veritas Certification, Inc. verified that the GHG emission reductions from the “Gaston County Landfill Gas Destruction Project” managed by EcoSecurities International Ltd. for the period December 4, 2008 to July 31, 2009 amount to 40,773 tonnes CO₂e. Emission reductions from December 4, 2008 to December 31st, 2008 were 3,753 tonnes CO₂e (vintage year 2008), and from January 1, 2009 to July 31, 2009 emission reductions were 37,020 tonnes CO₂e (vintage year 2009).

The verification of reported GHG emission reductions is based on the information made available to Det Norske Veritas Certification, Inc. and the engagement conditions detailed in this report. Det Norske Veritas Certification, Inc. cannot guarantee the accuracy or correctness of this information. Det Norske Veritas Certification, Inc. cannot be held liable by any party for decisions made or not made based on this report.

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REFERENCES

Category 1 Documents:

Documents provided by EcoSecurities and the GCPWD that relate directly to the GHG components of the project are listed below. These have been used as direct sources of evidence for the verification conclusions, and are usually further checked through interviews with key personnel.

#	Document Name	Submittal Source	Description
/1/	Proof_of_Title_Ecosecurites_Gaston_LFG_08.19.2009.pdf	Desk review	Verified emission reduction purchase agreement between EcoSecurities and GCPWD.
/2/	Workbook for CCAR LFG Protocol V2_Gaston v.3 08.19.09.xlsx	Desk review	Emission reduction estimates.
/3/	Gaston_Property Plan	Desk review	Property description for the GCL.
/4/	Gaston_Permit to Operate 36-06.pdf	Desk review	Approved operating permit for the GCL from the North Carolina Department of Natural Resources Division of Waste Management.
/5/	Gaston_Monitoring_Manual_Final 08.11.09.pdf	Desk review	Monitoring plan for the Gaston Project.
/6/	Gaston_Air Permit_APR022009	Desk review	Permit to operate the open flare. Dated 04/02/09.
/7/	Gaston County LFG Destruction Project – Description.docsx	Desk review	Brief project description documents provided by EcoSecurities project manger.
/8/	Gas Test Well.pdf	Desk review	Design specification for the gas recovery wells.
/9/	Electricity Invoices	Site visit	Invoices for the custody meter monitoring the electricity used to power the blower and monitoring equipment for the mobile flare unit.
/10/	Gaston Landfill-gas Recovery Wells Design	Site visit	Design specifications for the LFG collection system. Including the location and radius of influence for existing and future wells.
/11/	Ultramat 23 Manufacturer Specifications	Site visit	Two pages from the Ultramat 23 owner's manual that includes information on recommended calibration procedures.

#	Document Name	Submittal Source	Description
/12/	Flare Receipt	Site visit	Invoice from Enerdyne Power Systems for sale of the mobile flare unit to Gaston County. Dated 8/26/2008.
/13/	Landtec GEM200 Calibration Certificates	Site visit	Calibration certificates for the portable gas analyzer. Dated 9/11/2008 and 2/11/2009.
/14/	NC Air Permit NO. 09884R00	Site visit	Permit for the construction of the flaring device. Dated 5/5/2008.
/15/	LFG Flow Meter Manufacturer Specifications	Site visit	Manufacturer specifications for the thermal mass flow meter measuring flow of LFG to the destruction device.
/16/	LFG Flow Meter Calibration Certificate 120208	Site visit	Factory calibration certificate. Dated 12/02/2008.
/17/	LFG Flow Meter Calibration Certificate 042209	Site visit	Calibration certificate. Dated 04/22/2009.
/18/	LFG Flow Meter Calibration Certificate 060909	Site visit	Calibration certificate. Dated 06/09/2009.
/19/	Ultramat 23 Calibration Certificate 121108	Site visit	Factory calibration certificate, Dated 12/11/2009.
/20/	Ultramat 23 Calibration Certificate 060909	Site visit	Calibration certificate. Dated 06/09/09.
/21/	Project Developer's Regulatory Attestation	CAR web-site.	Attestation of environmental compliance.
/22/	CRT Monitoring Report	Post site visit	CRT monitoring report for the December 4, 2008 – July 31, 2009 verification period.
/23/	Flare Manufacturer Specification	Post site visit	Perennial Energy manufacturer specifications for the candlestick flare.
/24/	Propane Gas Receipts	Post site visit	Fuel receipts for the propane tank supplying the gas for the pilot light to the flare.
/25/	GCL Logbooks	Post site visit	Daily log books.
/26/	Design Capacity Report	Post site visit	Source of NMOC emission rate estimate.

Category 2 Documents:

The following table lists background documents related to the protocols employed in the design or other reference documents. Where applicable, Category 2 documents have been used to cross-check project assumptions and confirm the validity of information given in the Category 1 documents and in verification interviews.

#	DOCUMENT
/27/	Climate Action Reserve. (2009). "Program Manual: February 23, 2009".
/28/	Climate Action Reserve. (2008). "Landfill Project Reporting Protocol Version 2.0: Collecting and Destroying Methane from Landfills".
/29/	Climate Action Reserve. (2008). "Landfill Project Verification Protocol Version 2.0: Capturing and Destroying Methane from Landfills".
/30/	California Climate Action Registry. (2009). "California Climate Action Registry General Reporting Protocol Version 3.1: Reporting Entity-Wide GHG Emissions"
/31/	Climate Action Reserve. (2009). "Appendix to the Landfill Project Reporting Protocol, Version 2.1".
/32/	EPA Enforcement and Compliance History Online (ECHO) database http://www.epa-echo.gov/echo/compliance_report.html

APPENDIX

Table 10: Personnel Consulted

Name	Roles and Responsibilities
Nathan Bivins	1. Outside contractor responsible for assisting the GCPWD with managing the LFG capture and destruction system. 2. Prior to the creation of the position responsible for handling the LFG monitoring, Nathan was responsible for ensuring calibration of monitoring equipment was up to date.
Ray Maxwell	1. Director of Gaston County Public Works Department and project manager.
Robert Sallach	1. Outside consultant assisting with design, implementation and operation of the LFG system.
Marcie Smith	1. Responsible for environmental compliance at the Gaston County Landfill.
Emily Holland	1. Primary individual responsible for managing and recording GHG data on-site. 2. Responsible for mobile monitoring of LFG flow and CH₄ concentration at well heads.