VERIFICATION AND CERTIFICATION REPORT

Van der Wiel Stortgas B.V.

Landfill gas extraction on the landfill Villa Dominico, Buenos Aires, Argentina

SGS Climate Change Programme
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Date of Issue:	**Project Number:**
06.10.2008	CDM.VER0111
Project Title:	
Landfill gas extraction on the landfill Villa Dominico, Buenos Aires, Argentina	
Organisation:	**Client:**
SGS United Kingdom Limited	Van der Wiel Stortgas B.V.
Publication of Monitoring Report:	
Monitoring Period:	01/10/2007 to 29/02/2008
First Monitoring Version and Date:	Version 1, dated 12th March 2008
Final Monitoring Version and Date:	Version 3, dated 13th February 2009

Summary:

SGS United Kingdom Ltd has performed the 5th periodic verification of the CDM project Landfill gas extraction on the landfill Villa Dominico, Buenos Aires, Argentina" with UNFCCC Reference Number 0072. The verification includes confirming the implementation of the monitoring plan of the registered PDD and the application of the monitoring methodology as per AM0011 version 1, dated 13/07/2004. A site visit was conducted to verify the data submitted in the monitoring report.

The project has installed a degassing installation which extracts LFG from the landfill. The gas is transported to the flare and burnt. Every hour all process parameters are sampled and stored in the data-logger of the degassing installation. Once a day the data are transferred to the monitoring station. Monitoring data of the project are also available at Van der Wiel Stortgas B.V. in the Netherlands via online connection.

SGS confirms that the project is implemented in accordance with the validated and registered Project Design Document. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the implementation of the project has resulted in **21,827** tCO2e during period 01/10/2007 to 29/02/2008.

Subject:			
CDM Verification			
Verification Team:			
Irma Lubrecht – Lead Assessor Claudia Ottaggio – Local Assessor			☒ No Distribution (without permission from the Client or responsible organisational unit)
Technical Review:	**Trainee Technical Reviewer:**		
Date: Sanjeev Kumar Name: 10/09/2008 and 13/02/2009	Name: Kaviraj Singh		☐ Limited Distribution
Authorised Signatory:			
Name: Siddharth Yadav Date: 23-12-2008			☐ Unrestricted Distribution
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3	13/02/2009	16	

Abbreviations

AM	Approved Methodology
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
EIA	Environmental Impact Assessment
GHG	Greenhouse Gas
kWh	Kilo Watt Hour
INCaF	IFC International Finance Corporation – Netherlands Carbon Facility
LFG	Landfill Gas
Nm3	Normal Cubic Meter
NIR	New Information Request
PDD	Project Design Document
t CO2	Tonne Carbon Dioxide
UNFCCC	United Nations Framework Convention on Climate Change
AM	Approved Methodology

Table of Content

1. Introduction

1.1 Objective

SGS United Kingdom Ltd has been contracted by Van der Wiel Stortgas B.V. to perform an independent verification of its CDM project "Landfill gas extraction on the landfill Villa Dominico, Buenos Aires, Argentina". CDM projects must undergo periodic audits and verification of emission reductions as the basis for issuance of Certified Emission Reductions (CERs).

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- The emissions report conforms with the requirements of the monitoring plan in the registered PDD and the approved methodology; and
- The data reported are complete and transparent.

1.2 Scope

The scope of the verification is the independent and objective review and ex post determination of the monitored reductions in GHG emission by the project activity. The verification is based on the validated and registered project design document and the monitoring report. The project is assessed against the requirements of the Kyoto Protocol, the CDM Modalities and Procedures and related rules and guidance.

SGS has, based on the recommendations in the Validation and Verification Manual, employed a risk-based approach in the verification, focusing on the identification of significant reporting risks and the reliability of project monitoring.

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 Project Activity and Period Covered

This engagement covers emissions and emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the following project and period.

Title of Project Activity:	Landfill gas extraction on the landfill Villa Dominico, Buenos Aires, Argentina
UNFCCC Registration Number:	0072
Monitoring Period Covered in this Report	01/10/2007 to 29/02/2008
Project Participants	**INCaF** (IFC International Finance Corporation – Netherlands Carbon Facility): 2121Pennsylvania Avenue, NW Washington, DC 20433 USA **Van der Wiel Stortgas BV** De Meerpaal 11 9206 AJ Drachten P.O. Box 508 9200 AM Drachten, The Netherlands
Location of the Project Activity:	Buenos Aires, Argentina.

The project has installed a degassing installation which extracts LFG from the landfill. The gas is transported to the flare and burnt. Every hour all process parameters are sampled and stored in the data-logger of the degassing installation. Once a day the data are transferred to the monitoring station. Monitoring data of the project are also available at Van der Wiel Stortgas B.V. in the Netherlands via online connection.

2. Methodology

2.1 General Approach

SGS's approach to the verification is a two-stage process.

In the first stage, SGS completed a strategic review and risk assessment of the projects activities and processes in order to gain a full understanding of:

- Activities associated with all the sources contributing to the project emissions and emission reductions, including leakage if relevant;
- Protocols used to estimate or measure GHG emissions from these sources;
- Collection and handling of data;
- Controls on the collection and handling of data;
- Means of verifying reported data; and
- Compilation of the monitoring report.

At the end of this stage, SGS produced a Periodic Verification Checklist which, based on the risk assessment of the parameters and data collection and handling processes for each of those parameters, describes the verification approach and the sampling plan.

Using the Periodic Verification checklist, SGS verified the implementation of the monitoring plan and the data presented in the Monitoring Report for the period in question. This involved a site visit and a desk review of the monitoring report. This verification report describes the findings of this assessment.

2.2 Verification Team for this Assessment

Name	Role	SGS Office
Irma Lubrecht	Lead Assessor	SGS Netherlands
Claudia Ottaggio	Local Assessor	SGS Argentina

2.3 Means of Verification

2.3.1 Review of Documentation

The validated PDD, the monitoring report submitted by the client and additional background documents related to the project performance were reviewed. A complete list of all documents reviewed is attached in section 8 of this report.

2.3.2 Site Visits

As part of the verification, the following on-site inspections have been performed

Location: Villa Dominico Landfill, Buenos Aires, Argentina	**Date:** 03/04/2008
Coverage	**Source of Information / Persons Interviewed**
Review of training and personal records, procedural manuals, monitoring records. Interview with personnel.	Gabriela Nicora Wouter Joustra
Detailed audit of project procedures, inspections of infrastructure and equipments. Review of all calibration certificates	Gabriela Nicora Wouter Joustra
Verification Monitoring plan Verification of implementation of monitoring procedures. Confirmation of data collection and handling procedures, verification of emission reductions report.	Gabriela Nicora Wouter Joustra

2.4 Reporting of Findings

As an outcome of the verification process, the team can raise different types of findings

In general, where insufficient or inaccurate information is available and clarification or new information is required the team shall raise a New Information Request (NIR) specifying what additional information is required.

Where a non-conformance arises the team shall raise a Corrective Action Request (CAR). A CAR is issued, where:

I. the verification is not able to obtain sufficient evidence for the reported emission reductions or part of the reported emission reductions. In this case these emission reductions shall not be verified and certified;

II. the verification has identified misstatements in the reported emission reductions. Emission reductions with misstatements shall be discounted based on the verifiers ex-post determination of the achieved emission reductions

The verification process may be halted until this information has been made available to the assessors' satisfaction. Failure to address a NIR may result in a CAR. Information or clarifications provided as a result of an NIR may also lead to a CAR.

Observations may be raised which are for the benefit of future projects and future verification actors. These have no impact upon the completion of the verification activity.

Corrective Action Requests and New Information Requests are detailed in Periodic Verification Checklist. The Project Developer is given the opportunity to "close" outstanding CARs and respond to NIRs and Observations.

2.5 Internal Quality Control

Following the completion of the assessment process and a recommendation by the Assessment Team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team.

3. Verification Findings

3.1 Project Documentation and Compliance with the Registered PDD

The project documentation consisting of monitoring report, and separate spreadsheets comply with the revised approved monitoring plan (approved 18/03/2008, /3/). See section 8 for references.

3.2 Monitoring Results

During the verification of emission reductions from 01/10/2007 to 29/02/2008 the following parameters were verified:

3.2.1 Total Amount of Landfill Gas Collected from Project Wells (Nm^3*10)

Flow meter data:

01/10/2007: 2,865,067

29/02/2008: 3,263,148

Difference = 398,081

Data reported in the monitoring report dated 12/03/2008 were cross-checked with system data on-site. Formulae, data typed and units in the monitoring sheet (/5/) were all cross-checked with data collected on-site. No discrepancies were found. Calibration certificates for flow meters were reviewed and found to be in order.

All data for October 2007 – February 2008 was cross-checked.Some days with incomplete data sets were observed. On these days electricity failures resulted in no measurements on site, incomplete transfer of data to the remote location, or maintenance occurred. These days have been omitted from the data set and have not been used for calculation of emission reductions.

Total amount of landfill gas collected from project wells (Nm^3*10)	Reported Value	Verified Value
	398,081	398,081

3.2.2 Methane Fraction in the Landfill Gas (%)

Internal calibration procedure was checked (/10/) as well as calibration certificate of the methane analyser (/9/). All was found satisfactory.

The reported value (average in 136 days between 01/10/2007 to 29/02/2008) was compared with the readings in the system on-site (average in 136 days between 01/10/2007 to 29/02/2008). A sample of daily values was checked. No difference was observed.

Methane fraction in the landfill gas (%)	Reported Value	Verified Value
	40.31	40.31

3.2.3 Amount of Flared Methane (tCO2)

Calibration of flow meters and flow meter specifications (/8/,/10/) were checked and found to be in order. No findings regarding this parameter.

Amount of flared methane (tCO2)	Reported Value	Verified Value
	21,827	21,827

3.2.4 Combustion Efficiency

Flare efficiency analysis has been checked whether it covers the reported period. The analysis has been undertaken 19/12/2007 (/7/). This was found satisfactory.

Combustion efficiency (%)	Reported Value	Verified Value
	99.99%	**99.99%**

3.2.5 Combustion Temperature

Combustion temperature values were checked. No abnormalities were observed. Therefore there were no issues regarding this parameter.

3.2.6 LFG Pressure

Data for LFG pressure were reviewed. No abnormalities were found. Calibration certificate was checked and found to be in order. No issues regarding this parameter.

3.2.7 LFG Temperature

Data for LFG temperature were reviewed. No abnormalities were found. Calibration certificate was checked and found to be in order No issues regarding this parameter.

3.2.8 Flare Operation Hours

Data for flare operation hours were reviewed. The flare did not always burn due to electricity failures and maintenance. These days have been deleted from the emission reduction calculations.

3.2.9 Electricity Consumption (kWh)

Electricity consumed measured by TMM sates-pma TMM 13. Electricity consumption was verified by checking all invoices from the electricity supplier in the period 01/10/2007 to 29/02/2008 (/11/). No issues regarding this parameter.

Electricity consumption (kWh)	Reported Value	Verified Value
	34,930	34,930

3.2.10 CEF

The CEF of electricity has been derived from “Calculo del factor de Emisión de CO2 de la Red Argentina de Energía Eléctrica”, Secretaria de Energía, Junio 2007” (/12).

CEF (t CO2/MWh)	Reported Value	Verified Value
	0.47	**0.47**

3.3 Remaining Issues, CAR’s, FAR’s from Previous Validation or Verification

No issues remaining.

3.4 Project Implementation

Project was implemented and equipment installed as described in the registered PDD;

This report describes the verification outcome of the 5th monitoring period. The Monitoring Report complies with the revised Monitoring Plan (approved 18/03/2008, /3/).

3.5 Completeness of Monitoring

The reporting procedures reflect the content of the monitoring plan. The monitoring mechanism is effective and reliable.

3.6 Accuracy of Emission Reduction Calculations

The calculation of emission reductions is found to be correct. No CARs or NIRs were raised in this regard.

3.7 Quality of Evidence to Determine Emission Reductions

Critical parameters used for the determination of the Emission Reductions are discussed above in section 3.2 above. All the data recorded is in compliance with the monitoring report.

3.8 Management System and Quality Assurance

The company involved in the project has implemented a quality system described in the “Instruction operation and maintenance” manual (/10/). Training record and internal audit records were reviewed and interviews were held with responsible people. No issues were observed. Therefore we can affirm that the management system the CDM project is in place; with the responsibilities properly identified and in place.

In order to verify data quality, the Companies involves in the project works in accordance with a quality assurance procedure, which establishes the operational and management structure implemented.

3.9 Data from External Sources

During the verification the procedures for collecting and handling of data from external sources were checked. The following external data have been used to calculate the emission reductions:

1. GWP of CH4 (21tCO2/t CH4) (IPCC 2006);
2. Density of CH4 (0.72 kg/ Nm3) (IPCC 2006);
3. Carbon emission factor related to electricity consumption (0.47 t CO2/MWh) (/12/).

4. Calculation of Emission Reductions

Parameter	Reported Value	Verified Value
Total amount of landfill gas collected from project wells (Nm^3*10)	398,081	398,081
Methane fraction in the landfill gas (%)	40.31	40.31
Amount of flared methane (tCO2)	24,115	24,115
Combustion efficiency (%)	99.99	99.99
Electricity consumption (kWh)	34,930	34,930
CEF electricity (t CO2 / MWh)	0.47	0.47

Total CERs from installation (t CO2)	21,843
Total CO2 emission for use of electricity (t)	- 16
CERs claimed	**21,827 tCO2**

5. Recommendations for Changes in the Monitoring Plan

No recommendations.

6. Overview of Results

Assessment Against the Provisions of Decision 17/CP.7:

Is the project documentation in accordance with the requirements of the registered PDD and relevant provision of decision 17/CP.7, EB decisions and guidance and the COP/MOP?

Yes. The results of the compliance assessment are recorded in the verification checklist which is used as an internal report only.

Have on-site inspections been performed that may comprise, inter alia, a review of performance records, interviews with project participants and local stakeholders, collection of measurements, observations of established practices and testing of the accuracy of monitoring equipment?

Yes. Claudia Ottaggio visited the site on 03/04/2008. It was possible to verify the installed equipment (gas collection and flaring system) and the monitoring system. She undertook interviews, collected data, audited the implementation of procedures, checked calibration certificates and checked data, inter alia.

The results of the site visits are recorded in the verification checklist which is used as an internal report only.

The evidences have been checked and collected.

Has data from additional sources been used? If yes, please detail the source and significance.

Yes. External data comprises: the GWP of CH4 (21tCO2/t methane) and the density of CH4 (0.72 kg/ Nm3. These data are IPCC default values (/12/). CEF of electricity consumed (0.47 t CO2/MWh) was taken from "Calculo del factor de Emisión de CO2 de la Red Argentina de Energía Eléctrica", Secretaria de Energía, Junio 2007" (/12/). During the verification the procedures for collecting and handling these data were checked and found correct.

Please review the monitoring results and verify that the monitoring methodologies for the estimation of reductions in anthropogenic emissions by sources have been applied correctly and their documentation is complete and transparent.

Yes. The monitoring methodology has been correctly applied and the monitoring report and supporting references are complete and transparent. The aspects of the monitoring plan were implemented correctly. The supporting references and data were complete and transparent.

No CARs were raised.

Have any recommendations for changes to the monitoring methodology for any future crediting period been issued to the project participant?

No recommendation.

Determine the reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the CDM project activity, based on the data and information using calculation procedures consistent with those contained in the registered project design document and the monitoring plan.

The data used in anthropogenic emission reduction calculation is consistent with those contained in the registered PDD and monitoring plan. The emission reduction was 328,080 tCO2 for the period 01/10/2007 to 29/02/2008 as per the estimation made in the registered PDD. The actual emission reduction has been verified as 21,827 tCO2 for the same period.

Identify and inform the project participants of any concerns related to the conformity of the actual project activity and its operation with the registered project design document. Project participants shall address the concerns and supply relevant additional information.

"No such non conformity of the actual project activity and its operation with the registered project design document has been observed."

Post monitoring report on UNFCCC website

Yes, the monitoring report has been published on https://cdm.unfccc.int/Projects/DB/DNV-CUK1120732059.19/iProcess/SGS-UKL1220964911.3/view

7. Verification and Certification Statement

SGS United Kingdom Ltd has been contracted by Van der Wiel Stortgas B.V. to perform the verification of the emission reductions reported for the CDM project "Landfill gas extraction on the landfill Villa Dominico, Buenos Aires, Argentina" UNFCCC Ref. Number 0072 in the period 01/10/2007 to 29/02/2008.

The verification is based on the validated and registered project design document and the monitoring report for this project. Verification is performed in accordance with section I of Decision 3/CMP.1, and relevant decisions of the CDM EB and CoP/MoP. The scope of this engagement covers the verification and certification of greenhouse gas emission reductions generated by the above project during the above mentioned period, as reported in Landfill gas extraction on the landfill Villa Dominico, Buenos Aires (Argentina), version 3, dated 13/02/2009

The management of the Van der Wiel Stortgas B.V. is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project Monitoring Report version 3, dated 13/02/2009. Calculation and determination of GHG emission reductions from the project is the responsibility of the management of the "Landfill gas extraction on the landfill Villa Dominico, Buenos Aires, Argentina". The development and maintenance of records and reporting procedures are in accordance with the monitoring report.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the period 01/10/2007 to 29/02/2008 based on the reported emission reductions in the Monitoring Report version 3, dated 13/02/2009 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, SGS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

SGS confirms that the project is implemented as described in the validated and registered project design documents. Based on the information we have seen and evaluated, we confirm the following:

Project Title:	Landfill gas extraction on the landfill Villa Dominico, Buenos Aires, Argentina
UNFCCC Reference Number:	0072
Registered PDD used for Verification:	Version 2, registered 17th September 2005
Methodology used for Verification:	AM0011 version 11, dated 13th July 2004
Applicable Period:	01/10/2007 to 29/02/2008
Total GHG Emission Reductions Verified:	21,827 tCO2e

Signed on behalf of the Verification Body by Authorized Signatory

Signature: 

Name: Siddharth Yadav

Date: 13th February 2009

8. Document References

/1/ PDD “Landfill gas extraction on the landfill Villa Dominico, Buenos Aires, Argentina” version 2, registered 17th September 2005

/2/ AM0011 (version 1): Landfill gas recovery with electricity generation and no capture or destruction of methane in the baseline scenario. 13th July 2004

/3/ Revised monitoring plan, approved 18/03/2008

/4/ Landfill gas extraction on the landfill Villa Dominico, Buenos Aires, Argentina - Monitoring Report version 1 (12/03/2008)

/5/ Monitoring Sheet Villa Dominico Rev version 2 dated 03/04/2008

/6/ Landfill gas extraction worksheets dated 03/04/2008

/7 Flare efficiency analysis dated 19/12/2007

/8/ Calibration certificate flow meters dated 27/02/2008

/9/ Calibration certificate gas analyzer dated 19/02/2008

/10/ Instruction Operations & Maintenance

/11/ Electricity invoices 01/10/2007 to 29/02/2008

/12/ Calculo del factor de Emisión de CO2 de la Red Argentina de Energía Eléctrica”, Secretaria de Energía, Junio 2007

/13/ IPCC 2006

/14/ Monitoring Report version 1, 12/03/2008

/15/ Monitoring Report version 3, 13/02/2009

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