

VALIDATION REPORT



Document Prepared By TÜV Rheinland do Brasil Ltda. (On behalf of TÜV Rheinland (China) Ltd.)

Project Title	Composting Project in Santa Catarina
Version	02.0
Report ID	2793.11.A.0

Report Title	Validation Report of Composting Project in Santa Catarina
Client	Sustainable Carbon – Projetos Ambientais Ltda
Pages	70
Date of Issue	06 th -February-2014
Prepared By	TÜV Rheinland do Brasil Ltda. (On behalf of TÜV Rheinland (China) Ltd.)
Contact	Address: Rua Líbero Badaró, 293, São Paulo - SP - Brazil. Telephone: +55 11 3514-5791 Email: nathaly.jo@br.tuv.com / Website: www.tuv.com
Approved By	Mr. Henri Phan
Work Carried Out By	Mr. Sebastián del Valle Rosales, ex-Team Leader Ms. Kamala Devi Muniandy, Team Leader Ms. Nathaly Marie Jo, Auditor Ms. Tais Gennari Luciano, Auditor Mr. Yi Liu, Technical Expert Ms. Danae Diaz, Technical Reviewer

Summary:

The project activity involves the improvement of the animal waste management system in 8 swine farms and implementation of automated composting unit in 5 swine farms in Santa Catarina, reducing GHG emissions due to the replacement of anaerobic lagoons to composting units. This project is in accordance with the VCS v.3, applying CDM methodology AMS-III.F “Avoidance of methane emissions through composting” v.10, in combination with the CDM methodology AMS-III.D “Methane recovery in animal manure management systems” v.18, the CDM Additionality Tool, v.6.0 and the CDM “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” v.1. The validation was made to a reasonable level of assurance also applying the requirements outlined in VCS v.3. The project information validated includes the VCS PD and all relevant information and supporting evidence acquired during the validation process. The first output of the validation process is a list of Clarifications, Corrective Actions Requests and Forward Actions Requests (CL, CAR and FAR). Taking into account this output, the project proponent (PP) revised its project design document, while the FAR raised will be solved in the next crediting period. The validation team has come to the conclusion that based on the on-site assessment and all available documentation the GHG assertion is made in accordance with the requirements of the VCS programme, is materially correct and fairly represents the GHG emissions data and information without material discrepancies.

Abbreviations

ACCS	Association of Swine Producers of Santa Catarina State
AWMS	Animal Waste Management Systems
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CH ₄	Methane
CIDASC	Integrated Agricultural Development Company of Santa Catarina
CL	Clarification Request
CO ₂	Carbon Dioxide
CO _{2e}	Carbon dioxide equivalent
CONAMA	National Council on the Environment
DNA	Designated National Authority
EIA	Environmental Impact Assessment
FATMA	Foundation of the Environment
GHG	Greenhouse Gas(es)
GTA	Guide for Animal Transport
I	Interview
IPCC	Intergovernmental Panel on Climate Change
OCB	Organization of Cooperatives Brazil
PD	Project Description
Sescoob	National Service Learning Cooperative
UMAC	Mechanized and Automated Composting Unit
VCS	Verified Carbon Standard
VCUs	Voluntary Carbon Units

Table of Contents

1	Introduction	5
1.1	Objective	5
1.2	Scope and Criteria	5
1.3	Level of assurance	6
1.4	Summary Description of the Project	6
2	Validation Process	7
2.1	Method and Criteria.....	7
2.2	Document Review	8
2.3	Interviews	12
2.4	Site Inspections	13
2.5	Resolution of Any Material Discrepancy	15
3	Validation Findings.....	15
3.1	Project Design	15
3.2	Application of Methodology	18
3.2.1	Title and Reference	18
3.2.2	Applicability	18
3.2.3	Project Boundary	20
3.2.4	Baseline Scenario	21
3.2.5	Additionality	21
3.2.6	Quantification of GHG Emission Reductions and Removals	23
3.2.7	Methodology Deviations	25
3.2.8	Monitoring Plan	26
3.3	Environmental Impact	32
3.4	Comments by stakeholders.....	32
4	Validation conclusion	33
5	APPENDIX A – VALIDATION PROTOCOL.....	35

1 INTRODUCTION

This report summarizes the findings of the validation of the Composting Project in Santa Catarina, performed on the basis of VCS criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

The purpose of the Validation Report is to confirm that the Composting Project in Santa Catarina (hereafter the project) and all related project documentation conforms with all rules and requirements of the VCS Standard v.3 and the applied GHG methodology, here AMS-III.F, version 10 and its associated tools.

The validation serves as project design verification and is a requirement of all projects. The validation is an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan, and the project's compliance with relevant VCS criteria which are validated in order to confirm that the project design, as documented, is reasonable, and meets the stated requirements and identified criteria.

Further the validation shall be made for an initial crediting period of 10 years (01/01/2011 – 31/12/2020) as being part of possible two times renewable. Therefore, this is to be considered the first validation process for this project. Upon successful validation the project shall be approved by the VCS program to be included as a registered VCS project generating Verified Carbon Units (VCUs).

1.2 Scope and Criteria

The criteria for validation are the rules and requirements of the VCS Standard v.3, in particular the principles articulated in section 2.4 of the VCS Standard v.3. The VCS-PD applies an approved methodology from the UN Clean Development Mechanism (CDM). In this context, the methodology AMS-III.F “Avoidance of methane emissions through composting”, v.10, the AMS-III.D “Methane recovery in animal manure management systems”, v.18, and the CDM Additionality Tool, v.6.0 are additional criteria for the project.

The scope of validation is set in section 3 of the VCS Standard v.3. It includes the following key areas:

1. The VCS-PD is complete and fulfills the requirements of section 3.19 of the VCS Standard v.3;
2. The chosen methodology AMS-III.F is applicable to the project;
3. The project boundary is identified in accordance with AMS-III.F;
- 4.

5. The baseline is chosen in accordance with AMS-III.F and properly justified;
6. The emission factor for grid-based electricity is established in accordance with “Tool to calculate the emission factor for an electricity system”;
7. The data and parameters for the quantification of the GHG emission reductions are provided in accordance with AMS-III.F;
8. The monitoring plan establishes a reliable GHG information system for obtaining, recording, compiling and analyzing data for the quantification of GHG emission reductions;
9. The additionality of the project is demonstrated in accordance with the CDM Additionality Tool.

The validation 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 Level of assurance

The Validation Statement is made to a reasonable assurance level, and a materiality threshold of 5% is applied for identification of material omissions as required by VCS v.3 paragraph 5.3.1 item 4.

In order to comply with the requirements of VCS v.3 the validation shall be carried out selecting data and evidence to provide a reasonable level of assurance as stated in the VCS v.3 paragraph 5.3.1 item 1. In general, it shall be adhered to the procedures as defined in ISO 14064-3.

1.4 Summary Description of the Project

The project is located in Santa Catarina State (Brazil) in the cities of Arroio Trinta, Nova Erechim, Herval d'Oeste, Jaborá, Vargeão, Rio das Antas, Concórdia, Arvoredo and Nova Itaberaba, which are presented in Figure 1. The geographical coordinates are properly described in Table 4 of VCS PD / 2 /.

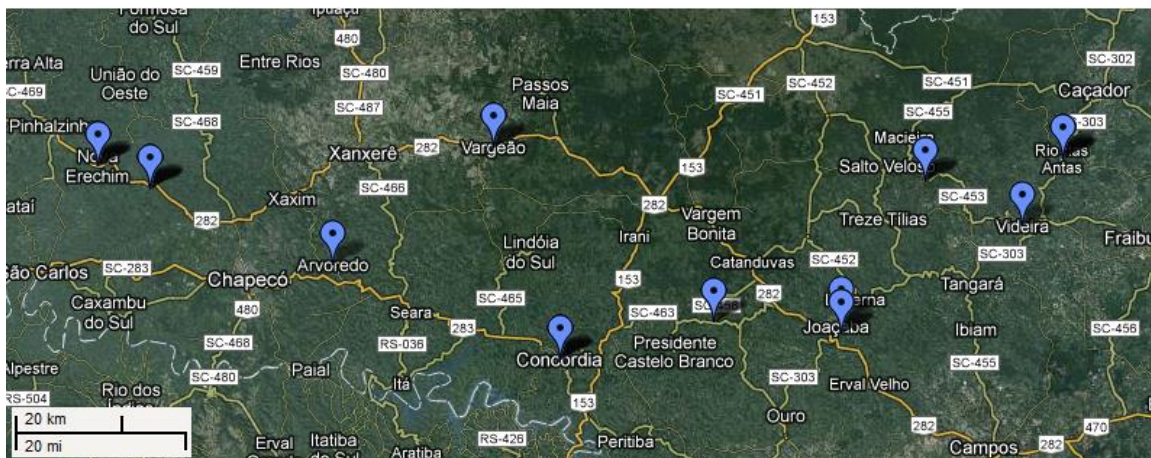


Figure 1: Location of cities where the farms are situated. (Source: Google Maps)

The project activity works as follow: the swine manure is transferred to the UMAC (Mechanized and Automated Composting Unit) installation by pumps, which throws the waste in the windrows. At the same time, the aeration and homogenization is performed by helical blades from UMAC, allowing appropriate levels of oxygen, moisture content and temperature. These conditions guarantee that the composting process will occur under aerobic conditions, avoiding methane emissions.

The UMAC is composed of eight threads of revolving motion with transverse electric motor and automatic panel, threads with anti-corrosive paint, gearboxes, two engines of 6 hp, one engine of 2 hp and a control panel with sensor end of courses.

The project aims the reduction of greenhouse gases through the replacement of anaerobic lagoons by the construction of composting units. The validation team was able to confirm the accuracy of the project description as per interviews and inspections conducted during the on-site audit.

2 VALIDATION PROCESS

2.1 Method and Criteria

The overall validation, from Contract Review to Validation Report & Opinion, was conducted by using TÜV Rheinland's internal procedures. Mainly, in order to ensure transparency, a validation protocol was customized for the project. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- i) It organizes, details and clarifies the requirements of a VCS project is expected to meet;
- ii) It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

Table 1: Validation Schedule

Validation Process	Date
Contract award for validation	05/01/2012
Receipt of Draft VCS PD	08/02/2012
Desk Review Findings	08/02/2012 – 12/02/2012
On-site assessment	13/02/2012 – 16/02/2012
Validation Protocol	1 st round: 09/03/2012 – 04/04/2012
	2 nd round: 04/05/2012 – 14/05/2012
Draft Validation Report	14/05/2012 – 16/05/2012
Internal Technical Review	16/05/2012 – 21/05/2012
Final Validation Report	21/05/2012

The validation process begins when the PPs submit the VCS PD to the validation team along with additional supporting information, in particular spreadsheet for the calculation of the estimated emission reductions. The validation team then reviews the documents and submits the desk review findings to the PPs. During the on-site visit, the validation team met with the project company in the project site. The validation team confirms that the actual project conforms to the VCS PD, collects further supporting documents and discusses the desk review findings with the PPs. Following the site visit a validation protocol is shared with the PPs, which contained the list of all Corrective Action Requests (CARs), Clarification Requests (CLs) and Forward Action Requests (FAR). The CAR/CLs are then closed by the PPs who are delivering additional supporting evidence and make necessary amendments to the VCS PD. FAR 1 was issued in order to confirm the starting date of Baccin's Farm since it was not possible to verify during the validation process. This matter will interfere in the emissions reduction, since the crediting period starts in 01/01/2011, but the beginning of the operation of this particular farm is planned for the second semester of 2012, which means that the emission reductions from 2011 are null. Once all CARs/CLs are closed, the validation team drafts the validation report. It is issued, after successfully passing the Internal Technical Review.

2.2 Document Review

The VCS Project Description submitted by Sustainable Carbon – Projetos Ambientais Ltda (who is a project participant, also acting as carbon consultant for this project) and additional background documents related to the project design and baseline, i.e. country Law, VCS Project Description Template, Approved methodology, Kyoto Protocol, Clarifications on Validation Requirements were reviewed.

To address TÜV Rheinland's corrective action request and clarification requests Sustainable Carbon – Projetos Ambientais Ltda, revised the Project Description and the last version (v.03) / 2 / was resubmitted to the validation team in 14/05/2012. After further clarifications all corrective action requests

and clarification requests were closed in 14/05/2012. All documents were reviewed under the requirements of the related CDM Methodologies, tools and VCS v.3 rules.

The documents as indicated in Table 2 have all been reviewed during the validation process and are referenced along the validation report.

Table 2: Document Review.

/ N° / Document	Comment	Date
/ 1 / VCS Project Description v.01.0	<i>VCS Project Description v. 01.0</i>	08/02/2012
/ 2 / VCS Project Description v.03	<i>VCS Project Description v. 03</i>	14/05/2012
/2.1/ VCS Project Description v.05.2	<i>VCS Project Description v. 05.2</i>	28/11/2013
/2.2/ VCS Project Description v.06.1	<i>VCS Project Description v. 06.1</i>	10/01/2014
/ 3 / VCS Project Description Template	<i>VCS Project Description Template v. 3.0</i> Available at: < http://www.v-c-s.org/program-documents >	08/03/2011
/ 4 / Approved Baseline & Monitoring Methodology - "Avoidance of methane emissions through composting"	<i>AMS-III.F v. 10</i>	Valid from 04/03/2011 onwards
/ 5 / CDM Executive Board - "Methane recovery in animal manure management systems"	<i>AMS-III.D, v.18</i>	Valid from 13/10/2011 onwards
/ 6 / INMET – National Institute of Meteorology - Climatological Normals of Brazil / Average Temperature Compensated	Available at: < http://www.inmet.gov.br/html/clima/mapas/?mapa=tmed > Last visit on: 03/04/2012	1961-1990
/ 7 / PSD_27-01-2011.jpg	<i>Starting Date of Sítio Pickler</i>	27/01/2011
/ 8 / 3. PSD_21-05-2010.jpg	<i>Starting Date of Altenor's Farm</i>	21/05/2010
/ 9 / PSD_21-10-2010.jpg	<i>Starting Date of Ramela's Farm</i>	21/10/2010
/ 10 / 4. Relatório dos lotes (integradoras) (3).jpg	<i>Starting Date of Sítio Santa Lucia</i>	29/11/2010

/ N° / Document	Comment	Date
/ 11 / 3. PSD_18-10-2011.jpg	<i>Starting Date of Helena's Farm</i>	18/10/2011
/ 12 / PSD Sinigaglia.jpg	<i>Starting Date of Gilmar's Farm (provided by BRF – Brasil Foods S.A.)</i>	11/01/2012
/ 13 / 3. PSD_27-07-2011.jpg	<i>Starting Date of Colônia Suspiro's Farm</i>	27/07/2011
/ 14 / PSD_20-12-2010	<i>Starting Date of Pissaia's Farm (provided by SEARA)</i>	20/12/2010
/ 15 / Declaracao LPC UMAC.pdf	<i>Declaration of LPC containing the date on which the UMAC was installed and the training was held</i>	28/03/2012
/ 16 / 8. Nota UMAC.jpg	<i>Purchase invoices of the UMAC Sítio Pickler's Farm</i>	26/07/2010
/ 17 / 8. Nota UMAC.jpg	<i>Purchase invoices of the UMAC Altenor's Farm</i>	28/10/2009
/ 18 / 8. Nota UMAC.jpg	<i>Purchase invoices of the UMAC Ramela's Farm</i>	25/06/2010
/ 19 / 8. Nota UMAC.jpg	<i>Purchase invoices of the UMAC Sítio Santa Lucia's Farm</i>	18/03/2010
/ 20 / P2140063.jpg	<i>Purchase invoices of the UMAC Helena's Farm</i>	18/10/2010
/ 21 / P2150119.jpg	<i>Purchase invoices of the UMAC Gilmar's Farm</i>	13/10/2010
/ 22 / 8. Nota UMAC.jpg	<i>Purchase invoices of the UMAC Suruvy's Farm</i>	28/11/2010
/ 23 / 8. Nota UMAC.jpg	<i>Purchase invoices of the UMAC Zuffo's Farm</i>	18/11/2010
/ 24 / P2140009.jpg	<i>Purchase invoices of the UMAC Pissaia's Farm</i>	16/03/2010
/ 25 / P2140056.jpg	<i>Purchase invoices of the UMAC Andretta's Farm</i>	24/01/2011
/ 26 / LAO_650 animais_Val. Julho 2012.pdf	<i>Environmental Operating License Sítio Pickler's Farm</i>	Valid until July/2012

/ N° / Document	Comment	Date
/ 27 / Protocolo Ren LAO Adelmo Pickler nov_2010.pdf	<i>Protocol of renewal of Environmental Operating License Sítio Pickler's Farm</i>	Issued on 05/11/2010
/ 28 / LAO_Val. Setembro 2015.pdf	<i>Environmental Operating License Suruvy's Farm</i>	Valid until Sep/2015
/ 29 / LAO Basso_Val. Novembro 2013.pdf	<i>Environmental Operating License Altenor's Farm</i>	Valid until Nov/2013
/ 30 / LAO_Val. Julho 2014.pdf	<i>Environmental Operating License Ramela's Farm</i>	Valid until July/2014
/ 31 / LAO_Val. Abril 2014.pdf	<i>Environmental Operating License Santa Lucia's Farm</i>	Valid until May/2014
/ 32 / LAO_Val. Setembro 2014.pdf	<i>Environmental Operating License Colônia Zuffo's Farm</i>	Valid until Sep/2014
/ 33 / LAO_Val. Outubro 2015.pdf	<i>Environmental Operating License Helena's Farm</i>	Valid until Aug/2015
/ 34 / LAO_Val. Fevereiro 2014.pdf	<i>Environmental Operating License Gilmar's Farm</i>	Valid until Feb/2014
/ 35 / LAO_Val. Junho 2015.pdf	<i>Environmental Operating License Granja Silva's Farm</i>	Valid until July/2015
/ 36 / LAO_Val. Fevereiro 2013.pdf	<i>Environmental Operating License Pissaia's Farm</i>	Valid until Feb/2013
/ 37 / LAO_Val. Novembro 2014.pdf	<i>Environmental Operating License Colônia Suspiro's Farm</i>	Valid until Nov/2014
/ 38 / LAI_Val. Novembro 2012.pdf	<i>Environmental Installation License Baccin's Farm</i>	Valid until Nov/2012
/ 39 / LAO_Val. Agosto 2015	<i>Environmental Operating License Andretta's Farm</i>	Valid until Aug/2015
/ 40 / Honorable Mention for UMAC project	<i>Agricultural Branch - Technological Innovation Award Cooperative of the Year 2008</i>	Issued in 26/08/2008
/ 41 / IBGE research about agricultural properties and the waste treatment applied	<i>Common Practice evidence – 11.55% of composting</i>	Issued in 11/09/2009
/ 42 / Pioneering Rural Award	<i>Common Practice evidence</i>	Issued in 11/09/2009

/ N° / Document	Comment	Date
/ 43 / Brazilian Emission Factor for 2011	<i>Operating and Build Margin published by Brazilian DNA</i> Available at: < http://www.mct.gov.br/index.php/content/view/307492.html > Last visit on: May/2012	2011
/ 44 / OLIVEIRA P. A., Production and Management of Swine Waste, EMBRAPA	<i>Evidence for default values of animal waste production</i> Available at: < http://www.cnpsa.embrapa.br/pnma/pdf_doc/8-PauloArmando_Producao.pdf > Last visit on: May/2012	N/A
/ 45 / Declaração treinamento.pdf	<i>Evidence of training held for all farmers about the monitoring plan</i>	07/05/2011 – 10/05/2012
/ 46 / Plano de monitoramento v01.pdf	<i>Detailed training provided to all farmers</i>	April/2012
/ 47 / Fritz Muller award	<i>Evidence for positive environmental impact</i>	04/08/2009
/ 48 / 2006 IPCC Guidelines for National Greenhouse Gas Inventories	Available at: < http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html >	2006
/ 49 / General guidelines for SSC CDM methodologies, version 20.0	Available at: < https://cdm.unfccc.int/filestorage/e/x/t/extfile-20131111125311310-methSSC_guid25.pdf/methSSC_guid25.pdf?t=Vml8bXd3MnlzfDBdn4hRNOytpET56t5NcKeT >	08/11/2013
/ 51 / LPC Declaration about operation time of UMAC and pump per day	<i>Evidence about the operation time of UMAC and pump per day in each farm</i>	19/11/2013
/ 52 / Compost destination folder	<i>Evidence of compost destination control filled by the farmers</i>	2012
/ 53 / FATMA, Normative Instruction nº 11	Available at: < http://www.fatma.sc.gov.br/index.php?option=com_docman&task=cat_view&gid=32&Itemid=83 >	21/02/2009
/ 54 / Guidelines on the demonstration of additionality of small-scale project activities, Version 09.0	Available at: < https://cdm.unfccc.int/Reference/Guidclarif/meth/methSSC_guid05.pdf >	20/07/2012
/ 55 / State Department of Agriculture and Supply, Swine Industry	Available at: < http://www.agricultura.pr.gov.br/arquivos/File/deral/Prognosticos/SuinoCultura_2012_2013.pdf >	Feb/2013

2.3 Interviews

The personnel who have been interviewed and/or provided additional information to the presented documentation are identified below:

- Vânia Gasperini (administrative assistant / LPC – Tecnologia Ambiental): she gave support in all related matters to the UMAC construction, installation, functioning, etc.
- Farmers and monitoring authorities of each farm are described below. They provided all available documents such as operation and environmental licenses, inputs and outputs of swines, GTAs (guides for animal transport), internal registries from integrators/state agencies (such as CIDASC reports, Agriness software, etc), invoices of the purchase of substrate, and also information regarding the handling of the UMAC.
 - Mr. Adelmo Pickler (Sítio Pickler's Farm)
 - Mr. Altenor José Basso (Altenor's Farm)
 - Mr. Antônio Carlos Ramela (Ramela's Farm)
 - Mr. Belmiro Secco (Sítio Santa Lucia's Farm)
 - Mr. Diacir Coradi (Helena's Farm)
 - Mr. Gilmar José Sinigaglia (Gilmar's Farm)
 - Mr. Airtón Piovezan (Suruvy's Farm)
 - Mr. Jair da Silva (Granja Silva's Farm)
 - Ms. Lenize Tomazi (Colônia Suspiro's Farm)
 - Mr. Dario Marcos Zuffo (Colônia Zuffo's Farm)
 - Mr. Neimar Pissaia (Pissaia's Farm)
 - Mr. Renato Baccin (Baccin's Farm)
 - Ms. Fabiana Andretta (Andretta's Farm)

2.4 Site Inspections

The opening meeting was held on 13/02/2012 at LPC's office (Dr. Maruri Street, 1637 – 89700-000 – Concórdia/SC – Brazil), where the following were present:

- Nathaly Marie Jo (auditor / TÜV Rheinland do Brasil Ltda.)
- Vânia Gasperini (administrative assistant / LPC – Tecnologia Ambiental)
- Anderson Medeiros (administrative manager / LPC – Tecnologia Ambiental)
- Renato Baccin (sales manager / LPC – Tecnologia Ambiental)
- Camila Vaccari (Technical Analyst / Sustainable Carbon – Projetos Ambientais Ltda.)
- Thiago de Avila Othero (Technical Coordinator / Sustainable Carbon – Projetos Ambientais Ltda.)

The site inspection was carried out between 13/02/2012 and 16/02/2012, and the participants are presented in the Table 3.

Table 3: Participants in site visit.

Role	Full name	Affiliation
Auditor	Nathaly Marie Jo	TÜV Rheinland do Brasil Ltda.
Project Developer, Project Participant and Project idealizer	Thiago de Avila Othero	Sustainable Carbon – Projetos Ambientais Ltda.
Project Developer, Project Participant and Project idealizer	Camila Vaccari	Sustainable Carbon – Projetos Ambientais Ltda.
Responsible for UMAC technology	Vânia Gasperini	LPC – Tecnologia Ambiental

The schedule of site visits was as follow:

- 13/02/2012: Suruvy and Granja Silva Farms;
- 14/02/2012: Alternor, Andretta, Colônia Suspiro, Helena and Pissaia's Farms;
- 15/02/2012: Ramella, Santa Lucia, Gilmar, Colônia Zuffo and Sítio Pickler's Farms;
- 16/02/2012: Baccin's Farm.

During the onsite assessment it was possible to observe that all anaerobic lagoons were located less than 1 km distance from the actual UMAC installation and were properly inactivated, with exception of Sítio Pickler's Farm, where it was possible to observe that the lagoon is still being applied for 300 animals. This quantity of animals will be subtracted from the total for the calculation of emission reduction in the monitoring period. All farmers receive a formulated feed for swine provided by the integrators, which are adequate for each kind of race and size.

Baccin's farm was the only one that was still in construction phase and therefore still doesn't have the UMAC purchase invoice. It's not possible to buy the machinery before the end of the construction since LPC technicians have to measure the exact distance between the windrows to install the UMAC.

Apart from this farm, the rest possessed the UMAC installed, substrate in sufficient quantity (mainly sawdust) and a roof that covered the entire composting area to avoid rainwater percolation. In these farms it was possible to observe that all farmers were able to properly manage the UMAC, which performs the homogenization and aeration due to its helical blades. The trainings for UMAC handling were done in all farms, including at Baccin's Farm, which was confirmed through interviews and also by a document provided by LPC (responsible for trainings) / 15 /. Also, all of them have associated the appliance of the UMAC to benefits such as odor reduction, better working conditions and fewer risks to the environment. The only negative point the farmers appointed is the price of this technology, which is higher than the baseline situation.

2.5 Resolution of Any Material Discrepancy

The validation protocol has been added as Annex A to this report. The validation protocol was prepared following the site visit during which all issues identified during the desk review were discussed. All CAR/CLs have been resolved by PPs via provision of additional supporting evidence and appropriate changes to the VCS PD.

3 VALIDATION FINDINGS

3.1 Project Design

The project activity involves the improvement of the animal waste management system in 8 swine farms and implementation of automated composting unit in 5 greenfields, properly described in Table 1 of VCS PD / 2 /. The project aims to reduce GHG emissions due the replacement of anaerobic lagoons to composting units. The project activity is under sectoral scope 13 (Waste handling and disposal). In section 1.8 of the VCS PD / 2 / the technology applied is described in a complete manner with details about the project's system and gives sufficiently information about the equipment.

The swine manure is transferred to the UMAC installation (Figure 2) by pumps, which throws the waste in the windrows. At the same time, the aeration and homogenization is performed by helical blades, which can be visualized in Figure 3, allowing appropriate levels of oxygen, moisture content and temperature. These conditions guarantee that the composting process will occur under aerobic conditions, avoiding methane emissions.



Figure 2: Overview of the composting process.



Figure 3: The UMAC machinery.

The location of each farm was confirmed onsite and can be visualized in Figure 1. Figure 2 shows one of the places where the composting process is performed. It was verified onsite that all farms, except Baccin's that is still under construction, have the same construction and machinery, which means the same technology is applied in all farms.

This project aims to reduce a total of 126,239 tCO₂e in 10 years of crediting period (01/01/2011 – 31/12/2020), which classifies as a project scale, not a mega-project, since it does not exceed 1,000,000 tCO₂e per year (as stated in item 3.10.1 of VCS Standard, v.3.2).

The project's spatial boundaries are clearly described for the project installation and respective emissions reduction through avoidance of methane emissions. The geographical coordinates of project locations are also included in the PD (page 10 - Table 4) / 2 /.

The project is in line with Local Environmental requirements, since all farms have the Environmental Operating License (/ 26 / to / 39 /), which is issued after checking whether the farm is in line with the Federal Forest Code (Law No. 4.771/65 and amendments), the State Decree No. 14.250/81, State Sanitary Code (Decree 24.980/85 and amendments) and CONAMA Resolution 302/02 and 303/02. The only exception is Baccin's Farm, that is not operating yet, and hence obtained an Environmental Installation License / 38 /, which is also issued by FATMA and is in line with the State Law 14.675/09.

The project's start date is the earliest date of all farms' starting date (21/05/2010). The starting date of each farm is the date on which the project began reducing GHG emissions, which correspond to the dates when the UMAC started running in an adequate manner: the date on which the farmers received trainings or the date on which the swine entered the farms, whichever is later. The validation team accepts the justification of starting date.

Table 4: Starting date and respective evidences.

Type of farm	Farm Name	Project Start Date	Date of Installation of UMAC and Training	Evidence
Brownfield	Sítio Pickler	27/01/2011	26/10/2010	First swine entrance in the farm (photo of GTA / 7 /)
Brownfield	Altenor	21/05/2010	27/01/2010	First swine entrance in the farm (photo of GTA / 8 /)
Greenfield	Ramela	21/10/2010	11/10/2010	First swine entrance in the farm (photo of GTA / 9 /)
Greenfield	Sítio Santa Lúcia	29/11/2010	21/09/2010	First swine entrance in the farm (photo of GTA / 10 /)
Brownfield	Helena	18/10/2011	12/09/2011	First swine entrance in the farm (photo of GTA / 11 /)
Brownfield	Gilmar	11/01/2012	15/08/2011	First swine entrance in the farm (photo of doc / 12 /)
Brownfield	Suruvy	28/11/2011	28/11/2011	Training date (photo of LPC declaration / 15 /)
Brownfield	Granja Silva	14/04/2011	14/04/2011	Training date (photo of LPC declaration / 15 /)
Greenfield	Colônia Suspiro	27/07/2011	21/03/2011	First swine entrance in the farm (photo of GTA / 13 /)
Greenfield	Colônia Zuffo	29/11/2010	19/11/2010	Training date (photo of LPC declaration / 15 /)
Brownfield	Pissaia	20/12/2010	18/09/2010	First swine entrance in the farm (photo of doc / 14 /)
Greenfield	Baccin	Expected to be 15/07/2012	Under construction	Will be checked in the Verification process, as required by FAR 1.
Brownfield	Andretta	26/10/2011	26/10/2011	Training date (photo of LPC declaration / 15 /)

With regard to the greenfield farms, these farmers started to design the swine confinement operation and at that moment they had the alternative to choose for the installation of anaerobic lagoons to store and stabilize the wastes for later soil application (the most likely scenario in the absence of the project, as a continuation of the historical practice), the installation of an anaerobic digester or the UMAC as part of this project activity. Since the brownfield farmers would install the UMACs, the greenfield farms also decided to install this technology although the lack of knowledge in this type of treatment.

3.2 Application of Methodology

3.2.1 Title and Reference

According to the VCS PD, PPs have applied the:

- Approved CDM methodology AMS-III.F / Version 10 “Avoidance of methane emissions through composting”;
- Approved CDM methodology AMS-III.D / Version 18 “Methane recovery in animal manure management systems”;
- “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”, Version 01;
- “Tool for demonstration and assessment of additionality”, Version 06;
- “Tool to calculate the emission factor for an electricity system”, Version 2.2.1.

3.2.2 Applicability

The approved baseline and monitoring methodology AMS-III.F “Avoidance of methane emissions through composting” (version 10) / 4 / has been applied for the proposed project activity, which is valid from 04/03/2011 onwards. The validation team verified the applicability of methodology AMS-III.F (version 10) as follows:

Table 5: Appliance of the project activity to the methodology AMS-III.F / 4 /.

Paragraph	Justification
§ 1	The project activity avoids the emissions of methane to the atmosphere from manure due to the introduction of aerobic treatment by composting. The manure would otherwise been left to decay anaerobically in lagoons, which is a common sort of animal waste management systems (AWMS) in the region.
§ 2	The project does not recover or combust any gas and does not undertake any controlled combustion.
§ 3	The emission reductions of this project are under 60kt CO _{2e} per year.
§ 4	The composting units only treat manure. This was confirmed during onsite assessment.
§ 5	The project comprises the construction of a new treatment facility. It was verified through onsite visit and purchase invoices that the UMACs (/ 16 / to / 25 /) were installed in all farms (except from Baccin’s farm, which is still under construction).

Paragraph	Justification
§ 6	These paragraphs are not applicable since this project doesn't comprise any co-composting process.
§ 7	
§ 8	The location and characteristics of the disposal site of animal manure in the baseline condition is well known, which is the use of anaerobic lagoon. Please also see Table 6.
§ 9	The project boundary covers a radius of 150km around each project site. Most of the produced compost will be used onsite (on each farm) or in the neighbouring region. The itinerary between these locations is also included in the project boundary.
§ 10	The compost produced will be used as fertilizer for the soil, and the farmers will control the final destination of the compost (control of sales, consumer records, distance, etc) through a spreadsheet developed by Sustainable Carbon. Farmers will also provide to the buyers of the compost a guidance explaining how to properly apply the compost into the soil, to avoid methane emissions, thus this ensures aerobic handling and treatment.
§ 11	Not applicable. The compost produced is not treated thermally/mechanically.
§ 12	The compost produced will neither be stored anaerobically nor disposed in landfills. With relation to storage under anaerobic conditions, validation team confirms that the properties of the waste being low porosity and moist based on interview with the technology provider, and thus will not lead to anaerobic conditions, in accordance with 'Emissions from solid waste disposal sites'. Furthermore, the compost removed from UMAC will be stored for less than a month, as per LPC (UMAC manufacturer) and Sustainable Carbon recommendations, which avoids anaerobic storage or disposal.

As required by paragraph 8 of the methodology AMS-III.F / 4 /, the project activity also meets paragraphs 1 and 2 (c) of AMS-III.D / 5 /, which can be better visualized through the Table 6.

Table 6: Appliance of the project activity to the methodology AMS-III.D / 5 /.

Paragraph	Justification
§ 1	(a) The livestock population in all farms is managed under confined conditions. It was confirmed during the onsite assessment.
	(b) The manure is not discharged into natural water resources since it is properly treated through composting, and the land is sealed, avoiding contamination of groundwater.
	(c) The annual average of temperature of baseline site where anaerobic manure treatment facility is located is higher than 5°C. It is proven by assessment of a document made by the National Institute of Meteorology / 6 /, where it can be visualized that Santa Catarina State has annual average temperature of 18°C. Also, it can be visualized that no region in Brazil has annual average temperature lower than 8°C.
	(d) In the baseline scenario the anaerobic lagoons had more than 1m depth. It was proven

		by interviews during the onsite assessment.
	(e)	No methane recovery or destruction was made in the baseline scenario. It was assessed through interviews of farmers during the onsite visit.
§ 2	(a)	The residual waste from the animal manure management system will be handled aerobically in composting as confirmed from interview with personnel from Tecnologia Ambiental. Aerobic soil application is ensured from presence of procedures and training provided to all farmers.
	(b)	No biogas is produced, and hence, this is not applicable to the project activity.
	(c)	The storage time of the manure after removal from the animal barns, including transportation, does not exceed 45 days before being fed into the composting unit, since it goes straight from the feedlots to the composting process. It was verified during the onsite assessment via interview with personnel from Tecnologia Ambiental.
§ 3	-	Not applicable. There is no recover of methane from landfills.
§ 4	-	Not applicable. There is no recover of biogas.
§ 5	-	The greenfield projects comply with the requirements of section 4.10 of the “General guidelines for SSC CDM methodologies” / 50 /.
§ 6	-	Not applicable. There is no replacement of equipment (anaerobic lagoons is not an equipment).
§ 7	-	The annual emission reductions estimated for the proposed project activity is less than 60 kt CO ₂ e. It is estimated to be 12,623 tCO ₂ e per year.

3.2.3 Project Boundary

The project boundary is in line with the methodology AMS-III.F v.10 / 4 /, since it includes all the physical geographical sites required: the place where the waste would have been disposed in the absence of the proposed project activity; the place where the treatment of biomass through composting takes place; the place where the compost is handled, disposed, submitted to soil application, or treated thermally/mechanically; and the itinerary between these places.

It is important to state that the place where the waste would have been disposed in the absence of the proposed project activity would be where the anaerobic lagoons operated. During the onsite visit it was possible to confirm that in the brownfield projects the lagoons took place very near to the location where UMAC is currently installed (less than 1 km distance). Hence, for the greenfield projects the sites where the waste would be disposed in the absence of the project activity is the place where the UMAC is installed nowadays.

The project boundary also consists of an area with a radius of 150 km around each farm, not exceeding 200 km, as required by paragraph 9 of AMS-III.F / 4 /, which aims to ensure that the transportation of the compost and its soil application is also included. It was confirmed through interviews that most of the farmers still don't sell the compost. Also, the ones that intend to sell the compost stated that their possible buyers are people from the region, which means the transportation of more than 150

km is not expected. These considerations are deemed real by the Validation Team as per evidences on the monitoring of compost destinations controlled by the farmers on 2012 / 52 /, on which the distance between the farm and destination is confirmed to be less than 30 km according to Google Maps tool. Also, Figure 1 presents the cities where the farms are located, showing that all the places are considerably near from each other.

The relevant baseline emission source is CH₄ from anaerobic lagoons, whereas CO₂ and N₂O were properly excluded for sake of simplification.

The project emission sources are CO₂ from transportation due to incremental distances and electricity consumption, and possible CH₄ emissions from the waste composting process, since the oxygen content won't be monitored.

3.2.4 Baseline Scenario

The baseline of the project activity is identified as per requirements of the General guidance for small scale CDM methodologies / 49 /.

Step 1: Three alternatives available to the project proponent that delivered comparable levels of service, including the proposed project activity undertaken without being registered were listed. The alternatives provided in section 2.4 of VCS PD / 2.1 / are realistic and credible for the region, verified through interviews and also compared with the experience from other projects in Santa Catarina.

Step 2: All alternatives listed in Step 1 are in compliance with local regulations, and hence, they were not excluded.

Step 3: After application of the barrier test, the only remaining alternative is the use of anaerobic lagoon. As per section 2.5 of VCS PD / 2.2/ it is possible to verify that the UMAC faces technological barrier, and both UMAC and the installation of anaerobic digester as waste management system require more investment than the continuation of the use of anaerobic lagoons in the brownfield farms or the installation of anaerobic lagoons in the greenfield farms. Hence, the validation team concluded that the only option that does not face any barrier is the use of anaerobic lagoon.

Step 4: Only one alternative remained, which is the use of anaerobic lagoon and corresponds to the baseline scenario.

Therefore, it is the Audit Team's opinion that the baseline scenario is determined according to the methodology and is reasonable. The baseline scenario is applied to all farms included in the project activity (brownfield and greenfield farms) since they all would operate in similar conditions (in terms of technology availability, market conditions, legal framework, amongst others). The validation team considers this approach as appropriate.

3.2.5 Additionality

The "Guidelines on the demonstration of additionality of small-scale project activities" (Version 09.0) / 54 / was applied to demonstrate the additionality of the project activity.

As already stated in section 3.2.4 of this report, all three alternatives (continuation of the common practice of the region – the use of anaerobic lagoons, installation of anaerobic digesters and implementation of composting unit not undertaken as a GHG emission reduction project) are realistic and credible for the region, verified as per interviews and also compared with the experience from other projects in Santa Catarina.

Any of the alternatives listed are mandatory by any law, statute of other regulatory framework in Federal, State and Municipal levels, as per Normative Instruction Nº 11 of FATMA (Foundation of Environment of Santa Catarina State) / 53 /.

Barrier Analysis

As per the “Guidelines on the demonstration of additionality of small-scale project activities” (Version 09.0) / 54 /, the PPs shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers: investment barrier, technological barrier, barrier due to prevailing practice or other barriers.

Investment Barrier

As demonstrated by Table 6 and 7 of VCS PD / 2 / and as per interviews carried out onsite, it was verified that the project activity requires higher costs than the baseline scenario (anaerobic lagoon) and the most likely alternative (anaerobic digesters), since the equipment UMAC is costly (as purchases invoices / 16 / - / 25 /), the composting sheds had to be built with impermeable soil and roof coverage in all farms to avoid rainwater percolation (and environmental consequences), it is periodically necessary to buy substrate (as purchases invoices checked during the onsite visit) and also, as stated above in the Technological Barrier section, trainings had to be held to guarantee the proper management of the composting unit.

Technological Barrier

It was confirmed onsite and through interviews that this type of technology is innovative. The UMAC was the object of honourable mention / 40 / since it was classified as a finalist in the category “Agricultural Branch - Technological Innovation Award Cooperative of the Year 2008”, held by the Organization of Cooperatives Brazil (OCB), National Service Learning Cooperative (Sescoob) and Globo Rural magazine. As a consequence, the project activity faces issues such as lack of experience, since the farmers had no experience with composting process before, which lead to the need of trainings to guarantee a proper management of this new technology.

The continuation of the anaerobic lagoons doesn’t face any technological barrier – this activity has been used in many farms in the region for a long period – and also is less expensive than the other alternatives.

As a result of the above, the validation team concludes that the additionality proof has been conducted by the PP in a correct way following the rules of the “Guidelines on the demonstration of additionality of small-scale project activities” (Version 09.0) / 54 /, and that the project can be deemed as additional.

3.2.6 Quantification of GHG Emission Reductions and Removals

Baseline Emissions

The baseline emissions are calculated as the methane emission from the total waste received on all composting units that would be, in the absence of the project activity, treated by anaerobic lagoons with soil application. In section 3 of the VCS-PD emission reductions are calculated in accordance with Option 9(a) (equation 1) of AMS-III.D v.18:

$$BE_y = GWP_{CH_4} * D_{CH_4} * UF_b * \sum_{j,LT} MCF_j * B_{0,LT} * N_{LT,y} * VS_{LT,y} * MS\%_{Bl,j}$$

For the parameter $VS_{LT,y}$ equation 2 of AMS-III.D v.18 was applied:

$$VS_{LT,y} = \left(\frac{W_{site}}{W_{default}} \right) * VS_{default} * nd_y$$

The average number of animals ($N_{LT,y}$) is calculated by equation 3 of AMS-III.D, which was applied since the production of animals are not done in a fixed period, it depends on the farm production.

$$N_{LT,y} = N_{da,y} * \left(\frac{N_{p,y}}{365} \right)$$

All the parameters and their units are properly described in section 3.1 of VCS PD / 2 /. After assessment of spreadsheet calculation provided by the PPs, the validation team deemed the baseline emissions estimations conservative.

Project Emissions

For the proposed project activity, project emissions from electricity consumption and methane emissions during composting process are considered, since there is no incremental transportation, no fossil fuel consumption, no runoff of water and the compost will not be stored in anaerobic conditions nor sent to landfills. Hence, simplifying equation 2 of AMS-III.F, the project emissions can be calculated as follow:

$$PE_y = PE_{y,power} + PE_{y,comp}$$

Where:

$$PE_{y,power} = \sum_j EC_{PJ,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})$$

$$PE_{y,comp} = Q_y * EF_{composting} * GWP_{CH_4}$$

The project emissions from electricity consumption were properly calculated as per equation 1 of “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” v.01, and the grid emission factor was calculated as per “Tool to calculate the emission factor for an electricity system” v.

2.2.1. The Brazilian DNA publishes annually the emission factor for the Brazilian grid, and the PPs properly applied the latest emission factor available from 2011 (0.1988 tCO₂/MWh) / 43 /, which will be updated annually during the crediting period.

The quantity of electricity consumed will be determined through the frequency of operation of the manure pumps and the UMAC, which was evidenced through a LPC declaration / 51 /.

The project emissions from composting are estimated at emission factor of 4g CH₄/kg waste treated on wet basis whereby oxygen content of the compost will not be monitored. The calculation is done as per equation 4 of AMS-III.F. The quantity of waste treated (Q_y) will be determined through the amount of hours that the pump functioned and/or applying default values. The validation team considers this appropriate, as the power capacity of the UMAC equipment and pump has been verified on-site. The amount of hours of pump function however were initially estimated by LPC (UMAC manufacturer) who considered the design of each individual farm, the size of each composting site and the typical operating conditions of the UMAC system in the calculations / 50 /. There is an intention from PPs to install digital hour meter during the crediting period, which is still under analysis due to the investment that will have to be made to purchase these equipment.

Quantity of compost (Q_{y,treatment}) produced for the proposed project will be estimated from compost packed in storage bags with pre-defined volume or weight. The validation team considers this acceptable as there will be no contribution to project emission due to aerobic storage and soil application.

Leakage

No leakage emission is expected to occur during the project activity, since the technology applied is not transferred to or from another project activity.

Summary of GHG emission reductions or removals

According to AMS-III.F, v.10, the emission reductions are the baseline emissions subtracting project emissions:

$$ER_y = BE_y - PE_y$$

The summary of emission reductions are described in the table below:

Table 7: Estimated baseline emissions, project emissions and emission reductions for the crediting period.

Year	Estimated Baseline Emissions (tCO _{2e})	Estimated Project Emissions (tCO _{2e})	Estimated net GHG emission reductions (tCO _{2e})
2011	9,147	1,905	7,241
2012	15,022	3,263	11,758
2013	17,112	3,707	13,405
2014	17,112	3,707	13,405
2015	17,112	3,707	13,405

Year	Estimated Baseline Emissions (tCO _{2e})	Estimated Project Emissions (tCO _{2e})	Estimated net GHG emission reductions (tCO _{2e})
2016	17,112	3,707	13,405
2017	17,112	3,707	13,405
2018	17,112	3,707	13,405
2019	17,112	3,707	13,405
2020	17,112	3,707	13,405
Total estimated	161,065	34,824	126,239

The main uncertainties regarding the estimated emissions reductions are properly described in section 3.4 of VCS PD. / 2 /

3.2.7 Methodology Deviations

As stated on the VCS PD /2.2/, a deviation from methodology regarding equation 3 of AMS-III.D / 5 / was done. The adaptation was accepted by the validation team since it does not negatively impact the conservativeness of the quantification of the emission reduction, also it increases the accuracy of the emission reduction since the farms operate in batches (from 3 to 4 months) instead of 365 days and the source of data will be obtained from third party information (documents from integrators or State Agricultural agencies).

In case electricity consumption is not directly monitored, another deviation will occur on the monitoring of the quantity of electricity consumed by the project, which methodology requires assuming that all relevant electrical equipment operate at full capacity, plus 10% to account for distribution losses, for 8,760 hours per year. However, given that the UMAC manufacturer (LPC) stated that the expected time of operation is a range between 25 minutes to 1 hour and 10 minutes for the pump and a range between 2 hours and 10 minutes to 5 hours and 16 minutes for UMAC, as per LPC declaration / 50 /. The estimates were corrected by a factor of 125% meaning an operation time 25% higher than expected by LPC. The validation team accepted it as the composting facility will not be operating 24 hours, as the operation depends on the scale of farm.

A deviation of parameter 'Q_y' (quantity of manure treated in the year y) occurred since the farmers will determine it based on the operating hours of the pump which destine the manure from the storage tank to the composting unit and/or applying default values of animal waste production, which shall be consistent with the farms manure techniques and shall only be applied if it is possible to determine that their use result in a conservative calculation of emission reduction. This is accepted by the validation team since using the default values are higher than monitored data, which is conservative. As per section 4.2 of VCS PD /2.2/, in the absence of data (or data is incomplete) and the use of the default values is not conservative, no emission reduction will be claimed for the period of time where monitoring data is incomplete.

Another deviation occurred in parameter 'Q_{y, treatment}' (quantity of compost produced in year y), which will be monitored through storage bags with predefined volume or weight. This is accepted by the

validation team because this parameter will not interfere in the conservativeness of the emission reduction quantification, as there is no project emission expected from the produced compost. The tool “Project and leakage emissions from composting” / 53 / allows for a different procedure in case there are no weighting device. The tool / 53 / recommends estimating the amount of waste based on the number of trucks and their capacity, which was not applied since there is no transportation of compost through trucks in the project activity.

3.2.8 Monitoring Plan

The project is based on the approved CDM methodology AMS-III.F v.10 “Avoidance of methane emissions through composting” / 4 /. The monitoring plan is described in details in sections 4.1 to 4.3 of VCS PD, where the parameters available at the time of validation, the parameters that will be monitored, recording frequency and QA/QC procedures are deemed reasonable and appropriate.

The parameters available at the time of validation are the following: methane global warming potential (GWP_{CH_4}), methane density (D_{CH_4}), correction factor to account for model uncertainties (UF_b) and the average technical transmission and distribution losses for providing electricity to source j in year y ($TDL_{j,y}$). These values are in accordance with the methodology AMS-III.D, v.18, and will be updated according to future decisions of COP/MOP. Other values were obtained from IPCC: the annual methane conversion factor for the baseline animal manure management system j (MCF_j), the maximum methane producing potential of the volatile solid generated for animal type LT ($B_{0,LT}$), the default average animal weight of a defined population ($W_{default}$), the default value for the volatile solid excretion rate per day on a dry-matter basis for a defined livestock population ($VS_{default}$) and the emission factor for composting of manure ($EF_{composting}$).

The parameters monitored are described in section 4.2 and Table 11 of VCS PD / 2 /. The volatile solids for livestock LT entering the animal manure management system in year y ($VS_{LT,y}$) is based on default values from IPCC ($VS_{default}$ and $W_{default}$) and W_{site} , which will be measured by the integrators, state agencies or internal documents, and since there is a commercial purpose involved, it can be deemed an accurate and conservative value.

For the market swine, the number of days in year y where the animal manure management system is operational (whenever manure is applied and/or the composting windrows are mixed with substrate to produce compost) (nd_y) and the number of days animal is alive in the farm in the year y ($N_{da,y}$) will be measured through a spreadsheet filled by the farmers every time they use the UMAC. Another option is to apply the value of days the animals are alive in the farm, which can be obtained by integrators or state agencies (normally the GTAs). For breeding swine, the $N_{da,y}$ applied will be 365 days per year, since this type of swine stays in the farm the entire year. GTA is a document issued by a third part which describes the amount and origin of animals transported, and the hygiene is certified by a veterinarian.

The number of animals produced annually of type LT for the year y ($N_{p,y}$) will be monitored using the spreadsheet filled onsite by the farmers or documents from third parties (integrators or state agencies), which is again considered reliable sources. For market swine, the PPs will consider the difference between the inputs and outputs. For the breeding swine, the PPs will use the annual average, since in general this type of animal stay in the farm the whole year.

The annual average number of animals of type LT in year y ($N_{LT,y}$) is based on $N_{da,y}$ and $N_{p,y}$, which were already discussed above.

The quantity of compost produced in year y ($Q_{y,treatment}$) will be measured every time the compost is removed from the windrows using standard bags with known volume or weight, which is deemed a non-accurate method, but since this parameter doesn't influence the emission reductions calculation, the validation team accepted this method, since higher precision is not feasible under the reality of the farmers.

The quantity of electricity consumed by the project electricity consumption source j in year y ($EC_{PJ,j,y}$) will be measured through spreadsheet filled by the farmers. They will register the time the electric equipments are turned on and off, and the period between them will be multiplied by the nominal electricity consumption of each equipment. This procedure is considered a low level accurate, but the validation team accepted since higher precision is not feasible under the reality of the farmers, and also because the electricity consumption is not high (confirmed as per interviews onsite), which won't contribute to more than 1% of the emission reductions.

The emission factor for electricity generation for source j in year y ($EF_{EL,j,y}$) is published by the Brazilian DNA annually, which is based on the CDM "Tool to calculate the emission factor for an electricity system".

The quantity of manure treated in the year y (Q_y) will be determined in a similar way to the $EC_{PJ,j,y}$. The farmers will fill the spreadsheet with the time they turn on/off the pumps, and the PPs will determine Q_y through the equation below.

$$Q_y = P_{NF} * P_{TO,y} * MD * 0.7$$

Where P_{NF} is the pump nominal flow (in m³/hour), $P_{TO,y}$ is the pump time of operation in year y (in hours), MD is the manure density (in tonnes/m³) and 0.7 is the fraction of waste from confinement that is manure. Since this procedure doesn't have high accuracy, the PPs will use default values of animal waste production from LPC, which are based on the FATMA normative and literature / 44 /.

The conditions of the composting process (temperature, moisture level and frequency of operation of the mixing equipment) will be monitored by the farmers. The temperature will be measured by a thermometer, and the moisture by a moisture meter. Both parameters will be measured in two different points of the composting shed and with an interval of 15 days. The accuracy is deemed high due to the technical specification of these equipments. The frequency of operation of the mixing equipment will be monitored by the spreadsheet filled by the farmers every time the UMAC operates.

The soil application of the compost for agricultural purposes will also be monitored. The farmers will control the final destination using a spreadsheet provided by Sustainable Carbon – Projetos Ambientais Ltda. The farmers will control all the compost used, including sells, donations and uses in their own properties. They will also provide a guidance to the buyers with information on how to apply the compost in a proper manner, avoiding methane emissions.

All data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

To assure that the monitoring will be done in all farms as indicated in the VCS PD, trainings were held in all farms with the monitoring authorities, which was confirmed through list of presence / 45 / signed. The PPs also prepared a manual where it is detailed the farmers' responsibilities, Sustainable Carbon's responsibilities, procedures to monitor all parameters and how to deal with problems and emergency situations. The validation team deemed this manual as adequate and in line with the monitoring plan. In section 4.3 of VCS PD there are also information and procedures on how to deal with erroneous measurements.

The management of the monitoring plan will be held by Sustainable Carbon – Projetos Ambientais Ltda, which means they will be responsible for emission reductions calculations, trainings and supporting all farmers regarding the monitoring plan, preparation of the monitoring report for the verification processes, QA/QC procedures and data storage. LPC – Tecnologia Ambiental will be responsible for supporting all farmers with regard to operation and maintenance of the composting unit, accompany Sustainable Carbon during onsite visit and project monitoring. The organization structure of the monitoring plan can be visualized in Figure 2 of VCS PD / 2 /.

Table 8: Parameters fixed ex-ante and to be monitored ex-post.

Parameters fixed ex-ante		
Parameter	Value / Unit	Justification of the validation team
Annual average temperature at project site (Annual average temperature)	18°C	The validation team accepted this value since was sourced from the National Institute of Meteorology / 6 /.
Global Warming Potential of CH ₄ (GWP _{CH₄})	21 tCO ₂ e/tCH ₄	The validation team accepted this value since was sourced from the AMS-III.D, version 18, paragraph 10 / 5 /.
Density of CH ₄ (DCH ₄)	0.00067 at room temperature (20°C) and 1 atm	The validation team accepted this value since was sourced from the AMS-III.D, version 18, paragraph 10 / 5 /.
Correction factor to account for model uncertainties (UF _b)	0.94	The validation team accepted this value since was sourced from the AMS-III.D, version 18, paragraph 10 / 5 /.
Annual methane conversion factor for the baseline animal manure management system j (MCF _j)	For uncovered anaerobic lagoons: 77%	The validation team accepted this value since was sourced from IPCC (Intergovernmental Panel on Climate Change) / 48 /.
Maximum methane producing potential of the volatile solid generated for animal type LT (B _{0,LT})	0.29 m ³ CH ₄ /kg dm for market swine and 0.45 m ³ CH ₄ /kg dm for breeding	The validation team accepted these values since they comply with paragraph 10(d) of AMS-III.D and also was sourced from IPCC (Intergovernmental Panel on Climate Change) / 48 /.

	swine	
Fraction of manure handled in baseline animal manure management system j ($MS_{0BL,j}$)	100%	At baseline scenario, all waste was sent to anaerobic lagoons in the Brownfield farms. This was accepted by the validation team since it was verified onsite that before the installation of the UMAC, the waste was treated through anaerobic lagoons. The same baseline scenario is considered for the Greenfield farms, since it is the common practice in the region.
Default average animal weight of a defined population ($W_{default}$)	28 kg for market swine and 198 kg for breeding swine	The validation team accepted these values since they comply with paragraph 10(d) of AMS-III.D and also was sourced from IPCC (Intergovernmental Panel on Climate Change) / 48 /.
Default value for the volatile solid excretion rate per day on a dry-matter basis for a defined livestock population ($VS_{default}$)	0.46 kg dm/animal/day for breeding swine and 0.3 kg dm/animal/day for market swine	The validation team accepted these values since they comply with paragraph 10(d) of AMS-III.D and also was sourced from IPCC (Intergovernmental Panel on Climate Change) / 48 /.
Emission factor for composting of manure ($EF_{composting}$)	4 gCH ₄ /kg waste treated on a wet weight basis	The validation team accepted this value since was sourced from IPCC (Intergovernmental Panel on Climate Change) / 48 /.
Average technical transmission and distribution losses for providing electricity to source j in year y ($TDL_{j,y}$)	10%	The validation team accepted this value since was sourced from the table III.F.1 of the AMS-III.F / 4 /.
Manure density (MD)	1,016 Kg/m ³	The validation team accepted this value since it is in line with the technical description of the swine manure of the farms (3% of solid manner) and also was sourced from EMBRAPA / 44 /, the Brazilian Agricultural Research Corporation.

Parameters to be monitored ex-post		
Parameter	Value / Unit	QA/QC Procedure
Volatile solids for livestock LT entering the animal manure management system in year y, ($VS_{LT,y}$)	Kg dm/animal/year	Annual monitoring. Checking the number of operational days (whenever manure is applied and/or the composting windrows are mixed with substrate to produce compost). The validation accepted this since this parameter is based on other parameters (W_{site} , $W_{default}$, $VS_{default}$ and n_{dy}).
Number of days in year y where the animal manure	Days	Annual monitoring. Farmers were trained for the monitoring of this parameter

management system is operational (nd_y)		via recording of operational hours of monitoring unit (whenever manure is applied and/or the composting windrows are mixed with substrate to produce compost). Monitoring spreadsheets shall be cross checked with third party information (integrators of state agricultural agencies) to assess possible errors. The integrators / State Agricultural agencies are deemed a reliable source since the data are used for financial purposes, and hence, was accepted by the validation team.
Average animal weight of a defined livestock population at the project site (W_{site})	kg	Periodic recording. Control forms and registration documents provided by the third parties (integrators, State Agencies, etc). The integrators / State Agricultural agencies are deemed a reliable source since the data are used for financial purposes, and hence, was accepted by the validation team.
Number of days animal is alive in the farm in the year y ($N_{da,y}$)	Days	Periodic recording. Control forms and registration documents provided by the third parties (integrators, State Agencies, etc). The integrators / State Agricultural agencies are deemed a reliable source since the data are used for financial purposes, and hence, was accepted by the validation team.
Number of animals produced annually of the type LT for the year y ($N_{p,y}$)	Number	Periodic recording. Control forms and registration documents provided by the third parties (integrators, state agencies, etc). Sustainable Carbon – Projetos Ambientais Ltda will keep a database with the information provided for each farm. The integrators / State Agricultural agencies are deemed a reliable source since the data are used for financial purposes, and hence, was accepted by the validation team.
Annual average number of animals of type LT in year y ($N_{LT,y}$)	Number	Monitored annually. The swine farmers will be responsible for keeping data regarding animal production, such as control forms and registration documents provided by the integrators. The integrators are deemed a reliable source since the data are used for financial purposes, and hence, was accepted by the validation team.
Quantity of compost produced in year y ($Q_{y,treatment}$)	Tonnes	Monitored annually. Farmers were trained on the project monitoring to allow more precision in the determination of this parameter, and the procedure is in predefined volume or weight storage bags. Therefore, it was accepted by the validation team.

Quantity of electricity consumed by the project electricity consumption source j in year y ($EC_{PJ,y}$)	MWh	Daily monitoring. Farmers were trained to ensure this parameter is correctly monitored. Sustainable Carbon shall manage the project database and check possible errors. In case monitoring data for this parameter is incomplete, estimated values shall be compared either to existing data of the same farm (for different periods of time) or to data from other farms with similar operating conditions. Such comparison will be made to assess if the use of estimated value is conservative. Estimated values are presented in annex 2 of PDD /2.2/. This procedure was accepted by the validation team. Estimated values shall only be applied if it is possible to determine that their use result in a conservative calculation of emission reduction.
Emission factor for electricity generation for source j in year y ($FE_{EL,j,y}$)	tCO ₂ /MWh	Monitored annually. The grid emission factor will be obtained directly from the CIMGC website. No QA/QC procedures are applied for this parameter.
Quantity of manure treated in year y (Q_y)	Tonnes	Monitored annually. The amount of waste produced will be monitored by registering the operating hours of the pump which destine the manure from the storage tank to the composting unit and/or applying default values. Default values shall only be applied if it is possible to determine that their use result in a conservative calculation of emission reduction. In case monitoring data for this parameter is incomplete, default values shall be compared either to existing data of the same farm (for different periods of time) or to data from other farms with similar operating conditions. Such comparison will be made to assess if the use of default values is conservative. In case monitoring data is incomplete and the use of default values cannot be considered conservative, no emission reductions shall be claimed for the periods of time where monitoring data is incomplete. Default values used are based in FATMA normative and specific literature and were also used by LPC in the design of the composting units. Values are described in PDD, under “calculation method”. This procedure was accepted by the validation team.
Conditions of the composting process	°C for temperature,	Monitored every 15 days. Farmers will perform the measurement of the

include monitoring the following parameters: temperature and moisture of the composting mass and frequency of operation of the mixing equipment (Conditions of the composting process)	moisture level (qualitative analysis), ranging from very humid to very dry; frequency of time for operation of the mixing equipment	temperature and moisture of the composting mass using thermometers and moisture meters. Sustainable Carbon will control the database of the project (spreadsheet, measurements, etc). LPC will give support on how control the moisture of the composting process. The moisture of the composting mass will be monitored by each farmer using visual inspections to check whether the composting mass is too dry (crumbling in the hand), or too wet (dripping liquid). In addition, a moisture meter will be used to indicate the level of moisture in the composting mass. Farmers were trained to ensure these parameters are correctly measured. Farmers shall be instructed to contact LPC for assistance in case the temperature or moisture of the composting mass is outside desired ranges. This procedure was accepted by the validation team.
Count of compost removal from the treatment system and description of soil application (Soil application of the compost for agricultural purposes)	Numerical frequency	An annual verification will be carried out by a technician on the compost application sites in a sample of users. This procedure was accepted by the validation team.

3.3 Environmental Impact

The swine waste is deemed a serious environmental impact since there are the next swine producers in the region: 7,968,116 swines in Santa Catarina State, which represents 27% of the total production of the whole country in 2011 / 55 /, resulting in a large amount of waste, which causes leaching of the land, and may pollute the water / ii /. Therefore, the environmental impacts of the project are considered positive, since the AWMS was improved in all farms and there is no risk of underground water contamination since the soil is properly sealed. In addition, the odors from anaerobic lagoons diminished, which also reduced the pathogenic vectors associated to animal manure. This information was checked through interviews of farmers during onsite assessment. Other benefits derived from the implementation of the project activity are described in section 5 of VCS PD / 2 /. The UMAC is also considered positive to the environment by Santa Catarina's population, which can be proved through the Fritz Muller award of 2009 / 47 /, issued in 04/08/2009 by FATMA.

3.4 Comments by stakeholders

The validation team went through two stakeholder's meetings. The dates, venues and the stakeholders consulted are described below:

Stakeholder's Name:	Felipe Pender / i /
----------------------------	---------------------

Date:	16/02/2012
Role:	Environmental Department
Organization:	ACCS – Association of Swine Producers of Santa Catarina State
Local:	ACCS – Association of Swine Producers of Santa Catarina State
Address:	R. do Comércio, 655 – 89700-000 – Concórdia/SC – Brazil
Comments: The common practice in the region is the treatment of the swine manure through anaerobic lagoons with impermeability of the soil, since it is a requirement for obtaining environmental licenses. He stated that there are no laws or obligations in the state to treat the swine manure through composting.	

Stakeholder's Name:	Antonio Colussi / ii /
Date:	17/02/2012
Role:	Secretary of Agriculture in Concórdia Municipality
Organization:	City Hall of Concórdia
Local:	LPC – Tecnologia Ambiental
Address:	R. Dr. Maruri, 1637 – 89700-000 – Concórdia/SC – Brazil
Comments: He became aware of the project by information provided by LPC, and also through the press. In his point of view, the project is beneficial to the region, improves quality of life of the farmers and also is a good solution for the swine manure, since the large amount of waste causes leaching of the land, and the solid waste, final residue from the anaerobic lagoons, had to be removed and transported, generating more GHG emissions. The only negative point is the high cost related to this type of technology, which is a lot high than the common practice (anaerobic lagoons). This project had a positive impact in the region, which can stimulate other farmers to apply this technology in their farms.	

4 VALIDATION CONCLUSION

The validation team of TÜV Rheinland has performed a Validation for the Composting Project in Santa Catarina in Brazil on the basis of VCS Version 3 and UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team concluded that the Composting Project in Santa Catarina is established as described in the VCS PD (v. 03) / 2 / and meets all relevant requirements of the above-defined criteria. TÜV Rheinland therefore issues a positive Validation opinion.

The estimated Emission Reductions during the crediting period (01/01/2011 – 31/12/2020) are displayed in Table 9.

Table 9: Estimated emission reductions for the crediting period.

Year	Estimated net GHG emission reductions (tCO _{2e})
2011	7,241
2012	11,758
2013	13,405
2014	13,405
2015	13,405
2016	13,405
2017	13,405
2018	13,405
2019	13,405
2020	13,405
Total estimated ERs	126,239
Average annual Ers	12,623

5 APPENDIX A – VALIDATION PROTOCOL

Table 1: Validation requirements (Based on VCS v.3, Program Guidance and § 37 of the CDM Modalities and Procedures and on CDM Validation and Verification Manual, Annex 3 of EB44)					
Checklist question	Ref.	MoV ¹	Findings, comments, references, data sources	Draft conclusion	Final conclusion
1. VCS Project Description Document					
1.1. Is the VCS PD presented for validation based on the latest template available at the VCS website? <i>Indicate Yes / No answer and describe all inconsistencies in the Tables 2 and 3 accordingly.</i>	/ 1 / / 3 /	www, DR	Yes, the VCS PD / 1 / presented is on the latest template / 3 / available at the VCS website.	OK	OK
1.2. Has the VCS PD been established in accordance with the VCS requirements for completing VCS PD issued by the VCS Association?	/ 1 /	DR	Yes, the VCS PD / 1 / has been established in accordance with the VCS requirements for completing VCS PD.	OK	OK

¹ MoV = Means of Verification, DR = Document Review, I = Interview, www = internet search.

2. Project Description					
2.1. Does the VCS PD contain a description, which provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation?	/ 1 / (1.1, 1.8)	DR	Sections 1.1 and 1.8 provide a good understanding of the project activity. CAR 1: Please state in PD that Ramella and Colônia Suspiro Farms are Greenfield. CL 1: Please insert a table for better visualization of which farms are Greenfield and Brownfield farms. CAR 2: The city of Suruvy Farm is not the correct one. Please change it in whole PD. CAR 3: Geographical coordinates of the project locations should be given in decimal system.	CAR 1 CL 1 CAR 2 CAR 3	CLOSED
2.2. In the case of green-field project activity, is the project design described sufficiently by means of specifications, drawings and manuals? <i>Provide Yes/No answer and indicate the documents which have been reviewed in relation to the issue.</i>	/ 1 /	DR	There are greenfield farms where the UMAC (Mechanized and Automated Composting Unit) was installed since the beginning of the swine production, and also brownfield farms, where the swine production was already operating when they decided to change the treatment technology from anaerobic lagoons to the UMAC. These explanations can be seen in section 1.1 of PD / 1 /. CL 2: Please provide all documents related to UMAC, for example drawings and manuals.	CL 2	CLOSED

2.3. Does the project activity reflect current good practices, uses state of the art technology or would the technology result in a significantly better performance, than any commonly used technologies in the host country? <i>Provide the description of how validation has been carried out and what comparisons have been made.</i>	/ 1 /	I, DR	Yes, the project activity reflects current good practices. In addition, the technology results in a significantly better performance than the commonly used technologies in Santa Catarina State. The project reduces or eliminates methane emissions, diminishes the risks of environmental pollution since the animal manure is properly treated, reduces the bad odor, lessens the proliferation of insects, eliminates machines rental costs for animal wastes distribution, the system is automatized and easily managed. The common practice in the region (Santa Catarina State) is the use of anaerobic lagoons, which was confirmed during on site assessment and interview with the responsible for the environment department of ACCS (Association of Swine Producers of Santa Catarina State) / i / and environment secretary of Concórdia City / ii /. This type of technology produces high GHG emissions, has greater risks to environment and also to the farmer.	OK	OK
---	-------	-------	--	----	----

2.4. In cases where the project activity involves the alteration of an existing installation or process, does the VCS PD provide a clear description of the differences between the project and the pre-project scenario? <i>Please, provide Yes/Now answer and update Tables 2, 3 and 4 accordingly, if there is anything unclear in the provided description.</i>	/ 1 / (1.1)	DR	Yes, the pre-project scenario in Brownfield farms was the treatment of swine manure through anaerobic lagoons. It is explained in section 1.1 of PDD / 1 /.	OK	OK
2.5. Does the project grouping apply for the proposed project? If yes, does the VCS PD include a description of one central GHG information system and controls associated with the project and monitoring?	/ 1 / (1.2)	DR	No, this is not a grouped project.	OK	OK
2.6. Does the central GHG information system and controls include items identified in ISO14064-3:2006, clause 4.5?	/ 1 /	DR	Not applicable.	OK	OK

2.7. How has the sampling been determined? Have any of the sub groups and associated activities within each sub group been considered? Does the sampling meet the requirement set out under IAF Guide to ISO/IEC 66/1999 at a minimum?	/ 1 /	DR	Not applicable.	OK	OK
3. Project Start Date and Crediting Period					
3.1. Are the project's start date clearly defined and evidenced? Does the project start date meet the requirements as stated in VCS 2007.1 clause 5.2.1? If project grouping is applied, each grouped project shall meet the requirement of VCS 2007.1 clause 5.2.1.	/ 1 / (1.5)	DR	The project's start date is the earliest date of all farms' starting date. The starting date of each farm is the date on which the project began reducing GHG emissions, which correspond to the dates when the UMAC started running in an adequate manner: the date on which the farmers received trainings or the date on which the swine entered the farms, whichever is later. The starting date is also in accordance with the VCS 2007.1 requirements clause 5.2.1 since it is not before 01/01/2002. CL 3: Please provide the evidences for trainings and also for the start date of operation.	CL 3	CLOSED
3.2. Is the start of the crediting period clearly defined and reasonable?	/ 1 / (1.6)	DR	CL 4: Please clarify in PD why 01/08/2011 was chosen as the start of the crediting period.	CL 4	CLOSED

4. Baseline and Monitoring methodology					
4.1. General requirements					
4.1.1 Is the methodology used in the project activity an approved VCS Program methodology or a methodology from a VCS-approved GHG program? Is the selected methodology version still valid?	/ 4 /	DR	Yes, the project uses a methodology belonging to Clean Development Mechanism. This project falls under the Small Scale CDM project AMS-III.F (Version 10) / 4 /, which is still valid.	OK	OK
4.2. Applicability of the selected methodology					
4.2.1 Are all applicability conditions of the selected baseline and monitoring methodology and all tools involved satisfied by the project activity? <i>Please indicate Yes/No answer. In case of positive conclusion provide details of the validation measures. Otherwise amend the Tables 2 and 3 accordingly.</i>	/ 1 / (2.2) / 4 / / 5 / /	DR	Yes, all applicability conditions of AMS-III.F / 4 / and tools are satisfied and described in PD / 1 /. It also meets all requirements of paragraph 1 and 2(c) of AMS-III.D / 5 / as requested by methodology / 4 /, EF tool for electricity consumption calculation.	OK	OK
4.2.2 Is the selection of the applied baseline and monitoring methodology justified?	/ 1 /	DR	Yes, the justification is in section 2.5 of PD / 1 / (page 23).	OK	OK

4.2.3 Is the selected methodology correctly quoted in all related documents?	/ 1 / / 4 /	DR	Yes, the selected methodology AMS-III.F / 4 / is correctly quoted in all related documents.	OK	OK
4.2.4 Does the VCS PD sufficiently describe all the GHG emission sources or sinks occurring as a result of project activity, which have not been accounted for under the selected methodology and are expected to contribute more than 1% of the overall expected average annual emission reductions? <i>Provide Yes/No answer. Indicate the sources or sinks of GHG, which were proved to be negligible. Otherwise amend the Tables 2 and 3 accordingly.</i>	/ 1 /	DR	CL 5: Please clarify the sentence “The quantity of electricity consumed by the project activity on each farm ($EC_{PJ,j,y}$) is determined considering the combined power capacity of the all equipment in the mechanized composting unit and its operation for a period of 2,920 hours, which represents a consumption of 8 hours per day” on page 32 of PD / 1 /. As per interviews during the onsite assessment, the UMACs operate less than 8 hours/day. CAR 4: Please insert the project emissions parameters, such as $EC_{PJ,j,y}$ and $TDL_{j,y}$, in the monitoring sections.	CL 5 CAR 4	CLOSED

4.3 Project boundary					
4.3.1 Does the VCS PD correctly describe the project boundary? <i>Provide Yes/No answer. And amend the Tables 2 and 3 if needed.</i>	/ 1 / (1.9, 2.3)	DR	CAR 5: Please insert Nova Itaberaba city in the map on page 8 of PD / 1 / (please also insert the subtitle “Figure 1: ...”).	CAR 5	CLOSED
4.3.2 Does the VCS PD correctly indicate and describe the emission sources and sinks of GHG gases that are included in the project boundary?	/ 1 / (2.3)	DR	Yes, the VCS PD / 1 / correctly indicate and describe the emission sources and sinks of GHG gases that are included or not in the project boundary.	OK	OK
4.3.3 In cases where the methodology allows project participants to choose whether a source or gas is to be included in the project boundary, is the choice explained and justified by PPs?	/ 1 /	DR	Not applicable since the methodology doesn’t allow PPs to choose whether a source or gas is to be included in the project boundary.	OK	OK

4.4 Baseline identification					
4.4.1 Has the procedure contained in the selected methodology to identify the most reasonable baseline scenario been applied correctly and documented in the VCS PD?	/ 1 / (3.1)	DR	CL 6: Please clarify why option 9(a) of AMS-III.D has been chosen for baseline emission calculation and insert this explanation in PD.	CL 6	CLOSED
4.4.1.1 Is the identified baseline scenario plausible?	/ 1 / (3.1)	DR	Yes, the identified baseline is plausible.	OK	OK
4.4.1.2 Are all assumptions stated in a transparent and conservative manner?	/ 1 / (3.1)	DR	Idem CL 6 (item 4.4.1).	CL 6	CLOSED
4.4.2 Does the selected methodology require the use of tools <u>and</u> does VCS PD reflects that correctly?	/ 1 / (3.1)	DR	Yes, the selected methodology AMS-III.F requires the use of the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”/, which is mentioned in page 32 of PD / 1 /.	OK	OK
4.4.2.1 Were all the tools applied correctly?	/ 1 /	DR	Idem CAR 4 (item 4.2.4).	CAR 4	CLOSED

4.4.3 In case the methodology requires several alternative scenarios to be considered in the identification of the most reasonable baseline scenario, have all scenarios been considered <u>and</u> have no reasonable alternative scenario been excluded?	/ 1 / (2.4) / 4 /	DR	All reasonable scenarios were considered (page 23 of PD / 1 /).	OK	OK
4.4.3.1 Has the choice of the baseline scenario been done using conservative assumptions?	/ 1 / (2.4)	DR	CAR 6: The choice of baseline scenario was not done in accordance with the guidance in the GHG Protocol for Project Accounting, Chapter 7, as stated in page 2 of PD / 1 / since the project doesn't meet any one of the baseline candidates of Table 7.1.	CAR 6	CLOSED
4.4.4 Is the identified baseline scenario reasonable according to the assumptions, calculations and rationales used in the VCS PD and other reference sources?	/ 1 / (2.4)	DR	Yes, the assumptions, calculations and rationales used are reasonable.	OK	OK

4.4.5 Does the VCS PD describe how the national and sectoral policies relevant to the baseline scenario have been identified and considered in the VCS PD?	/ 1 / (2.5)	DR, I	There are no relevant national or sectoral policies that influence on the baseline scenario. This is described in section 2.5 (Substep 1b) on page 24 of PD / 1 / and was also verified through interviews / i / and / ii /.	OK	OK
4.4.6 Does the VCS PD provide a verifiable description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the project activity?	/1/ (2.4, 2.5)	DR	Yes, this description is available in section 2.4 and 2.5 (Step 1) on page 22 of PD / 1 /.	OK	OK
4.5 Algorithm and/or formulae used to determine emission reductions					
4.5.1 Are all calculations applied and documented according to the selected methodology and in a complete and transparent manner?	/1/ (1.1, 1.7, 1.8)	DR	CAR 7: The emission reductions for the crediting period indicated in section 1.1 (page 3) and 1.8 (page 8) is 152,767 tCO _{2e} , which differs from the quantity estimated in section 1.7 (page 6), where the ER is 155,309 tCO _{2e} . Please correct it.	CAR 7	CLOSED

4.5.2 In case the methodology allows a selection between different options for equations or parameters, has adequate justification been given and have the correct equations and parameters been used, in accordance with the methodology selected?	/1/	DR	Not applicable.	OK	OK
4.5.3 In case some data and parameters will not be monitored throughout the crediting period, but have already been determined and fixed, are all data sources, assumptions and calculations correct, applicable to the proposed VCS project activity and conservative?	/1/ (3.1, 4.1, 4.2)	DR	CAR 8: It is stated in PD / 1 / page 29 that “The values of nd_y are listed in section 4.2”. This parameter was found in the section 4.1, please correct it.	CAR 8	CLOSED

4.5.4 In case data and parameters will be monitored on implementation and hence become available only after validation of the project activity, are the estimates provided in the VCS PD for these data and parameters reasonable?	/1/ (4.1)	DR	CAR 9: The values from Western Europe is not the most suitable choice for values of “B _{0,LT} ”, “VS _{default} ”, “W _{default} ”. Please provide Latin America values.	CAR 9	CLOSED
4.5.5 Have the major risks and uncertainties, which can influence the emission reduction estimates, been identified and addressed in the VCS PD?	/1/ (3.1, 4.1, 4.2)	DR	CAR 10: The major risks and uncertainties, which can influence the emission reduction estimates, shall be identified and addressed in the PDD.	CAR 10	CLOSED
4.6 Leakage					
4.6.1 Has the leakage been identified and calculated according to the approved methodology?	/ 1 / (1.13)	DR	Not applicable. The methodology doesn't require leakage calculation.	OK	OK
4.6.2 Have the leakage been addressed in complete, conservative and substantiated manner?	/ 1 / (1.13)	DR	Not applicable. The methodology doesn't require leakage calculation.	OK	OK

4.6.3 Are uncertainties in the leakage emission estimates properly addressed?	/ 1 / (1.13)	DR	Not applicable. The methodology doesn't require leakage calculation.	OK	OK
5. Additionality					
5.1 Identification of alternatives					
5.1.1 What additionality tool has been selected in the VCS PD? Does it comply with the requirement of VCS 2007.1 clause 5.8 and the latest FAQs at VCS website? (http://www.v-c-s.org/faq.html)	/ 1 / (2.5)	DR	The "Tool for the demonstration and assessment of additionality" was used, which is in compliance with Test 1 of clause 5.8 (VCS 2007.1 requirements) and also with the latest FAQs at VCS website.	OK	OK
5.1.2 Does the VCS PD identify and list credible alternatives to the VCS project activity in order to determine the most realistic baseline scenario, unless selected approved methodology prescribes/identifies the baseline scenario and no further analysis is required?	/ 1 / (2.5)	DR	The methodology doesn't prescribe the baseline scenario, and the PD / 1 / identify and list credible alternatives to the project in order to determine the most realistic baseline scenario.	OK	OK

5.1.3 Does the list of alternatives include as one of the options that the project activity is undertaken without being registered as a VCS project activity?	/ 1 / (2.5)	DR	Yes, one of the alternatives is the “Installation of a mechanized composting unit not undertaken as a GHG emission reduction project”.	OK	OK
5.1.4 Does the list contain all realistic/credible alternatives that the DOE, on the basis of its local and sectoral knowledge, considers to be viable means of supplying the outputs or services that are to be supplied by the project activity? <i>Note: All alternatives listed in the selected methodology should be included, as well as those not covered by the methodology.</i>	/ 1 / (2.5)	DR, I	Yes, all alternatives are viable, realistic and credible. It was also checked through interviews (/ i / and / ii /) by the Validation Team.	OK	OK

5.1.5 Is the exclusion of the alternatives for legal reasons justified? <i>Note: Some alternatives might be illegal, according to the local regulations, but still widely practiced due to lack of enforcement. It should be verified.</i>	/ 1 / (2.4)	DR	No exclusion was made, since all alternatives are in accordance with the local regulations.	OK	OK
5.2 Investment Analysis					
5.2.1 Are all sources of revenues (including savings) have been considered in the VCS PD and all calculations?	/ 1 / (2.5)	DR	CAR 11: The calculation of costs of Alternative 2 (cells D56, D57, D58, E56 and E57) and Alternative 3 (line E) in the excel spreadsheet “Feasibility Analysis” are not correct. Please revise it. CL 7: Please describe in PD (page 26) the reason why did you use 120 days in Alternative 1 and 30 days in calculation of Anaerobic digester and 90 days for anaerobic lagoons in Alternative 2. CAR 12: Please update Tables 3 and 4 with the data collected during onsite assessment.	CAR 11 CL 7 CAR 12	CLOSED

5.2.2 Is the type of investment analysis selected correctly in the VCS PD?	/ 1 / (2.5)	DR	Idem CAR 11 (item 5.2.1)	CAR 11	CLOSED
5.2.3 Is the selected financial indicator chosen and applied correctly?	/ 1 / (2.5)	DR	Idem CAR 11 (item 5.2.1)	CAR 11	CLOSED
5.2.4 Is the guidance on IRR calculation and assessment correctly applied? <i>Note: Means of validation should be recorded.</i>	/ 1 / (2.5)	DR	Idem CAR 11 (item 5.2.1)	CAR 11	CLOSED
5.2.5 In case project participants use values from Feasibility Study Reports (FSR) is it possible to verify that the period between the FSR date and investment decision was reasonably short and FSR values did not change materially?	/ 1 / (2.5)	DR	No FSR was used in this project.	OK	OK

5.2.6 Are all the values consistent between FSR and VCS PD <u>and</u> are inconsistencies properly justified?	/ 1 / (2.5)	DR	No FSR was used in this project.	OK	OK
5.2.7 Were all the values from FSR applicable and valid at the time of the investment decision?	/ 1 / (2.5)	DR	No FSR was used in this project.	OK	OK
5.2.8 Is it reasonable to assume that no investment would be made at a rate of return lower than the benchmark by, for example, assessing previous investment decisions by the project participants or some verifiable circumstances that have lead to a change in the benchmark?	/ 1 / (2.5)	DR	Idem CAR 11 (item 5.2.1)	CAR 11	CLOSED
5.2.9 Is the Investment Analysis prepared in compliance with the latest version of the “Guidance on the Assessment of Investment Analysis” as provided by the CDM EB?	/ 1 / (2.5)	DR	Idem CAR 11 (item 5.2.1)	CAR 11	CLOSED

5.3 Barrier analysis					
5.3.1 Are there any issues addressed in the barrier analysis that have a clear impact on the financial viability of the project activity and that shall be assessed by an investment analysis?	/ 1 / (2.5)	DR	Yes, the barrier analysis addressed that the technology applied in this project activity is the most expensive among other alternatives.	OK	OK
5.3.2 Do the listed barriers exist <u>and</u> is their existence substantiated? Note: (a) by independent sources of data such as relevant national legislation, surveys of local conditions and national or international statistics and/or (b) by interviews with relevant individuals: including members of industry associations, government officials or local experts if necessary?	/ 1 / (2.5)	DR	Yes, the barriers exist and also are substantiated with documents, which can be visualized via internet, through websites stated in PD. The interview was held by the Validation Team during the onsite visit, and it as verified that this project is the most expensive in comparison to other alternatives.	OK	OK

5.3.3 Would any of the identified barriers prevent the implementation of the project activity but not equally prevent the implementation of the possible alternatives, in particular the implementation of the identified baseline scenario?	/ 1 / (2.5)	DR	Yes, investment barrier shows a big difference between the value required to implement the project activity and to continue with the baseline scenario, which is much lower.	OK	OK
5.4 Common practice analysis					
5.4.1 Does the additionality tool require common practice analysis for the project?	/ 1 / (2.5)	DR	Yes, the tool requires the common practice analysis, which can be seen on page 27 of PD / 1 /.	OK	OK
5.4.2 If the PPs claim in the VCS PD that VCS project activity is the “first of its kind”, is it justified?	/ 1 / (2.5)	DR	Not applicable. The PPs don’t claim that this project activity is “first of its kind”.	OK	OK
5.4.3 Are the geographical scope of the project activity identified correctly?	/ 1 / (2.5)	DR	CL 8: Yes, the entire country was considered in this analysis. But please provide evidences for this statement "Activities that are similar to the project are not common in Brazil" (on page 27 of PD)	CL 8	CLOSED

5.4.4 Does the VCS PD provide an explanation why this region was selected and deemed more appropriate <u>and</u> is this explanation traceable and reliable?	/ 1 / (2.5)	DR	CL 9: No, please explain why Brazil was selected and deemed more appropriate.	CL 9	CLOSED
5.4.5 Are there similar operational project activities, other than VCS activities, “widely observed and commonly carried out” in the defined region? <i>Note: Use official sources and local and industry expertise.</i>	/ 1 / (2.5)	DR	Idem CL 8 (item 5.4.3)	CL 8	CLOSED
5.4.6 In case there are similar commercially operated project activities, other than VCS activities, already “widely observed and commonly carried out” in the defined region, are there essential distinctions between the VCS project activity and the other similar activities?	/ 1 / (2.5)	DR	Idem CL 9 (item 5.4.4)	CL 9	CLOSED

6. Monitoring plan					
6.1 Are all parameters required by the selected approved methodology or tool identified <u>and</u> listed in the VCS PD?	/ 1 / (3.1, 4.1-4.3)	DR	Idem CAR 4 (item 4.2.4) and CAR 8 (item 4.5.3). CAR 13: During the onsite assessment it was possible to collect some data from the farmers. Please update Table 5 on page 30 of PD / 1 / and provide the evidences. CAR 14: Some parameters in section 4.2 have in the field “Value applied” the following answer: “Available in VCS Calculation Spreadsheet”. Please insert the values in PD.	CAR 4 CAR 8 CAR 13 CAR 14	CLOSED
6.2 Is the measurement method clearly stated for each value to be monitored and deemed appropriate?	/ 1 / (4.1-4.3)	DR	CL 10: As per interviews during the onsite assessment with farmers and PD developers, it was mentioned that the monitoring method of some parameters would be made through spreadsheets and filled by hand by the farmers responsible for operating the UMAC. Please clarify on PD which parameters will be considered in this spreadsheet.	CL 10	CLOSED

6.3	Are values of the ex-ante parameters / monitoring parameters selected correctly and conservative in accordance to methodology or tools?	/ 1 / (3.1)	DR	CAR 15: During the onsite assessment in Sítio Pickler Farm, it was possible to verify that the anaerobic lagoon was applied for 300 animals. Please make sure the proper quantity of animals is used for calculation. Also, please clarify how this parameter will be monitored in this farm.	CAR 15	CLOSED
6.4	Is the measurement equipment for each parameter described and deemed appropriate?	/ 1 / (4.2)	DR	CL 11: Please confirm which measurement equipment will be used to monitor “Q _y ”.	CL 11	CLOSED
6.5	Is the measurement accuracy addressed and deemed appropriate?	/ 1 / (4.2)	DR	CAR 16: Please provide a description regarding measurement accuracy in PD for all parameters.	CAR 16	CLOSED
6.6	Are procedures in place on how to deal with erroneous measurements <u>and</u> are the corrective actions identified?	/ 1 / (4.2)	DR	CAR 17: Please provide procedures in place on how to deal with erroneous measurements and respective corrective actions.	CAR 17	CLOSED
6.7	Is the frequency of measurement identified and deemed appropriate?	/ 1 / (4.2) / 4 /	DR	CL 12: Please clarify how did you calculate the frequency of the parameter “Oxygen content” to achieve maximum margin of error of 10% at a 90% confidence level as required by the methodology AMS-III.F / 4 /.	CL 12	CLOSED
6.8	Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/ 1 / (4.2)	DR	Idem CAR 14 (item 6.1), CAR 15 (item 6.3) and CL 11 (item 6.4).	CAR 14 CAR 15 CL 11	CLOSED

6.9 Are the sampling, measurement methods and procedures defined?	/ 1 / (4.2)	DR	Idem CL 11 (item 6.4) and CAR 17 (item 6.6).	CL 11 CAR 17	CLOSED
6.10 Are procedures identified for maintenance of monitoring equipment and installations?	/ 1 / (4.2)	DR	CL 13: Please provide procedures for maintenance and/or installations of: (a) weigh scales used for measurement of $Q_{y,treatment}$ and Q_y ; (b) oxygen meter used for measurement of oxygen content.	CL 13	CLOSED
6.11 Are the equipment calibration intervals identified and justified?	/ 1 / (4.2)	DR	CL 14: Please provide calibration intervals for: (a) weigh scales used for measurement of $Q_{y,treatment}$ and Q_y ; (b) oxygen meter used for measurement of oxygen content.	CL 14	CLOSED
6.12 Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?	/ 1 / (4.2)	DR	CL 15: Please provide a more detailed description on procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation).	CL 15	CLOSED
6.13 Are the monitoring arrangements described in the monitoring plan feasible within the project design?	/ 1 / (4.2)	DR	Yes, the monitoring plan is feasible.		OK

6.14 Are the means of implementation of the monitoring plan, including the data management and quality control procedures, sufficient to ensure that the emission reductions achieved by / resulting from the project activity can be reported ex post and verified?	/ 1 / (4.2)	DR	Idem CAR 16 (item 6.5), CAR 17 (item 6.6), CL 13 (item 6.10), CL 14 (item 6.11) and CL 15 (item 6.12)	CAR 16 CAR 17 CL 13 CL 14 CL 15	CLOSED
6.15 Do the PPs make provisions for personnel training needs?	/ 1 / (4.2)	DR	CL 16: Please provide evidences to Validation Team after the trainings are held.	CL 16	CLOSED
6.16 Is the authority and responsibility of overall project management clearly described?	/ 1 / (4.2)	DR	Yes, Sustainable Carbon is the enterprise responsible for the management of this project activity. This can be visualized in PD and was also was observed during the onsite visit.	OK	OK
6.17 Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/ 1 / (4.2)	DR	CL 17: Please provide procedures for cases where emergencies can cause unintended emissions.	CL 17	CLOSED
6.18 Are procedures identified for review of reported results/data?	/ 1 / (4.2)	DR	CL 18: Please provide procedures for review of reported results/data.	CL 18	CLOSED

6.19 Is the data archiving period for this project activity stated in the VCS PD and appropriate? <i>Note: All archived monitoring data, required for verification and issuance, should be kept for at least two years after the end of the crediting period or the last issuance of CER.</i>	/ 1 / (4.2)	DR	CL 19: Please provide the data archiving period for monitoring data (for how long the data will be kept).	CL 19	CLOSED
7. Monitoring of the leakage					
7.1 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/ 1 / (1.13)	DR	Not applicable. The methodology AMS-III.D doesn't require leakage calculation, and the methodology AMS-III.F states that there is leakage if the project technology is the equipment transferred from another activity or if the existing equipment is transferred to another activity, which are not applicable for this project activity.	OK	OK
7.2 Is the choice of project leakage indicators made according to selected methodology in a reasonable and conservative manner? <i>Note: local knowledge and sectoral expertise shall also be considered.</i>	/ 1 / (1.13)	DR	Not applicable. The methodology doesn't require leakage calculation.	OK	OK

7.3	Is the measurement method clearly stated and deemed appropriate for each leakage value?	/ 1 / (1.13)	DR	Not applicable. The methodology doesn't require leakage calculation.	OK	OK
8. Sustainable development						
8.1	If VCS PD indicates any additional environmental benefits of the project, other than GHG emission reductions, were those benefits properly substantiated?	/ 1 / (5)	DR	Yes, some environmental benefits apart from GHG emission reduction are described in section 5 of PD / 1 / (page 49).	OK	OK
9. Stakeholders' consultation and comments						
9.1	Were the stakeholders identified in appropriate and complete manner?	/ 1 / (6)	DR	VCS projects don't claim for a Stakeholder Consultation Process, but even so, the PPs identified in appropriate and complete manner the stakeholders for this project activity. This information is available in section 6 of PD / 1 / .	OK	OK
9.2	Are the identified stakeholders plausible?	/ 1 / (6)	DR	Yes, the identified stakeholders are plausible	OK	OK
9.3	Does VCS PD describe the means being used to invite local stakeholder's comments?	/ 1 / (6)	DR	Yes, the stakeholders were informed about the project through letters.	OK	OK
9.4	Were those means appropriate?	/ 1 / (6)	DR	Yes, the Validation Team considered that sending letters are appropriate.	OK	OK
9.5	Was the project presented to the stakeholders in unbiased manner?	/ 1 / (6)	DR	CL 20: Please provide the letter sent to stakeholders and also the confirmation receipts.	CL 20	CLOSED

9.6	If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/ 1 / (6)	DR	Not applicable. There is no need under Brazilian law to carry out a stakeholder consultation process for VCS projects.	OK	OK
9.7	Is a summary of the stakeholder comments provided in the VCS PD?	/ 1 / (6)	DR	No comments were provided yet.	OK	OK
9.8	Has due account of any stakeholder comments been taken by PPs and reflected in the VCS PD?	/ 1 / (6)	DR	No comments were provided yet.	OK	OK
10. Environmental impacts						
10.1	Is the documentation supplied by the PPs regarding environmental impacts relevant and accurately reflected in the VCS PD?	/ 1 / (6)	DR	CAR 18: Please revise the item "Contribution to capacitating and technological development" on page 50 of PD / 1 / because it is written that the new AWMS captures methane, and other issues that doesn't meet this VCS project.	CAR 18	CLOSED
10.2	Is an environmental impact assessment (EIA) required for the VCS project activity? <i>Note: determine by using a review of relevant legislation and local expertise.</i>	/ 1 / (6)	DR	No, an EIA is not required for this VCS project activity.	OK	OK

10.3 In case an EIA is required, has the EIA has been approved by local authorities and is the outcome accurately reflected in the VCS PD?	/ 1 / (6)	DR	No, an EIA is not required by local authorities..	OK	OK
10.4 Does the VCS PD include a brief description of the environmental effects of the project, including transboundary?	/ 1 / (6)	DR	Yes, there is a brief description on page 49 and 50 of PD / 1 /.	OK	OK
10.5 Are those effects properly addressed in the design of the project activity?	/ 1 / (6)	DR	Idem CAR 18 (item 10.1)	CAR 18	CLOSED
10.6 Does the project comply with environmental legislation in the host country?			CAR 19: Please provide the renewal of LAO for Sítio Pickler Farm.	CAR 19	CLOSED

Table 2: List of Requests for Corrective Action (CAR) and Clarification (CL)

Observation (CAR/CL)	Reference	Summary of project owner response	Validation team conclusion
CAR 1: Please state in PD that Ramella and Colônia Suspiro Farms are Greenfield.	2.1	This information has been included in Section 1.10 of the VCS PD.	Correction was made on Table 1 (page 4) of PD v. 02.1. CAR is CLOSED.
CAR 2: The city of Suruvy Farm is not the correct one. Please change it in whole PD.	2.1	This information was revised in the VCS PD. Information on the location of other farms were also corrected throughout the document.	Correction was made in PD v. 02.1. CAR is CLOSED.
CAR 3: Geographical coordinates of the project locations should be given in decimal system.	2.1	Geographical coordinates were revised as requested.	Correction was made on Table 4 (page 10). CAR is CLOSED.
CAR 4: Please insert the project emissions parameters, such as ECPJ,j,y and TDLj,y, in the monitoring sections.	4.2.4	Information on TDLj,y was included to Section 4.1 of the VCS PD. Information on ECPJ,j,y was included to Section 4.2 and 4.3 of the VCS PD.	Both parameters were properly included in the monitoring sections. CAR is CLOSED.
CAR 5: Please insert Nova Itaberaba city in the map on page 8 of PD / 1 / (please also insert the subtitle "Figure 1: ...").	4.3.1	Figure 1 was revised to include Nova Itaberaba and to exclude Videira, since no farm included in the project is located in Videira.	All corrections were made on Figure 1 (page 8) of PD v. 02.1. CAR is CLOSED.

CAR 6: The choice of baseline scenario was not done in accordance with the guidance in the GHG Protocol for Project Accounting, Chapter 7, as stated in page 2 of PD / 1 / since the project doesn't meet any one of the baseline candidates of Table 7.1.	4.4.3.1	Reference on the procedures used to determine the baseline were corrected. Chapter 7 of the GHG Protocol for Project Accounting was not used on this project.	Correction made on page 21 of PD v. 02.1. CAR is CLOSED.
CAR 7: The emission reductions for the crediting period indicated in section 1.1 (page 3) and 1.8 (page 8) is 152,767 tCO₂e, which differs from the quantity estimated in section 1.7 (page 6), where the ER is 155,309 tCO₂e. Please correct it.	4.5.1	Emission reductions were corrected throughout the VCS PD. Figures are consistent with version 02.1 of the emission reduction spreadsheets. Answer round 2: information was revised to be consistent with the version 3 of the calculation spreadsheet. The following changes were made to version 3: - the grid CO₂ emission factor was updated with the most recent data available; - project start date for Fazenda Baccin was postponed to 15/07/2012. - project start date for Fazenda Gilmar was revised to 11/01/2012 (as per CL 3).	The emission reduction from 2012 is 12,477 in the spreadsheet "Emission reduction resume_v.02.1", and 12,478 in the VCS PD v.02.1. Please make the corrections as needed. CAR is OPEN. Emission reduction is consistent in the entire PDD, which is also in accordance with the calculation provided in the spreadsheet "Emission reduction resume_v.03", where the correct value of emission factor was applied. The project start date of Gilmar's Farm was properly revised in v.03 of VCS PD.

			It's not possible for the present Validation Report to validate the start date of Baccin's Farm. Hence, FAR 1 was raised to confirm this date in the verification process. CAR is CLOSED.
CAR 8: It is stated in PD / 1 / page 29 that "The values of ndy are listed in section 4.2". This parameter was found in the section 4.1, please correct it.	4.5.3	Information on ndy is described in Section 4.1, since this parameter is not monitored, by fixed during the crediting period. Answer round 2: the VCS PD was revised. Parameter ndy was included as one of the parameters to be monitored.	As per AMS-III.D this parameter shouldn't be fixed. "If any farm has no operations on a given day it needs to be documented (e.g. logbook) and taken into account for the calculation of BE_{ex-post}". Please correct it. CAR is OPEN. Correction properly made. CAR is CLOSED.
CAR 9: The values from Western Europe is not the most suitable choice for values of "B0,LT", "VSdefault", "Wdefault". Please provide Latin America values.	4.5.4	Values for Latin America were considered for all market swine. However, both Farrowing farms comply with all conditions described in paragraph 10 (d) of AMS-III.D version 18. Hence, the use of default values from	Please insert this information in VCS PD and provide evidences for this statement. CAR is OPEN. This information was properly added to the VCS PD v.03, and all evidences were checked and

		developed countries is allowed and considered more appropriate. Answer round 2: information was included in Section 4.1 of the VCS PD. The following evidences were sent to the validation team to support this statement: - Document regarding the genetic origin of sows for Fazenda Granja Silva. This document also demonstrates animal weight is more similar to developed countries default weight than to Latin America default weight (animal weight in the document refers to entry weight, meaning it refers to a young animal that will further grow). - Annual Report of swine genetic records, demonstrating the most common genetics used in Santa Catarina are from Annex I parties (information on page 32 details total stock by animal breed). The most common breeds are Landrace and Large white or a breed of both (information on	deemed appropriate by the Validation Team. CAR is CLOSED.
--	--	--	--

		Page 28). Also, the report states Sadia S.A. and Agrocere Pic Suinos S.A (which are the genetics providers or farrowing farms included in this project) make use of breeds from Annex I parties. - Formulated feed ratio invoices, demonstrating compliance with bullets two and three of paragraph 10(d) of AMS-III.D, version 18. - Although no records are available for the animal weight of animals in Fazenda Andretta, it is clear from photographic evidence and site visits animal weight is more similar to developed countries default weight than to Latin America default weight, given the significant difference between them.	
CAR 10: The major risks and uncertainties, which can influence the emission reduction estimates, shall be identified and addressed in the PDD.	4.5.5	Information was included in Section 3.4 of the VCS PD.	Response accepted. CAR is CLOSED.
CAR 11: The calculation of costs of Alternative 2	5.2.1	Corrections were made to	Corrections were done. CAR is

(cells D56, D57, D58, E56 and E57) and Alternative 3 (line E) in the excel spreadsheet “Feasibility Analysis” are not correct. Please revise it.		feasibility analysis spreadsheet. Please check version 02.1.	CLOSED.
CAR 12: Please update Tables 3 and 4 with the data collected during onsite assessment.	5.2.1	Information on such tables were corrected according to data collected during the onsite assessment. Please note the number of the tables changed in the revised VCS PD.	Modification accepted in Tables 6 and 7 of PD v.02.1. CAR is CLOSED.
CAR 13: During the onsite assessment it was possible to collect some data from the farmers. Please update Table 5 on page 30 of PD / 1 / and provide the evidences.	6.1	Information on such table is now consistent with version 02.1 of emission reduction spreadsheets. Please note the number of the table changed in the revised VCS PD.	Information updated was set in Table 1A (annex 1). CAR is CLOSED.
CAR 14: Some parameters in section 4.2 have in the field “Value applied” the following answer: “Available in VCS Calculation Spreadsheet”. Please insert the values in PD.	6.1	Values were included in Table 9 and Annex 1 of the VCS PD.	In table 9 and in PE calculation, please use the grid emission factor of 2011 instead of 2010.
CAR 15: During the onsite assessment in Sítio Pickler Farm, it was possible to verify that the anaerobic lagoon was applied for 300 animals. Please make sure the proper quantity of animals is used for calculation. Also, please clarify how this parameter will be monitored in this farm.	6.3	This information was corrected in the emission reduction calculations. 300 animals were reduced from the annual average number of animals of type LT in year y (parameter $N_{LT,y}$). The same procedure will be used during the monitoring period, where 300	Response and correction accepted. CAR is CLOSED.

		animals will be reduced from $N_{LT,y}$. This approach is considered consistent since this amount of animals is expected to remain constant during the crediting period, as there is one barn with a capacity of 300 animals whose waste is not destined to the composting unit. Therefore, the number is not expected to increase or decrease. As the number is reduced from $N_{LT,y}$ (instead of $N_{p,y}$) the correction is consistent, meaning 300 animals from the annual average livestock will not be considered for emission reduction calculation.	
CAR 16: Please provide a description regarding measurement accuracy in PD for all parameters.	6.5	Information on measurement accuracy was included for all monitored parameters on Section 4.2 of the VCS PD.	Information properly added to VCS PD v.02.1. CAR is CLOSED.
CAR 17: Please provide procedures in place on how to deal with erroneous measurements and respective corrective actions.	6.6	Information on how erroneous measurements will be dealt with were included in Section 4.3 of the VCS PD.	Information properly added to VCS PD v.02.1. CAR is CLOSED.
CAR 18: Please revise the item "Contribution to capacitating and technological development" on page 50 of PD / 1 / because it is written that the new AWMS captures methane, and other issues that	10.1	This information was revised in the VCS PD.	Item properly revised in VCS PD v.02.1. CAR is CLOSED.

doesn't meet this VCS project.			
CAR 19: Please provide the renewal of LAO for Sítio Pickler Farm.	10.6	The LAO for Sítio Pickler is being processed by the State Environmental Agency (FATMA). A protocol for the submission of such license will be sent to the validation team as soon as possible.	Response accepted and document received. CAR is CLOSED.
CL 1: Please insert a table for better visualization of which farms are Greenfield and Brownfield farms.	2.1	This information was included in Table 1 of the VCS PD.	Correction made. CL is CLOSED.
CL 2: Please provide all documents related to UMAC, for example drawings and manuals.	2.2	The following documents are being sent to the validation team: - Technical projects of the UMAC system and - UMAC operation manual. Both documents have been developed by LPC Tecnologia Ambiental	All documents were received and met all descriptions of VCS PD v.02.1, and also the constructions observed onsite. CL is CLOSED.
CL 3: Please provide the evidences for trainings and also for the start date of operation.	3.1	Sustainable Carbon will provide training for farmers on the project monitoring during April, 2012. Evidences will be sent to the validation team as soon as possible. Regarding the start of	Please send evidence of starting date for Gilmar Farm. CL is OPEN: Evidence received with the date

		operation, the following evidences are being sent to the validation team: - LPC declaration on dates of farmers training on the operation of UMAC system; - Documents demonstrating the first confinement of animals on farms where the first confinement is considered to be the PSD. This is valid to all finishing unit farms except those that have received a batch of animals soon before the training. In this case, the PSD is considered the data of training. On farrowing farms, the date of training is also considered as the PSD, since these farms constantly have animals confined. Answer round 2: information was sent to the validation team. The actual project start date for this farm is 11/01/2012.	stated in this protocol (11/01/2012). CL is CLOSED.
CL 4: Please clarify in PD why 01/08/2011 was chosen as the start of the crediting period.	3.2	The starting date of the crediting period was revised to 01/01/2011. A clarification on why this date was chosen was included in	Explanation accepted. CL is CLOSED.

		Section 1.6 of the VCS PD.	
CL 5: Please clarify the sentence “The quantity of electricity consumed by the project activity on each farm (ECPJ,j,y) is determined considering the combined power capacity of the all equipment in the mechanized composting unit and its operation for a period of 2,920 hours, which represents a consumption of 8 hours per day” on page 32 of PD / 1 /. As per interviews during the onsite assessment, the UMACs operate less than 8 hours/day.	4.2.4	The electricity consumption was revised considering a total operation of 4 hours per day. Farmers informed they operate the system from 1 to 2 hours per day. Four hours per day is being considered to be conservative on the ex-ante calculation of emission reductions.	Validation Team confirms this information. CL is CLOSED.
CL 6: Please clarify why option 9(a) of AMS-III.D has been chosen for baseline emission calculation and insert this explanation in PD.	4.4.1	Option 9(a) of AMS-III.D was chosen since data needed to apply option 9(b) is not available. This information was included in Section 3.1 of the VCS PD.	Response accepted and information added. CL is CLOSED.
CL 7: Please describe in PD (page 26) the reason why did you use 120 days in Alternative 1 and 30 days in calculation of Anaerobic digester and 90 days for anaerobic lagoons in Alternative 2.	5.2.1	The rationale behind these assumptions was included on Page 26 of the VCS PD.	Information assessed and considered appropriate. CL is CLOSED.
CL 8: Yes, the entire country was considered in this analysis. But please provide evidences for this statement "Activities that are similar to the project are not common in Brazil" (on page 27 of PD)	5.4.3	References to this statement were included in the VCS PD, Section 2.5.	Information assessed and considered appropriate. CL is CLOSED.
CL 9: No, please explain why Brazil was selected and deemed more appropriate.	5.4.4	The host country was selected as the applicable geographical area	Response accepted. CL is

		following recommendation on the CDM Guidelines on Common Practice (CDM EB report 63, Annex 12). This information was included in the VCS PD, Section 2.5.	CLOSED.
CL 10: As per interviews during the onsite assessment with farmers and PD developers, it was mentioned that the monitoring method of some parameters would be made through spreadsheets and filled by hand by the farmers responsible for operating the UMAC. Please clarify on PD which parameters will be considered in this spreadsheet.	6.2	The monitoring procedures were described in more detail in Section 4 of the VCS PD. This includes mentioning which parameters will be monitored through spreadsheets.	Information added. CL is CLOSED.
CL 11: Please confirm which measurement equipment will be used to monitor "Qy".	6.4	This parameter will be monitored through spreadsheets. The project aims to install digital hour meters or data loggers on each farm, to allow a more precise monitoring. However, this will likely occur in a later moment. This information was included in Sections 4.2 and 4.3 of the VCS PD.	Measurement procedure clarified. CL is CLOSED.
CL 12: Please clarify how did you calculate the frequency of the parameter "Oxygen content" to achieve maximum margin of error of 10% at a 90% confidence level as required by the methodology	6.7	The monitoring of oxygen content was excluded from the monitoring plan. PP shall consider methane emissions from composting since	Methane emissions from composting were properly calculated. CL is CLOSED.

AMS-III.F / 3 /.		the oxygen content will no longer be monitored, as recommended on the applied methodology. This information was included in Section 4 of the VCS PD.	
CL 13: Please provide procedures for maintenance and/or installations of: (a) weigh scales used for measurement of $Q_{y,treatment}$ and Q_y; (b) oxygen meter used for measurement of oxygen content.	6.10	Weigh scales will not be used for the measurement of $Q_{y,treatment}$ and Q_y. This information was revised on the VCS PD, Section 4. An assessment of the accuracy of the monitoring procedures for Q_y and $Q_{y,treatment}$ is available on the same Section. As described on CL 12, the oxygen meter will no longer be used.	Response accepted. CL is CLOSED. CL is OPEN upon closure of CL 23. CL is CLOSED due to closure of CL 23.
CL 14: Please provide calibration intervals for: (a) weigh scales used for measurement of $Q_{y,treatment}$ and Q_y; (b) oxygen meter used for measurement of oxygen content.	6.11	As described on CL 13, weigh scales and oxygen meters will not be used on the project monitoring.	Response accepted. CL is CLOSED.-CL is OPEN upon closure of CL 23. CL is CLOSED due to closure of CL 23.
CL 15: Please provide a more detailed description on procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation).	6.12	More information on the monitoring procedures were included in Section 4.3 of the VCS PD.	Information properly added. CL is CLOSED.

CL 16: Please provide evidences to Validation Team after the trainings are held.	6.15	Evidences will be sent as soon as training is done. Answer round 2: evidences of training were sent to the validation team.	Training evidences are not yet available. CL is OPEN. Evidence sent and checked by the Validation Team. CL is CLOSED.
CL 17: Please provide procedures for cases where emergencies can cause unintended emissions.	6.17	Procedures for emergency situations were included in Section 4.3 of the VCS PD. These procedures are part of the training Sustainable Carbon will provide to farmers.	Information properly added. CL is CLOSED.
CL 18: Please provide procedures for review of reported results/data.	6.18	This information was included in Section 4.3 of the VCS PD.	Information properly added. CL is CLOSED.
CL 19: Please provide the data archiving period for monitoring data (for how long the data will be kept).	6.19	This information was included in Section 4.2 of the VCS PD.	Information properly added. CL is CLOSED.
CL 20: Please provide the letter sent to stakeholders and also the confirmation receipts.	9.5	A copy of the letter sent to stakeholders is being sent to the validation team, along with evidences that stakeholders have received such letters.	Evidences were received and deemed appropriate. The letter was complete and also provided some explanation about the project. CL is CLOSED.
CL 21: Reference is made to Finding 1 of VCS Project Review Report: Though it is understood that the quantity of of solid	-	The CDM Methodological Tool "Project and leakage emissions from composting" (EB 65 Annex 09) allows for a different	This is indeed a deviation of methodology as PD is not using Option 2 quoted, i.e. truck capacity and delivery quantity. Deviation is

waste generated is small and does not necessitate the use weighbridge for the project, a proper calibrated weighing system/equipment is requested especially for the parameter Qy (quantity of raw waste/manure treated) as it affects the emission reduction calculation. A review of the monitoring parameters in the Project Description is requested.	procedure in case there are no weighing device. The tool recommends estimating the amount of waste based on the number of trucks and their capacity. Under this option, no direct measurement or calibrated equipments are used for the monitoring of the amount waste composted. Since the project does not involve the transportation of waste by trucks. Project Proponents have proposed to determine the amount of waste composted by monitoring the number of operating hours of the pump that sends manure to the composting unit and/or applying default values. Since this parameter is only used to calculate project emissions, using default values is conservative as long as values are higher than monitored data. Hence, PPs are of the view the monitoring plan as defined on version 03 of the VCS PD	allowed in VCS, refer para 3.5.1 of VCS Std version 3. CL is OPEN. DOE response on 21/11/2013: The deviation is accepted by the validation team since it is in accordance with the paragraph 3.5.1 and 3.5.2 of VCS Standard (Version 3). The raw waste/manure (Q_y) will not be decomposing anaerobically as system is in place to ensure aerobic decomposition. This has also been clarified in the VCS-PD and accepted by the validation team. CL is CLOSED.
--	---	--

		provides a conservative method to determine this parameter. PP reply on 19.11.2013: Such monitoring approach was identified as a methodology deviation on Section 2.6 of the VCS PD.	
CL 22: Reference is made to Finding 1 of VCS Project Review Report: The methodology AMS-III.F (V10) requires monitoring of oxygen content inside the windrows in accordance with AMS-III.F , Table III.F.1 Parameter 7 which states aerobic conditions of the composting process to be monitored. Note that the monitoring can be done via multiple sample measurements throughout different stages of the composting process, with maximum margin of error of 10% at a 90% confidence level. A review of the monitoring parameters in the Project Description is requested.	-	The CDM Methodological Tool "Project and leakage emissions from composting" (EB 65 Annex 09) allows for the use of default values to calculate project emissions from composting in case oxygen content is not monitored. PPs have chosen to use this approach given it is not feasible to monitor the oxygen content on the project sites due to cost constraints. To ensure conservativeness, PPs have used a methane emissions factor from composting that is twice as higher as the value proposed under this tool, in line with version 10 of III.F. Given the exposed, PPs consider the monitoring plan as defined on version 03 of the VCS	OK. A maximum EF provided by the methodology has been applied for the proposed project. This is conservative and thus is accepted by the validation team. CL is CLOSED.

		PD provides a conservative method to determine project emissions from composting.	
CL 23: Reference is made to Finding 1 of VCS Project Review Report: As a follow up to CL13 & CL14 issued in the validation report, procedures for maintenance and calibration of equipment to monitor the parameters Qy (quantity of raw waste/manure treated) and Oxygen content of windrows need to be provided to the validation team. This is in accordance with VCS Standard version 3 para 3.16.5 which requires monitoring and measurement equipment calibrated according to equipment's specifications and/or relevant national or international standards.	-	Please view our replies to CL 21 and CL 22, above. PP reply on 19.11.2013: Please view our latest reply to CL 21.	The deviation for the parameters has not been appropriately justified. CL is OPEN. DOE response on 21/11/2013: The deviation for another option of monitoring of the parameters Qy and oxygen content is accepted, there is no requirement to carry out calibration of monitoring equipment with the accepted deviation. CL is CLOSED. DOE response on 21/11/2013: Deviation is accepted (see CL 21). CL is CLOSED.
CL 24: Reference is made to Finding 2 of VCS Project Review Report: 1. Applicability of methodology AMS-III.F no. 5, 10 and 12 in the Project Description require review: a. No. 5's applicability which requires explanation of expansion of treatment facilities is not	-	1.a The project does not involve the expansion of treatment facilities. This is explained in Section 1.1 and 1.10 of the VCS PD. 1.b Farmers received training on the project monitoring plan that included information on how to	1a. Section 1.10 explanation is not acceptable. It has to be clearly stated what would have been the treatment used for the greenfield without the proposed project. 1b. Evidence of training and what is the recommended application provided by the agricultural

clearly explained/justified, b. No. 10's applicability, it is unclear how compost is handled aerobically as the conditions of proposed project does not clearly state how this point is being fulfilled in accordance with AMS-III.F para 25 which requires in-situ verification of proper soil application of the compost to ensure aerobic conditions for further decay, c. No. 12's applicability is not properly justified as without oxygen content measurement, it is unclear how oxygen content in compost stored. 2. Justification of applicability of methodologies AMD-I.D & AMS-III.D are requested to be incorporated in the Project Description.		ensure the compost is handled aerobically. Also, farmers apply the compost following recommendations from agricultural technicians. Additionally, annual verifications will be carried out by a technician on the compost application sites in a sample of users. 1.c Item 12 refers to storage of compost once it is produced in the composting unit. AMS-III.F version 11 has the same applicability condition and makes reference to the CDM Methodological Tool "Project and leakage emissions from composting" (EB 65 Annex 09), which allows for composting units where no measurement of oxygen content takes place. Also, the technical aspects of the composting units involve low humidity, high temperatures and frequent mixing, which avoid anaerobic conditions, as seen on validation and verification site visits.	technicians is requested. 1c . The clarification provided is still not fulfilling what is requested in point 12: i.e. how is the produced compost being stored prior to land application. And further explanation as to the length of time of storage before being delivered is recommended to address point 12 (i.e. 'storage' and 'delivery'). 2. AMS-III.D's applicability no. 7 need to be reviewed. DOE response on 21/11/2013: 1a: Section 1.10 was revised. Explanation added is accepted. 1b: Evidence received and in line with PP response. The validation team also confirms that continuous trainings were held on 2011 and 2012, based on signed attendance list. Training includes application of compost which is accepted by the validation team / 46 /
---	--	---	--

		2. Justification of applicability conditions of III.D were included in the new version of the VCS PD. References to I.D were excluded, given it is not applied to the project. PP reply on 19.11.2013: 1.a: Section 1.10 was revised to provide further clarity on the expected scenario is the absence of the project. Also, more information was included in the common practice analysis of manure treatment systems on Section 2.5 of the VCS PD. 1.b Farmers received extensive training from LPC regarding the operation of the composting unit and from Sustainable Carbon regarding the emission reduction project and its monitoring. Trainings provided by LPC and Sustainable Carbon included information on how to manage, store and provide final destination	1c: Information added. The validation team confirms that the UMAC manual states that the UMAC must be frequently used to mix the compost, that a water management must be made and that the temperature must be between 45-60°C. If not between this range, there are corrective actions to be followed. 2. applicability of item 7 of AMS-III.D justified in PDD.
--	--	---	--

		to the compost. LPC was involved in extensive research regarding the composting of swine manure and the use of the produced compost as fertilizer. LPC has transferred such knowledge to farmers to allow a proper and sustainable use of the composting units, since the quality of the compost produced is a crucial factor for the successful and continuous use of the UMAC system. LPC training to farmers relied mostly on on-site instructions with limited documentation, given the project context. Evidences include operational manuals provided by LPC and Sustainable Carbon, declaration from LPC regarding farmers guidance on manure application, farmers declaration on the training provided to Sustainable Carbon and a report with the findings of a research by a State Agricultural Agency on manure composting, which involved	
--	--	--	--

		members from LPC team. 1.c Item 12 of Table 5 of the VCS PD was revised to provide further clarity. 2. Information was revised on Section 2.2 of the VCS PD.	
CL 25: Reference is made to Finding 3 of VCS Project Review Report: There is a lack of continuity and link of formulae in emission calculation in Section 3.1, 3.2 of PD. A review of formulae in Project Description is requested: 1. Section 3.1 equation (1), an explanation/justification is requested to start from AMS-III.F (V10) equation (1) to arrive at the current equation (1) in the Project description, 2. The link of Equation 6 in the Project Description page 33, the project emission from electricity consumption ($PE_{EC,y} = PE_{y,power}$) to the main formula for Project Emission: $PE_y = PE_{y,power} + PE_{y,compost}$ is not clearly explained, 3. Measurement method and procedure for $PE_{y,power}$ is not done in accordance with Table AMS-III.F.1 parameter 8.	-	1. Equations on the VCS PD were revised to provide further clarity. 2. Equations on the VCS PD were revised to provide further clarity. 3. Please check response to CL 5. Project Proponents are using a conservative method to determine project emissions from electricity consumption given the limited use of electricity on the project sites. PP reply on 19.11.2013 The approach to determine project emissions from electricity consumption was revised. Instead of a default value of 4	1. OK, the equations were properly revised in VCS PD. Accepted 2. OK, the equations were properly revised in VCS PD. Accepted 3. For conservative assumption, the PE calculation has to consider use of 8760 hours and full rated capacity (plus 10%) of equipment, refer to Table AMS-III.F.1 parameter 8 (pg. 11/13). Clarify how the assumption applied in the PD is indicated as conservative. DOE response on 21/11/2013: The calculations were revised accordingly. The LPC judgment was accepted by the validation team since they are the UMAC manufacturer and has the knowledge to provide such

		hours, conservative estimated values are being used. These values were based on LPC judgment on the time of operation of electric equipment for each farm, verified by the validation team through document / 51 /, and corrected by a conservative factor. This information was included in appropriate sections of the VCS PD. Using this new approach has caused a minor revision on the calculation of emission reductions, The VCS PD was revised to be consistent with current calculations. Evidences to demonstrate the assumption is conservative are being provided. Spreadsheets with updated calculation of emission reductions are also being provided.	information.CL is CLOSED.
CL 26: Reference is made to Finding 3 of VCS Project Review Report: An explanation on the deviation to formula in page 30 of Project Description for Equation 3 is provided	-	The minor adaptation to equation 3 increases the accuracy of emission reduction quantification, since it allows PPs to use reliable	OK. Accepted since it provides a more accurate emission reduction as the described in the Equation 3 of the Project Document. The CL is

which indicates methodology deviation. Justification is requested to transparently demonstrate that this does not negatively impact the conservativeness of the quantifications of GHG emissions reductions or removals. Thus, clarification is requested if methodology deviation is applicable for the deviation indicated in the Project Description Equation 3 formula.		third party information to monitor key parameters related to animal production. As farms operate in batches lasting from 3 to 4 months, all data on animal production is documented by integrators after each batch is delivered. Batches and related documents do not follow a yearly calendar. Further information was included on Section 3.1 of the revised VCS PD.	closed.
CL 27: Reference is made to Finding 4 of VCS Project Review Report: In Section 1.10 of the Project Description, Greenfield projects are stated as greenfield due to farms started to operate with a composting unit instead of using an anaerobic lagoon. This gives a reader indication that the greenfields project are implementing composting unit due to project activity. It is unclear if the baseline for such greenfield farms are similar with brownfield farms. Identification of baseline scenarios in Section 2.4 however does not give similar indication. Further review and explanation/justification on baseline scenario of greenfield farms are requested	-	Sections 1.10 and 2.4 of the VCS PD were revised to provide further clarity. PP reply on 19.11.2013: Section 1.10 was revised to provide further clarity on the expected scenario is the absence of the project.	In Section 1.10, it is still unclear on the 5 greenfield farms. Further clarification is requested on what would have been the waste management treatment used in the absence of the proposed project. DOE response on 21/11/2013: Response accepted, as validation team accepts that the common and prevailing practice of lagoon being used as treatment method in Brazil. CL is closed.

for sections 1.10 and 2.4 of project description.			
CL 28: Reference is made to Finding 4 of VCS Project Review Report: 1. Swine manure composting start date for the greenfield sites is requested to further accept the current chosen project baseline scenario. 2. Further explanation to the chosen baseline scenario is required to demonstrate how the accuracy and conservativeness of the chosen project baseline scenario is confirmed.	-	Section 2.4 of the VCS PD was revised to provide further clarity on the appropriateness of the chosen baseline scenario. The timeline for the start of the composting process at greenfield farms is described on Section 1.5 of the VCS PD, which was also revised to provide further clarity. Evidences to such date were provided as part of the project validation. PP reply on 19.11.2013: 1. Section 1.5 of the VCS PD was revised to provide further clarity on how the PSD was defined for each farm. 2. Evidences are being sent as requested.	This need to be further improved as currently only start date of farms are indicated: 1. Please include the start date of swine manure composting for the greenfield sites. 2. Evidence is also requested to substantiate the event. DOE response on 21/11/2013: Evidences received (trainings and first batches) are in line with the start dates listed in the VCS PD. The starting date of each farm is the date on which the project began reducing GHG emissions, which correspond to the dates when the UMAC started running in an adequate manner: the date on which the farmers received trainings or the date on which the swine entered the farms, whichever is later. The option of using training for start of composting is accepted by the validation team since it indicates that the farmers are well

			prepared to manage the UMAC system to achieve the estimated GHG emission reduction. / 7 – 15/ / 45 / CL is CLOSED.
CL 29: In the methodology applicability criteria analysis it is missing to analyse paragraph 8 (a) and (b).	-	Information was included on Table 05 of the VCS PD version 06.	The applicability criteria analysis was properly done to meet paragraphs 8(a) and (b) of the applied methodology on page 22 of VCS PD. CL is CLOSED.
CL 30: Provide the assessment/evidence of the itinerary of produced compost transportation between each farm and the final consumer of the compost as a justification of the 150km radius.	-	Most of the farmers either use the compost as soil fertilizer within their farms or sell/distribute small amounts to neighbors. Since farmers also produce vegetables their demand for the compost usually accounts for the entire production from the composting units. As of this date, only two farmers (Mr. Belmiro Secco and Mr. Nóbile Tomazi) sell their compost on a regular basis. Farmers have been trained to control the destination of the compost according the monitoring plan	The validation team checked the distance between the cities (as per evidences on the monitoring of compost destination / 52 /) through the tool Google Maps and confirms that they are less than 30km. CL is CLOSED.

		and were informed they should not sell the compost to consumers located more than 150km away from their base. All farmers agreed on restricting compost destination to a 150km radius. Farmers informed it is very unlikely that distant consumers will be interested in the compost, as farmers are generally located in rural areas where local demand is higher than their production capacity and road access is difficult. The 150km radius was chosen as a conservative approach, given the 200km limit described on paragraph 9 of AMS-III.F version 10. Such approach is considered conservative given the project conditions described above. A sample of evidences on the monitoring of manure destination are being sent and demonstrate that the amount of manure that is sold is usually acquired by consumers within a 15km radius (the most distant consumer was	
--	--	---	--

		located 30km away from the project site).	
CAR 20: Missing to develop the "Guidelines on the demonstration of additionality of small-scale project activities" and provide the results of such analysis.	-	Information was revised on Section 2.5 of the VCS PD, version 06. Additionality assessment is now based on the Guidelines on the demonstration of additionality of small-scale project activities, as recommended on Page 1 of AMS-III.F, version 10. Demonstration of additionality provides an assessment of how identified barriers affect the project with more emphasis than they do to the identified baseline scenario, as available at the end of Section 2.5.	The additionality assessment was properly revised to meet the "guidelines on the demonstration of additionality of small-scale project activities". CAR is CLOSED.
CAR 21: Missing to develop the "Guidelines for objective demonstration and assessment of barriers" and provide the results of such analysis.	-	Such guidelines are not mandatory for VCS projects. Project proponents consider clear rational and proper justification for additionality arguments were used, as available on Section 2.5 of the VCS PD, version 06.	Response accepted since they are in line with VCS requirements. CAR is CLOSED.

		However, PPs consider it is not necessary to apply such guidelines. Project additionality is no longer based on the CDM Tool for the demonstration and assessment of additionality which makes reference to such guidelines.	
CAR 22: The PD mention the use of the CDM Guidelines on Common Practice, however the Nall value is not mentioned. Include the analysis.	-	Such reference was removed from the VCS PD, since it is not mandatory. Please check Section 2.5 for an assessment of additionality.	The response is accepted by the validation team since it is in line with the “guidelines on the demonstration of additionality of small-scale project activities” / 54 /. CAR is CLOSED.
CL 31: Clarify in the VCS PD the meaning of “operation day”. This is operational days of the farm or of the AWMS? Clarify if the 365 Days for ‘ndy’ parameter are only operation days. Also, 365 is not a conservative value and do not reflect activities in the farm as sanity or animals movement. Moreover not all the farms are narrow-to -finish therefore, some days can be without animals. Clarify how this value represents a conservative approach for this parameter.	-	The term “operational day” was removed from the table regarding the monitoring of parameter VSLT,y. More information on how to determine if the AWMS is “operational” was included on the table describing the monitoring of ndy. For the ndy parameter, only operational days are considered. Please notice both the baseline and the project treatment	The validation team agrees that ndy will be lower than 365 days during the monitoring period, which will provide a more conservative value, and hence, the CL is CLOSED.

		systems are operational for 365 days, as manure is stored and treated by bacterial activity during 365 days of the year. These systems are never subject to maintenance or emptied for other reasons. Also, please notice parameter NLT,y represents the annual average number of animals, which represent an equivalent of animals produced within 365 days even in case farms remain without animals for part of the year. This means animals movement and evacuation procedures due to sanitation requirements are already accounted for in the calculation of NLT,y2, Therefore, it is reasonable to use 365 days for ndy as long as the AWMS remains operational for the whole year, as methane emissions will only be accounted	
--	--	---	--

		for an annual average number of animals. Finally, please notice ndy will be monitored based on monitoring spreadsheets where farmers record operating time of the composting unit or from third party information (such as documents from integrators or State Agricultural agencies), as described on Section 4.2 of the VCS PD. Therefore, ndy will be different than 365 days during the project monitoring.	
CL 32: With regard to the monitoring parameters (page 51-53 of VCS PD), the use of information from third parties should be used only if the farmers do not have a registry of his animals. Also clarify if the farmers use Pig Champ or other software. Related to the “reliable sources”, the most reliable source are the direct data from the farmers. Provide an explanation regarding the use of the internal data or the information from the third parties. Also is not clear if the integrators use information from the producers.	-	Third parties mentioned on Section 4.2 (especially for parameters ndy, Wsite, Nda,y and Np,y) such as integrators and State agencies are the direct responsible for measurement and recording of monitoring parameters. Such information is used to determine farms’ productivity and to calculate financial compensations. Farmers do not control animal production on a consistent and	The third parties information was clarified and is accepted by the validation team since there is a commercial purpose involved / 7 /- / 14 /, and is a more reliable data. CL is CLOSED.

		regular basis, as this is the responsibility of integrators as defined on predefined agreements and procedures. Only one farmer (Mr. Selvino Andretta) utilizes Agriness software to control animal production (http://www.agriness.com/br/home.php). This software was provided by the integrator to assist the farmer on this farrow-to-nursery farm. Information from Agriness was used to determine baseline emissions and shall be preferred to third party information in such case. More information was included on Sections 2.6 and 4.3.	
CAR 23: There is no leakage assessment based on III.D methodology.	-	According to AMS-III.F, AMS-III.D shall only be used to determine baseline emissions. Assessment of leakage emissions according to III.F is described on Section 3.3 of the VCS PD version 06.	It was verified by the validation team that the leakage assessment is correctly done according to AMS-III.F. CAR is CLOSED.

Table 3: List of forward action requests (FARs)

FAR number	Reference	Summary of project owner response	Validation team conclusion
FAR 1: Please confirm the date on which the Baccin's Farm will start the composting process, since it was not possible to assess during the validation process.	3.1	Such date will be confirmed during the first verification by monitoring records on the operation of the composting unit or by third party evidences regarding the confinement of animals in the farm.	To be verified by the verifying VVB.