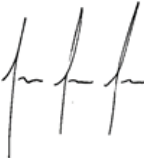




**Verification and certification report form for
CDM project activities
(Version 03.0)**

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil (Reference Number: 3455)
Scale of the project activity	<input type="checkbox"/> Large-scale <input checked="" type="checkbox"/> Small-scale
Version number of the verification and certification report	1.1
Completion date of the verification and certification report	15/03/2020
Monitoring period number and duration of this monitoring period	Second monitoring period, from the 1 st of January 2019 to the 31 st of December 2019
Version number of the monitoring report to which this report applies	2
Crediting period of the project activity corresponding to this monitoring period	Second Crediting Period from the 21 st of August 2017 to the 20 th of August 2024
Project participants	Brascarbon Consultoria, Projetos e Representação Ltda Norwegian Ministry of Climate and Environment
Host Party	Brazil
Applied methodologies and standardized baselines	AMS.III.D "Methane recovery in animal manure management systems" version 20.1
Mandatory sectoral scopes	Sectorial scope 13 – Waste handling and disposal
Conditional sectoral scopes, if applicable	N/A
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	57,067 tCO ₂ e
Certified amount of GHG emission reductions or GHG removals for this monitoring period	56,005 tCO ₂ e
Name and UNFCCC reference number of the DOE	Instituto Colombiano de Normas Técnicas y Certificación – ICONTEC Internacional, E-0024
Name, position and signature of the approver of the verification and certification report	 Juan Sebastian Salazar Technical Director

SECTION A. Executive summary

Brascarbon Consultoria, Projetos e Representação Ltda commissioned ICONTEC to perform the verification assessment of the Second monitoring period (from the 1st of January 2019 to the 31st of December 2019) of the second crediting period (from the 21st of August 2017 to the 20th of August 2024) of the proposed project activity “BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil (Reference Number: 3455), on the basis of UNFCCC criteria contained in Article 12 of the Kyoto Protocol and CDM modalities and procedures according to the Marrakech Agreement, the criteria of the CDM Executive Board and the host country, as well as the operational and technical monitoring criteria specific to this type of projects.

The proposed project activity assessed through the verification process makes use of the methodology “Methane recovery in animal manure management systems (AMS-III.D, version 20.1)” as the methodological framework. The project activity involves the waste management system put in place to manage animal waste effluent and avoid emissions of decay of organic matter. The system is put in place as a mean to treat animal waste generated from swine confined feed operations; effluents generated from swine production are treated in Enclosed Anaerobic Biodigesters (manure effluent). On its turn, biodigesters consists of a covered in-ground anaerobic reactor capable of anaerobically treat effluent originated at the swine production. Lastly, the effluents treated on enclosed anaerobic biodigesters generate biogas to be destroyed through a flaring system. The verification scope encompassed by the audit team is defined an independent and objective assessment of the GHG emission reductions. The verification process consisted of the following three phases:

- i. Desk review of the monitoring documentation, registered PDD, validation report and relevant information
- ii. Telephonic interviews with project personnel responsible of the operation and monitoring of the proposed project activity.
- iii. Resolution of outstanding issues and the issuance of the final verification and certification report.

ICONTEC confirmed that the PP correctly followed the instructions for filling out the Monitoring report form version 07.0 /15/.

The review of the monitoring documentation, registered PDD, validation opinion, relevant information and follow-up interviews allowed ICONTEC to collect enough evidence to completely assess the verification criteria and conclude that the project has been implemented as planned and as it has been described in the latest version of PDD (version 5) /1/. Lastly, the emission reductions were correctly calculated based on the registered PDD, and the monitoring equipment with an impact on the claimed emission reductions performed a reliable operation. The monitoring systems are in place and have been calibrated appropriately. ICONTEC concludes that the GHG emission reductions are calculated without material misstatements. Hence, ICONTEC can confirm the following:

CDM project:	BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil (Reference Number: 3455)
Reporting period:	1 st of January 2019 to the 31 st of December 2019
Baseline emissions:	74,560 tCO ₂ e (Total Methane destroyed: 69,827 tCO ₂ e)
Project emissions:	17,803 tCO ₂ e
Leakage:	0 tCO ₂ e
Emission Reductions:	56,005 tCO ₂ e

SECTION B. Verification team, technical reviewer and approver**B.1. Verification team member**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader and Technical Expert	EI	Carrizales	Jacobo	ICONTEC's Freelance	X	X	X	X

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Urrego	Erika	Professional of technical Unit of Validation and verification
2	Approver	IR	Salazar	Sebastian	Technical director - ICONTEC

SECTION C. Application of materiality**C.1. Consideration of materiality in planning the verification**

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Human error in the quantification of emissions	Medium	During the desk review, the audit team did not identify CLs and CARs associated to misinterpretations of the methodology, neither errors of aggregate calculation of GHG emission reductions.	The audit team performed an assessment support documents and calculation files. Crosschecking of data and figures along the calculation files, including the sampling plan
2	Undue reliance on a poorly designed information system, which may have few effective quality controls	Low	At the time of the desk review, it was identified a strong QA/QC of data reported on MR.	Assessment of the QA/QC for each one of the monitoring parameters. Design of the audit plan including a telephonic interview as a mean to understand the nature of data, collection procedures, calculations process as well as reporting.
3	Calibration delays on monitoring equipment	Medium	The audit team assessed calibration records in order to identify calibration procedures and how the calibration	Assessment of calibration records and calibration frequencies regarding the current monitoring period and previous crediting period

			covered the entire monitored period.	
4	Use of out-dated parameters for the calculation of the ERs	Low	During the desk review ICONTEC did not identify the application of out-dated parameters in the calculation of the GHG emission reductions.	Assessment of the calculation files together with the documents related to the monitoring data reports. Assessment of the MR, including the MR of the unclaimed period. Comparison of data and parameters against the applicable methodology and methodological tools

C.2. Consideration of materiality in conducting the verification

In accordance with the general requirements set out in the VVS /10/, the materiality threshold applicable to the proposed project activity is a “5 per cent of the emission reductions or removals for small-scale project activities”. The risk assessment presented in section C.1 and the materiality threshold is the main considerations taken into account to develop the verification process for the proposed project activity. As part of the activities carried out, the audit team performed documental review of the calculation files /6/ /14/ and cross checked the information, data and figures of the calculation file against the data provided in different support documents used for the calculation of GHG emission reductions. In addition, personnel involved in monitoring activities were interviewed, and the QA/QC activities as well as data collection assessed.

Since the calculated emission reductions in MR /5/ are 56,005 tCO₂e (365 days), the applicable materiality threshold is 2,800.25 tCO₂e. Registers and support files were verified using the sampling approach. Data and figures were cross-checked, and the traceability of data was assessed by comparing the different support documents and contrasting figures of baseline emissions, project emissions and emission reductions of GHG.

The verification team is able to confirm that all the parameters are correctly monitored, and the calibration of the meters was assured by calibration procedures defined by the PP. All data reported in the ER calculation file /6/ has been completely verified. The data management system and QA/QC process are carried out appropriately. Thus, the audit team did not detect material errors, omissions or misstatements during the risk assessment. The audit team did not identify misstatements, aggregated errors or material misstatements beyond the materiality threshold (2,800.25 tCO₂e) stated by UNFCCC on applicable criteria /9/ /10/ /11/ /12/.

SECTION D. Means of verification

D.1. Desk/document review

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The desk review stage took place from 12th to the 14th of February 2020. The desk review focused in Quantitative and Qualitative information. Quantitative information comprised the reported numbers in the monitoring report submitted. Qualitative information comprises information on internal management controls, calculation procedures, and procedures for transfer of data, frequency of data collection and the calculation (calculation file /6/) of the GHG emission reductions including the report of GHG emission reductions, QA/QC procedures and internal audit of calculations. The audit team followed the rules and requirements described in the VVS /10/, PS /9/ and PCP /11/ in order to determine the completeness of the monitored period. As part of the activities carried out, the audit team assessed documentation provided by the project proponent in order to understand the monitoring environment and the operational features of the project. Among the documents assessed are:

- PDD version 5, dated on 29/01/2018 /1/
- Validation report dated on 31/01/2018, version 1.2 /2/

- Monitoring report of the second monitoring period /3/, regarding previous monitoring. The proposed project activity did not claim the first monitored period of the second crediting period
- Monitoring report of the Second monitoring period, version 1, date on: 10/02/2020 / (from 1st of January 2019 to the 31st of December 2019) /4/
- Guideline on the Application of Materiality in Verifications, version: 02.0 /12/

In addition to the understanding of the context of the project activity, the audit team assessed the data and information provided by the PP as a mean to verify if the monitoring conditions meet and fulfil rules and reference. The documents included in the desk review of data and information are presented, but not limited, as follows:

- CER Calculation file (calculation of the GHG emission reductions) /6/
- Sampling Plan /16/
- Information regarding monitoring equipment /14/
- Methodology: Methane recovery in animal manure management systems (AMS-III.D, version 20.1, EB58) /7/
- Tool to determine project emissions from flaring gases containing methane (EB 28, Annex 13) /8/

D.2. On-site inspection

According to the CDM validation and verification standard (paragraphs 339 and 340) /10/, it is optional to conduct an on-site visit when verifying the compliance of the proposed project activity against the rules and reference set out for this type of projects. Since the VVS does not enforce the validation team to conduct an on-site inspection (unless the proposed project activity meets requirements of the paragraph 339), the verification process focused on the quantitative and qualitative information provided by the project proponent.

As part of the activities carried out as alternative means of verification, the audit team assessed the information provided by the monitoring report of the Second monitoring period (from 01/01/2019 to 31/12/2019) /4/, as well as the calculation of the GHG emission reductions /6/ and Sampling /14/ against registered PDD /1/ and previous monitoring and verification reports /3/, among other documents listed in Appendix 3. Furthermore, the audit team assessed the calculation file /6/ regarding the baseline emissions, project emissions, leakage emissions, and the total GHG Emission Reductions. The desk review of documents allowed the audit team to conclude the monitoring of the project activity are accounted and correctly calculated. Supplementary, the information provided, its assessment and the follow-up interviews using virtual means of communication allowed the audit team to analyse the monitoring environment.

ICONTEC and the audit team has performed validation and verification activities of projects of similar characteristics, knowing beforehand the technical features, technologies and implementation in several locations within the local and regional context as well as acknowledging associated risks when assessing the proposed project activity. The audit team is a qualified group of professionals with experience in the same category of projects. Taking into account the information previously stated the audit team determines that, the verification of the Second monitoring period can be implemented and complete without an on-site inspection. The knowledge of the audit team as well as the sectorial expertise of ICONTEC on projects of the equal essence and technical characteristic, contributes to an assessment based on the desk review of the relevant documents and the telephonic interview with the project representatives.

Duration of on-site inspection: DD/MM/YYYY to DD/MM/YYYY				
No	Activity performed on-site	Site location	Date	Team member
1.	N/A			
...				

D.3. Interviews

The audit team performed a series of telephonic interviews with the Brascarbon CDM Manager, Mr. David Garcia in order to confirm all information provided regarding the Second monitoring period; the operational conditions were discussed in an interview with Mr. Eliselton Cavalli. In addition, an interview with Mr Mario Pacifico was held as a mean to inquire the implementation of the project activity on the different project sites. The dates and subjects of the discussed telephonic interviews conducted with the PP are described as follows:

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Pacifico	Mario	Brascarbon Director	12/02/2020 20	-Description and operation of the project activity. -Implementation status of the project	Jacobo Carrizales
2	Garcia	David	Brascarbon CDM Manager	13/02/2020	-Baseline GHG emissions -Project GHG emissions	Jacobo Carrizales
3	Garcia	David	Brascarbon CDM Manager	14/02/2020	-Leakage GHG emissions -GHG emission reductions -Reviewing of the spread sheets Materiality basement	Jacobo Carrizales
4	Garcia	David	Brascarbon CDM Manager	17/02/2020	-Verification and data cross checking. -Materiality assessment -Calibration performance	Jacobo Carrizales
5	Cavalli	Eliselton	Regional Technician	18/02/2020	-Implementation status of the project -Implementation status of the project -General conditions of the monitoring of the project activity -Monitoring equipment in operation	Jacobo Carrizales
6	Garcia	David	Brascarbon CDM Manager	19/02/2020	-Verification of the application of the Sampling Plan -Verification and data cross checking.	Jacobo Carrizales

D.4. Sampling approach

The audit team verified and assessed all support documents provided by the PP including those files product of the equipment system and reported on .x/sx format. In turn, the audit team verified the sampling approach used by the project proponent and described in the sampling plan /16/ in order to determine the parameter $W_{CH_4,y}$, P_{Biogas} , T_{Biogas} , and $f_{vCH_4,RG}$, as it will be described further on the present verification report. The audit team verified the coherence of the sampling plan and assessed how this sampling plan was in line with the requirements of the methodology /7/ and the applicable tools /8/, including the confidence level of 90/10. In addition, the audit team verified the applicable

sample size in accordance with the sampling and survey framework /25/ applicable to the proposed project activity and the required significance level /7/.

D.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form			
Compliance of the project implementation and operation with the registered PDD	CL 1 CL 2	CAR 1	
Post-registration changes			
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines			
Compliance of monitoring activities with the registered monitoring plan			
Compliance with the calibration frequency requirements for measuring instruments			
Assessment of data and calculation of emission reductions or net removals			
Assessment of reported sustainable development co-benefits			
Global stakeholder consultation			
Others (please specify)			
Total	2	1	

SECTION E. Verification findings

E.1. Compliance of the monitoring report with the monitoring report form

Means of verification	The verification team crosschecked all sections contained in the MR /4/ against the MR form provided in the UNFCCC and available in the section <i>Forms</i> of the UNFCCC website. The audit team compared guidelines provided in the MR form /15/, how the PP presented information and how the form was filled up by PP.
Findings	No findings identified
Conclusion	<p>The audit team assessed the Monitoring Report version 1 /4/ /5/ as part of the desk review activities. The DOE has made this report publicly available prior to the start of the verification activities. No comments were received. Subsequently, the version 2 of the monitoring report /5/ follows the instructions of the latest form available regarding the MR /15/.</p> <p>During the verification, no clarifications related to the monitoring report form were identified by ICONTEC. It can be confirmed that the monitoring report is complete, transparent and in accordance with the applicable monitoring report form.</p>

E.2. Remaining forward action requests from validation and/or previous verifications

The audit team did not identify FARs or issues remaining from the previous verification period (first monitoring period). Lastly, the audit team verified the previous Verification report /3/ assuring no FARs were raised for that period and, therefore, no FARs are to be treated for the present verification process for the Second monitoring period.

E.3. Compliance of the project implementation and operation with the registered project design document

Means of verification	<p>While carrying out the desk review activities, it was assessed the implementation of the project reported on MR /4/ against the one established on the registered PDD /1/. As part of the verification activities, the lead auditor interviewed MR. David Garcia (CDM Manager), in order to understand the implementation status and the operational characteristics. Mr Garcia explained in detail the implementation status of the different project sites. In addition, in an interview carried out with Mr Eliselton Cavalli, the audit team assured the necessary information to understand the implementation status and operational features of the project sites.</p> <p>Lastly, the support documentation included the operation licences for all project sites /13/ operating during the monitored period. The operating licenses describe the capacity of the facility (total number of animals allowed in the farm), name of the owner, exact location (coordinates), and general characteristics of the farms. The audit team verified each support document provided finding compliance with the implementation and characteristics described on registered PDD /1/ and MR /4/.</p>																																																															
Findings	<p>CL 1: Regarding the applicable monitoring period</p> <p>CL2: Regarding information stated on MR on the matters of non-operational project sites</p> <p>CAR 1: Regarding operation of the project site <i>Granja Serra Dourada</i> (BCA-041MS1- 05)</p>																																																															
Conclusion	<p>Thanks to the interviews previously stated and the assessment of the support documents, ICONTEC confirms that MR /5/ is free of material misstatements and the project activity runs as was established in the current PDD. The audit team identified two CLs and one CAR regarding the implementation of the proposed project activity. Nevertheless, findings are closed once PP corrected information of the MR /5/. On the matters of CL1, PP provided information regarding the actual monitored period, while as for CL2, PP corrected misleading information on MR /5/. Lastly, PP provided due explanations regarding the implementation status of the project site <i>Granja Serra Dourada</i> (BCA-041MS1- 05)</p> <p>ICONTEC also verified the project boundary and conclude that the project is located within the limit of its type, in accordance with applicable specific verification requirements for small-scale project activities in the VVS /10/. The audit team verified the implementation status of the project as well for all the farms that follows the PDD and section B.1 of the monitoring report finding compliance with the information stated in the registered PDD /1/. The implementation status on each project site is described as follows:</p> <table><tr><th>Project site</th><th>Status of Implementation</th><th>Construction</th><th>Operation</th></tr><tr><td>Fazenda Dragão (BCA-032MS1-05)</td><td>Completed</td><td>100%</td><td>100%</td></tr><tr><td>Lote 55 e 54 (BCA-034MS1-05)</td><td>Completed</td><td>100%</td><td>100%</td></tr><tr><td>Lote 101 (BCA-035MS1-05)</td><td>Completed</td><td>100%</td><td>100%</td></tr><tr><td>Lote 105 (BCA-036MS1-05)</td><td>Completed</td><td>100%</td><td>100%</td></tr><tr><td>Lote 71 (BCA-037MS1-05)</td><td>Completed</td><td>100%</td><td>100%</td></tr><tr><td>Lote 82 (BCA-038MS1-05)</td><td>Completed</td><td>100%</td><td>100%</td></tr><tr><td>Lote 28 e 27 (BCA-039MS1-05)</td><td>Completed</td><td>100%</td><td>100%</td></tr><tr><td>Fazenda Bela Vista (BCA-040MS1-05)</td><td>Completed</td><td>100%</td><td>100%</td></tr><tr><td>Fazenda Cachoeira (BCA-042MS1-05)</td><td>Completed</td><td>100%</td><td>100%</td></tr><tr><td>Granja Capivara (BCA-043MS1-05)</td><td>Completed</td><td>100%</td><td>100%</td></tr><tr><td>Fazenda Sorgatto (BCA-046MS1-05)</td><td>Completed</td><td>100%</td><td>100%</td></tr><tr><td>Fazenda Bambú - Quinhão A (BCA-051MS1-05)</td><td>Completed</td><td>100%</td><td>100%</td></tr><tr><td>Fazenda Folleto (BCA-052MS1-05)</td><td>Completed</td><td>100%</td><td>100%</td></tr><tr><td>Grania Serra Dourada (BCA-041MS1-05)</td><td>Completed</td><td>100%</td><td>100%</td></tr></table>				Project site	Status of Implementation	Construction	Operation	Fazenda Dragão (BCA-032MS1-05)	Completed	100%	100%	Lote 55 e 54 (BCA-034MS1-05)	Completed	100%	100%	Lote 101 (BCA-035MS1-05)	Completed	100%	100%	Lote 105 (BCA-036MS1-05)	Completed	100%	100%	Lote 71 (BCA-037MS1-05)	Completed	100%	100%	Lote 82 (BCA-038MS1-05)	Completed	100%	100%	Lote 28 e 27 (BCA-039MS1-05)	Completed	100%	100%	Fazenda Bela Vista (BCA-040MS1-05)	Completed	100%	100%	Fazenda Cachoeira (BCA-042MS1-05)	Completed	100%	100%	Granja Capivara (BCA-043MS1-05)	Completed	100%	100%	Fazenda Sorgatto (BCA-046MS1-05)	Completed	100%	100%	Fazenda Bambú - Quinhão A (BCA-051MS1-05)	Completed	100%	100%	Fazenda Folleto (BCA-052MS1-05)	Completed	100%	100%	Grania Serra Dourada (BCA-041MS1-05)	Completed	100%	100%
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	<p>The PP correctly described the implementation of the proposed project activity by including the relevant information as described in PS /9/ such as the technical and technological features of the proposed project activity and the monitoring activities and equipment. Project site <i>Granja Serra Dourada</i> (BCA-041MS1-05) was fully operational during the monitoring period under verification whereas it was not in the previous monitored period. The verification team was able to establish monitoring equipment regarding <i>Granja Serra Dourada</i> was on place and therefore data collected and GHG emission reductions calculated.</p> <p>The specific operation procedures and activities are also part of the information provided by the PP in the MR version 2 /5/. In turn, the description of the monitoring system sufficiently allowed the audit team to conclude the procedure to collect data, roles and responsibilities of the monitoring activities are in accordance to those described in the registered PDD and also in accordance with the methodological requirements /7/ /8/. The PPs are correctly stated and the finding regarding PPs is therefore closed. Regarding the PPs, the MR report was corrected in order to match the PPs stated in the registered PDD /1/.</p>
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E.4. Post-registration changes

The audit team did not identify the necessity of PRC. The implementation, monitoring and use of methodological requirements do not indicate future PRCs for the proposed project activity. The changes regarding to the proposed project activity are related to the revision of the monitoring plan and the approval of the changes proposed to the monitoring plan /2/.

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents¹

No deviations from the registered monitoring plan and/or methodology were identified during this assessment. As part of the desk review, the audit team assessed the PRC approved to the proposed project activity. The assessment of the PRC was deemed necessary in order to understand the nature of the monitoring system as well as the monitoring plan implemented by the proposed project activity.

E.4.2. Corrections

The audit team did not identify corrections to the information, figures and assumptions in the MR /5/ when compared against the registered PDD /1/, and the methodological requirements /7/ /8/

E.4.3. Changes to the start date of the crediting period

No changes were identified during this assessment, regarding the start date of the proposed project activity

E.4.4. Inclusion of a monitoring plan

No changes were identified during this assessment regarding the inclusion of a monitoring plan

¹ Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents

The audit team identified the monitoring plan remains the same in terms of the parameters monitored, the monitoring frequency and the monitoring equipment. Therefore, no changes were detected. When the MR /4/, /5/ was compared with the registered PDD /1/

E.4.6. Changes to the project design

The proposed project activity does not modify the design of the project since the project sites remain the same as well as the technical characteristics

E.4.7. Changes specific to afforestation and reforestation project activities

Not applicable

E.5. Compliance of the registered monitoring plan with applied methodologies, applied standardized baselines, and other applied methodological regulatory documents

Means of verification	Desk review assessing how the monitoring activities meet the methodological requirements /7/ /8/. The audit team compared the monitoring plan described in the registered PDD /1/ against the monitoring plan described in the MR /4/ and crosschecked the parameters monitored, measurement frequencies against the parameters monitored and measurement frequencies stated in the methodology "AMS-III.D version 20.1- Methane recovery in animal manure management systems" /7/. And the registered PDD /1/, section regarding the monitoring plan. The assessment of support documentation included and assessment of the calculation file /6/ and formula in order to verify compliance with the methodological framework applicable to the proposed project activity /7/ /8/.
Findings	No findings associated
Conclusion	<p>The proposed project activity complies with the registered monitoring plan stated on the registered PDD /1/. Furthermore, parameters applicable to the proposed project activity are correctly defined and are in line with the methodological framework /7/ /8/. Those parameters not relevant when monitoring are correctly identified by PP and the MR describes those parameters not applicable.</p> <p>The monitoring plan complies with the applied methodology /7/ including the applicable tool /8/ in accordance with applicable verification requirements related to the compliance of the monitoring plan with the monitoring methodology including in the VVS /10/. The registered monitoring plan has been correctly implemented and followed by the PP.</p>

E.6. Compliance of monitoring activities with the registered monitoring plan

E.6.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	The registered PDD /1/ stated the parameters ex-ante sections D.1. The audit team assessed the parameters fixed <i>ex ante</i> indicated by PP the MR /4/. The following table describes the parameters determined ex-ante:			
	Parameter	Description	Value	Source
	MC _{Fj}	Annual methane conversion factor for the baseline animal waste management system "j".	79%	IPCC 2006, vol. 4, chapter 10, Tables 10.17.
	MS _{%Bl,j}	Fraction of manure handled in baseline animal manure management system "j".	1	PP

	VS _{default}	kg of dry matter/animal/day	Market Swine: 0.3 Breeding Swine: 0.46 Gilts: 0.46	IPCC 2006, vol 4, chapter 10, Tables 10A-7 and 10A-8.
	GWP _{CH4}	Global warming potential of Methane (CH ₄)	25	EB69 Annex 3 (version 01.0) / IPCC Fourth Assessment Report: Climate Change 2007 (AR4). PP correctly addressed the UNFCCC requirement of applying 25 for methane GWP for the second commitment period of the Kyoto Protocol (from the 1 st of January 2013 onwards).
	B _{0,LT}	Maximum methane producing potential of the volatile solid generated for animal type "LT".	Sows (breeding swine more than 200 kg mass): 0.45 Finishers (market swine more than 50 kg mass): 0.45 Nursery: 0.45 Boars and Gilts (market swine more than 100 kg mass): 0.45	IPCC 2006, Tables 10-A7 and 10-A8.
	W _{default}	Default average animal weight of a defined population at the project site.	Sows (breeding swine): 198 kg Finishers (market swine): 50 kg Nursery (market swine): 50 kg Boars (market swine): 50 kg Gilts (breeding swine): 198 kg	IPCC 2006, Tables 10-A7 and 10-A8
	UF _b	Model correction factor to account for model uncertainties	0.94	FCCC/SBSTA/2003/10/Ad d.2, page 25. Available on the website: http://unfccc.int/resource/docs/2003/sbsta/10a02.pdf
Findings		No findings identified		
Conclusion		<p>The audit team was able to verify the <i>ex-ante</i> parameters used and specified in the MR used by the PP as a mean to determine the GHG emission reductions are in line with those <i>ex-ante</i> fixed parameters stated. IPCC default values, GWPs and other reference figures are applied and result in a conservative estimate of the GHG emission reductions calculated and stated on the calculation file /6/.</p> <p>Complementary, the audit team concludes the applicability of the parameters W_{default}, VS_{default}, B_{0,L,t} to the default values of the Tables 10 A-7 and 10 A-8 from the 2006 IPCC Guidelines for <i>National Greenhouse Gas Inventories, Volume 4, chapter 10</i> considering that according to paragraph 10 (d) from AMS-III.D version 20.1 /7/, VS figures applicable to developed countries can be used since the following conditions are satisfied:</p> <ul style="list-style-type: none"> • <i>The genetic source of the livestock originates from an Annex I Party:</i> ICONTEC could confirm that the genetics and nutrition adopted for these farms as so as in western Europe through records of swine purchase and selling as well as trough PP internal procedure (POP 15 – Genetics) and form 15 – Genetics /28/. The supplier (<i>Genética porc</i>) /29/ provides with animals to COOASGO (the association gathering not just the project sites but the swine producer in São Gabriel do Oeste) which in turn provides to the different project sites /28/ having a traceable record of the animal type. As it has been found through telephonic interviews, COOASGO purchased 		

	<p>parental material (breeding sows) in 2018 in order to supply producers associated, as a common practice in the area of influence of the proposed project activity. PP keeps record of the genetic source of each and every project site through form 15.001 /28/ as it was verified by the audit team by assessing dedicated form as well as telephonic interviews.</p> <ul style="list-style-type: none"> • <i>The farm uses formulated feed rations (FFR) which are optimized for the various animal(s), stage of growth, category, weight gain/productivity and/or genetics:</i> The audit team verified through telephonic interviews animals are feed with formulated feed rations. The rations are obtained through a mixture of different raw materials such as soy, corn, mineral, etc. The rations are adjusted to different stages of swine production /17/ /26/. Formulated rations do not vary since raw materials are available through time at the area of influence of the proposed project activity. In addition, pork production systems maintain conditions of animal feeding since all project sites are associated to COOASGO, the animal producer's association and therefore, feeding operations are controlled. • <i>The project specific animal weights are more similar to developed country IPCC default values:</i> The animal weights are described in the calculation file /6/ and compared to the default weights. The differences between the animal weights determined in each project site and the default values is not significant and assures the fulfilment of the requirements. <p>ICONTEC could confirm the formulated feed ratio by assessing support documents regarding balanced feed ratios given to swine as part of the productive system, as well as Form 14.001 /17/, in compliance with the monitoring plan of the registered PDD. With this assessment it was also possible to verify that the FFR is optimized for the various animals, stage of growth, category, weight gain and genetics. The overall conclusion of the assessment regarding data and parameters fixed ex-ante is that those data and parameters are correctly set since methodological conditions are met.</p>
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E.6.2. Data and parameters monitored

Means of verification	During the verification process, the audit team assessed the whole set of monitoring parameters relevant to the proposed project activity (as listed in chapter B.7.1 of the registered PDD /1/ and section D.2 of MR /4/), the figures as reported in the MR and the information flow management system have been verified with regard to the appropriateness of the applied measurement and equipment, the correctness of the values applied for calculation of GHG emission reductions, the accuracy and applied QA/QC measures. The monitored parameters described in the MR /5/ are described as follows:	
	1. Parameter:	T_f
	Description:	Combustion temperature of the flare (enclosed flares)
	Value:	In the spreadsheet calculation file /6/ on folder <i>MDy-PEpower,y,ex-post</i> .
	Used Equipment:	ALUTAL Standard Thermocouple, Accuracy Class; $\pm 1.5^{\circ}\text{C}$ or $\pm 0.25\%$. . Equipment of each project site is described in section C of the MR
	Source of Data and Frequency:	Flare temperature is measured once per minute through thermocouples and recorded by the PLC system (Programmable Logic Control). On its turn, records are monthly collected by the Regional Technician through flash memory. Data collected is gathered monthly and kept on form: 01.001, also known as " <i>Tabela de Dados</i> " /18/. In addition, the QA/QC officer according to the internal procedure verifies Data collected.

	Data Cross Checking:	<p>Historical data was available at the different project sites and was crosschecked by the audit team. The operational conditions of the monitoring equipment were assessed through interview with Mr Eliselton Cavalli (regional technician). In addition, it was verified procedure followed by Mr Eliselton in order to verify the collect data collection and reporting.</p> <p>It was also verified collected temperature data by considering methane content of biogas against form 01.001 /18/ as well as the emission reduction calculation file /6/.</p>
	Consistency Between the QA/QC defined in the Methodology:	It was verified PP fulfils the proposed QA/QC procedures on applicable methodology and registered PDD /1/. The records of temperature /18/ /23/ have been thoroughly examined in order to identify correctness when applying figures. The monitoring equipment operated in the range of the technical specifications defined by the manufacturer /14/, and therefore assuring the monitoring conditions in line with requirements set out on applicable methodology.
	Consistency Between the QA/QC established by the Project Participants in the PDD:	QA/QC procedures taken by the project activity are in line with the proposed procedures on PDD /1/ as well as applicable methodology /7/ /8/.
	Conclusion:	The overall conclusion on the matters of Parameter T _i is that the parameter is properly applied according to the monitoring plan, the approved PDD and in accordance with the applied methodology. In addition, provided information (data and figures) is consistent with the primary and secondary information source used to verify the information as well as the information verified on-site.
	2.Parameter:	SITE INSPECTION
	Description:	Inspection on the site considering relevant regulation and the infra-structure of the site
	Value:	Not Applicable
	Used Equipment:	Not Applicable
	Source of Data and Frequency:	According to the PDD /1/ the frequency of site visits is annual; nevertheless, PP performs two site inspections to the different project sites, information gathered on this follow summarized in Form 02 /19/. In addition, PP visits different project sites once a month in order to collect data and to identify operational conditions of the different project sites in accordance with the sampling plan /16/ stated in the monitoring plan /4/.
	Data Cross Checking:	Information provided on <i>Form 02.001</i> (POP 02) /19/ was crosschecked against sources such as raw files of data. In addition, dates have been verified by telephonic interviewing the Regional Technician Mr Eliselton Cavalli . Lastly, the operation licenses /13/ were assessed
	Consistency Between the QA/QC defined in the Methodology:	Site inspection is performed in the required frequency (according to applicable methodology /7/); furthermore, site inspection is done for each and every project site.
	Consistency Between the QA/QC established by the Project Participants in the PDD:	PP does site inspection on the frequency described on PDD /1/. More important, PP acting in a conservative manner performs two site visits per period.

	Conclusion:	Based on assessed evidence, the overall conclusion on the matters of SITE INSPECTION is that the entire project sites are inspected as described on the monitoring plan. The project activity compliances with mandatory legal requirements for each and every project site, including operation licenses and environmental licenses for the entire monitored period /13/.
	3.Parameter:	N_{LT,y}
	Description:	Annual average number of animals of type "LT" in year "y"
	Value:	The values of N _{LT,y} can be found in calculation file for every project site /6/
	Used Equipment:	Not Applicable
	Source of Data and Frequency:	The actual figure of animals at each of the project sites is done monthly. PSO provides monthly reports using form 03.003 and 03.001 (Animal control system form) /20/, the one presents the daily entrance and exits records (such as purchase, births, sales, deaths, and internal transfer); in addition, the previously mentioned forms include information related to number of animals per animal category for each project site, specific for each specific farm. Data aggregation and reporting is monthly /20/ by the owner or manager of each farm. Calculation and reporting are managed through the monitoring system put in place by Brascarbon. The audit team verified all files provided by PP and related to animal figures. Files are listed on reference section /20/.
	Data Cross Checking:	Information provided on excel files of the form 03.001 /20/, were cross-checked by comparing figures on Calculation file /6/ as well as livestock inventory stated in the MR stated on form 03.003 /20/
	Consistency Between the QA/QC defined in the Methodology:	The calculation procedures as well as the QA/QC measurements taken by PP are in accordance with requirements.
	Consistency Between the QA/QC established by the Project Participants in the PDD:	QA/QC measures taken by PP for the different project sites are in line with proposed QA/QC measures described on PDD.
	Conclusion:	The overall conclusion is that PP correctly applies the parameter, taking into account data collection and reporting. In addition, QA/QC procedures agree with proposed procedures on PDD.
	4.Parameter:	N_{da,y}
	Description:	Number of days animal is alive in the farm, in year "y"
	Value:	The values N _{da,y} can be found in the calculation file /6/
Used Equipment:	Not Applicable	
Source of Data and Frequency:	The animal inventory records are kept in <i>formulario</i> 03.003 /20/. The actual figure of animals at each of the project sites is done monthly. PCL provides monthly reports using form 03.003 and 03.001 (Animal control system form) /20/, the form 03.003 (summarized in form 03.001) presents the records regarding livestock entrance and exits (such as purchase, births, internal transfer, sales, deaths, internal transfer); this information helps to determine the number of days the animals are alive in each farm. Data aggregation and recording is done monthly by the owner	

	or manager of each farm. Calculation and reporting are made on the Brascarbon Monitoring Report System. The audit team verified all files provided by PP and related to animal figures. Files are listed on reference section as /20/.
Data Cross Checking:	Information provided on excel files of the form 03.001 /20/, were crosschecked by comparing figures on Calculation file /6/ as well as livestock inventory stated in the MR
Consistency Between the QA/QC defined in the Methodology:	The calculation procedure as the QA/QC measures taken by PP are in accordance with requirements.
Consistency Between the QA/QC established by the Project Participants in the PDD:	QA/QC measures taken by PP for the different project sites are in line with proposed QA/QC measures described on PDD.
Conclusion:	The overall conclusion is that PP correctly applies the parameter, taking into account data collection and reporting. In addition, QA/QC procedures agree with proposed procedures on PDD.
5.Parameter:	N_{p,y}
Description:	Number of animals produced annually of type "LT" in year "y"
Value:	The values N _{p,y} can be found in the calculation file /6/
Used Equipment:	Not Applicable
Source of Data and Frequency:	The animal inventory records are kept in <i>formulario 03.003</i> . The actual figure of animals at each of the project sites is done monthly. PCL provides monthly reports using form 03.003 and 03.001 (Animal control system form) /20/, the form 03.003 (summarized in form 03.001) presents the records regarding livestock entrance and exits (such as purchase, births, internal transfer, sales, deaths, internal transfer, among others); this information helps to determine the number of days the animals are alive in each farm. Data aggregation and recording is done monthly by the owner or manager of each farm. Calculation and reporting are made on the Brascarbon Monitoring Report System. The audit team verified all files provided by PP and related to animal figures. Files are listed on reference section as /20/.
Data Cross Checking:	Information provided on excel files of the form 03.001 /20/, were crosschecked by comparing figures on Calculation file /6/ as well as livestock inventory stated in the MR
Consistency Between the QA/QC defined in the Methodology:	The calculation procedure as the QA/QC measures taken by PP are in accordance with requirements.
Consistency Between the QA/QC established by the Project Participants in the PDD:	QA/QC measures taken by PP for the different project sites are in line with proposed QA/QC measures described on PDD.
Conclusion:	The overall conclusion is that PP correctly applies the parameter, taking into account data collection and reporting. In addition, QA/QC procedures agree with proposed procedures on PDD.
6.Parameter:	BG_{burnt,y}

	Description:	Biogas flared or used as a fuel in the year “y”
	Value:	The values of $BG_{burnt,y}$ can be found in the calculation file /6/.
	Used Equipment:	Flow Meter, Endress+Hauser thermal mass flow meter t-trend - ATT12 A99D31A4D1 MODEL, Accuracy class $\pm 5\%$ of factory full scale. Equipment of each project site is described in section E.7.
	Source of Data and Frequency:	Data related to the parameter is collected with a flow meter. On its turn, collected data is gathered by the Regional Technician, Mr Eliselton Cavalli on a monthly basis and stored on forms 04.001 /21/, and 01.001 /18/.
		Related equipment measures the actual biogas volume on wet basis. As the flow meter registers the biogas that is directed to the flare cumulatively (and that is also the data registered in the PLC), the $BG_{burnt,y}$ is calculated by differential with the previous biogas volume reading.
	Data Cross Checking:	Flow meter operation was verified crosschecking the calculation file /6/ against form 04.001 /21/ and form 01.001 /18/, /20/, against. In addition the regional technician confirmed the origin of data and the procedure of collection as described in MR /5/.
	Consistency Between the QA/QC defined in the Methodology:	QA/QC procedures follow mandatory requirements from applicable methodology.
	Consistency Between the QA/QC established by the Project Participants in the PDD:	QA/QC procedures are in line with proposed procedures on PDD.
	Conclusion:	Calculation of the parameter was correctly addressed as the audit team confirmed. Furthermore, PP correctly applied procedures defined on PDD. In addition, data related to the parameter has been correctly collected and kept by the project; furthermore, information provided by the equipment (flow meter) has been correctly taken into account for calculation procedures.
7.Parameter:		$W_{CH_4,y}$
	Description:	Methane content in biogas in the year “y”
	Value:	The values of $W_{CH_4,y}$ can be found in the calculation file /6/ and MR /5/.
	Used Equipment:	Biogas Check Portable Digital Analyser from Geotech/Landtech. Accuracy CH_4 : $\pm 0.5\%$ from 0-5% CH_4 content; $\pm 1.0\%$ from 5-15% CH_4 content; $\pm 3.0\%$ from 15%-full scale CH_4 content. Equipment is described in section E.7.
	Source of Data and Frequency:	Data is collected in accordance to the sampling plan by the Regional Technician (Mr Eliselton Cavalli) as set out mandatory on methodological tool /22/. Data is collected through a Portable Gas Analyzer and reported in form 04.001 /21/ at the suitable monitoring frequency: monthly. Since methodology /7/ requires that parameter $W_{CH_4,y}$ to be measured with the confidence level defined on registered PDD /1/ /2/, PP measured the parameter assuring the required confidence level as well as in accordance with the sampling methods required /22/.
		Monthly measured methane content ($W_{CH_4,y}$) is taken as $f_{V_{CH_4,RG,h}}$ (average). This approach is considered to be

		accurate when calculating $PE_{flare,y}$ since the monthly monitored $W_{CH_4,y}$ (measured on wet basis) assures a 95% confidence/precision level in the methane concentration measurement /22/ as assessed on the Sampling Plan /13/.
	Data Cross Checking:	Data collected and reported through calculation file /6/ was crosschecked against Form 04.001 /21/ provided for the verification process and regarding all of the project sites, therefore assuring the integrity of data available for the monitoring period. No differences were found between stated figures within the different data sources.
	Consistency Between the QA/QC defined in the Methodology:	QA/QC is in line with requirements determined by the applicable methodology /7/ when measuring with a 90% confidence level the parameters $W_{CH_4,y}$ and $f_{VCH_4,RG}$. The audit team verified the data collection is in line with the confidence level required /7/ and stated /1/
	Consistency Between the QA/QC established by the Project Participants in the PDD:	QA/QC activities were carried out as defined on PDD as well as approved monitoring plan and, as required by methodology /7/. The audit team performed interview with the personnel on charge of the QA/QC procedures in order to verify the consistency with the procedures.
	Conclusion:	The parameter has been measured consequently with mandatory requirements as well as stated on PDD /1/, therefore the overall conclusion is that the project activity complies with measurement requirements. Data collection is also reliable and calculations using these data have been taken adequately. Lastly the application of the sampling plan /13/ is in accordance with the methodological requirements for sampling /25/ the methane content of the biogas described in the applicable methodology /7/ /8/
	8.Parameter:	T_{biogas}
	Description:	Temperature of the biogas at ambient conditions
	Value:	The values of T _{biogas} can be found in the spreadsheet calculation file /6/ and MR /5/
	Used Equipment:	Biogas Check Portable Digital Analyser from Geotech/Landtech. Accuracy Temperature: $\pm 0.2^{\circ}C$ (Biogas check analyser accuracy) $\pm 0.5^{\circ}C$ (temperature probe accuracy) /14/. Equipment is described in section E.7.
	Source of Data and Frequency:	Data is collected in form 04.001 /21/ and the monitoring frequency is monthly by the regional technician as verified by the audit team through telephonic interview. Since methodology /7/ requires that parameter $W_{CH_4,y}$ be measured with a 90/10 confidence level, PP correctly designed and applied a sampling plan /13/, the one was developed by using the "Guidelines for sampling and survey" /25/.
	Data Cross Checking:	Data collected and reported through calculation file /6/ was crosschecked against Form 04.001 /21/ provided for the verification process and regarding all of the project sites, therefore assuring the integrity of data available for the monitoring period. No differences were found between stated figures within the different data sources.
	Consistency Between the QA/QC defined in the Methodology:	QA/QC activities were carried out as defined on PDD as well as approved monitoring plan and, as required by methodology /7/ and Guidelines for sampling /25/. The audit team performed interview with the personnel on charge of the QA/QC procedures in order to verify the consistency with the procedures

Consistency Between the QA/QC established by the Project Participants in the PDD:	QA/QC activities were carried out as defined on PDD as well as approved monitoring plan and, as required by methodology /7/.
Conclusion:	The parameter has been measured consequently with mandatory requirements as well as stated on PDD /1/, therefore the overall conclusion is that the project activity complies with measurement requirements. Data collection is also reliable and calculations using these data have been taken adequately.
9.Parameter:	D_{CH4,y}
Description:	Density of the methane combusted
Value:	<p>The values of the parameter can be found in the calculation file /6/ and MR /5/. Used formula:</p> $D_{CH4,y} = \frac{P_n}{\frac{R_u}{MM_{RG,h}} \times T_n}$ <p>D_{CH4,y}: Density of methane in the biogas (kg/m3) P_n: Pressure of biogas (Pa) R_u: Universal Gas Constant (8314 Pa.m3/Kmol.K) MM_{RG,h}: Molecular mass of methane (16.04 kg/kmol) T_n: Biogas temperature (K)</p>
Used Equipment:	Not Applicable since the parameter is calculated, making use of Temperature and Pressure data monitored (parameters monitored and described further in this verification report)
Source of Data and Frequency:	POP 07.001 /35/ states the monitoring procedure and data regarding pressure and temperature are collected with the frequency determined in the sampling plan /13/, the one is in line with the sampling and survey framework /13/ /25/.
Data Cross Checking:	Formulae used in the calculation file /6/ was crosschecked against mandatory formulae stated in the methodological tool /8/ finding compliance and coherent use of formulae
Consistency Between the QA/QC defined in the Methodology:	Both, calculation and data collection for calculation were done applying requirements set out on the applicable methodology /7/.
Consistency Between the QA/QC established by the Project Participants in the PDD:	QA/QC procedures applied are in line with provisions on PDD and applicable requirements.
Conclusion:	Methane density was correctly calculated by PP, applying the applicable methodological tool /8/.
10.Parameter:	FE (η_{flare,h})
Description:	Flare Efficiency
Value:	The values of the parameter can be found in the spread sheet calculation file /6/ and MR /5/
Used Equipment:	Enclosed Flare, in addition a thermocouple
Source of Data and Frequency:	Flare efficiency is defined as 90% (If flare temperature >=500°C for all minutes in an hour), 50% (If flare temperature >=500°C but the flare is operating out of manufacturer specification in any minute) and 0% (If flare temperature <500°C in any minute).

		<p>Information related to flare efficiency of each hour for 24 hours per day is registered on the form 08.001 /23/ and obtained through a macro applied to form 01.001 /18/ (temperature and biogas volume registered minute by minute, data stored in the PLC). The hourly flare efficiency is compounded monthly for emission reduction calculation through a monthly weighted average that takes into consideration the number of hours that the flare has operated in each different condition (90%, 50%, 0%)</p>
	Data Cross Checking:	<p>As part of the verification activities, the verification team assessed the form 08.001 /23/ of each project site of the proposed project activity; this is to say: the audit team verified each and every hour covering the monitoring period. Data aggregated was crosschecked against data used on calculation file /6/, finding no differences between stated figures.</p> <p>The audit team verified that during the Second monitoring period the flare always operated within the range of manufacturer specifications when above 500°C, hence the level of 50% flare efficiency has not been applied.</p>
	Consistency Between the QA/QC defined in the Methodology:	<p>PP took into account applicable requirements as well as registered PDD /1/ and performed QA/QC according to applied methodology /7/. The verification process included a dully assessment on flare temperature records /23/, finding PP correctly applied methodology, those periods of time where temperatures were lower than 500°C, and therefore 0% flare efficiency, were not claimed by the project as emission reductions. Consequently, all data and parameters that are required to monitor the flare operation within the range of operating conditions according to manufacturer's specifications were continuously monitored according to the methodology requirements.</p> <p>Since manufacturer specifications /14/ have been presented by PP which stated: "system is made to the natural flow of biogas, which works under atmospheric pressure, without forced ventilation systems for biogas once the flare is designed and customized for each farm working exclusively with the atmospheric pressure". The monitoring equipment has been put in operation and, the verification team assesses all relevant information related to the parameter, it is concluded the parameter has been correctly monitored and determined and it follows the proposed monitoring plan described at the revised and approved PDD. Furthermore, the audit team confirmed that, given that the flaring temperature accounted for the ER calculations was above 500°C, the flare was always operated within the range of manufacturer specifications.</p>
	Consistency Between the QA/QC established by the Project Participants in the PDD:	<p>Q/A/QC included maintenance (replacement) procedures as described on the approved PDD, therefore there is consistency for the QA/QC procedures.</p>
	Conclusion:	<p>The overall conclusion is that PP correctly determined parameter "Flare Efficiency" on the basis of a reliable data collection system. The parameter measurement methods and calculation follow requirements set out in the methodology /7/. Since the equipment is operated</p>

		according to manufacturer's specifications the audit team confirms that, measurements and flare efficiency parameter are reliable and in monitored in accordance with all the requirements and specifications.
	11.Parameter:	QDM
	Description:	Sludge soil application
	Value:	N/A. Sludge was not removed during this monitoring period.
	Used Equipment:	Not Applicable
	Source of Data and Frequency:	Sludge Soil Application will be reported through form 09.001. Nevertheless, at the moment the project activity has not carried out any sludge application as verified by the lead auditor.
	Data Cross Checking:	Not Applicable since there has not been sludge applied. In interview with the person responsible for the site inspection, Mr Eliselton Cavalli, the audit team did verify no sludge application has taken place within the project boundaries. The audit team also interviewed project site owners whom assured no need of sludge application was evident during the monitoring period. The on-site visit performed by the verification team confirms the biogasifiers do not require withdrawals of sludge to date.
	Consistency Between the QA/QC defined in the Methodology:	Not Applicable since there has not been sludge applied.
	Consistency Between the QA/QC established by the Project Participants in the PDD:	Not Applicable since there has not been sludge applied.
	Conclusion:	By the time the verification process was carried out no sludge application was confirmed by the PP, for this reason the parameter has neither been measured nor reported for this monitoring period. By the time the On-site Visit was carried out no sludge application was confirmed by the PP or registered in the project sites, for this reason the parameter has neither been measured nor reported for this monitoring period. In addition, the methodological choice does not make compulsory the usage of the parameter; therefore the PP did not carry out monitoring activities assuring fulfilment of the methodological requirements.
	12.Parameter:	W_{site}
	Description:	Average animal weight of a defined livestock population at the project site
	Value:	The values of W _{site} can be found in the calculation file /6/ and MR /5/
	Used Equipment:	Not Applicable
	Source of Data and Frequency:	The data collection is carried out quarterly by each project site owner (together with COOASGO and provided to the PP. COOASGO ² is the Pig Producers Association to which the farms contained in the PDD are associated;) and is provided to PP in order to be incorporated in the GHG emission reductions calculations. The quarterly weight of the animals for each producer of the PDD is

² The main role of COOASGO is to act as a third party responsible for the assurance of all the logistics associated with the swine producers, providing the animal nutrition, genetics and all the overall animal weight.

		made following internal procedures of each farm and is not under the PP's control. Each project site presents the actual animal weight by using Brascarbon form 16.001 /34/ after a crosscheck by the PP, using the information collected on-site when each batch of animals leaves each farm; the template was designed to quarterly report animal weight per category.
	Data Cross Checking:	<p>Reported data was verified by comparing different figures of calculation file /6/ and raw data on form 16.001 /34/, finding no differences between figures.</p> <p>ICONTEC also assessed that the PP QA/QC procedures involves the checking of the site records and documents. Figures of the quarterly weights presented by COOASGO (following the association's internal procedures) to the PP are crosschecked against two different credible sources, in compliance with what is stated in the version 20.1 of methodology AMS-III.D, the following information:</p> <ul style="list-style-type: none"> Pig standard weights, available on the website: https://www.embrapa.br/documents/1355242/0/Curso+Suinocultura+-+Apostila.pdf. Source: EMBRAPA Empresa Brasileira de Pesquisa Agropecuária (as in English: Agricultural Research Brazilian Corporation) allowing a crosscheck of the values provided in the form 16.001, used for the monitoring and control of the parameter W_{site}, Records of purchase to Geneticpork /29/ are provides as part of the support documents, in addition, COOASGO weights animals as part of the activities carried out <p>Through the above primary and secondary sources, PP and DOE confirm the consistency between the reported W_{site} values and the indirect information, in line with the methodological framework /7/. Therefore, values presented by the PP are crosschecked both with literature values (EMBRAPA) as well as the real swine production when each batch of each farm is sold assuring the required consistency.</p> <p>Since was not possible to perform a telephonic interview with representatives of COOASGO, the audit team requested to PP to demonstrate the role of COOASGO through a document issued by the swine association regarding figures and data collection /36/</p>
	Consistency Between the QA/QC defined in the Methodology:	<p>Data collection and its subsequent use for calculations follows requirements set out on applicable methodology /7/.</p> <p>ICONTEC confirmed, based on interviews and on-site that the data collection is carried out quarterly per year by each farm owner</p> <p>It is important to highlight farm owners rely on the quality of the values measured weights since their sole professional occupation is the pig production and, therefore, it is within their best interests to have a correct and reliable way to assess the weighting of the animals based on their experience and internal procedures.</p>

	Consistency Between the QA/QC established by the Project Participants in the PDD:	QA/QC is performed as described in the approved PDD; PP correctly measured the actual animal weight at the various project sites.	
	Conclusion:	<p>PP correctly measured, reported and usage data for calculations on the matters of the parameter W_{site}, in addition QA/QC procedures follow applied methodology /7/ and provisions on PDD</p> <p>Monitoring of the parameter was monitored in accordance with the revised PDD and therefore, in accordance with the revised monitoring plan, both calculation method as well as frequency were pre-determined on revised monitoring plan and performed accordingly for the verification period. Data collection is carried out quarterly by each farm owner and provided to the PP.</p> <p>The business as usual practice of swine production is that each farm performs regular and periodical weighting activities in order to adjust animal nutrition, health issues and general growing conditions. Weight data is required swine operations such as the ones featured on the project sites. Farm owners rely on the quality of the values measured since their sole professional occupation is the pig production and it is within their best interests to have a correct and reliable way to assess the weight of the animals based on their experience and internal procedures.</p> <p>The audit team can confirm the consistency between the reported W_{site} values and the indirect information, in line with the paragraph 30 (a) of the methodology AMS-III.D /7/. Therefore values presented by the PP are crosschecked both with literature values (EMBRAPA) as well as the real swine production when each batch of each farm is sold assuring the required consistency of the methodology AMS-III.D Version 20.1.</p> <p>The audit team confirmed and verified that figures of parameter W_{site} considered in the monitoring report are in line the reference figures, the exit values of each batch and that all values are within the admissible weight difference. Therefore, in conclusion, the parameter has been correctly assessed and was monitored in accordance with the revised monitoring plan available in the revised PDD. In addition, QA/QC procedures are also in line with proposed monitoring plan stated on registered PDD /1/.</p>	
		13.Parameter:	$ER_{y,ex-post}$
		Description:	Ex-post emission reductions achieved by the project activity based on monitored values for the year "y".
		Value:	The values of $ER_{y,ex-post}$ can be found in the spread-sheet calculation file /6/ and MR /5/
	Used Equipment:	Not Applicable. No direct use of equipment	
Source of Data and Frequency:	The parameter is calculated on the basis of all collected data. As it was verified, PP uses formula provided on methodology ($ER_{y,ex-post} = \min[(BE_{y,ex-post} - PE_{y,ex-post}), (MD_y - PE_{power,y,ex-post})]$), in order to calculate the		

		parameter on a yearly basis. Ad in accordance with the methodology /7/
	Data Cross Checking:	<p>Figures of Baseline emissions ($BE_{y,ex-post}$), project emissions ($PE_{y,ex-post}$) and methane captured and destroyed (MD_y) Reported on MR and CERs calculation file /6/ were assessed as part of the desk review activities. The assessment involved a review of the raw data necessary to calculate the parameter. Further in this verification report calculations and its verification will be presented.</p> <p>On its turn $PE_{y,ex-post}$ calculations were verified by crosschecking them against records collected on each and every project site. In addition, calculation file provided /6/ was assessed in order to verify compliance with PDD and applicable methodology /7/.</p>
	Consistency Between the QA/QC defined in the Methodology:	QA/QC activities are in line with the applicable methodology /7/.
	Consistency Between the QA/QC established by the Project Participants in the PDD:	During the monitored period QA/QC activities have been carried out in accordance to approved PDD.
	Conclusion:	Emission reductions calculation comply with mandatory requirements set out on methodology AMS-III.D version 20.1, applicable tool, approved and revised PDD /1/, including the revised monitoring plan for the verification period.
	14.Parameter:	FFR
	Description:	Formulated feed rations
	Value:	Not applicable
	Used Equipment:	Not Applicable
	Source of Data and Frequency:	Data provided on form 14.001 /17/ (internal control document) was crosschecked by the audit team against records of animal feed rations /26/.
	Data Cross Checking:	Information provided on PDD, Monitoring report and support documents /26/.
	Consistency Between the QA/QC defined in the Methodology:	Keeping records and supplier evidence are in line with methodology /7/ requirements.
	Consistency Between the QA/QC established by the Project Participants in the PDD:	PP followed proposed QA/QC procedures on PDD, therefore the QA/QC procedure complies with pre-established.
	Conclusion:	The parameter has been monitored adequately and in accordance to the monitoring plan and the registered PDD /1/; furthermore, information provided by PP is consistent with the secondary information sources used to verify the information. Lastly the technical expertise of the audit team allowed concluding formulated feed rations has been implemented in order to acquire a stable productive cycle in terms of the number the animals are present in the farms. Formulated feed rations allow to standardize the swine productive system being nutritional therefore balanced rations the basis of modern animal production systems

	15.Parameter:	P_{biogas}
	Description:	Pressure of the biogas at operation conditions
	Value:	The values of P _{biogas} can be found in the spread-sheet calculation file /6/ and MR /5/
	Used Equipment:	Biogas Check Portable Digital Analyser from Geotech/Landtech. Accuracy. Pressure: ± 4mbar typically and ±15 mbar maximum. Equipment is described in section E.7.
	Source of Data and Frequency:	Data is collected in form 04.001 /21/ and the monitoring frequency is monthly by the regional technician as verified by the audit team through telephonic interview. Since methodology /7/ requires that parameter W _{CH₄,y} be measured with a 90% confidence level, based on the statistical analysis performed to determine methane concentration according to the characteristics of Data /14/, the one is in line with methodology /7/.
	Data Cross Checking:	Data provided through calculation file /6/ was crosschecked against Form 04.001 for every project site. No differences were found between stated figures on different data sources. Data was also crosschecked against records available on each project site
	Consistency Between the QA/QC defined in the Methodology:	QA/QC is in line with requirements determined by the applicable methodology /7/.
	Consistency Between the QA/QC established by the Project Participants in the PDD:	QA/QC activities were carried out as defined on PDD as well as approved monitoring plan and, as required by methodology /7/.
	Conclusion:	The parameter has been measured consequently with mandatory requirements as well as stated on PDD /1/, therefore the overall conclusion is that the project activity complies with measurement requirements. Data collection is also reliable and calculations using these data have been taken adequately.
	16.Parameter:	GENETIC SOURCE
	Description:	Genetic source from annex I party
	Value:	Western Europe genetic
	Used Equipment:	Not Applicable
	Source of Data and Frequency:	Genetic source is internally reported (every project site reports) by using form 15.001 /28/.
Data Cross Checking:	Information provided by PP /28/ was crosschecked against support documentation provided by Geneticpork /29/, company responsible for the animal genetic at each production site. There were no differences among reported information	
Consistency Between the QA/QC defined in the Methodology:	Support letter confirms genetic source of each producer /29/ since COOASGO provides genetic material to the farms and, simultaneously, the genetic provider of COOASGO is Geneticporc. In addition, there is consistency between procedures and provisions on Methodology /7/.	
Consistency Between the QA/QC established by the Project Participants in the PDD:	Procedures for the monitoring period of reference are in accordance with PDD.	
Conclusion:	Genetic source is the adequate for the project activity as verified while carrying out the Desk Review stage,	

	furthermore animal genetic supplier confirmed through a letter /29/ genetic source.
17.Parameter:	MS%_{i,y}
Description:	Fraction of manure handled in system “i”, year “y”.
Value:	1 (100%)
Used Equipment:	Not Applicable
Source of Data and Frequency:	Information related to the manure fraction handled is described on form 02.001 /19/; the actual fraction is monitored on annually basis and estimated in accordance with this monitoring frequency.
Data Cross Checking:	Information provided on MR /5/ was assessed thanks to telephonic interview with relevant personnel evidence suggesting a different fraction of the manure is handled; in fact, manure collection system handles a 100% all over the project sites.
Consistency Between the QA/QC defined in the Methodology:	Procedures are in line with applicable methodology /7/.
Consistency Between the QA/QC established by the Project Participants in the PDD:	Site visit inspections are carried out by PP as determined on approved PDD /1/.
Conclusion:	Percentage of manure handled has been correctly determined by PP. On the other hand, the verification process, allowed the lead auditor to state that the figure of 100% is accurate.
18.Parameter:	F_{CH4,m}
Description:	Mass flow rate of methane in the residual gas in the hour h
Value:	The values of the parameter can be found in the calculation file /6/ and MR /5/, defined in the operational system by the PP as the form 17.001, name given to the calculation file (CERs calculation file /6/).
Used Equipment:	Not Applicable since the parameter is calculated
Source of Data and Frequency:	The parameter is calculated in accordance with the tool to determine project emissions from flaring gases containing methane /8/ which refers to the “ <i>Tool to determine the mass flow of a greenhouse gas in a gaseous stream</i> ”, using Option 2 of the Step 1. The calculation is made using data collected on a monthly basis. Data collected is presented on Calculation file /6/.
Data Cross Checking:	Crosschecking was performed by assessing calculation file /6/ against figures assessed while carrying out the on-site inspection
Consistency Between the QA/QC defined in the Methodology:	Calculation has been done taking into account the “Tool to determine project emissions from flaring gases containing methane” /8/, therefore QA/QC procedures are in line with requirements.
Consistency Between the QA/QC established by the Project Participants in the PDD:	QA/QC procedures are in accordance with provisions on PDD /1/.
Conclusion:	The parameter is properly correctly calculated on the basis of an adequate data collection and formula used on form 17.001, CERs Calculation File, /6/ is correctly stated,

	constant figures such as absolute pressure and universal ideal gas are correctly put in place when calculating the parameter.
19.Parameter:	FV_{RG,h}
Description:	Volumetric flow rate of the residual gas at normal conditions in an hour h
Value:	The values of FV _{RG,h} can be found in the spread-sheet calculation file /6/ and MR /5/
Used Equipment:	Not Applicable since the parameter is calculated
Source of Data and Frequency:	Data related to the parameter is collected with a flow meter. On its turn, collected data is gathered by the Regional Technician on a monthly basis and stored on forms 04.001 /21/ and 01.001 /18/.
Data Cross Checking:	Flow meter operation was verified crosschecked provided calculation file /6/ against aggregated data files /18/, /21/. It was verified as well that parameter FV _{RG,h} is calculated at normal conditions (101.325 kPa and 273.15 K) in accordance with the "Tool to determine project emissions from flaring gases containing methane" /8/. The parameter is calculated monthly dividing the biogas volume by the total hours of operation, approach that has been considered accurate for the calculation since the biogas hourly flow is considered to be constant as there is no an artificial blower in place as it was confirmed through interview with relevant personnel.
Consistency Between the QA/QC defined in the Methodology:	QA/QC procedures follow mandatory requirements from applicable methodology.
Consistency Between the QA/QC established by the Project Participants in the PDD:	QA/QC procedures are in line with proposed procedures on PDD.
Conclusion:	Calculation of the parameter was correctly addressed as the audit team confirmed. Furthermore, PP correctly applied procedures defined on PDD. In addition, data related to the parameter has been correctly collected and kept by the project; furthermore, information provided by the equipment (flow meter) has been correctly taken into account for calculation procedures.
20.Parameter:	fV_{CH4,RG,h}
Description:	Volumetric fraction of methane content in the residual gas in hour "h"
Value:	The values of fV _{CH4,RG,h} can be found in the spread-sheet calculation file /6/ and MR /5/
Used Equipment:	Not applicable since the parameter is calculated
Source of Data and Frequency:	Regional Technician (Mr Eliselton Cavalli) collects information related to the parameters (W _{CH4,y} , T _{biogas} and P _{biogas}), by measuring the actual figures of these parameters with a portable gas analyser this information was verified on-site by cross-checking figures reported and figures available on each project site in accordance with the Sampling Plan /13/.
	Information of parameters is put into form 04.001 /21/. Since methodology /7/ requires that parameter W _{CH4,y} be measured with an adequate level of confidence, PP

		<p>correctly designed and applied a sampling plan /13/ PP measured the parameter assuring the required confidence level based in the characteristics of data; the sampling of the parameter /22/ is in line with the requirements /1/ /7/ /25/. Monthly measured methane content ($W_{CH_4,y}$) is taken as $fv_{CH_4,RG,h}$ (average).</p> <p>This approach is considered to be accurate when calculating $PE_{flare,y}$ since the monthly monitored $W_{CH_4,y}$ (measured on wet basis) assures a 95% confidence level in the methane concentration measurement which is in turn more conservative than the proposed approach of 90/10 according to requirements /7/ /8/.</p>
	Data Cross Checking:	Data provided through calculation file /6/ was crosschecked against Form 04.001 /21/ provided for the verification process. No differences were found between stated figures on different data sources.
	Consistency Between the QA/QC defined in the Methodology:	The confidence level is obtained by the frequency defined by the PP. QA/QC is in line with requirements determined by the applicable methodology /7/.
	Consistency Between the QA/QC established by the Project Participants in the PDD:	QA/QC activities were carried out as defined on PDD as well as approved monitoring plan and, as required by methodology /7/.
	Conclusion:	The parameter has been measured consequently with mandatory requirements as well as stated on PDD /1/, therefore the overall conclusion is that the project activity complies with measurement requirements. Data collection is also reliable and calculations using these data have been taken adequately.
	21.Parameter:	nd_y
	Description:	Number of days in year “y” where the treatment plant was operational
	Value:	The values of nd _y can be found in the calculation file /6/ and MR /5/
	Used Equipment:	Not Applicable since the parameter is calculated
	Source of Data and Frequency:	The parameter is calculated on a monthly basis. Aggregate information is kept on form 08.001 /23/ as a result of the PLC data collection. Parameter figure is used for calculations on calculations file /6/.
	Data Cross Checking:	Reported figures for the different project sites were crosschecked against form 08.001 /23/ in order to verify the total hours of operation of the equipment, finding no significant disturbance such as stops for installation of equipment, ending of productive cycles, among others. The total hours records were assessed in the on-site visit and crosschecked against the reported operation hours finding no differences.
	Consistency Between the QA/QC defined in the Methodology:	PP monitored the parameter as requested on the applied methodology /7/
	Consistency Between the QA/QC established by the Project Participants in the PDD:	The QC officer as defined on PDD verifies calculations.

Conclusion:	The parameter was monitored in accordance with the approved PDD /1/ as well as required by the applicable methodology /7/.
22.Parameter:	VS_{LT,y} (SVS_{jLT,y})
Description:	Volatile solids for livestock LT entering the animal manure management system in year y
Value:	The values of the parameter can be found in the calculation file /6/ and MR /5/
Used Equipment:	Not applicable since the parameter is calculated
Source of Data and Frequency:	Annually
Data Cross Checking:	The parameter was assessed in the calculation file /6/ and the figures needed for the calculation are verified. Animal weight, VS default according to animal category and the number of days the treatment plant is operational are verified.
Consistency Between the QA/QC defined in the Methodology:	PP calculated the parameter as requested on the applied methodology /7/, using figures applicable to developed countries.
Consistency Between the QA/QC established by the Project Participants in the PDD:	The QC officer as defined on PDD verifies calculations. QA/QC activities were carried out as defined on PDD as well as approved monitoring plan and, as required by methodology /7/.
Conclusion:	The verification team assessed the calculations and assumptions of the calculation of the parameter. The fact the animal production system makes use of formulated feed rations in accordance with animal category and, the animal genetics is closer to the expected genetics of developed countries makes the calculation of the parameter accurate. Lastly, the animal weights monitored allow as well the use of the methodological choice defined by the PP for the project. The overall conclusion is that the proposed project activity correctly calculates the parameter in order to calculate the total volatile solids entering the system and therefore, the emission reductions calculated on the basis of the parameter are correctly stated.
23.Parameter:	Q_{manure LT,y}
Description:	Quantity of manure treated from livestock type <i>LT</i> at animal manure management system <i>j</i>
Value:	100%
Used Equipment:	Not Applicable
Source of Data and Frequency:	Annually. Form 02.001, Brascarbon Report System
Data Cross Checking:	Data, procedures and figures verified crosschecking information provided on MR against information provided by relevant personel on telephonic interviews.
Consistency Between the QA/QC defined in the Methodology:	PP determined the parameter as requested on the applied methodology /7/,
Consistency Between the QA/QC established by the	The regional technician as well as the QA/QC officer used form 02.001 as described in the registered PDD /1/ and therefore compiling with the stated QA/QC procedures.

Project Participants in the PDD:	
Conclusion:	The animal manure treatment system was in place during the entire monitored period (including the claimed monitored period and the unclaimed monitoring period). The verification team assessed the operation of the treatment system findings no stops in its operation and no changes in the operational conditions. Nevertheless, the parameter is not applicable since the methodological option does not enforce the monitoring of the parameter. PP correctly stated on MR the parameter has no application (and therefore not monitoring) during the monitoring period.
24.Parameter:	ASH
Description:	Fraction of the dry matter feed intake
Value:	Not Applicable
Used Equipment:	Not Applicable
Source of Data and Frequency:	N/A
Data Cross Checking:	Not Applicable
Consistency Between the QA/QC defined in the Methodology:	Not Applicable
Consistency Between the QA/QC established by the Project Participants in the PDD:	Not Applicable
Conclusion:	The parameter is not used since PP makes use of the methodological option d) of paragraph 17 of the methodology /7/. The methodological option excludes monitoring of the parameter and therefore the measures taken by the PP are in line with methodological requirements.
25.Parameter:	Flame_m
Description:	Flame detection in the minute m
Value:	Figures reported on form 08.001
Used Equipment:	Enclosed flare
Source of Data and Frequency:	Monitoring system Brascarbon
Data Cross Checking:	The flame detection was crosschecked against form 01.001 "Tabela de Dados" of each project with the combustion temperature of the flare.
Consistency Between the QA/QC defined in the Methodology:	Calibration procedures and frequencies /30/ /31/ /33/ as well as maintenance activities /19/
Consistency Between the QA/QC established by the Project Participants in the PDD:	Continuous monitoring of operational conditions within the manufacturers' specifications and maintenance (maintenance procedures are stated on form 02.001 /19/)
Conclusion:	The flame detection is assured by following POP 08 as the verification team assessed data collected on form 08.001. In addition the operation conditions of the equipment have been verified through the on-site visit

	26.Parameter:	AI_I
	Description:	Annual average interval between manure collection and delivery for treatment at a given storage device I
	Value:	Not Applicable
	Used Equipment:	Not Applicable
	Source of Data and Frequency:	N/A
	Data Cross Checking:	Not Applicable
	Consistency Between the QA/QC defined in the Methodology:	Not Applicable
	Consistency Between the QA/QC established by the Project Participants in the PDD:	Not Applicable
	Conclusion:	The parameter is not used since the proposed project activity does not make use of storage units or storage in order to manage manure. The collection system conducts manure directly to the treatment system.
	27.Parameter:	GE_{LT}
	Description:	Daily average gross energy intake in MJ/day
	Value:	Not Applicable
	Used Equipment:	Not Applicable
	Source of Data and Frequency:	Not Applicable
	Data Cross Checking:	Not Applicable
	Consistency Between the QA/QC defined in the Methodology:	Not Applicable
	Consistency Between the QA/QC established by the Project Participants in the PDD:	Not Applicable
	Conclusion:	The parameter is not used since PP makes use of the methodological option d) of paragraph 17 of the methodology /7/. The methodological option excludes monitoring of the parameter and therefore the measures taken by the PP are in line with methodological requirements.
	28.Parameter:	DE_{LT}
	Description:	Digestible energy of the feed in per cent
	Value:	Not Applicable
	Used Equipment:	Not Applicable
Source of Data and Frequency:	Not Applicable	
Data Cross Checking:	Not Applicable	
Consistency Between the QA/QC defined in the Methodology:	Not Applicable	

	Consistency Between the QA/QC established by the Project Participants in the PDD:	Not Applicable
	Conclusion:	The parameter is not used since PP makes use of the methodological option d) of paragraph 17 of the methodology /7/. The methodological option excludes monitoring of the parameter and therefore the measures taken by the PP are in line with methodological requirements.
	29.Parameter:	UE
	Description:	Urinary energy expressed as fraction of GE
	Value:	Not Applicable
	Used Equipment:	Not Applicable
	Source of Data and Frequency:	Not Applicable
	Data Cross Checking:	Not Applicable
	Consistency Between the QA/QC defined in the Methodology:	Not Applicable
	Consistency Between the QA/QC established by the Project Participants in the PDD:	Not Applicable
	Conclusion:	The parameter is not used since PP makes use of the methodological option d) of paragraph 17 of the methodology /7/. The methodological option excludes monitoring of the parameter and therefore the measures taken by the PP are in line with methodological requirements.
	30.Parameter:	ED_{LT}
	Description:	Energy density of the feed in MJ/kg fed to livestock type LT
	Value:	Not Applicable
	Used Equipment:	Not Applicable
	Source of Data and Frequency:	Not Applicable
	Data Cross Checking:	Not Applicable
	Consistency Between the QA/QC defined in the Methodology:	Not Applicable
	Consistency Between the QA/QC established by the Project Participants in the PDD:	Not Applicable
	Conclusion:	The parameter is not used since PP makes use of the methodological option d) of paragraph 17 of the methodology /7/. The methodological option excludes monitoring of the parameter and therefore the measures taken by the PP are in line with methodological requirements.

	31.Parameter:	EG_y
	Description:	Total electricity generated from the recovered biogas in year y
	Value:	Not Applicable
	Used Equipment:	Not Applicable
	Source of Data and Frequency:	Not Applicable
	Data Cross Checking:	Not Applicable
	Consistency Between the QA/QC defined in the Methodology:	Not Applicable
	Consistency Between the QA/QC established by the Project Participants in the PDD:	Not Applicable
	Conclusion:	The proposed project activity does not generate energy and therefore the parameter is not applicable, nor monitored. Paragraph 29 of the Methodology /7/ is not applicable
	33.Parameter:	EE_y
	Description:	Energy Conversion Efficiency of the project equipment
	Value:	Not Applicable
	Used Equipment:	Not Applicable
	Source of Data and Frequency:	Form 02.001
	Data Cross Checking:	Not Applicable
	Consistency Between the QA/QC defined in the Methodology:	No electricity consumption for the operation of the proposed project activity
	Consistency Between the QA/QC established by the Project Participants in the PDD:	Not Applicable
	Conclusion:	The verification team interviewed relevant personnel at the project sites and the regional technician assuring no electricity was used in the operation system, as described on registered PDD /1/. Since is no electricity consumption for the operation of the proposed project activity the parameter is not applicable
	Findings	No findings identified
	Conclusion	The verification team could verify the completeness and integrity of the data used by the project proponents for the emission reductions calculations. During the verification, ICONTEC confirmed that all parameters are correctly applied according to the monitoring plan stated in the registered PDD /1/ and the

	<p>methodology, and this information is consistent with the secondary information sources used for verification and cross check of the information. As a general cross check of the data, ICONTEC verified the backup system of the company and cross checked the information of the calculation spread sheet /6/ with the backup files, which include the raw data information generated by the PLC system.</p> <p>In conclusion the process of data management, transfer, storage and reporting was carried out in compliance with the monitoring plan, registered PDD and the methodology AMS-III.D: Methane recovery in animal manure management systems version 20.1. All parameters stated in the monitoring plan of the registered PDD have been correctly and sufficiently monitored and listed. The monitored data for required parameters have been verified by ICONTEC and have been found complete, reliable and consistent. ICONTEC deems that the material misstatements identified for these parameters were correctly conducted and corrected by the PP on the MR /5/.</p>
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E.6.3. Implementation of sampling plan

Means of verification	<p>The Sampling plan was subject to assessment while carrying out the desk review activities. In addition, during the verification process, the verification team has checked the file Sampling Plan /13/, where the PP, according to methodology AMS-III.D version 20.1 /7/, presented a sampling plan for the parameter W_{CH_4}, P_{Biogas}, T_{Biogas}, "methane content in biogas" with periodical measurements at a 90% confidence level and a 10% precision level.</p> <p>ICONTEC attested that the sampling plan developed by the PP was correctly designed and applied, according and in compliance with the Guideline on the Application of Materiality in Verifications /12/.</p> <p>ICONTEC confirmed, since the biogas is flowing continuously, that the study population can be thought of as all the possible methane content measurements in the monitoring period, as stated in the sampling plan file /13/. The telephonic interviews with personnel in charge of the monitoring activities in the project sites, section D.3, allowed the audit team to verify the monitoring plan complies with the methodological requirements /7/ /8/.</p>
Findings	No findings were raised regarding the sampling plan
Conclusion	ICONTEC verified the measurement of monthly frequency assures the required confidence level 90/10 /7/ /25/, the procedure to collect data and the system to report and store data. The sampling plan /13/ and sampling procedure was correctly designed and implemented by PP, based on the "Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities v 04" /25/.

E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	The audit team performed a desk review of all calibration certificates of the Biogas analyser /32/, Flow meter /31/ and thermocouples /30/. ICONTEC assessed how calibration and calibration records covered the entire Second monitoring period (From 01/01/2019 to 31/12/2019). The audit team verified the date of the calibration certificates provided by the PP for the monitoring equipment and crosschecked against installation certificates /27/. Calibration records are summarized as follows:						
	Monitoring Equipment	Project site	Serial	Calibration Record	Calibration	Installation	Expiration
	Standard Thermocouple ALUTAL Accuracy class: ± 1.5 °C or ±0.25%	Fazenda Dragão (BCA-032MS1-05)	483441	CA-1421/18	08/01/18	27/03/18	26/03/19
			166925	CA-1586/19	05/03/19	20/03/19	19/03/20
		Lote 55 e 54 (BCA-034MS1-05)	483442	CA-1422/18	08/01/18	27/03/18	26/03/19
			166926	CA-1587/19	05/03/19	20/03/19	19/03/20
		Lote 101 (BCA-035MS1-05)	483443	CA-1423/18	08/01/18	27/03/18	26/03/19
			166927	CA-1588/19	05/03/19	20/03/19	19/03/20

		Lote 105 (BCA-036MS1-05)	483444	CA-1424/18	08/01/18	27/03/18	26/03/19
			166928	CA-1589/19	05/03/19	20/03/19	19/03/20
		Lote 71 (BCA-037MS1-05)	483445	CA-1425/18	08/01/18	27/03/18	26/03/19
			166929	CA-1590/19	05/03/19	20/03/19	19/03/20
	Calibration frequency: once a year	Lote 82 (BCA-038MS1-05)	483447	CA-1426/18	08/01/18	27/03/18	26/03/19
			166930	CA-1591/19	05/03/19	20/03/19	19/03/20
		Lote 28 e 27 (BCA-039MS1-05)	81339	CA-1427/18	08/01/18	27/03/18	26/03/19
			166931	CA-1592/19	05/03/19	20/03/19	19/03/20
		Fazenda Bela Vista (BCA-040MS1-05)	83889	CA-1428/18	08/01/18	28/03/18	27/03/19
			166932	CA-1593/19	05/03/19	20/03/19	19/03/20
		Granja Serra Dourada (BCA-041MS1-05)	83890	CA-1429/18	08/01/18	28/03/18	27/03/19
			166933	CA-1594/19	05/03/19	20/03/19	19/03/20
	Parameter: Tf.	Fazenda Cachoeira (BCA-042MS1-05)	83891	CA-1430/18	08/01/18	28/03/18	27/03/19
			166934	CA-1595/19	05/03/19	20/03/19	19/03/20
		Granja Capivara (BCA-043MS1-05)	83892	CA-1431/18	08/01/18	28/03/18	27/03/19
			166935	CA-1596/19	05/03/19	20/03/19	19/03/20
		Fazenda Sorgatto (BCA-046MS1-05)	83893	CA-1432/18	08/01/18	28/03/18	27/03/19
			166936	CA-1597/19	05/03/19	20/03/19	19/03/20
		Fazenda Bambú - Quinhão A (BCA-051MS1-05)	83900	CA-1433/18	08/01/18	28/03/18	27/03/19
			166937	CA-1598/19	05/03/19	20/03/19	19/03/20
		Fazenda Folleto (BCA-052MS1-05)	83910	CA-1434/18	08/01/18	28/03/18	27/03/19
			166938	CA-1599/19	05/03/19	20/03/19	19/03/20
	<p>For the case of thermocouples, the monitoring equipment is calibrated previous installation and therefore replaced as verified by the audit team while carrying out the on-site visit. The calibration records together /30/ with the installation records /27/ assure correctness of the calibration activities regarding the monitoring equipment</p>						
	Monitoring Equipment	Project site	Flow Meter Serial Number	Calibration Record Number	Installation Calibration Date	Expiration Date	
	Flow Meter, Endress+Hauser thermal mass flow meter t-trend - ATT12. Accuracy class $\pm 5\%$ of factory full scale	Fazenda Dragão (BCA-032MS1-05)	A700693412A	EN 10204 - 2.1	13/04/17	12/04/19	
					10/04/19	09/04/21	
		Lote 55 e 54 (BCA-034MS1-05)	A700613412A	EN 10204 - 2.1	13/04/17	12/04/19	
					10/04/19	09/04/21	
		Lote 101 (BCA-035MS1-05)	A700753412A	EN 10204 - 2.1	13/04/17	12/04/19	
					10/04/19	09/04/21	
		Lote 105 (BCA-036MS1-05)	A700663412A	EN 10204 - 2.1	13/04/17	12/04/19	
					10/04/19	09/04/21	
		Lote 71 (BCA-037MS1-05)	A700683412A	EN 10204 - 2.1	13/04/17	12/04/19	
					10/04/19	09/04/21	
	Calibration frequency: Every two years	Lote 82 (BCA-038MS1-05)	A700633412A	EN 10204 - 2.1	13/04/17	12/04/19	
					10/04/19	09/04/21	
		Lote 28 e 27 (BCA-039MS1-05)	A700583412A	EN 10204 - 2.1	13/04/17	12/04/19	
					10/04/19	09/04/21	
	Parameters: BG _{burnt,y} and FV _{RG,h}	Fazenda Bela Vista (BCA-040MS1-05)	A700623412A	EN 10204 - 2.1	13/04/17	12/04/19	
					10/04/19	09/04/21	

		Granja Serra Dourada (BCA-041MS1-05)	A700643412A	EN 10204 - 2.1	13/04/17	12/04/19																						
					10/04/19	09/04/21																						
		Fazenda Cachoeira (BCA-042MS1-05)	A700553412A	EN 10204 - 2.1	13/04/17	12/04/19																						
					10/04/19	09/04/21																						
		Granja Capivara (BCA-043MS1-05)	A700563412A	EN 10204 - 2.1	13/04/17	12/04/19																						
					10/04/19	09/04/21																						
		Fazenda Sorgatto (BCA-046MS1-05)	A700833412A	EN 10204 - 2.1	13/04/17	12/04/19																						
					10/04/19	09/04/21																						
		Fazenda Bambú - Quinhão A (BCA-051MS1-05)	A700713412A	EN 10204 - 2.1	13/04/17	12/04/19																						
					10/04/19	09/04/21																						
		Fazenda Folleto (BCA-052MS1-05)	A700573412A	EN 10204 - 2.1	13/04/17	12/04/19																						
					10/04/19	09/04/21																						
		The calibration of the monitoring equipment Flow Meter, Endress+Hauser thermal mass flow meter t-trend - ATT12. Accuracy class ± 5% of factory full scale, was carried out by the Regional Technician, who was provided of appropriated training /33/ for calibration purposes as verified by the audit team. As part of the verification activities, the training records /33/ have been assessed.																										
		<table><tr><th>Monitoring Equipment</th><th>Project site</th><th>Biogas Analyzer Serial Number</th><th>Calibration Certificate Number</th><th>Last Calibration Date</th><th>Expiration Date</th></tr><tr><td rowspan="12">Biogas Check Portable Digital Analyzer (Geotech/Landtech), serial numbers BM 11043 · Accuracy CH4: ± 0.5% from 0-5% CH4 content; ± 1.0% from 5-15% CH4 content; ± 3.0% from 15%-full scale CH4 content · Temperature: ± 0.2°C (Biogas check analyzer accuracy) ± 0.5°C (temperature probe accuracy) · Pressure: ± 4mbar typically and ± 15mbar Calibration frequency: Every two years Parameters: BGburnt,y and FVRG,h</td><td>Fazenda Dragão (BCA-032MS1-05)</td><td rowspan="12">BM 11043 BM 11043 BM 11043</td><td rowspan="12">BM11043_6/2620 BM11043_7/4510 BM11043_3/2470</td><td rowspan="12">18/07/18 14/01/19 07/07/19</td><td rowspan="12">17/01/19 13/07/19 06/01/20</td></tr><tr><td>Lote 55 e 54 (BCA-034MS1-05)</td></tr><tr><td>Lote 101 (BCA-035MS1-05)</td></tr><tr><td>Lote 105 (BCA-036MS1-05)</td></tr><tr><td>Lote 71 (BCA-037MS1-05)</td></tr><tr><td>Lote 82 (BCA-038MS1-05)</td></tr><tr><td>Lote 28 e 27 (BCA-039MS1-05)</td></tr><tr><td>Fazenda Bela Vista (BCA-040MS1-05)</td></tr><tr><td>Granja Serra Dourada (BCA-041MS1-05)</td></tr><tr><td>Fazenda Cachoeira (BCA-042MS1-05)</td></tr><tr><td>Granja Capivara (BCA-043MS1-05)</td></tr><tr><td>Fazenda Sorgatto (BCA-046MS1-05)</td></tr></table>						Monitoring Equipment	Project site	Biogas Analyzer Serial Number	Calibration Certificate Number	Last Calibration Date	Expiration Date	Biogas Check Portable Digital Analyzer (Geotech/Landtech), serial numbers BM 11043 · Accuracy CH4: ± 0.5% from 0-5% CH4 content; ± 1.0% from 5-15% CH4 content; ± 3.0% from 15%-full scale CH4 content · Temperature: ± 0.2°C (Biogas check analyzer accuracy) ± 0.5°C (temperature probe accuracy) · Pressure: ± 4mbar typically and ± 15mbar Calibration frequency: Every two years Parameters: BGburnt,y and FVRG,h	Fazenda Dragão (BCA-032MS1-05)	BM 11043 BM 11043 BM 11043	BM11043_6/2620 BM11043_7/4510 BM11043_3/2470	18/07/18 14/01/19 07/07/19	17/01/19 13/07/19 06/01/20	Lote 55 e 54 (BCA-034MS1-05)	Lote 101 (BCA-035MS1-05)	Lote 105 (BCA-036MS1-05)	Lote 71 (BCA-037MS1-05)	Lote 82 (BCA-038MS1-05)	Lote 28 e 27 (BCA-039MS1-05)	Fazenda Bela Vista (BCA-040MS1-05)	Granja Serra Dourada (BCA-041MS1-05)	Fazenda Cachoeira (BCA-042MS1-05)
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	<div>Fazenda Bambú - Quinhão A (BCA-051MS1-05)</div> <div>Fazenda Folleto (BCA-052MS1-05)</div>				
	<p>Calibration of the equipment Endress+Hauser thermal mass flow meter is performed by Mr Cavalli (Regional Technician) at each and every project site, following due training provided by the manufacturer of the equipment /33/. The audit team verified dates and certificates of calibration of the equipment by assessing calibration records and a telephonic interview with Mr de Brito, who manifested no changes to monitoring equipment took place in the fifth monitoring period.</p>				
Findings	No findings applicable to the monitored period regarding calibration.				
Conclusion	<p>The audit team verifies the calibrations of all monitoring equipment installed. ICONTEC assessed that calibration and calibration records covered the entire Second monitoring period. For the specific case of thermocouples, PP replaced them on a yearly basis, therefore it was verified how replacement (also its installation) covered the entire monitored period. This replacement responds to supplier specifications since calibration is required every year of continuous operation counted from the date when the thermocouples are installed. PP follows supplier's instructions and replaces thermocouples with calibrated ones.</p> <p>ICONTEC concluded that the calibration is conducted at the frequency proposed by the supplier of the different equipment used in monitoring the project activity and specified by the applicable methodology.</p> <p>Based on that the DOE can confirm that all installed monitoring equipment has been duly calibrated for this entire monitoring period. As a result of the assessment of calibration certificates the audit team concludes the calibration records are consecutive when compared with the previous monitoring period /3/</p>				

E.8. Assessment of data and calculation of emission reductions or net removals

E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	<p>The proposed project activity makes use of the option a) of the methodology AMS-III.D version 20.1 /7/ was chosen by the PP, paragraph 16(a). For this reason, equation (1) is the formulae used to determine the baseline emissions as follows:</p> $BE_y = GWP_{CH_4} * D_{CH_4} * UF_b * \sum_{j,LT} MCF_j * B_{0,LT} * N_{LT,y} * VS_{LT,y} * MS\%_{B}$ <p>Where:</p> <p>BE_y Baseline emissions in year "y" (tCO₂e)</p> <p>GWP_{CH_4} Global Warming Potential (GWP) of CH₄ (25)</p> <p>D_{CH_4} CH₄ density (0.00067 t/m³ at room temperature (20 °C) and 1 atm pressure).</p> <p>LT Index for all types of livestock</p> <p>j Index for animal waste management system</p> <p>MCF_j Annual methane conversion factor (MCF) for the baseline animal waste management system "j"</p> <p>$B_{0,LT}$ Maximum methane producing potential of the volatile solid generated for animal type "LT" (m³ CH₄/kg dm)</p> <p>$N_{LT,y}$ Annual average number of animals of type "LT" in year "y" (numbers)</p> <p>$VS_{LT,y}$ Volatile solids for livestock "LT" entering the animal manure management system in year "y" (on a dry matter weight basis, kg dm/animal/year)</p> <p>$MS\%_{B,j}$ Fraction of manure handled in baseline animal manure management system "j"</p> <p>UF_b Model correction factor to account for model uncertainties (0.94)</p>
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	<p>On its turn, calculation of the parameter $VS_{LT,y}$ (part of equation 1), requires the use of equation number 2 of the methodology /7/:</p> $VS_{LT,y} = \left(\frac{W_{site}}{W_{default}} \right) * VS_{default} * nd_y$ <p>Where:</p> <p>W_{site} Average animal weight of a defined livestock population at the project site (kg)</p> <p>$W_{default}$ Default average animal weight of a defined population, this data is sourced from IPCC</p> <p>$VS_{default}$ Default value for the volatile solid excretion rate per day on a dry-matter basis livestock population (kg dm/animal/day)</p> <p>nd_y Number of days in year "y" where the treatment plant was operational.</p> <p>In section E.1 of the MR /5/, the PP explains the baseline calculation. The details of the calculation and the formulae usage are present in the calculation file /6/, the one was thoroughly assessed by the audit team on the matters of formulae usage, traceability of data, and consistency with the methodological requirements /7/ /8/ when calculating the GHG emission reductions. According to this calculation verified by the audit team, the baseline emissions for the monitoring period are calculated to be 74,560 tCO₂e, as confirmed by the audit team.</p> <p>In order to cross check the information contained in the calculation file /6/ and monitoring report /5/, the following records were verified by the audit team:</p> <ul style="list-style-type: none"> Records of the monthly site visits performed by the Regional Technician in each project site, verified through on-site inspection Data collected /20/ /18/ Calibration records /30/ /31/ /32/ Training records /33/ <p>The data used for the baseline emission reduction calculation is the product of the monitoring activities and the meters readings. All the data were issued by automatically systems and crosschecked by the lead auditor with the row data collected by the Regional Technician.</p>
Findings	No findings identified for this subject.
Conclusion	<p>The information provided in the monitoring report /5/ and calculation file /6/ has been crosschecked with other sources to confirm the correctness and for plausibility check.</p> <p>The calculations of baseline GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, registered PDD and the applied methodology. Appropriate default values, as for example GWP_{CH_4}, and other reference figures have been correctly applied. The assumptions, figures and formulae applied in the MR and the calculations were correctly justified.</p>

E.8.2. Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

Means of verification	<p>The formula used for the calculations of the project emissions is consistent with the registered PDD /1/. According to applicable methodology /7/, PE calculations require the use of formula number (5) as follows:</p> $PE_y = PE_{PL,y} + PE_{flare,y} + PE_{power,y} + PE_{transp,y} + PE_{storage,y}$ <p>Where:</p>
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	<ul style="list-style-type: none"> • $PE_{PL,y}$: Is the physical leakage of biogas in the manure management systems, which includes Biogas generation, collection and transport of biogas to the point of flaring/combustion or gainful use. The used formula is presented as follows: $PE_{PL,y} = 0.10 * GWP_{CH_4} * D_{CH_4} * \sum_{i,LT} B_{0,LT} * N_{LT,y} * VS_{LT,y} * MS\%_{i,y}$ <p>Where:</p> <ul style="list-style-type: none"> • $PE_{flare,y}$: Emissions from flaring or combustion of the gas stream • $PE_{power,y}$: CO₂ emissions due to the usage of fossil fuels or electricity for the operation of all the installed facilities <p>Nevertheless, there are no emissions due to use of fossil fuels or electricity. ICONTEC confirmed that no electricity was consumed from the grid since the monitoring equipment present in each project site is powered by photovoltaic cells. And the energy generated is stored in 12 volts batteries. The treated effluent is discharged in open lagoons by gravity and the flare operates with biogas at atmospheric pressure. No pump or blower was used, and no fossil fuel was used.</p> <ul style="list-style-type: none"> • $PE_{power,y}$: CO₂ emissions from incremental transportation distances. <p>ICONTEC confirmed that there is not transportation and therefore no emissions related.</p> <ul style="list-style-type: none"> • $PE_{storage,y}$: Emissions from the storage of manure before being fed into the anaerobic digester. <p>ICONTEC confirmed that there is no manure storage and therefore no emissions related. The audit team assessed the operational conditions of the proposed project activity and concluded the management of manure does not include storage or transport of the effluent s of swine production operations.</p> <p>Calculating of the parameter $PE_{flare,y}$ requires the use of the “Tool to determine project emissions from flaring gases containing methane” /8/. The tool provides a seven steps calculation approach in order to determine the actual emissions generated by the flaring of the biogas containing methane. Main equation used by PP to determine emissions is equation number 15 /8/ as follows:</p> $PE_{flare,y} = \sum_{h=1}^{8760} TM_{RG,h} \times (1 - \eta_{flare,h}) \times \frac{GWP_{CH_4}}{1000}$ <p>It was verified each and every calculation addressed to determine project emission, finding either material mistakes or wrong calculation procedures.</p> <p>The verification team against basic monitored data crosschecked all the figures as per the monitoring report.</p> <p>In section E.2 of the monitoring report /5/, the PP explains the PE calculation. The detailed calculation is presented by PP in the CER calculation spreadsheet /6/. According to this calculation validated by ICONTEC, the PE for the Second monitoring period are calculated to be 17,803 tCO₂.</p>
Findings	No issues related to the calculation of the PE were detected during the verification process.
Conclusion	The calculation of project GHG Project emissions is correct as verified by the audit team. Furthermore, the information provided in the monitoring report has been crosschecked with other sources such as original record and reports of the PCL (.xls files) and manual records kept on-site. No material errors have been detected

	<p>and no misstatements alter the figures obtained after applying the methodological requirements.</p> <p>The calculations of project GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan and the applied methodology. Any assumptions, appropriate emission factor and other reference values have been correctly applied.</p>
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E.8.3. Calculation of leakage GHG emissions

Means of verification	According to methodology AMS-III.D version 20.1 /7/ the methodological tool " <i>Project and leakage emissions from anaerobic digesters</i> " is mandatory in order to determine the leakage emissions of the proposed project activity. According to the tool /24/ leakage emissions are associated to storage and composting of manure. Since no composting or storage takes place within the project boundary, no leakage emissions are required.
Findings	No calculation is deemed necessary according to the applicable methodological framework /7/ /8/.
Conclusion	ICONTEC confirms that no leakage needs to be considered. The verification on-site of the operation features of the project allow the audit team to assure no neither storage nor composting takes place in the proposed project activity

E.8.4. Summary calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	<p>The verification team assessed the whole set of data and calculations of GHG emission reductions /6/ resulting from the project activity by the application of selected methodology, formulae and default values applied both for the claimed and unclaimed period monitored.</p> <p>The achieved ex-post emission reductions are the product of direct measurement of the amount of methane flared in the monitored period. Project emissions and the Baseline emissions have been previously described in this verification report. For this purpose, PP used the following formula from the applicable methodology /7/:</p> $ER_{y,ex\ post} = \min[(BE_{y,ex\ post} - PE_{y,ex\ post}), (MD_y - PE_{power,y,ex\ post})]$ <p>It was verified that, monitoring procedures as well as collected data represent the actual emission reductions of the Project Activity. It was also verified the emissions calculations file /6/ in order to detect material mistakes or mistakes on calculation procedures; the audit team identified those emission reductions not claimed follow the very same methodological requirements as the claimed emission reductions.</p> <p>The use of this formula requires, among other, determination by monitoring of the amount of biogas flared, methane fraction (measured at a 90% of confidence level through a sampling plan designed taking into account the methodology /7/) and flare temperature (by using a thermocouple).</p> <p>As a general crosscheck of the data, ICONTEC verified the backup system of the company and cross checked the information of the ERs spread sheet /6/ with the backup files, which include the raw data information generated by the PLC system. The information is reported by the system through .xls files containing all information in the adequate measurement frequencies /18/ /20/ /21/ /22/ /23/ /27/ /28/ /34/.</p>
Findings	No findings associated
Conclusion	The calculation of project GHG emissions is correct. In turn, the audit team agrees the total GHG emission reductions are correctly calculated and reported since formulae are used in line with the registered PDD /1/ and methodological requirements /7/ /8/.

	<p>ICONTEC could verify the completeness and integrity of the data used by the project proponents for the emission reductions calculations. Equally important, the audit team verified the total GHG emission reductions are calculated to be 56,005 tCO₂e in the monitoring period from 1st of January 2019 to the 31st of December 2019 (Considering a total amount of methane destroyed as 69,827 tCO₂e)</p> <p>The appropriate methods and formulae for calculating baseline emissions, project emissions and leakages emissions were followed in accordance with the approved PDD and applied methodology. The assumptions, emission factors and default values applied in the MR and the calculations were correctly justified. During the verification, ICONTEC was able to verify that the parameters are properly measured according to the monitoring plan, the registered PDD and monitoring methodology, and that the information is consistent with the secondary information sources used to verify the information.</p>
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E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	<p>The MR (Section E.5) states a comparison between the calculated actual emission reductions with the ex-ante calculated values in the latest approved PDD. The verification team verified the figures stated on the registered PDD /1/ and compared these figures against the calculations of GHG emission reductions of the monitoring period from the 1st of January 2019 to the 31st of December 2019:</p> <table border="1"> <thead> <tr> <th>Figures estimated ex ante (registered PDD)</th><th>Figures calculated for the Second monitoring period (from 1st of January 2019 to the 31st of December 2019), ex post</th></tr> </thead> <tbody> <tr> <td>57,067 tCO₂e</td><td>56,005 tCO₂e</td></tr> </tbody> </table> <p>The audit team assessed the figures of the MR /5/ against the registered PDD /1/. The PDD states the GHG emission reductions calculated ex ante are 57,067 tCO₂e considering all of the project sites are operational during the monitoring period. When crosschecking the GHG emission reductions achieved in the Second monitoring period stated in the MR /5/, the audit team did not find relevant concerns when compared the GHG emission reductions calculated <i>ex-post</i> against the <i>ex-ante</i> GHG emission reduction of the proposed project activity.</p>	Figures estimated ex ante (registered PDD)	Figures calculated for the Second monitoring period (from 1 st of January 2019 to the 31 st of December 2019), ex post	57,067 tCO ₂ e	56,005 tCO ₂ e
Figures estimated ex ante (registered PDD)	Figures calculated for the Second monitoring period (from 1 st of January 2019 to the 31 st of December 2019), ex post				
57,067 tCO ₂ e	56,005 tCO ₂ e				
Findings	No findings were identified.				
Conclusion	GHG calculated ER are lower than the calculated <i>ex-ante</i> emission reduction, the audit team verified the decrease on figures is justified mainly by the fact the average weight of the animals was lower in most of the project sites, being -2% less in average. Figures of the <i>ex-ante</i> and <i>ex-post</i> scenario are correct and calculated in accordance with the requirements /7/ /8/ /25/. According to the PDD the actual emission reductions figure is 57,067 tCO ₂ e. The PP calculated the emission reductions taking into account the project site <i>Granja Serra Dourada</i> was fully operational during the monitoring period. The decrease in GHG emission reductions compared to those calculated <i>ex-ante</i> are justified and are due to factors described in Section E.8.6				

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	<p>During the monitoring period, from 1st of January 2019 to the 31st of December 2019, the audit team verified through desk review of the documentation relevant to the project that the project is operated as stated on the registered PDD /1/. The difference between the estimated values in registered PDD against the value calculated of GHG emission reductions are described by PP in section E.6 of the MR /5/.</p> <p>Differences between <i>ex-ante</i> emission reductions stated on PDD and <i>ex-post</i> calculated emission reductions could be explained since the total weight of the animals was lower than expected in each project site. The average decline in the</p>
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	animal weight was -2%, reducing the amount of manure treated in the treatment system and, therefore, decreasing the total emission reductions. Livestock fluctuations in population are a characteristic of the animal production system. In this sense, different livestock inventories will generate differences in the stated emission reductions. Nevertheless, differences found are not significant since the actual GHG emission reductions of the <i>ex-post</i> are very much as those calculated in the <i>ex-ante</i> scenario
Findings	No findings were identified for this subject.
Conclusion	The remarks on difference have been correctly justified by PP and crosschecked by ICONTEC. The project activity achieved 98% of the GHG emission reductions expected to be achieved. Differences are not significant and demonstrate the baseline scenario was correctly calculated when establishing the <i>ex-ante</i> scenario. On the matters of animal inventory changes, the decrease in a 2% of the total number of animals does not imply relevant changes in the total amount of GHG emission reductions. ICONTEC confirms that the pro-rata approach followed by the PP was correctly applied to the calculations of GHG emission reductions.

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	The MR /5/ in section E.4, includes a summary table of the ER. The entire monitoring period was covered only by the second commitment period of the Kyoto Protocol (from 01/01/2013). The formula used and the data source of the calculations are present in the calculation file /6/, the one was thoroughly verified by the audit team.
Findings	No findings identified
Conclusion	ICONTEC deems that the current ERs have been correctly reported on the second commitment period of the Kyoto Protocol. The differences in the total GHG emission reductions were clarified by the PP and the finding was closed. Lastly, PP followed procedures to report ER accordingly with the commitment period.

E.9. Assessment of reported sustainable development co-benefits

Means of verification	Not applicable to the proposed project activity
Findings	Not applicable to the proposed project activity
Conclusion	Not applicable to the proposed project activity

E.10. Global stakeholder consultation

Means of verification	Not applicable to the proposed project activity
Findings	Not applicable to the proposed project activity
Conclusion	Not applicable to the proposed project activity

SECTION F. Internal quality control

As part of the measures taken to assure a due internal quality control, the audit team generated a Draft version of the Verification Report to be assessed by the technical review team. The draft report and other documents needed for the review were subject of a Technical Review performed by qualified professionals (Appendix 2). Following the assessment completion, the reviewer verified whether the draft report and verification conclusion for the second monitoring period and its procedures were in line with the specific requirements /9/ /10/ /11/ and methodological framework /7/ /8/. The reviewer reported on 13/03/2019 the review results to the audit team including comments associated to the means of verification and reporting requirements. The audit team generated the final version of the verification report (15/03/2020) in response to comments of the reviewer. Lastly the team sent the final version of the present report to approval and subsequent submission.

SECTION G. Verification opinion

The audit team carried out a thorough and independent assessment of the implementation, operation and the reported GHG emission reductions of the proposed project activity "BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil (Reference number 3455)" as well as the quantitative and qualitative information provided in the MR version 02 /5/ against the applicable CDM rules and

requirements set out in the VVS, PS and PCP /9/ /10/ /11/ and the applicable methodological framework /7/ /8/ /13/. The verification process allows the audit team to conclude, the proposed project activity compiles with the requirements of paragraph 62 of the CDM M&Ps. The audit team confirms that, verification activities used as a basis for the assessment of the Second monitoring period (from 1st of January 2019 to the 31st of December 2019) are exclusively undertaken after the publishing of the MR on the UNFCCC CDM website.

The audit team crosscheck data and information provided by the PP and reported in the MR /5/ and calculation file /6/. In addition, the audit team performed interview with the personnel of the propose project activity as a mean to understand the nature of the evidence. In summary, the information provided is sufficient, both in terms of frequency (time period between evidence) and coverage; therefore the calculated GHG emission reductions are based on traceable evidence. Figures verified are stated as follows:

CDM project:	BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil (Reference Number: 3455)
Reporting period:	1 st of January 2019 to the 31 st of December 2019
Baseline emissions:	74,560 tCO ₂ e (Total Methane destroyed: 69,827 tCO ₂ e)
Project emissions:	17,803 tCO ₂ e
Leakage:	0 tCO ₂ e
Emission Reductions:	56,005 tCO ₂ e

PP implemented and operated the registered CDM project activity in accordance with the description in the registered PDD /1/. In addition, the GHG emission reductions have been monitored in accordance with the registered monitoring plan. Regarding the parameters subject of verification, the MR /5/ correctly describes the values, equipped used, measurement and calculation procedures, as well as the QA/QC measures taken. Furthermore, the sampling approach used to calculate relevant parameters /13/ is also described by the PP and verified by the audit team, in accordance with the PS /9/. The formulae used by the PP in order to determine the emission reductions are correctly applied in the calculation regarding the emission reductions file /6/. These formulae are the mandatory formulae stated in the methodology /7/ as well as the methodological tool /8/ applicable to the proposed project activity.

The audit team verified the resulting GHG emission reductions do not exceed 60 kt CO₂e per year in any year of the crediting period, remaining in the Type III projects, assuring the project type eligibility complying with the mandatory requirements. The verification was performed based on the requirements set by the CDM and relevant guidance provided by CMP and the CDM Executive Board. ICONTEC considers that the project's GHG emissions and resulting GHG emissions reductions reported in the monitoring report version 02 dated on 02/03/2020, are fairly stated.

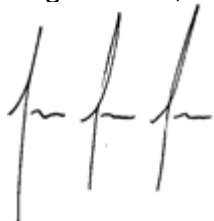
SECTION H. Certification statement

ICONTEC confirms that the project is implemented as described in the validated and approved PDD. Installed equipment essential for generating emission reductions are running reliably and calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions as a CDM project. BRASCARBON is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project's monitoring and verification plan. BRASCARBON is also responsible for developing and keeping records and reporting procedures in accordance with the monitoring plan.

ICONTEC received the information and asked for explanations deemed necessary to provide enough evidence about the amount of GHG emissions and the calculation of the GHG emission reductions. ICONTEC's examination process includes test-based assessments of all evidence relevant to the amounts and disclosures of a project's GHG emissions and the calculations of such reductions for the reporting period. ICONTEC utilizes a risk-based approach that draws on an

understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate them. ICONTEC confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

Bogotá D.C., 15/03/2020

A handwritten signature in black ink, consisting of three stylized, vertical strokes with horizontal crossbars, representing the name Juan Sebastian Salazar.

Juan Sebastian Salazar
Technical director -ICONTEC

Appendix 1. Abbreviations

Abbreviations	Full texts
CAR	Corrective Action Request
CDM	Clean Development Mechanism
ERs	Emission Reductions
CERs	Certified emission reductions
CL	Clarification Request
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
FAR	Forward Action Request
GHG	Greenhouse Gases
ICONTEC	Colombian Institute of Technical Standards and Certification (Instituto Colombiano de Normas Técnicas y Certificación)
PDD	Project Design Document
QA/QC	Quality Assurance/ Quality Control
PP	Project Participant
IPCC	Intergovernmental Panel on Climate Change
PS	CDM Project Standard
PDD	Project Design Document
PCL	Programmable Logic Control
PCP	CDM Project Cycle Procedure
POP	Operational Procedure
PP	Project Participant
PSO	Project site owner
PRC	Post Registration Changes
MP	Monitoring Plan
MR	Monitoring Report
UNFCCC	United Nations Framework Convention on Climate Change
VVS	CDM Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers

JACOBO CARRIZALES
CDM LEAD AUDITOR AND TECHNICAL EXPERT (SECTOR 13)

Professional Profile

Zootechnician (animal husbandry) with postgraduate studies in Environmental Management and Sustainable Development. Experience in areas related to animal production, animal management and wildlife. Marketing and research knowledge also teamwork and group management skills.

Work Experience

Date: 6th of December 2011 – Present

Position: Technical expert – Lead Auditor

Duties: Lead auditor of Clean Development Mechanism under the Kyoto Protocol, VCS and Gold Standard projects in validation and verification activities and technical expert in Agricultural issues. Experience in scopes of: Energy industries renewable / non-renewable sources, Chemical industry, Waste handling and disposal and Agriculture. Carbon Footprint and Carbon Neutral auditor.

Employer: ICONTEC (DOE). Private – Environmental

Date: 3d to 24th of December 2011 and y 2nd to 10th of January 2012. Paz de Rio –Boyacá-Colombia.

Position: Field Assistant.

Duties: Soil associated fauna recognition as part of environmental impact studies.

Employer: Estudios Técnicos Diana Rauchwergwer. Private – Environmental Consultancy.

Date: 15th to 30th of November 2011. Bogotá.

Position: Loan Reviewer.

Duties: Credit requests documentation inspection.

Employer: Corporación Colombia Internacional -CCI-. Private – NGO.

Date: 7th of March to 9th of June 2011. Bogotá.

Position: Public server. Professional responsible of wildlife traffic prevention.

Duties: Lectures on sensitizing about wildlife traffic on district public schools. Complementary

Complementary Duties: 13th of November to 3d of December 2010. Bogotá, lecturer at the course “Good environmental practices in Animal Commercialization”. Escuela de Altos estudios -OPEL- (Secretaria Distrital de Ambiente). Wildlife legal use monitoring, lectures sensitizing public schools about wildlife traffic.

Employer: Secretaría Distrital de Ambiente, Public – Environmental.

Date: 8th of September 2010 to 7th of January 2011. Bogotá.

Position: Public server. Professional responsible of wildlife traffic prevention.

Duties: Wildlife legal use monitoring, lectures sensitizing public schools about wildlife traffic.

Employer: Secretaria Distrital de Ambiente. Public – Environmental.

Date: 10th of April 2007 to 2th of June 2007. Cundinamarca, Colombia

Position: Assistant, Professional services.

Duties: Dairy Farm data management and data updating.

Employer: Agrominera Zelandia S.A. Farm – Ricardo Arenas. Private – Animal Husbandry, Zootechnics.

Date: 5th of February to 15th of May 2007. Bogotá, Villa de Leyva -Boyacá-

Position: Lecturer. Professional supporting the Project “Contributions to the natural history of Fauna and Flora of Villa de Leyva (Boyacá, Colombia)”.

Duties: Lectures to public students from Antonio Nariño school at Villa de Leyva school. The main subject was: traditional productive techniques and rustic poultry races.

Employer: Universidad Nacional de Colombia - Facultad de Ciencias, Departamento de Geociencias. Grupo: Centro De Estudios Historia Natural De Colombia. Profesora Cristina Garzón. Public – Education

Date: August to December 2006. La Calera, Vereda el Volcán – Cundinamarca.

Position: Professional of protection and forest conservation..

Duties: Silvopastoral productive system design and reforestation. Animal husbandry, animal production, reforestation.

Employer: Farm Sevilla– Raul Behar.

Date: December 2005 to March 2006. La Calera Vereda Jerusalén – Cundinamarca.

Position: Professional of protection and forest conservation.

Duties: Silvopastoral productive system design, wetlands protection and reforestation.

Employer: Tres Esquinas Farm – Gloria de Luque. Private – animal husbandry, animal production, reforestation.

Date: February to December 2004. Simijaca – Cundinamarca-

Position: Professional Practice.

Duties: Productive duties and stock control. Productive, sanitary, and reproductive records updating. Advisory in animal nutrition and management.

Employer: Juncales Farm. – Philip George. Private – Animal production, animal husbandry.

Voluntary Experience

Date: 9th of June to 27th of June 2016

Employer: WWF UK.

Duties: Desk research

Academic Background

Date: September 2015 – September 2016.

Degree: Water Science and Governance, MSc, pending

Professional skills: Masters focused on research, water science and water policy

Institution: King’s College of London.

Date: 2010 to 2012 – 14th of December 2012-.

Degree: Environmental Management and Sustainable Development. Magister.

Professional skills: Masters focused on research, self-deepening on economic valuation of natural resources and environmental economy.

Institution: Universidad Distrital Francisco José de Caldas, Bogotá Colombia.

Dissertation Title: Potential use and management, and valuation of game wildlife associated to beef cattle productive areas in Orinoquia Region. Case of study: White-Tailed Deer (*Odocoileus virginianus* Zimmermann, 1780) y Capybara (*Hydrochoerus hydrochaeris* Linnaeus, 1766) harvesting in "Pénjamo" farm of Hato Corozal county (Casanare).

Date: 1999 a 2005 – 27th of October 2005-.

Degree: Zootechnician (animal husbandry specialist)

Professional skills: Domestic animal productive methods, wildlife breeding, quality process analysis and agricultural business management.

Institution: Universidad De La Salle, Bogotá Colombia.

Dissertation Title: Relationship between age, weight and reproductive efficiency in competition Brahman Cattle females.

Additional Studies

August to October 2009.

Market Research.

Market Research.

City University of London. London.

February to April 2009.

Advanced Marketing.

Marketing

City University of London. London.

June to December 2007.

General English.

English

Avalon School of English. London.

February 2006.

Emprendimiento y Empresarismo.

Business administration.

SENA. Bogotá.

June 2000.

Artificial Insemination.

Bovine reproduction.

Asociación Club Bovino Lasallista. Universidad De La Salle. Bogotá.

Inseminación Artificial - Junio 2000

EXPERIENCE IN CDM AND VOLUNTARY MARKETS ACTIVITIES

Lead Auditor

- Validation of Thuan Nhen Phong Wind Farm, Viet Nam
- Validation of Phuong Mai 3 Wind Power Project, Viet Nam
- Validation of SHPs Tambaú, das Pedras and Rio do Sapo CDM Project (JUN1132), Brazil
- Validation of SHPs Poço Fundo and Providência CDM Project (JUN1133), Brazil
- Validation of San Lorenzo Hydroelectric Plant, Panamá
- Validación of Hidroeléctrico MIRA (HIDROMIRA), Ecuador
- Validation of Conservation and reforestation of degraded areas in Barbosa, Colombia
- Validation and Verification of Caruquia 9.76 MW hydroelectric project, Colombia
- Verification of Monomeros nitrous oxide abatement project, Colombia
- Verification of MIO Cali, Colombia
- Verification of BRT Bogotá, Colombia: TransMilenio Phase II to IV
- Verification of BRT Macrobus Guadalajara, Mexico
- Verification Post Registration Changes: BRASCARBON Methane Recovery Project BCA-BRA-09
- Verification Post Registration Changes: BRASCARBON Methane Recovery Project BCA-BRA-15
- Verification of Carbon Footprint Expreso Del Futuro
- Verification of Carbon Footprint Cerdito De La Corte
- Verification of Carbon Footprint Sigra
- Verification of Carbon Footprint Transportes Loyola
- Verification of Carbon Footprint Transportes Loyola
- Verification of Carbon Footprint Europharma
- Verification of Carbon Footprint Procables

- Verification of Carbon Footprint Hotel De Bogota
- Verification of Carbon Footprint Gascol
- Verification of Carbon Footprint Symrice
- Verification of Carbon Footprint Pacific
- Verification of Carbon Footprint Challenger
- Verification of Carbon Footprint Promigas
- Verification of Carbon Footprint Propilco
- Verification of Carbon Footprint Inversiones Pinzón Martínez
- Verification of Carbon Footprint Ladrillera La Clay
- Verification of Carbon Footprint Arcillas De Colombia
- Verification of Carbon Footprint Gimnasio La Fontana
- Verification of Carbon Footprint Red de Salud de Ladera ESE
- Verification of Carbon Footprint RECKITT BENCKINER Colombia
- Verification of Carbon Footprint Carvajal Tecnología y servicios S.A.S.
- Verification of Carbon Footprint INGREDION Colombia S.A
- Verification of Carbon Footprint INDUSTRIA NACIONAL DE GASEOSAS
- Verification of Carbon Footprint MANITOBA LTDA
- Pre-Verification of Carbon Footprint Gascol
- Pre-Verification of Carbon Footprint Helistar
- Pre-Verification of Carbon Footprint Somos K
- Pre-Verification of Carbon Footprint Symrice
- Pre-Verification of Carbon Footprint Challenger
- Pre-Verification of Carbon Footprint Procables
- Pre-Verification of Carbon Footprint Expreso Del Futuro
- Pre-Verification of Carbon Footprint Hotel De Bogota
- Pre-Verification of Carbon Footprint Multidimensionales
- Pre-Verification of Carbon Footprint General Motors
- Pre-Verification of Carbon Footprint Clínica San Rafael
- Pre-Verification of Carbon Footprint Vilaseca

Technical expert

- Validation of CGR Catanduva Landfill Gas Project, Brazil
- Verification of Macaubas Landfill Gas Project, Brazil
- Verification of Ciudad Juarez Landfill Gas to Energy Project, México
- Verification of SUPERCERDO PAISA S.A.S., Colombia
- Verification of Palmeras POME Co-composting Project, Colombia
- Verification of BIORGANICOS S.A.S., Colombia
- Validation Cururos win farm project, Chile.

Technical reviewer

- Verification of BRASCARBON Methane Recovery Project BCA-BRA-02, Brazil
- Verification of BRASCARBON Methane Recovery Project BCA-BRA-03, Brazil
- Verification of BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil
- Verification of BRASCARBON Methane Recovery Project BCA-BRA-07, Brazil
- Verification of BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil, Brazil
- Verification of Biogas energy plant from palm oil mill effluent, Guatemala
- Verification of Co-composting of EFB and POME project, Guatemala
- Validation VCS of BRASCARBON Methane Recovery Project BCA-BRA-02, Brazil
- Validation VCS of BRASCARBON Methane Recovery Project BCA-BRA-03, Brazil
- Validation VCS of BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil
- Validation VCS of BRASCARBON Methane Recovery Project BCA-BRA-07, Brazil
- Validation VCS of BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil, Brazil
- Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-02, Brazil
- Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-03, Brazil
- Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil
- Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-07, Brazil
- Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil, Brazil
- Verification Post Registration Changes: BRASCARBON Methane Recovery Project BCA-BRA-04A
- Verification Post Registration Changes Brascarbon Methane Recovery Project BCA-BRA-14, Brazil
- Verification of Carbon Footprint Cámara y Comercio de Bogotá

ERIKA LUCIA URREGO ORTIZ**Lead auditor and Technical Expert in Sectoral Scope 13****MAIN PROFESSIONAL EDUCATION**

MSc on Quality and integral management. Universidad Santo Tomas en Convenio con ICONTEC. Bogotá, Colombia. April, 2013.

Magister Environmental Management Systems. Universidad Externado de Colombia. Bogotá D.C. September 2002

Zootechnician, Universidad Agraria de Colombia, Bogotá D.C. Colombia. August 1997.

Lead Auditor on Energy management systems under ISO 50001:2011 and version 2018. Bogotá, Colombia. Since July 2015.

Lead auditor on Quality Management Systems under ISO 9001, ICONTEC, Bogotá, Colombia. Since 2006.

Lead auditor on OHSAS 18001 and ISO 45001, ICONTEC, Bogotá D.C. Since July 2005.

Lead auditor Environmental management system under ISO 14001, ICONTEC, Bogotá, Colombia. Since 2002.

Updating on CDM Course, Ministry of Environment, Housing and Territorial Development, Bogotá D.C, Colombia. 2006

PROFESSIONAL EXPERIENCE

- **ICONTEC (2006 – Actual)**

To prepare and perform the certification services assigned as per her career plan qualification, according to the stated on the procedures. To provide guidance to the certification costumers about the technical aspects of the assigned services provision. To participate in changing or designing certification services, by changing or creating the respective procedures. Perform audits on schemes of ISO 9001, ISO 14001, OHSAS 18001, ISO 45001, ISO 50001. Validation and verification of CDM projects like technical expert and lead auditor to scope 13.

- **ASOCIACION COLOMBIANA DE PORCICULTORES-FNP (2003 – 2006) (Colombian Association of Pig Farmers)**

To coordinate the activities to be performed by the Environmental Window Program in the various country areas. To allocate and execute resources engaged under the Cleaner Production agreements signed together with several environmental authorities. To lead the CDM project, focused to reduce methane (CH₄) emissions issued by animal waste.

To be aware of the Ecuadorian and Chilean methodologies already approved by the CDM's Executive Board for Hog Breeding Sector to elaborate a proposal for the hog breeding sector together with the Ministry of Environment, Housing and Territorial Development in order to join farms to CDM projects.

- **FICHTNER GmbH & Co. KG (2001 – 2002)**

To prepare, design and apply surveys focused to identify power consumption in the sector of slaughter, processed meat and food concentrate for animals

- **Regional Environmental Authority (CAR Sumapaz) 1998 – 2001**

To support the environmental management unities on technical concepts of processes, permissions, sanctions, control, monitoring and assessment in the proper and timely management of the Sumapaz area's natural resources.

EXPERIENCE IN CDM ACTIVITIES

Lead auditor on validation MDL:

1. Validation of Macano Small Hydro Power Plant, Panamá
2. Validation of Montenegro Landfill Gas Recovery and Flaring, Colombia
3. Validation of Monteria Landfill Gas Recovery and Flaring, Colombia
4. Validation of Pigua Landfill Gas Recovery and Flaring, Colombia
5. Validation of Tunjita Diversion Hydroelectric Project, Colombia
6. Validation of El Toqui wind power project, Chile
7. Validation of Los Angeles Landfill Gas Flaring Project, Colombia
8. Validation of Ferreira Gomes Hydro Power Plant CDM Project, Brazil
9. Validation of BRASILM 1 - Avoidance of Methane Emissions through Composting of Manure Waste, Brazil

10. Validation of CGR Catanduva Landfill Gas Project, Brazil
11. Validation of Macaubas Landfill Gas Project, Brazil
12. Validation of Palmaceite Wastewater Treatment and Biogas Utilization Project, Colombia
13. Validation of Teresina Landfill Gas Project, Brazil
14. Validation of Maceio Landfill Gas Project, Brazil
15. Validation of SHP Morro Azul CDM Project (JUN1164), Colombia
16. Validation Doña Teresa Small hydro power plant, Colombia
17. Validation Biogas recovery and heat generation from Palm Oil Mill Effluent (POME), Coopeagropal. Costa Rica.
18. Validation Panuco Bagasse Cogeneration Project. México.

Lead auditor on verification MDL:

1. Verification of Biogas energy plant from palm oil mill effluent, Guatemala 2
2. Verification of Doña Juana Landfill gas-to-energy project, Colombia
3. Verification of Tres Valles Cogeneration Project, Honduras
4. Verification of Landfill Gas to Energy Facility at the Nejapa Landfill Site, El Salvador, El Salvador
5. Verification of La Venta II, México
6. Verification of Jepirachi Wind Power Project, Colombia
7. Verification of Santa Ana Hydroelectric Project, Colombia
8. Verification of BRASCARBON Methane Recovery Project BCA-BRA-01, Brazil
9. Verification of BRASCARBON Methane Recovery Project BCA-BRA-02, Brazil
10. Verification of BRASCARBON Methane Recovery Project BCA-BRA-03, Brazil
11. Verification of Ciudad Juarez Landfill gas-to-energy Project, México.

Lead auditor renewal crediting period:

1. Monte Rosa Bagasse Cogeneration Project (MRBCP)

Lead auditor on other schemes:

1. Validation VCS de Reforestación de áreas de pastura en la Sociedad Agrícola de Interés Social “José Carlos Mariátegui” – Proyecto Joven Forestal, Perú.
2. Validation Gold Standard Energy Efficiency at Ladrillera Alcarraza, Colombia.
3. Validation Gold Standard de Paramonga Bagasse Boiler Project, Perú.
4. Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-02, Brazil
5. Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-03, Brazil
6. Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil
7. Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-07, Brazil
8. Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-08, Brazil

Specialist

1. Validation of ECC methane capture and combustion from AWMS at dairy farms in Mexico – I, México
2. La Calera Biodigesters Project, Perú

Technical Review

1. Validation of Fuel Switching through change of furnaces at Imusa S.A., Colombia
2. Validation of Cervecería Hondureña Methane Capture Project, Honduras
3. Validation of Paysandú Clean Energy, Uruguay
4. Validation of Securitization and Carbon Sinks Project, Chile
5. Validation of METALDOM Fossil fuel switch from reheat furnace, República Dominicana
6. Validation of Reforestation of degraded/degrading land in the Caribbean Savannah of Colombia, Colombia
7. Validation of Co-composting of organic residues in ORO ROJO's Palm Oil Mill at Sabana de Torres, Colombia
8. Validation of EMGEA Small Hydropower (SHP) Run-of-the-River CDM Project Bundle, Colombia
9. Validation of Energy efficiency at Malvinas Gas Plant, Perú
10. Validation of Marañón Hydroelectric Project, Perú
11. Validation of Santa Rita Hydroelectric Plant, Guatemala
12. Verification of Bio energy in General Deheza –Electric power generation from peanut hull and sunflower husk-, Argentina
13. Validation of Biogas project, Olmeca I, Santa Rosa, Guatemala
14. Validation of CTR Rosario Landfill Gas Project, Brazil
15. Validation of SHP Itaguacu CDM Project (JUN 1146), Brazil
16. Validation of Taurichuco Hydropower Project, Perú
17. Validation of Feira de Santana Landfill Gas Project, Brazil
18. Validation of Doña Juana Landfill gas-to-energy Project, Colombia
19. Renovación Inversiones Hondurenas Cogeneration Project
20. Validación SHPs Tambaú, das Pedras and Rio do Sapo CDM Project (JUN1132), Brazil

21. Validación SHPs Poço Fundo and Providência CDM Project (JUN1133), Brazil
22. Validación Santa Rita Hydroelectric Plant, Colombia
23. Validation Conservation and reforestation of degraded areas in Barbosa, Colombia
24. Verification Doña Juana Landfill gas-to-energy Project, Bogotá, Colombia.
25. Verificación Monomeros nitrous oxide abatement project. Barranquilla, Colombia.
26. Verification BRT Bogotá, Colombia: TransMilenio Phase II to IV
27. Verification BRT Macrobus Guadalajara, Mexico
28. Verification Inversiones Hondurenas Cogeneration Project, Honduras.
29. Verification Incauca S. A. Fuel Switch from Coal to Green Harvest Residues CDM Project. Colombia.
30. Verification Brascarbon 14, -Brazil.

Appendix 3. Documents reviewed or referenced

No	Author	Title	References to the document	Provider
1	BRASCARBON	Registered PDD version 05, dated on: 29/01/2018	https://cdm.unfccc.int/Projects/DB/DNV-CUK1267175509.52/view	UNFCCC Website
2	ICONTEC	Validation Report issued by Icontec on 31/01/2018, version 1.2	https://cdm.unfccc.int/Projects/DB/DNV-CUK1267175509.52/view	UNFCCC Website
3	ICONTEC	Monitoring report of the 1 st Monitoring Period, version 02, dated on 09/02/2019 Verification report of the 1 st Monitoring Period version 1.1. Dated on 25/03/2019.	https://cdm.unfccc.int/Projects/DB/DNV-CUK1267175509.52/view	UNFCCC Website
4	BRASCARBON	Monitoring report of the 2 nd Monitoring Period. Submitted to UNFCCC, version 1, date: 10/01/2020 regarding the period from the 1 st of January 2019 to the 31 st of December 2019	https://cdm.unfccc.int/Projects/DB/DNV-CUK1267175509.52/view	UNFCCC Website
5	BRASCARBON	Monitoring report of the 2 nd Monitoring Period, version 02, regarding the period from the 1 st of January 2019 to the 31 st of December 2019	BCA-BRA-05 MR08_v2 tc.pdf BCA-BRA-05 MR08_v2 clean.pdf	Project Participant
6	BRASCARBON	Emission Reductions Calculation file version 1	CER Calculation MR08 - BCA-BRA-05.xls	Project participant
7	UNFCCC	Methodology: Methane recovery in animal manure management systems. AMS-III.D, version 20.1	http://cdm.unfccc.int/filestorage/I/M/Y/IMYW7DN36VU2BL84TOQAZKERGC5PS9/Methane%20recovery%20in%20animal%20manure%20management%20system.s.pdf?t=U3l8cG5uMzhvfDDFJIQbsrNoKVVohh135Y2H	UNFCCC Website
8	UNFCCC	Methodological tool "Project emissions from flaring" (Version 02.0.0) EB 68 Report Annex 15	http://cdm.unfccc.int/Reference/tools/index.html	Others
9	UNFCCC	CDM project standard for project activities, version 02.0	http://cdm.unfccc.int/Reference/Standards/index.html	UNFCCC Website
10	UNFCCC	CDM validation and verification standard for project activities version 02.0	http://cdm.unfccc.int/Reference/Standards/index.html	UNFCCC Website
11	UNFCCC	CDM project cycle procedure for project activities, version 02.0	http://cdm.unfccc.int/Reference/Standards/index.html	UNFCCC Website

12	UNFCCC	Guideline on the Application of Materiality in Verifications. Version 02.0	https://cdm.unfccc.int/filestorage/e/x/t/extfile-20150225171039012-iss_guid08.pdf/iss_guid08.pdf?t=OEI8cG5uNjN2fDA0C04Cd0GvnakwXoWSnLJs	UNFCCC Website
13	Project site Owners / State of Mato Grosso do Sul	Operation Licences of the project sites	4 - BCA-036MS1-05 - LO pag 2.pdf 4 - BCA-036MS1-05 - LO pag 3.pdf 5 - BCA-037MS1-05 - LIO.pdf 6 - BCA-038MS1-05 - LO pag 1.pdf 6 - BCA-038MS1-05 - LO pag 2.pdf 7 - BCA-039MS1-05 - RLO Protocolo.pdf 7 - BCA-039MS1-05 - RLO.pdf 8 - BCA-040MS1-05 - RLO.pdf 9 - BCA-041MS1-05 - R.L. O.pdf 9 - BCA-041MS1-05 - RLO.pdf 10 - BCA-042MS1-05 - RLO.pdf 11 - BCA-043MS1-05 - LO.pdf 11 - BCA-043MS1-05 - Protocolo RenovapOo LO.pdf 12 - BCA-046MS1-05 - LO pag 2.pdf 12 - BCA-046MS1-05 - LO pag 3.pdf 12 - BCA-046MS1-05 - LO pag 1.pdf 13 - BCA-051MS1-05 - Fazenda Bambu RLO.pdf 13 - BCA-051MS1-05 - LO Fazenda Bambu.pdf 14 - BCA-052MS1-05 - LO.pdf	Others
14	Various	Technical and manufacturer specifications	Equipment information through the websites (second sources information): - http://www.endress.com : for the Thermal Mass flow Endress+Hauser information - http://www.landtecna.com : for the portable biogas analyzer Landtec information - https://issuu.com/alutal/docs/catalogo-tecnico - Especificação Flare.pdf: Regarding the flare specifications	Project Participant
15	UNFCCC	CDM-MR-FORM Monitoring Report form for CDM project activities	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	UNFCCC Website
16	BRASCARBON	Sampling Plan (parameters $W_{CH_4,y}$ and $f_{VCH_4,RG}$)	<i>Sampling_Plan_BCA-BRA_05_MR08.xls</i>	Project Participant
17	BRASCARBON	Operational Procedure: POP-14 Formulated fee rations	<i>FORMULARIO 14.001 - BCA-BRA-05 - RACAO - 2019.xlsx</i>	Others

18	BRASCARBON	Form 01.001. Information with minute by minute temperature and biogas volume data stored in the PLC	BCA-032MS1-05 - Fazenda Dragão - 01-04-19 - TABELA DE DADOS.xls BCA-032MS1-05 - Fazenda Dragão - 01-10-19 - TABELA DE DADOS.xls BCA-032MS1-05 - Fazenda Dragão - 02-01-20 - TABELA DE DADOS.xls BCA-032MS1-05 - Fazenda Dragão - 02-02-19 - TABELA DE DADOS.xls BCA-032MS1-05 - Fazenda Dragão - 02-06-19 - TABELA DE DADOS.xls BCA-032MS1-05 - Fazenda Dragão - 02-09-19 - TABELA DE DADOS.xls BCA-032MS1-05 - Fazenda Dragão - 03-01-19 - TABELA DE DADOS.xls BCA-032MS1-05 - Fazenda Dragão - 03-03-19 - TABELA DE DADOS.xls BCA-032MS1-05 - Fazenda Dragão - 03-07-19 - TABELA DE DADOS.xls BCA-032MS1-05 - Fazenda Dragão - 03-12-19 - TABELA DE DADOS.xls BCA-032MS1-05 - Fazenda Dragão - 04-05-19 - TABELA DE DADOS.xls BCA-032MS1-05 - Fazenda Dragão - 04-08-19 - TABELA DE DADOS.xls BCA-032MS1-05 - Fazenda Dragão - 04-11-19 - TABELA DE DADOS.xls BCA-034MS1-05 - Lote 55 e 54 - 01-04-19 - TABELA DE DADOS.xls BCA-034MS1-05 - Lote 55 e 54 - 01-10-19 - TABELA DE DADOS.xls BCA-034MS1-05 - Lote 55 e 54 - 02-01-20 - TABELA DE DADOS.xls BCA-034MS1-05 - Lote 55 e 54 - 02-02-19 - TABELA DE DADOS.xls BCA-034MS1-05 - Lote 55 e 54 - 02-06-19 - TABELA DE DADOS.xls BCA-034MS1-05 - Lote 55 e 54 - 02-09-19 - TABELA DE DADOS.xls BCA-034MS1-05 - Lote 55 e 54 - 03-01-19 - TABELA DE DADOS.xls BCA-034MS1-05 - Lote 55 e 54 - 03-03-19 - TABELA DE DADOS.xls BCA-034MS1-05 - Lote 55 e 54 - 03-07-19 - TABELA DE DADOS.xls BCA-034MS1-05 - Lote 55 e 54 - 03-12-19 - TABELA DE DADOS.xls BCA-034MS1-05 - Lote 55 e 54 - 04-05-19 - TABELA DE DADOS.xls BCA-034MS1-05 - Lote 55 e 54 - 04-08-19 - TABELA DE DADOS.xls BCA-034MS1-05 - Lote 55 e 54 - 04-11-19 - TABELA DE DADOS.xls BCA-035MS1-05 - Lote 101 - 01-04-19 - TABELA DE DADOS.xls BCA-035MS1-05 - Lote 101 - 01-10-19 - TABELA DE DADOS.xls BCA-035MS1-05 - Lote 101 - 02-01-20 - TABELA DE DADOS.xls BCA-035MS1-05 - Lote 101 - 02-02-19 - TABELA DE DADOS.xls BCA-035MS1-05 - Lote 101 - 02-06-19 - TABELA DE DADOS.xls BCA-035MS1-05 - Lote 101 - 02-09-19 - TABELA DE DADOS.xls BCA-035MS1-05 - Lote 101 - 03-01-19 - TABELA DE DADOS.xls BCA-035MS1-05 - Lote 101 - 03-03-19 - TABELA DE DADOS.xls BCA-035MS1-05 - Lote 101 - 03-07-19 - TABELA DE DADOS.xls BCA-035MS1-05 - Lote 101 - 03-12-19 - TABELA DE DADOS.xls BCA-035MS1-05 - Lote 101 - 04-05-19 - TABELA DE DADOS.xls BCA-035MS1-05 - Lote 101 - 04-08-19 - TABELA DE DADOS.xls BCA-035MS1-05 - Lote 101 - 04-11-19 - TABELA DE DADOS.xls	Project Participant
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			BCA-051MS1-05 - Fazenda Bambú - 01-06-19 - TABELA DE DADOS.xls BCA-051MS1-05 - Fazenda Bambú - 02-03-19 - TABELA DE DADOS.xls BCA-051MS1-05 - Fazenda Bambú - 02-04-19 - TABELA DE DADOS.xls BCA-051MS1-05 - Fazenda Bambú - 02-10-19 - TABELA DE DADOS.xls BCA-051MS1-05 - Fazenda Bambú - 02-12-19 - TABELA DE DADOS.xls BCA-051MS1-05 - Fazenda Bambú - 03-01-19 - TABELA DE DADOS.xls BCA-051MS1-05 - Fazenda Bambú - 03-01-20 - TABELA DE DADOS.xls BCA-051MS1-05 - Fazenda Bambú - 03-02-19 - TABELA DE DADOS.xls BCA-051MS1-05 - Fazenda Bambú - 03-05-19 - TABELA DE DADOS.xls BCA-051MS1-05 - Fazenda Bambú - 03-08-19 - TABELA DE DADOS.xls BCA-051MS1-05 - Fazenda Bambú - 03-09-19 - TABELA DE DADOS.xls BCA-051MS1-05 - Fazenda Bambú - 03-11-19 - TABELA DE DADOS.xls BCA-051MS1-05 - Fazenda Bambú - 04-07-19 - TABELA DE DADOS.xls BCA-052MS1-05 - Fazenda Foletto - 01-06-19 - TABELA DE DADOS.xls BCA-052MS1-05 - Fazenda Foletto - 02-03-19 - TABELA DE DADOS.xls BCA-052MS1-05 - Fazenda Foletto - 02-04-19 - TABELA DE DADOS.xls BCA-052MS1-05 - Fazenda Foletto - 02-10-19 - TABELA DE DADOS.xls BCA-052MS1-05 - Fazenda Foletto - 02-12-19 - TABELA DE DADOS.xls BCA-052MS1-05 - Fazenda Foletto - 03-01-19 - TABELA DE DADOS.xls BCA-052MS1-05 - Fazenda Foletto - 03-01-20 - TABELA DE DADOS.xls BCA-052MS1-05 - Fazenda Foletto - 03-02-19 - TABELA DE DADOS.xls BCA-052MS1-05 - Fazenda Foletto - 03-05-19 - TABELA DE DADOS.xls BCA-052MS1-05 - Fazenda Foletto - 03-08-19 - TABELA DE DADOS.xls BCA-052MS1-05 - Fazenda Foletto - 03-09-19 - TABELA DE DADOS.xls BCA-052MS1-05 - Fazenda Foletto - 03-11-19 - TABELA DE DADOS.xls BCA-052MS1-05 - Fazenda Foletto - 04-07-19 - TABELA DE DADOS.xls	
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19	BRASCARBON	Form 02.001: checklist for site inspection	BCA-046MS1-05 - Granja Sorgatto - 31-12-19 - FORMULARIO 02.001.xls BCA-043MS1-05 - Granja Capivara - 31-12-19 - FORMULARIO 02.001.xls BCA-034MS1-05 - Lote 55 e 54 - 30-12-19 - FORMULARIO 02.001.xls BCA-035MS1-05 - Lote 101 - 31-12-19 - FORMULARIO 02.001.xls BCA-039MS1-05 - Lote 28 e 27 - 31-12-19 - FORMULARIO 02.001.xls BCA-037MS1-05 - Lote 71 - 31-12-19 - FORMULARIO 02.001.xls BCA-038MS1-05 - Lote 82 - 31-12-19 - FORMULARIO 02.001.xls BCA-051MS1-05 - Fazenda Bambú –Quinhão A - 31-12-19 - FORMULARIO 02.001.xls BCA-041MS1-05 - Granja Serra Dourada - 31-12-19 - FORMULARIO 02.001.xls BCA-032MS1-05 - Fazenda Dragão - 31-12-19 - FORMULARIO 02.001.xls BCA-036MS1-05 - Lote 105 - 31-12-19 - FORMULARIO 02.001.xls BCA-040MS1-05 - Fazenda Bela Vista - 31-12-19 - FORMULARIO 02.001.xls BCA-042MS1-05 - Fazenda Cachoeira - 31-12-19 - FORMULARIO 02.001.xls BCA-052MS1-05 - Fazenda Folleto - 31-12-19 - FORMULARIO 02.001.xls	Project Participant
20	BRASCARBON	Livestock inventory. Total number of animals, information collected on form 03.001 and 03.003 (the file name is <i>Sistema de Controle de Animais</i> , regarding each project site, nevertheless is the form 03.003)	BCA-032MS1-05 - Fazenda Dragão - 30-12-19 - Form 03.001.xls BCA-034MS1-05 - Lote 55 e 54 - 30-12-19 - Form 03.001.xls BCA-035MS1-05 - Lote 101 - 30-12-19 - Form 03.001.xls BCA-036MS1-05 - Lote 105 - 30-12-19 - Form 03.001.xls BCA-037MS1-05 - Lote 71 - 30-12-19 - Form 03.001.xls BCA-038MS1-05 - Lote 82 - 30-12-19 - Form 03.001.xls BCA-039MS1-05 - Lote 28 e 27 - 30-12-19 - Form 03.001.xls BCA-040MS1-05 - Fazenda Bela Vista - 30-12-19 - Form 03.001.xls BCA-041MS1-05 - Granja S. Dour. - 31-12-19 - Form 03.001.xls BCA-042MS1-05 - Fazenda Cachoeira - 30-12-19 - Form 03.001.xls BCA-043MS1-05 - Granja Capivara - 30-12-19 - Form 03.001.xls BCA-046MS1-05 - Fazenda Sorgatto - 30-12-19 - Form 03.001.xls BCA-051MS1-05 - Fazenda Bambu - Quinhão A - 30-12-19 - Form 03.001.xls BCA-052MS1-05 - Fazenda Folleto - 30-12-19 - Form 03.001.xls	Project Participant

21	BRASCARBON	Form 04.001. Information related to parameters biogas volume, W_{CH_4} , P_{biogas} and T_{biogas}	<p>BCA-032MS1-05 - Fazenda Dragão - 02-06-19 - FORMULARIO 04 001.xls</p> <p>BCA-036MS1-05 - Lote 105 - 02-06-19 - FORMULARIO 04 001.xls</p> <p>BCA-036MS1-05 - Lote 105 - 03-12-19 - FORMULARIO 04 001.xls</p> <p>BCA-037MS1-05 - Lote 71 - 03-12-19 - FORMULARIO 04 001.xls</p> <p>BCA-038MS1-05 - Lote 82 - 03-12-19 - FORMULARIO 04 001.xls</p> <p>BCA-039MS1-05 - Lote 28 e 27 - 02-06-19 - FORMULARIO 04 001.xls</p> <p>BCA-039MS1-05 - Lote 28 e 27 - 03-12-19 - FORMULARIO 04 001.xls</p> <p>BCA-041MS1-05 - Granja Serra Dourada - 02-06-19 - FORMULARIO 04 001.xls</p> <p>BCA-041MS1-05 - Granja Serra Dourada - 03-12-19 - FORMULARIO 04 001.xls</p> <p>BCA-043MS1-05 - Granja Capivara - 01-06-19 - FORMULARIO 04 001.xls</p> <p>BCA-046MS1-05 - Fazenda Sorgatto - 01-06-19 - FORMULARIO 04 001.xls</p> <p>BCA-046MS1-05 - Fazenda Sorgatto - 02-12-19 - FORMULARIO 04 001.xls</p> <p>BCA-051MS1-05 - Fazenda Bambú - Quinhão A - 01- 06-19 - FORMULARIO 04 001.xls</p> <p>BCA-051MS1-05 - Fazenda Bambú - Quinhão A - 02- 12-19 - FORMULARIO 04 001.xls</p> <p>BCA-032MS1-05 - Fazenda Dragão - 03-12-19 - FORMULARIO 04 001.xls</p> <p>BCA-034MS1-05 - Lote 55 e 54 - 02-06-19 - FORMULARIO 04 001.xls</p> <p>BCA-034MS1-05 - Lote 55 e 54 - 03-12-19 - FORMULARIO 04 001.xls</p> <p>BCA-035MS1-05 - Lote 101 - 02-06-19 - FORMULARIO 04 001.xls</p> <p>BCA-035MS1-05 - Lote 101 - 03-12-19 - FORMULARIO 04 001.xls</p> <p>BCA-037MS1-05 - Lote 71 - 02-06-19 - FORMULARIO 04 001.xls</p> <p>BCA-038MS1-05 - Lote 82 - 02-06-19 - FORMULARIO 04 001.xls</p> <p>BCA-040MS1-05 - Fazenda Bela Vista - 02-06-19 - FORMULARIO 04 001.xls</p> <p>BCA-040MS1-05 - Fazenda Bela Vista - 03-12-19 - FORMULARIO 04 001.xls</p> <p>BCA-041MS1-05 - Granja Serra Dourada - 02-01-20 - FORMULARIO 04 001.xls</p> <p>BCA-042MS1-05 - Fazenda Cachoeira - 02-06-19 - FORMULARIO 04 001.xls</p> <p>BCA-042MS1-05 - Fazenda Cachoeira - 03-12-19 - FORMULARIO 04 001.xls</p> <p>BCA-043MS1-05 - Granja Capivara - 02-12-19 - FORMULARIO 04 001.xls</p> <p>BCA-052MS1-05 - Fazenda Foletto - 01-06-19 - FORMULARIO 04 001.xls</p> <p>BCA-052MS1-05 - Fazenda Foletto - 02-12-19 - FORMULARIO 04 001.xls</p>	Project Participant
22	UNFCCC	Methodological tool: "Project and leakage emissions from anaerobic digesters" version 2	http://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-14-v2.pdf	UNFCCC Website

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			<i>BCA-052MS1-05 - Formulário 08.001 - 03-2019.xlsx</i> <i>BCA-052MS1-05 - Formulário 08.001 - 04-2019.xlsx</i> <i>BCA-052MS1-05 - Formulário 08.001 - 05-2019.xlsx</i> <i>BCA-052MS1-05 - Formulário 08.001 - 06-2019.xlsx</i> <i>BCA-052MS1-05 - Formulário 08.001 - 07-2019.xlsx</i> <i>BCA-052MS1-05 - Formulário 08.001 - 08-2019.xlsx</i> <i>BCA-052MS1-05 - Formulário 08.001 - 09-2019.xlsx</i> <i>BCA-052MS1-05 - Formulário 08.001 - 10-2019.xlsx</i> <i>BCA-052MS1-05 - Formulário 08.001 - 11-2019.xlsx</i> <i>BCA-052MS1-05 - Formulário 08.001 - 12-2019.xlsx</i>	
24	UNFCCC	Methodological tool: "Project and leakage emissions from anaerobic digesters" version 2	http://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-14-v2.pdf	UNFCCC Website
25	UNFCCC	Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities. Version 04	https://cdm.unfccc.int/Reference/Guidclarif/index.html	UNFCCC Website
26	Formulated Feed Rations	Formulated feed ration	<i>Racao 1.pdf</i> <i>Racao 2.pdf</i>	Others
27	BRASCARBON	Installation records	<i>Formulario Instalação Calibração PDD 05 Vazao 2019 2021 FL 2.pdf</i> <i>Formulario Instalação Calibração PDD 05 Vazao 2019 2021 FL1.pdf</i> <i>Formulario Instalação Calibração PDD 05 Vazão 2017 2019 FL 1.pdf</i> <i>Formulario Instalação Calibração PDD 05 Vazão 2017 2019 FL 2.pdf</i> <i>Instalação Termopar PDD 05 2019 2020 FL2.pdf</i> <i>Instalação Termopar PDD 05 2019 2020 FL1.pdf</i> <i>Instalacao Termopar PDD 05 2018-2019 FL2.pdf</i> <i>Instalacao Termopar PDD 05 2018-2019 FL1.pdf</i>	Project Participant
28	BRASCARBON	Form 15.001 (Genetic source)	<i>FORMULARIO 15.001 - BCA-BRA-05 - GENETICA – 2019.xlsx</i>	Project Participant
29	Geneticporc and COOASGO	Purchase record provided by PP and COOASGO	<i>Nota Genetica.pdf Geneticporc</i> <i>Declaracao Genetica.pdf COOASGO</i>	Other

30	ALUTAL	Calibration records of the thermocouples (installation records are described on reference 27)	<p> <i>BCA-032MS1-05 - Medidor de Temperatura Serie 483441 e Certificado CA-1421 18.PDF</i> <i>BCA-034MS1-05 - Medidor de Temperatura Serie 483442 e Certificado CA-1422 18.PDF</i> <i>BCA-035MS1-05 - Medidor de Temperatura Serie 483443 e Certificado CA-1423 18.PDF</i> <i>BCA-036MS1-05 - Medidor de Temperatura Serie 483444 e Certificado CA-1424 18.PDF</i> <i>BCA-037MS1-05 - Medidor de Temperatura Serie 483445 e Certificado CA-1425 18.PDF</i> <i>BCA-038MS1-05 - Medidor de Temperatura Serie 483447 e Certificado CA-1426 18.PDF</i> <i>BCA-039MS1-05 - Medidor de Temperatura Serie 81339 e Certificado CA-1427 18.PDF</i> <i>BCA-040MS1-05 - Medidor de Temperatura Serie 83889 e Certificado CA-1428 18.PDF</i> <i>BCA-041MS1-05 - Medidor de Temperatura Serie 83890 e Certificado CA-1429 18.PDF</i> <i>BCA-042MS1-05 - Medidor de Temperatura Serie 83891 e Certificado CA-1430 18.PDF</i> <i>BCA-043MS1-05 - Medidor de Temperatura Serie 83892 e Certificado CA-1431 18.PDF</i> <i>BCA-046MS1-05 - Medidor de Temperatura Serie 83893 e Certificado CA-1422 18.PDF</i> <i>BCA-051MS1-05 - Medidor de Temperatura Serie 83900 e Certificado CA-1433 18.PDF</i> <i>BCA-052MS1-05 - Medidor de Temperatura Serie 83910 e Certificado CA-1434 18.PDF</i> </p> <p> <i>BCA-032MS1-05 - Medidor de Temperatura Serie 483441 e Certificado CA-1421 18.PDF</i> <i>BCA-034MS1-05 - Medidor de Temperatura Serie 483442 e Certificado CA-1422 18.PDF</i> <i>BCA-035MS1-05 - Medidor de Temperatura Serie 483443 e Certificado CA-1423 18.PDF</i> <i>BCA-036MS1-05 - Medidor de Temperatura Serie 483444 e Certificado CA-1424 18.PDF</i> <i>BCA-037MS1-05 - Medidor de Temperatura Serie 483445 e Certificado CA-1425 18.PDF</i> <i>BCA-038MS1-05 - Medidor de Temperatura Serie 483447 e Certificado CA-1426 18.PDF</i> <i>BCA-039MS1-05 - Medidor de Temperatura Serie 81339 e Certificado CA-1427 18.PDF</i> <i>BCA-040MS1-05 - Medidor de Temperatura Serie 83889 e Certificado CA-1428 18.PDF</i> <i>BCA-041MS1-05 - Medidor de Temperatura Serie 83890 e Certificado CA-1429 18.PDF</i> <i>BCA-042MS1-05 - Medidor de Temperatura Serie 83891 e Certificado CA-1430 18.PDF</i> <i>BCA-043MS1-05 - Medidor de Temperatura Serie 83892 e Certificado CA-1431 18.PDF</i> <i>BCA-046MS1-05 - Medidor de Temperatura Serie 83893 e Certificado CA-1422 18.PDF</i> <i>BCA-051MS1-05 - Medidor de Temperatura Serie 83900 e Certificado CA-1433 18.PDF</i> <i>BCA-052MS1-05 - Medidor de Temperatura Serie 83910 e Certificado CA-1434 18.PDF</i> </p>	Others
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31	Endress+Hauser	Calibration records of the Flow Meter Formulario Instalacao o Calibraçao	<i>BCA-035MS1-05 - Vazao.pdf</i> <i>BCA-036MS1-05 - Vazao.pdf</i> <i>BCA-042MS1-05 - Vazao.pdf</i> <i>BCA-037MS1-05 - Vazao.pdf</i> <i>BCA-038MS1-05 - Vazao.pdf</i> <i>BCA-040MS1-05 - Vazao.pdf</i> <i>BCA-043MS1-05 - Vazao.PDF</i> <i>BCA-046MS1-05 - Vazao.PDF</i> <i>BCA-041MS1-05 - Vazao.PDF</i> <i>BCA-039MS1-05 - Vazao.PDF</i> <i>BCA-032MS1-05 - Vazao.pdf</i> <i>BCA-052MS1-05 - Vazao.pdf</i> <i>BCA-034MS1-05 - Vazao.pdf</i> <i>BCA-051MS1-05 - Vazao.pdf</i> <i>BCA-035MS1-05 - Vazao.pdf</i> <i>BCA-036MS1-05 - Vazao.pdf</i> <i>BCA-042MS1-05 - Vazao.pdf</i> <i>BCA-037MS1-05 - Vazao.pdf</i> <i>BCA-038MS1-05 - Vazao.pdf</i> <i>BCA-040MS1-05 - Vazao.pdf</i> <i>BCA-043MS1-05 - Vazao.PDF</i> <i>BCA-046MS1-05 - Vazao.PDF</i> <i>BCA-041MS1-05 - Vazao.PDF</i> <i>BCA-039MS1-05 - Vazao.PDF</i> <i>BCA-032MS1-05 - Vazao.pdf</i> <i>BCA-052MS1-05 - Vazao.pdf</i> <i>BCA-034MS1-05 - Vazao.pdf</i> <i>BCA-051MS1-05 - Vazao.pdf</i>	Others
32	LANDTEC	Calibration records of the gas Analyser	<i>BM11043_10072019.pdf</i> <i>BM11043_14012019.pdf</i> <i>BM11043_18072018.PDF</i>	Others
33	BRASCARBON	Training records referring training for calibration and installation of the flow meter, issued by Endress+Hauser Controle e Automação LTDA.	<i>Declaracao ALUTAL - Termopar.jpg</i> <i>Declaracao Medidores Vazao.pdf</i> <i>Certificado Treinamento Brascarbon.pdf</i>	Project Participant
34	BRASCARBON	Form 16.001: where each animal category is monitored during the year, according to the operational procedure POP 16 – Animal Weight Monitoring.	<i>FORMULARIO 16 001 - BCA-BRA-05 - 2019.xls.xls</i>	Project Participant
35	BRASCARBON	Operational Procedure 07	<i>POP 7 - CALCULO DA DENSIDADE O METANO rev6.pdf</i>	Project Participant
36	COOASGO	Weighting letter	<i>Declaracao Peso.pdf</i>	

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FAR from validation and/or previous verifications

FAR ID	xx	Section no.	E.2	Date: DD/MM/YYYY
Description of FAR				
Project participant response				
Date: DD/MM/YYYY				
Documentation provided by project participant				

DOE assessment	Date: DD/MM/YYYY

Table 2. CL from this verification

CL ID	1	Section no.	Cover	Date: 21/02/2020
Description of CL				
Monitoring report version 01 refers to the eighth monitoring period, nevertheless the applicable monitoring period is the second monitoring period of the second crediting period. PP is requested to clarify the actual applicable monitoring period				
Project participant response				Date: 27/02/2020
<i>The revised version 2 of the MR is dully corrected.</i>				
Documentation provided by project participant				
<i>MR version 02</i>				
DOE assessment				Date: 28/02/2020
The verification team assessed MR version 02 finding correctness on cover letter regarding the applicable monitoring period and therefore the finding is closed				

CL ID	2	Section no.	B.1	Date: 21/02/2020
Description of CL				
Section B.1 of the MR states project site Fazenda Rancho Fundo, Fazenda Santa Cecilia, Fazenda Cachoeira Parte and Fazenda São Marcos are not operational during the monitored period. Nevertheless, previously mentioned project sites are not stated to be project sites on the registered PDD, nor on previous monitored periods				
Project participant response				Date: 27/02/2020
<i>The revised version 2 of the MR is dully corrected. Those farms as not part of the project and were incorrectly referred to in version 1 of the MR.</i>				
Documentation provided by project participant				
<i>MR version 02</i>				
DOE assessment				Date: 28/02/2020
Misleading information on section B.1 of the MR was corrected by PP. The audit team assessed section B.1 finding information stated is in line with the actual project sites applicable to the proposed project activity. Therefore, the finding is closed				

Table 3. CAR from this verification

CAR ID	1	Section no.	Along MR	Date: 21/02/2020
Description of CL				
According to information stated on previous monitoring period ((from 28/11/2017 to 31/12/2018) project site <i>Granja Serra Dourada</i> was not operational during the first monitoring period. On the matters of the current monitoring period, the second from 01/01/2019 to 31/12/2019, operation license as well as calibration records of the project site <i>Granja Serra Dourada</i> (BCA-041MS1- 05) are provided. In addition, CERs calculation file states ER for the project site. PP is requested to provide information regarding the operational status of the project site <i>Granja Serra Dourada</i> (BCA-041MS1- 05)				
Project participant response				Date: 27/02/2020
<i>Granja Serra Dourada has been out of operation for a couple of monitoring periods, including the 1st Monitoring Period for the 2nd Crediting Period. In the current monitoring period (Second Monitoring Period for the 2nd Crediting Period, from 01/01/2019 to 31/12/2019) the farm as resume its normal activity and therefore was account for both in terms of documentation (as licenses and certificates) as well as in terms of CER calculation</i>				
Documentation provided by project participant				
<i>MR version 02 and CERs calculation file</i>				
DOE assessment				Date: 28/02/2020

The audit team assessed operation conditions of the project site *Granja Serra Dourada* (BCA-041MS1- 05) by performing telephonic interviews with relevant personel including regional technician Mr Eliselton Cavalli whom confirmed the project site resumed operations for the monitored period. Swine facilities stop their operation due to several reasons and are able to resume operations since facilities are still on place. For the case of the previously mentioned project site, it is verified monitoring equipment is in place and normally operating, GHG emission reductions have been calculated and data collection procedures have been carried out as for the other project sites. Support documentation provided as part of the evidences of the monitored period demonstrate operation of the project site has been taken into account by PP in order to determine the total GHG emission reductions of the project activity, therefore the audit team deems transparent and adjusted to requirements the inclusion of project site *Granja Serra Dourada* (BCA-041MS1-05) to the total GHG emission reduction calculation. Therefore, the finding is closed

Table 4. FAR from this verification

FAR ID	xx	Section No.	Date: DD/MM/YYYY
Description of FAR			
N/A			
Project participant response			Date: DD/MM/YYYY
Documentation provided by project participant			
DOE assessment			Date: DD/MM/YYYY