



**Verification and certification report form for
CDM project activities
(Version 04.0)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	BRASCARBON Methane Recovery Project BCA-BRA-15, Brazil (Reference Number: 6411)		
Scale of the project activity	<input type="checkbox"/> Large-scale <input checked="" type="checkbox"/> Small-scale		
Version number of the verification and certification report	03		
Completion date of the verification and certification report	15/07/2021		
Monitoring period number and duration of this monitoring period	First monitoring period of the second crediting period 18/06/2019 to 31/12/2020 (first and last days included)		
Version number of the monitoring report to which this report applies	03		
Crediting period of the project activity corresponding to this monitoring period	second period of 18/06/2019 until 17/06/2026.		
Project participants	SPCarbono Créditos de Carbono S/A. Norwegian Ministry of Climate and Environment		
Host Party	Brazil		
Applied methodologies and standardized baselines	AMS-III.D version 21		
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	82,325 tCO ₂ e (563 days)		
Certified amount of GHG emission reductions or GHG removals for this monitoring period	Amount before 1 January 2013	Amount from 1 January 2013 until 31 December 2020	Amount from 1 January 2021
	N/A	79,636 tCO ₂ e (563 days)	N/A
Name and UNFCCC reference number of the DOE	Colombian Institute for Technical Standards and Certification – ICONTEC International, E-0024		
Name, position and signature of the approver of the verification and certification report	 Juan Sebastian Salazar Technical Director		

SECTION A. Executive summary

SPCarbono Créditos de Carbono S/A commissioned ICONTEC to perform the verification assessment of the First monitoring period (18/06/2019 to 31/12/2020 (first and last days included) of the second crediting period (from 18/06/2019 until 17/06/2026) of the proposed project activity "BRASCARBON Methane Recovery Project BCA-BRA-15, Brazil (Reference Number: 6411), 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 21.0)" 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 08.0 /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 10) /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-15, Brazil (Reference Number: 6411)
Reporting period:	18st of June 2019 to the 31st of December 2020
Baseline emissions:	119,821 tCO ₂ e (Total Methane destroyed: 104,044 tCO ₂ e)
Project emissions:	37,185 tCO ₂ e
Leakage:	0 tCO ₂ e
Emission Reductions:	79,636 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	Bermudez	Adriana	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	EI	Aubad	Ana Isabel	Freelance -Unit of Validation and verification
2	Approver	IR	Salazar	Sebastian	Employee - 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 covered the entire monitored period.	Assessment of calibration records and calibration Frequencies regarding the current monitoring period and previous crediting period
4.	Use of out-dated	Low	During the desk review	Assessment of the calculation

	parameters for the calculation of the ERs		ICONTEC did not identify the application of out- dated parameters in the calculation of the GHG emission reductions.	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
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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 /6/22/ 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 79,636 tCO₂e (366 days), the applicable materiality threshold is 3,981,80 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 (3,981,80 tCO₂e) stated by UNFCCC on applicable criteria /9/ /10/ /11/ /12/.

SECTION D. Means of verification

D.1. Desk/document review

The desk review stage took place from 18,19 and 23 of March 2021. 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 10, dated on 22/09/2020 /1/
- Validation report dated on 22/09/2020, version 3 /2/
- Monitoring report of the first monitoring period and verification report version 02 /3/, regarding previous monitoring.
- Monitoring report of the first monitoring period, version 1, date on: 12/01/2021 / (from 18st of June 2019 to the 31st of December 2020) /4/
- Emission Reductions Calculation file version 1 – date on 12/01/2021 CER Calculation MR08 - BCA-BRA-15.xls
- Monitoring report of the first monitoring period, version 2, date on: 09/04/2021 / (from 18st of June 2019 to the 31st of December 2020) /5/
- 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 21, EB96) /7/
- Methodological tool (06) “Project emissions from flaring” (Version 03.0) /8/
- Methodological Tool(14): “Project and leakage emissions from anaerobic digesters” (version 02) /22/
- Methodological Tool: “Assessment of the validity of the original/current baseline and to update the baseline at the renewal of a crediting period” (version 03.0.1) /35/

D.2. On-site inspection

According to the CDM validation and verification standard VVS (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. The VVS does enforce the validation team to conduct an on-site inspection, paragraph 339 (b): *“More than three years have elapsed since the last on-site inspection conducted for verification for the project activity”*; in this case, the project activity the last on-site inspection was at the 2017. However, taking into account that the board in its meetings EB 107, 108 and 109 established the conditions for remote visit due to the current pandemic by covid-19, there is restriction on travel to countries such as Brazil and therefore, the projects that had scheduled visit can be done remotely, according to the authorization given by the board of the CDM. Taking into account that the board in its meetings 107, 108 and 109 established the conditions for remote visit due to the current pandemic by covid-19, there is restriction on travel to countries such as Brazil and therefore, the projects that had scheduled visit can be done remotely, according to the authorization given by the board of the CDM.

Considering the ongoing pandemic situation(COVID 19), the fact that we have a audit team and Project Participant performing this verification process in different countries, namely Brazil (CDM manager and project sites and focal point of the project) and Colombia (DOE) and since we are still without any prevision of safe travelling between so different countries (biosafety's protocols and legislation),as well as declarations quarantine's dated, we feel that the most secure approach is to conduct a remote on site visit if needed. Additionally, there are internal deadlines and contracts which expect that the Monitoring Report and the Verification Report, both need to be submitted until the end may 2021, not allowing the postpone of the site visit, especially since there is no real estimation for that to happen, regarding the covid global situation.

According To EB meeting 108 paragraph 28¹, the DOE may apply alternative measures of validation/verification to mandatory on-site inspections, therefore, the verification was carried out entirely remotely with digitals aids, documents support, additional and real-time photography, as well as, photographic records, files and interviews. On the other hand, the DOE developed versions of formats for validation and verification project, and the CDM formats will be implemented.

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 first monitoring period (from 18/06/2019 to 31/12/2020) /4/, as well as the calculation of the GHG emission reductions /6/ and Sampling /16/ 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.

The audit team verified, while carrying out the on remote audit, the procedures to collect and report data related to the calculation of the GHG emission reductions. All operational project sites provided primary data in order to be crosschecked against the data and support documents provided by the PP.

Supplementary, the information provided, its assessment and the follow-up interviews using virtual means of communication allowed the audit team to analyze the monitoring environment.

¹ Paragraph 28: *In response to the communications from the stakeholders (see paragraph 47 below), the Board agreed to further extend the period in which DOEs may apply alternative measures of validation/verification to mandatory on-site inspections until 30 June 2021. The Board had agreed on 20 March 2020 via electronic decision-making, to the temporary deviation from requirements regarding on-site inspections by DOEs because of travel restrictions caused by COVID-19 (CDM EB 106 meeting report, paragraph 26). The Board had further agreed on 23 June 2020, via electronic decision-making, to extend the period in which DOEs may apply alternative measures of validation/verification to mandatory on-site inspections until 31 December 2020, as contained in paragraph 30 of the 107th CDM Executive Board meeting report (Meeting report CDM Executive Board 108th meeting Version 01.0 Date: 1–3 December, 9–11 December, and 14 December 2020 Venue: Virtual- page 8)*

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 first 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 interviews 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 was interviewed in order to confirm all information provided regarding the first monitoring period of the second crediting period; the operational conditions were discussed in an interview with Mr Luis Chiericato. In addition, an interview with Mr Mario Pacifico was held to assure the implementation of the project activity. Lastly, interviews performed while carrying out the on-site visit to project sites owners and the regional technician assure the understanding of the project's environment, operation and data acquisition, comparing these aspects against the registered PDD /1/ as well as the applicable requirements.

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	05/04/2021	Description and operation of the project activity -Implementation status of the project	Adriana Bermudez
2	Garcia	David	Brascarbon CDM Manager	05-06/04/2021	-Baseline GHG emissions -Project GHG emissions -Leakage GHG emissions -GHG emission reductions -Reviewing of the spread sheets -Materiality basement	Adriana Bermudez
3				06/04/2021	Verification and data cross checking. -Materiality assessment -Calibration performance	
4				07/04/2021 – 08/04/2021	-Implementation status of the project -General conditions of the monitoring of the project activity -Monitoring equipment in operation - POPs	
5	Chieregato	Luis	Regional Technician	05/04/2021	-General conditions of the monitoring of the project activity -Monitoring equipment in operation - Description of activities and functions - data and files	Adriana Bermudez
6	Garcia	David	Brascarbon CDM Manager	9 -13/04/21	-Verification of the application of the Sampling Plan -Verification and data cross checking.	Adriana Bermudez

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 .xlsx 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 WCH₄,y, PBiogas, TBiogas, and fvCH₄,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, standard and guideline /24/ applicable to the proposed project activity and the required significance level /7/, and according to VVS version 2/10/.

ICONTEC, verified that BRASCARBON implemented the sampling and surveys according to the sampling plan in the registered monitoring plan. The verification included confirmation of the 90/10 confidence level used.

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
E.1 Compliance of the monitoring report with the monitoring report form			
E.3 Compliance of the project implementation and operation with the registered PDD	CL 1 CL 2		
E.4 Post-registration changes			
E.5 Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines	CL 4	CAR 2	
E.6 Compliance of monitoring activities with the registered monitoring plan	CL 3 CL 5		FAR 1
E.7 Compliance with the calibration frequency requirements for measuring instruments			
E.8 Assessment of data and calculation of emission reductions or net removals		CAR 1	
E.9 Assessment of reported sustainable development co-benefits			
E.10 Global stakeholder consultation			
Others (please specify)			
Total	5	2	

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 Forms 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/ as part of the desktop review activities. The PP has made this report public before the start of verification activities in the version 7 format. During verification, the CDM team informed DOE that the versions of the MR and VCR formats had changed, therefore the PP changed the monitoring report form version 7 to 8, as well as, the DOE implemented the new version of the verification and certification report format to version 4. Subsequently, version 2 of the MR /5/ follows the instructions in the most recent form available with respect to 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. (seventh 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 first 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, the audit team assured the necessary information to understand the implementation status and operational features of the project sites.</p> <p>PP provided due explanations regarding the operation licenses; Sao Paulo state does not provide operation licenses since it is not compulsory for the operation of the swine farms.</p> <p>The audit team performed telephonic and videocalls, interviews with relevant personnel of the proposed project activity as well an assessment of the actual normative conditions required for the state of Sao Paulo regarding licencing at Sao Paulo State: https://cetesb.sp.gov.br/licenciamentoambiental/avicultura-suinocultura-e-bovinocultura/.</p> <p>On the matters of licensing, no operation licence is required as long as farms maintain a certain number of animals per each category. More importantly, those enterprises of swine farms which operation started before 21/03/2018 do not require operation licence, nevertheless those swine farms which operation is later to the previous described date, do require operation licence. All project sites are in line with relevant normative. Since the audit team confirmed no operation license is compulsory.</p> <p>The audit team interviewed to the regional technician Luis Chierregato, who explained maintenance activities, frequency of visits to project sites, records and diligence of forms 12,001 /37/, and data for forms 01,001, 02,001, 03.003, 04,001 /18/ /19/ /20/ / 21/. The technician has an assistant for field operation work if necessary and in accordance with the corresponding POPs.</p>
Findings	<p>CL 1: Regarding PDD version /1 /15/ CL 2: Identification of project site, table A.1 and parameter Wsite /1/5/</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 (CL 1). On the matter of CL2, PP corrected information about the project sites with the fazenda Colorado applicable MR version 2 /5/.</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>

	Project site	Status of Implementation	Construction	Operation
	Sítio Barreiro BCA-221SP1-15	Completed	100%	100%
	Fazenda Bom Retiro BCA-222SP1-15	Completed	100%	100%
	Granja Colorado BCA-223SP1-15	Completed	100%	100%
	Sítio Água do Rosário. BCA-224SP1-15	Completed	100%	100%
	Sítio Mirante do Macuco BCA-225SP1-15	Completed	100%	100%
	Sítio Rosa dos Ventos BCA-227SP1-15	Completed	100%	100%
	Fazenda São Francisco BCA-228SP1-15	Completed	100%	100%
	<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.</p> <p>The specific operation procedures and activities are also part of the information provided by the PP in the MR version 3 /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/.</p> <p>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> <p>The PP corrected the monitoring report version 3 /5/ and the CL 1 and CL 2 was closed.</p>			

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.

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents²

² 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).

No deviations from the registered monitoring plan and/or methodology were identified during this assessment.

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.

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 21.0- Methane recovery in animal manure management systems" /7/ and the registered PDD /1/, section regarding the monitoring plan.
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	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	<p>CL 4 - Calculation of the reduction of emissions or net anthropogenic removals in Section E: Equations 1, 2, 3, 4 and 6.1 where the parameters of the equations present an incomplete description (AMS-III.D version 21.0 - missing in the summation sign the correspondent sub-index / 7 /; the equations have incorrect names of the equation and methodologies used.</p> <p>CAR 1 – Data and parameters to be monitoring, frequency monitoring incomplete for parameters. Described in the PDD /1/ /7/</p>
Conclusion	<p>ICONTEC confirmed that the PP included the parameter adjustments necessary to meet the requirements set out in the methodology /7/ and the methodological tools/8/ and PDD version 10 /1/.</p> <p>Therefore, 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/. The parameters when monitoring are correctly identified by PP and the MR describes those non-applicable parameters.</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> <p>CL 4 and CAR 2 were closed in MR version 2 /5/.</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 ex ante indicated by PP the MR /4/. The following table describes the parameters determined ex-ante:		
	Color resaltado verde oscuro – viene bien de PDD		
	Parameter	Description	Value
	VS _{default}	Default value for the volatile solid excretion rate per day on a dry-matter basis for a defined livestock population	Market Swine: 0.3 Breeding Swine: 0.46 Gilts: 0.46
	MC _{Fj}	Annual methane conversion factor for the baseline animal waste management system "j".	79%
	MS _{%Bl,j}	Fraction of manure handled in baseline animal manure management system "j".	1
			PP

	GWP_{CH_4}	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 January 1 st 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
	$SPEC_{flare}$	Manufacturer's flare specifications for temperature, flow rate and maintenance schedule	The flare optimal conditions are, according the manufacturers specifications: Flow: between + 40% of the estimated flow (in m ³ /h) for any giving farm; Temperature: between 500oC and 800oC Maintenance: Annually, recommended by the manufacturer. The PP preforms monthly maintenance, both preventive and corrective, if needed.	Flare manufacturer
Findings	CAR 2 - associated to section E.5, parameters MCF_j - $MS\%_{BI,j}$ - GWP_{CH_4} - UF_b			
Conclusion	The audit team was able to verify the ex-ante 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 ex-ante fixed parameters stated. IPCC default values, GWPs and other reference figures are applied and result in a conservative estimate of the			

	<p>GHG emission reductions calculated and stated on the calculation file /6/.</p> <p>Complementary, the audit team concludes the applicability of the parameters Wdefault, Vsdefault, BO,L,t to the default values of the Tables 10 A-7 and 10 A-8 from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, chapter 10 considering that according to paragraph 18 (b, c, d) from AMS-III.D version 21.0 /7/, VS figures applicable to developed countries can be used since the following conditions are satisfied:</p> <ul style="list-style-type: none"> •The genetic source of the livestock originates from an Annex I Party: 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 15.001 – Genetics /27/. The supplier (Genéticporc - Agrocerees /28/ provides with animals at the producers or at the Associação Brasileira dos Criadores de Suínos (Brazilian Swine Association) – http://www.abcs.org.br/ and also at FAZENDAS ROSSETTO, which in turn provides to the different project sites /27/ having a traceable record of the animal type. As it has been found through written statement /28/, •<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/ /25/. 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 FAZENDAS ROSSETTO, tthe animal producer's association and therefore, feeding operations are controlled. •The project specific animal weights are more similar to developed country IPCC default values: 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

<p>Means of verification</p>	<p>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:</p>
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	1. Parameter:	T_f
	Description:	Combustion temperature of the flare (enclosed flares)
	Value:	In the spreadsheet calculation file version 2 /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/4/5
	Source of Data and Frequency:	<p>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.</p> <p>Every 1 minute measurement and registration by a Control Logic Program (CLP) According to the Monitoring Operational Procedure POP-01</p>
	Data Cross Checking:	<p>Historical data was available and was crosschecked by the audit team. The operational conditions of the monitoring equipment were assessed through interview to David Garcia CDM Manager, and it was verified procedure followed as well as the collect data collection and reporting.</p> <p>The audit team received current photographic records taken by the PP, evidence related to equipment in operation, such as panoramic views and records of thermocouples at the project sites / 36 /.</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 _f 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 (remote).
	2.Parameter:	SITE INSPECTION
Description:	Inspection on the site considering relevant regulation and the infra-structure of the site	

	Value:	Annual follow-up of the documentation to check the expiration date, changes in the production lay-out and surroundings of the digester. Actions within the property and around the biodigesters should be taken both by the contractor and the client Brascarbon. Photos should be attached to the annual inspection report to prove that the system of wastewater management has not changed namely regarding the following items: pipes, gutters, roofs, fences, trees, control panel, flare, terminal boxes and general cleaning. Use of the annex attached at the operational procedure POP-02/19/
	Used Equipment:	Not Applicable
	Source of Data and Frequency:	According to the PDD /1/ and MR version 2 /3/ the frequency of site visits is annually; The site inspection is monitored by the use of the form 02.001/19/. 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 monitoring plan /4/.
	Data Cross Checking:	Information provided on <i>Form 02.001 /19/</i> and POP 2 /13/ was crosschecked against information relevant sources verified since the archives presented by PP and telephonic interviews and videocall. The audit team received current photographic records taken by the PP, evidence related to equipment in operation, such as panoramic views at the project sites / 36 /.
	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/: a copy of the documents is submitted to the central office to the Quality Coordinator, who will verify the data, controlling it through an electronic system and ensuring its integrity.
	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.
	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, transfers, 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 is 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 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/ - same parameter NLT,y
	Used Equipment:	Not Applicable
	Source of Data and Frequency:	The animal inventory records are kept in <i>formulario 03.003 /20/</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); this information helps to determine the number of days the animals are alive in each farm. The Recording frequency is annually, based on monthly records: 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 (Annually, based on monthly records). 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. The same parameter NLT_y
	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 continuously recording, collected monthly from the field with a flow meter. On its turn, collected data is gathered by the Regional Technician, Mr Luis Chieragato on a monthly basis and stored on forms 04.001 /21/, and 01.001 /18/.
	Data Cross Checking:	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.
	Consistency Between the QA/QC defined in	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/.
		QA/QC procedures follow mandatory requirements from applicable methodology.

	the 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_{CH4,y}
	Description:	Methane content in biogas in the year "y"
	Value:	The values of W _{CH4,y} can be found in the calculation file /6/ and MR /5/.
	Used Equipment:	Biogas Check Portable Digital Analyzer from Geotech/Landtech. Accuracy CH4: ± 0.5% from 0-5% CH4 content; ± 1.0% from 5-15% CH4 content; ± 3.0% from 15%-full scale CH4 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 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 _{CH4,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 (According with the data/parameter table 6 of the methodology AMS III.D version 21.0 /7/), content (W _{CH4,y}) is taken as fv _{CH4,RG,h} (average). This approach is considered to be accurate when calculating PE _{flare,y} since the monthly monitored W _{CH4,y} (measured on wet basis) assures a 90% confidence and 10% precision level in the methane concentration measurement /22/. as assessed on the Sampling Plan /22/
	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 _{CH4,y} and fv _{CH4,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 /16/ is in accordance with the methodological requirements for sampling /24/ 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 spread-sheet calculation file /6/ and MR /5/
	Used Equipment:	Biogas Check Portable Digital Analyser from Geotech/Landtech. Accuracy Temperature: $\pm 0.2^{\circ}\text{C}$ (Biogas check analyser accuracy) $\pm 0.5^{\circ}\text{C}$ (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 AMS III.D version 21.0 /7/ requires that parameter W _{CH₄,y} be measured with a 90/10 confidence level, PP correctly designed and applied a sampling plan /16/, the one was developed by using the "Guidelines for sampling and survey" /24/ (the equation 38 paragraph 102 and 103),.
	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 these form 04.0001, contains the data collected monthly by project site: data, time visit, actual volume (m ³) (BG _{burnt,y} ;FVRG,h), Temperature biogas,(T ^o C) (this parameter), Pressure biogas (P amber), and was crosschecked with Collect data and Analysis spreadsheets (Mean, Standard Deviation, n, t-value, standard error, precision and relative precision) of sampling plan /16/, each per farm. 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 /24/. 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/ Measurement according with Operational Procedure POP-06. /41/
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 /34/ states the monitoring procedure and data regarding pressure and temperature are collected with the frequency determined in the sampling plan /16/, the one is in line with the sampling and survey framework /16/ /24/.
	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 and methodological tool /8/.
	10.Parameter:	FE (η_{flare,h})
	Description:	Enclosed Flare Efficiency
	Value:	80% (if all the conditions below are met).The values of the parameter can be found in the spread sheet calculation file /6/ and MR /5/.
	Used Equipment:	Enclosed Flare, is used in the entire project in addition a thermocouple
	Source of Data and Frequency:	<p>Every 1 minute measurement and registration by a CLP of flare temperature and biogas flow rate. Data is recovered monthly for Flare Efficiency hourly calculation.</p> <p>Enclosed flare (low height) is used in the entire project.</p> <p>Brascarbon registers the gas flow sent to the flares and</p>

		<p>the combustion temperature of the flares every minute.</p> <p>According to the methodology /7/ and Tool 6 /8/: the PP selected option A of tool 6 as follow:</p> <p><i>A 80% efficiency for a specific hour is considered if the following conditions are met for all minutes in that specific hours:</i></p> <p><i>(i) all temperature records are above or equal to 500o Celsius and</i></p> <p><i>(ii) the temperature of the flare (TEG,m) and the flow rate of the residual gas to the flare (FRG,m) are within the manufacturer's specification for the flare (SPECflare).</i></p> <p><i>(iii) The flame is detected in minute m (Flamem).</i></p> <p><i>Otherwise, a 0% efficiency for the specific hour is applied if at any minute the records of temperature measurement are below 500o Celsius or the flare is operating outside of the manufacturer's specification (SPECflare).</i></p> <p><i>This discount will be applied to the volume of that specific hour since it is a more conservative approach than to discount in the average of the flare efficiency percentage for any giving hour.</i></p> <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 monthly weighted average that takes into consideration the number of hours that the flare has operated in each different condition (80%, 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 first 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/ and the Tool 06 version 3 /8/. 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</p>

		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.
	Consistency Between the QA/QC established by the Project Participants in the PDD:	Q/A/QC included maintenance (replacement) procedures as described on the approved PDD, therefore there is consistency for the QA/QC procedures.
	Conclusion:	The overall conclusion is that PP correctly determined parameter "Flare Efficiency" on the basis of a reliable data collection system. Furthermore, the parameter measurement methods and calculation follow requirements set out in the methodology and tool /7/ /8/. Since the equipment is operated 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 and POP 09. 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, the audit team did verify no sludge application has taken place within the project boundaries.
	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.
	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/

		in the folder BEy ex-post – PEy ex-post, and MR /5/
	Used Equipment:	Not Applicable
	Source of Data and Frequency:	<p>The data collection is carried out quarterly by each project site owner 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 made following internal procedures of each farm and is not under the PP's control. Nevertheless the producers (project site owners), weight animals on a 100% basis since all animals arriving the farm are weighted in order to determine animal production variables, used for production purposes. More important, animals are weighted one again when sold, replaced or transferred. The animal weight data is collected on Brascarbon form 16.001 /33/ 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 (based on sampling following FAZENDAS ROSSETTO's internal procedure) and at full weight of the batch of pigs every time it leaves the farms farms (each batch stays around 5 to 6 months per farm).</p>
	Data Cross Checking:	<p>Reported data was verified by comparing different figures of calculation file /6/ and raw data on form 16.001 /33/, finding no differences between figures.</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}, Purchase records /28/ are provided as part of the support documents. <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>
	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 that the data collection is carried out quarterly per year by FAZENDAS ROSSETTO (following the association's internal procedures) to the PP are cross-checked against two different credible sources:</p> <ul style="list-style-type: none"> - reference figures from EMBRAPA (an undisputed Brazilian Agricultural Research Corporation nationally recognized for the these scope) for each category; and - the figures provided by FAZENDAS ROSSETTO when each

		<p>of the swine batches exits each farm (each batch stays around 5 to 6 months per farm), as explained below. Here FAZENDAS ROSSETTO provides with 100% of the animals weight (and number), allowing a full cross-check with the weight values provided and assuring all the information is accurate.</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 36 (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 21.0</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 spreadsheet 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:	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. 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/.
	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 21.0, 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 /25/.
	Data Cross Checking:	Information provided on PDD, Monitoring report and support documents /25/
	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 have been implemented in order to acquire an 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 Analyzer 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 periodical 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 /21/, calibration records of the gas analyzer /31/ the one is in line with methodology /7/. PP correctly designed and applied a sampling plan /16/, the one was developed by using the "Guidelines for sampling and survey" /24/ (the equation 38 paragraph 102 and 103),.
	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. these form 04.0001,contains the data collected monthly by project site: data, time visit, actual volume (m3) (BG _{burnt,y} ;FVRG,h), Temperature biogas,(T°C) Pressure biogas (P _{amber}) (this parameter), and was crosschecked with Collect data and Analysis spreadsheets (Mean, Standard Deviation, n, t-value, standard error, precision and relative precision) of sampling plan /16/, each per farm. 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/ and Measurement according with Operational Procedure POP-13 /39/.
	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 /27/. The frequency annually
Data Cross Checking:	Information provided by PP /27/ was crosschecked against support documentation provided /28/. There were no differences among reported information
Consistency Between the QA/QC defined in the Methodology:	Support letter confirms genetic source of each producer /28/ according to Operational Procedure POP-15 /27/. 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 /28/ 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 based on daily measurement and monthly aggregation
Data Cross Checking:	Information provided on MR /5/ was assessed thanks to 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 gaseous stream in the minute m
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 To the monitoring frequency This parameter and the parameter BG _{burnt,y} are the same.
	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 “ <i>Tool to determine project emissions from flaring gases containing methane</i> ” /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	QA/QC procedures follow mandatory requirements from applicable methodology.

	the 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:	<p>Regional Technician (Mr Luis Chieragato) 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 analyzer this information was verified audit remote by cross-checking figures reported and figures available on each project site in accordance with the Sampling Plan /16/.</p> <p>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 correctly designed and applied a sampling plan /16/ 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/ /24/. Monthly measured methane content ($W_{CH4, y}$) is taken as $fv_{CH4, RG, h}$ (average).</p> <p>This approach is considered to be accurate when calculating $PE_{flare, y}$ since the monthly monitored $W_{CH4, y}$ (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> <p>This parameter and the parameter $W_{CH4, y}$ are the same.</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	QA/QC activities were carried out as defined on PDD as well as approved monitoring plan and, as required by methodology /7/.

the PDD:	
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 version 2 /5/.
Used Equipment:	Not Applicable since the parameter is calculated.
Source of Data and Frequency:	The parameter is calculated on a monthly basis (Annually, based on daily records and monthly aggregation). 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.
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/. in the folder BEy ex-post – PEy ex-post. 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/. and the PP internal procedure POP 14 /17/, Form 02.001 /19/.

	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 based on daily measurement and monthly aggregation. Form 02.001/19/, Brascarbon Report System
	Data Cross Checking:	Data, procedures and figures verified crosschecking information provided on MR against information provided by relevant personal 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 Project Participants in the PDD:	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.
	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.
	24.Parameter:	ASH
	Description:	Ash content of the manure calculated as a 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	Not Applicable

	Project Participants in the PDD:	
	Conclusion:	The parameter is not used since PP makes use of the methodological option d) of paragraph 18 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 on flare in the minute m
	Value:	Figures reported on form 08.001 /23/ - this form present date, time (each minute), temperature, average value and minimum value by each site project.
	Used Equipment:	Enclosed flare
	Source of Data and Frequency:	Monitoring system Brascarbon - Once per minute.
	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 /18/ The audit team compared in form 01.001 of each site: files, date, time, temperatures, each minute registered.
	Consistency Between the QA/QC defined in the Methodology:	Calibration procedures and frequencies /29/ /30/ /31/ /36/ 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/) Nevertheless, the PDD10/1/ page 61 and the tool 6 indicate them in Measurement procedures (if any) that: Measure will be made using a fixed installation optical flame detector", however, the methodology tool 06 consider: "Measure using a fixed installation optical flame detector: Ultra Violet detector or Infra-Red or both",
	Conclusion:	The flame detection (YES or NO) is assured by following POP 08 as the verification team assessed data collected on form 08.001 /23/ and CER /6/, where it is possible to positively confirm, every minute, that the flame was detected (YES) in every minute of the monitoring period, through the indirect measure using the thermocouple. No minute without flame was detected (NO), Additionally, the PP, in a conservative approach, already does the discount of an entire hour if, in that hour, only one minute has registered a temperature below 500oC. Nevertheless, be applied one Action Request (FAR) indicates essential risks for further periodic verifications.
	26.Parameter:	AI_i
	Description:	Annual average interval between manure collection and delivery for treatment at a given storage device I
	Value:	Not Applicable During the site inspection (PP), it was confirmed that no changes in the manure management system occurred and all the manure was handled in the project facilities. Value is therefore 1.

	Used Equipment:	Not Applicable
	Source of Data and Frequency:	N/A -frequency: Annually, based on monthly records
	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 18 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 18 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 18 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 18 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. However the Form 02:001 and POP-22/40/ were found (Brascarbon Monitoring Report System).
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 30 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:	Source of Data Brascarbon Monitoring Report System (form 02.001) Frequency: Not Applicable
	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	<p>CL 5: Spreadsheets in CER MR08-BCA-BRA-15.xls: Comparison NLT, and y Comparison Wsite with named titles with dates in 2018, the valid title corresponds to 2020 /6/</p> <p>CAR 2 - associated to section E.5, parameters T_f - SITE INSPECTION - $N_{LT,y}$ - $N_{da,y}$ - $N_{p,y}$ - $BG_{burnt,y}$ - $WCH_{4,y}$ - T_{biogas} - $DCH_{4,y}$ - QDM - $ER_{y,ex-post}$ - FFR - P_{biogas} -</p>	

	<p><i>GENETIC SOURCE - MS%_{i,y} - FCH_{4,m} - FVRG_h - fVCH_{4,RG,h} - nd_y - VSLT_y - Q_{manure,j,LT,y} - SVS_{j,LT,y} - Flame_m - GE_{LT} - DE_{LT} - UE - ASH - ED_{LT} - EG_Y - EE_Y</i></p> <p>FAR 1 - The UNFCCC secretariat (13/07/2021), requests an explanation of the reasons why the parameter <i>Flame_m</i> is measured indirectly by thermocouple and is not measured by a fixed installation optical flame detector that is required.</p>
Conclusion	<p>PP corrected each one parameter with the correct name calculation spreadsheet, as well as updated titles spreadsheets on MR version 2 /5/ and CER version 2 /6/.</p> <p>The verification team could verify the completeness and integrity of the data used by the project proponents for the emission reductions calculations/6/. During the verification, ICONTEC confirmed that all parameters are correctly applied according to the monitoring plan stated in the registered PDD /1/ and the 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 21.0 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 version 2 /5/.</p> <p>FAR 1: the PP explained among other aspects that MR version 3 /5/, the thermocouple, as stated in the parameter Combustion temperature of the flare and also Flare Efficiency as minute-by-minute readings of the burning temperature inside the enclosed flare. Additionally, the station has an ignition system, which automatically, every 5 seconds, performs a spark if, by any case, the flare is out.</p> <p>The PP explain too: <i>"However, there could be situations where a record of "Combustion temperature of the flare" in a minute is below 500oC, for example because the flare was turned on and achieving a temperature of 500oC from the ambient temperature is not instantaneously. In order to secure that environmental integrity of the ERs being claimed, a conservative approach has been adopted where the flare efficiency for the an entire certain hour is assumed as zero if there is any minute-record of "Combustion temperature of the flare" below 500oC within this certain hour..."</i></p> <p><i>...Therefore, BRASCARBON understands that the methods and approaches applied to indirectly measure the parameter "Flame_m" do not decrease the accuracy of monitoring of this parameter and the approach applied to assume a flare efficiency equals to zero secures that the GHG emission reductions will not be over-estimated..."</i></p> <p>The audit team accept the response based on the above and a FAR (see page 94) is raised for analysis in an upcoming verification of this second accreditation period, alternatives will be recommended such as: including a revision of the monitoring plan or a possible deviation of the methodology.</p> <p>PP corrected each one parameter with the correct name calculation spreadsheet, items on spreadsheet, and form 02.001 therefore CL 5 and CAR 2 were closed</p>

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 /16/, where the PP, according to methodology AMS-III.D version 21.0 /7/, presented a sampling plan for the parameter WCH₄, PBiogas, TBiogas, “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 /16/. 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/ /24/, the procedure to collect data and the system to report and store data. The sampling plan /16/ 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” /24/.

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

Means of verification	<p>The audit team performed a desk review of all calibration certificates of the Biogas analyzer /31/, Flow meter /30/ and thermocouples /29/. ICONTEC assessed how calibration and calibration records covered the entire first monitoring period (From 18/06/2019 to 31/12/2020). The audit team verified the date of the calibration certificates provided by the PP for the monitoring equipment and crosschecked against installation certificates /26/. Calibration records are summarized as follows:</p> <p>Serials Thermocouple (PP-BCA-BRA-15):</p>
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Farm name	Site ID	Thermocouple Serial Number	Calibration Certification Number	Calibration Date	Installation Date	Expiration Date
Sítio Barreiro	BCA-221SP1-15	83909	CA-1568/19	05/03/19	21/04/19	20/04/20
		81320	CA-1664/20	07/01/20	12/04/20	11/04/21
Fazenda Bom Retiro	BCA-222SP1-15	83911	CA-1569/19	05/03/19	21/04/19	20/04/20
		81325	CA-1665/20	07/01/20	12/04/20	11/04/21
Granja Colorado	BCA-223SP1-15	83912	CA-1570/19	05/03/19	21/04/19	20/04/20
		81328	CA-1666/20	07/01/20	12/04/20	11/04/21
Sítio Água do Rosário	BCA-224SP1-15	83913	CA-1571/19	05/03/19	21/04/19	20/04/20
		81335	CA-1667/20	07/01/20	12/04/20	11/04/21
Sítio Mirante do Macuco	BCA-225SP1-15	83914	CA-1572/19	05/03/19	21/04/19	20/04/20
		81339	CA-1668/20	07/01/20	12/04/20	11/04/21
Sítio Rosa dos Ventos	BCA-227SP1-15	83915	CA-1573/19	05/03/19	21/04/19	20/04/20
		81341	CA-1669/20	07/01/20	12/04/20	11/04/21
Fazenda São Francisco	BCA-228SP1-15	83916	CA-1574/19	05/03/19	21/04/19	20/04/20
		81342	CA-1670/20	07/01/20	12/04/20	11/04/21

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 /29/ with the installation records /26/ assure correctness of the calibration activities regarding the monitoring equipment.

Flow Meter - Calibration Control (PP- Serials Flow Metter BCA-BRA-15):

Farm name	Site ID	Flow Meter Serial Number	Calibration Certification Number	Installation Calibration Date	Expiration Date
Sítio Barreiro	BCA-221SP1-15	C401353412A	EN 10204 - 2.1	08/05/18	07/05/20
				18/04/20	17/04/22
Fazenda Bom Retiro	BCA-222SP1-15	B601073412A	EN 10204 - 2.1	08/05/18	07/05/20
				18/04/20	17/04/22
Granja Colorado	BCA-223SP1-15	D700453412A	EN 10204 - 2.1	08/05/18	07/05/20
				18/04/20	17/04/22
Sítio Água do Rosário	BCA-224SP1-15	C401623412A	EN 10204 - 2.1	08/05/18	07/05/20
				18/04/20	17/04/22
Sítio Mirante do Macuco	BCA-225SP1-15	D700383412A	EN 10204 - 2.1	08/05/18	07/05/20
				18/04/20	17/04/22
Sítio Rosa dos Ventos	BCA-227SP1-15	D700523412A	EN 10204 - 2.1	08/05/18	07/05/20
				18/04/20	17/04/22
Fazenda São Francisco	BCA-228SP1-15	C401653412A	EN 10204 - 2.1	08/05/18	07/05/20
				18/04/20	17/04/22

The calibration of the monitoring equipment Flow Meter, Endress+Hauser thermal mass flow meter t-trend - ATT12. Accuracy class $\pm 5\%$ of factory full scale, was carried out by the Regional Technician, who was provided of appropriated training /32/ for calibration purposes as verified by the audit team. As part of the verification activities, the training records /32/ have been assessed.

Biogas Analyzer Calibration Control(PP- Serials Flow Metter BCA-BRA-15):

	Farm Name	Site ID	Biogas Analyser Serial Number	Calibration Certificate Number	Last Calibration Date	Expiration Date
	Sítio Barreiro	BCA-221SP1-15				
	Fazenda Bom Retiro	BCA-222SP1-15	BM 10259	BM10259_1/1550	10/04/19	9/09/19
	Granja Colorado	BCA-223SP1-15	BM 10259	BM10259_7/2580	8/08/19	7/02/20
	Sítio Água do Rosario	BCA-224SP1-15	BM 10259	BM10259_3/1350	5/02/20	4/08/20
	Sítio Mirante do Macuco	BCA-225SP1-15	BM 10259	BM10259_8/1510	1/08/20	28/01/21
	Santa Rosa dos Ventos	BCA-227SP1-15				
	Fazenda São Francisco	BCA-228SP1-15				
	<p>Calibration of the equipment Endress+Hauser thermal mass flow meter is performed by Regional Technician at each and every project site, following due training provided by the manufacturer of the equipment /32/. The audit team verified dates and certificates of calibration of the equipment by assessing calibration records, identified that no changes to monitoring equipment took place in the third 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 21.0 /7/ was chosen by the PP, paragraph 17(a). For this reason, equation (1) is the formulae used to determine the baseline emissions as follows: Where:</p> $BE_y = GWP_{CH_4} * D_{CH_4} * UF_b * \sum_{j,LT} MCF_j * B_{0,LT} * N_{LT,y} * VS_{LT,y} * MS\%_{BL,y}$ <p>Where:</p>
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	<p> BE_y Baseline emissions in year "y" (tCO₂e) GWP_{CH_4} Global Warming Potential (GWP) of CH₄ (25) D_{CH_4} CH₄ density (0.00067 t/m³ at room temperature (20 °C) and 1 atm pressure). LT Index for all types of livestock j Index for animal waste management system MCF_j Annual methane conversion factor (MCF) for the baseline animal waste management system "j" $B_{0,LT}$ Maximum methane producing potential of the volatile solid generated for animal type "LT" (m³ CH₄/kg dm) $N_{LT,y}$ Annual average number of animals of type "LT" in year "y" (numbers) $VS_{LT,y}$ Volatile solids for livestock "LT" entering the animal manure management system in year "y" (on a dry matter weight basis, kg dm/animal/year) $MS\%_{BI,j}$ Fraction of manure handled in baseline animal manure management system "j" UF_b Model correction factor to account for model uncertainties (0.94) </p> <p>On its turn, calculation of the parameter $VS_{LT,y}$ (part of equation 3), 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) $W_{default}$ Default average animal weight of a defined population, this data is sourced from IPCC 2006 (kg) $VS_{default}$ Default value for the volatile solid excretion rate per day on a dry-matter basis for a defined livestock population (kg dm/animal/day) 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 119,821 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 /20/, verified through on-site inspection • Data collected /18/ /20/ • Calibration records /29/ /30/ /31/ • Training records /32/ <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 raw 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</p>

correctly justified.

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 (6) as follows:</p> $PE_y = PE_{PL,y} + PE_{flare,y} + PE_{power,y} + PE_{transp,y} + PE_{storage,y}$ <p>Where:</p> <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: $PE_{PL,y} = 0.10 * GWP_{CH4} * D_{CH4} * \sum_{i,LT} B_{0,LT} * N_{LT,y} * VS_{LT,y} * MS\%_{i,y}$ <p>Where:</p> <ul style="list-style-type: none"> • $PE_{flare,y}$: Emissions from flaring or combustion of the gas stream in the year y (t CO₂e) • $PE_{power,y}$: CO₂ emissions due to the usage of fossil fuels or electricity for the operation of all the installed facilities in the year y (t CO₂e) <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 effluents 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>
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	$PE_{flare,y} = GWP_{CH_4} \times \sum_{m=1}^{525600} F_{CH_4, RG, m} \times (1 - \eta_{flare, m}) \times 10^{-3}$ <p>Where:</p> <p>$PE_{flare,y}$ = Project emissions from flaring of the residual gas in year y (tCO₂e)</p> <p>GWP_{CH_4} = Global warming potential of methane valid for the commitment period (tCO₂e/tCH₄)</p> <p>$F_{CH_4, RG, m}$ = Mass flow of methane in the residual gas in the minute m (kg)</p> <p>$\eta_{flare, m}$ = Flare efficiency in minute m</p> <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 third monitoring period are calculated to be 37,185 tCO₂.</p>
Findings	<p>CL 5 – on section E On MR section E. Calculation of emission reductions or net anthropogenic, the sum of each one parameter not corresponds with the data of CER Calculation MR08 – BCA-BRA-15.xls.</p> <p>Tables as follow:</p> <ul style="list-style-type: none"> • Table E1 – Baseline Emissions ($Be_{y, ex post}$) in the current monitoring period • Table E2 – Project Emissions ($Pe_{y, ex post}$) in the current monitoring period
Conclusion	<p>Once the revised MR version 2 /5/ and CER calculation spreadsheet version 2 /6/, were assessed by the audit team, it was verified the tables' values were corrected, therefore, the tables (E.4 and E.5) were also corrected, as well as the total amount of GHG emission reductions or GHG removals for this monitoring period.</p> <p>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.</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> <p>The CL 5 was closed.</p>

E.8.3. Calculation of leakage GHG emissions

Means of verification	<p>According to methodology AMS-III.D version 21.0 /7/ the methodological tool "Project and leakage emissions from anaerobic digesters" is mandatory in order to determine the leakage emissions of the proposed project activity. According to the tool /22/ leakage emissions are associated to storage and composting of manure.</p>
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	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>Where:</p> <p>$ER_{y,ex\ post}$ = Emission reductions achieved by the project activity based on monitored values for year y (t CO₂e)</p> <p>$BE_{y,ex\ post}$ = Baseline emissions calculated using equation 1 (for projects using option in paragraph 16(a)) using ex post monitored values of $N_{LT,y}$ and if applicable $VS_{LT,y}$. For projects using option in paragraph 16(b), the ex post monitored values for $Q_{manure,j,LT,y}$ and $SVS_{j,LT,y}$ are used</p> <p>$PE_{y,ex\ post}$ = Project emissions calculated using equation 5 using ex post monitored values of $N_{LT,y}$, $MS\%_{i,y}$, $MS\%_i$, AI_i, $Q_{res\ waste,y}$ and if applicable $VS_{LT,y}$</p> <p>MD_y = Methane captured and destroyed or used gainfully by the project activity in year y (t CO₂e)</p> <p>$PE_{power,y,ex\ post}$ = Emissions from the use of fossil fuel or electricity for the operation of the installed facilities based on monitored values in the year y (t CO₂e)</p> <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</p>
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	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/ /23/.
Findings	CL 5 - finding associated to section E.8.2
Conclusion	<p>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> <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 79,636 tCO₂e in the monitoring period from 18st of June 2019 to the 31st of December 2020 (Considering a total amount of methane destroyed as 104,044 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>

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 18st of June 2019 to the 31st of December 2020:</p> <table border="1"> <thead> <tr> <th>Figures estimated ex ante (registered PDD)</th><th>Figures calculated for the third monitoring period (from 1st of January 2020 to the 31st of December 2020), ex post</th></tr> </thead> <tbody> <tr> <td>82,325 tCO₂e</td><td>79,636 tCO₂e</td></tr> </tbody> </table> <p>The audit team assessed the figures of the MR version 2 /5/ against the registered PDD /1/. The PDD states the GHG emission reductions calculated ex ante are 82,325 tCO₂e in the ex-ante scenario, making the comparison adjusted to the actual baseline, the PP compared the GHG emission reduction of the proposed project activity; on the other hand, the amount achieved during this monitoring period (according to the Monitoring report version 3 the PP) indicates that is 79,636 tCO₂e. The PP explained by the fact that February had 29 days, hence the year had 366 days, therefore, PP changed the value(MR 8. version 3.Table E5) /5/.</p>	Figures estimated ex ante (registered PDD)	Figures calculated for the third monitoring period (from 1 st of January 2020 to the 31 st of December 2020), ex post	82,325 tCO ₂ e	79,636 tCO ₂ e
Figures estimated ex ante (registered PDD)	Figures calculated for the third monitoring period (from 1 st of January 2020 to the 31 st of December 2020), ex post				
82,325 tCO ₂ e	79,636 tCO ₂ e				
Findings	CAR 1- : Regarding applicable days by the project activity, the Amount of GHG emission reductions or net anthropogenic GHG removals achieved by project activity in this monitoring period and described on CER calculation spreadsheet.				
Conclusion	On Cover page MR version 1/4/ : indicated that "Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period" is achieved on 580 days; The auditor team identify that the duration of this monitoring period corresponded of 563 days (18/06/2019 to 31/12/2020 (first and last days included).				

	<p>Similarly, the Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD, the PP defined 580 days; The auditor team identify that the duration of this monitoring period corresponded of 563 days</p> <p>The verification team assessed MR version 03 finding correctness on cover letter regarding the applicable about the days by the project activity in this follow-up period, which is achieved in 563 days, and the “Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD” changed on CER and therefore on MR.</p> <p>GHG calculated ER are lower than the calculated ex-ante emission reduction, the audit team verified the decrease -4%. Figures of the ex-ante and ex-post scenario are correct and calculated in accordance with the requirements /7/ /8/ /24/. According to the PDD the estimated emission reductions figure is 82,325 tCO₂e.</p> <p>The decrease in GHG emission reductions compared to those calculated ex-antes are justified and are due to factors described in Section E.8.6.</p> <p>The PP corrected the monitoring report version 3 /5/ and the CAR 1 was closed</p>
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E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	<p>During the monitoring period, from 18st of June 2019 to the 31st of December 2020, 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>At the project sites, the pro-ageing of animal weight increased to 2%, increasing the amount of manure treated in the treatment system; on the other hand, there was an increase in the number of animals 7% (on average), however, there are differences between the ex ante emission reductions set out in the DDA and the emission reductions calculated ex post, the application of the FE Enclosed Flare Efficiency parameter , which changed the value according to version 21.0 /7/ and tool 06 version 3/8/ where the PP selected the tool option A, with 80% applied efficiency. where before, the value to be applied was 90% efficiency (see parameter 10, page 22 of the VCR).</p>
Findings	No findings were identified for this subject.
Conclusion	<p>The remarks on difference have been correctly justified by PP and crosschecked by ICONTEC. The project activity achieved 97% of the GHG emission reductions expected to be achieved. Differences are not significant an demonstrate de baseline scenario was correctly calculated when establishing the ex-ante scenario. On the matters of animal inventory changes, the decrease in the number and weight 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.</p>

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
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	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 third monitoring period and its procedures were in line with the specific requirements /9/ /10/ /11/ and methodological framework /7/ /8/. The reviewer reported on (05/05/2021) 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 (05/05/2021) 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-15, Brazil (Reference number 6411)" as well as the quantitative and qualitative information provided in the MR version 03 /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/ /16/. 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 first monitoring period (from 18st of June 2019 to the 31st of December 2020) 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-15, Brazil (Reference Number: 6411)
Reporting period:	18st of June 2019 to the 31st of December 2020
Baseline emissions:	119,821 tCO ₂ e (Total Methane destroyed: 104,044 tCO ₂ e)
Project emissions:	37,185 tCO ₂ e
Leakage:	0 tCO ₂ e
Emission Reductions:	79,636 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 /16/ 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 03 dated on 14/07/2021, 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., 15/07/2021

A handwritten signature in black ink, appearing to be 'J. Salazar', written over a vertical line.

Juan Sebastian Salazar
Technical director -ICONTEC

Appendix 1. Abbreviations

Abbreviations	Full texts
BRC	Brascarbon
CAR	Corrective Action Request
CDM	Clean Development Mechanism
Ers	Emission Reductions
CERs	Certified Emission Reductions
CL	Clarification request
CO ₂ e	Carbon dioxide equivalent
DOE	Designated Operational Entity
FAR	Forward Action Request
GHG	Green House Gas
ICONTEC	Colombian Institute of Technical Standards and Certification (Instituto Colombiano de Normas Técnicas y Certificación)
IPCC	Intergovernmental Panel on Climate Change
QA/QC	Quality Assurance/ Quality Control
MP	Monitoring Plan
MR	Monitoring Report
PDD	Project Design Document
PCL	Programmable Logic Control
PCP	CDM Project Cycle Procedure
POP	Operational Procedure
PP	Project Participants
PRC	Post Registration Changes
PS	CDM Project Standard
PSO	Project Site owner
GW _{PCH4}	Global Warming Potential of Methane
UNFCCC	United Nations Framework Convention on Climate Change
VVS	CDM validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers

ADRIANA MERCEDES BERMÚDEZ BEDOYA
CDM LEAD AUDITOR AND TECHNICAL EXPERT (SECTOR 13)

Profile

Leader Professional with broad experience in the agricultural and environmental sector, in both technical and administrative areas, with emphasis on Innovation and Quality, inspections and audits of norms in the certification of managerial processes, services and products, on oversight of compliance in the execution of publicly funded projects, on services related to consultancy, planning, managing and developing projects in the field of agricultural sustainability, agro-industrial

and environmental sustainability, production and commercialization of organic products, resource management and knowledge management.

Undergraduate	Veterinary Medicine/ Zootechnics, University of Caldas, Manizales, Colombia, 1992
Postgraduate	Master's Degree in Agroecology, University of Caldas, Manizales, Colombia, 2003 Specialization in Management, University Externado de Colombia, Bogotá, Colombia, 2014

Specialized Courses last 7 years

- Training on ISO 14025:2006 - Environmental labels and declarations - Environmental declarations type III - Principles and procedures /ISO 14026:2017 Environmental labels and declarations - Principles, requirements and guidelines for the communication of footprint information / ISO 14027:2017 - Environmental labels and declarations. Development of product category rules /ISO 14040:2006 - Environmental management - Life cycle assessment - Principles and framework /ISO 14044 - Environmental management - Life cycle assessment - Requirements and guidelines / ISO 14073 - Environmental management - Water footprint - Illustrative examples on how to apply ISO 14046 /ISO 14071:2014 Environmental management - Life cycle assessment - Critical review processes and reviewer competencies: Additional requirements and guidelines to ISO 14044:2006 / Certificadora Icontec Internacional Bogotá D.C: - September - October 2020.
- Online Course – Overview of the Risk Management standard NTC ISO 31000: 2011 (virtual 16 hours – 16 hours self-employment) Certification Icontec Internacional Bogota D.C: - August 26, 2019 – September 16, 2019.
- Certificate Of Training – FSPCA (Food Safety Controls Alliance), FSPCA PREVENTIVE CONTROL FOR HUMAN FOOD – given by IICA – Universidad Javeriana and TFFC approved by the FSPCA Alliance – the course has a certificate of attendance and approval as a “Qualified Individual in Preventive Food Controls for Humans ”Approach of the Food Safety Modernization Law (FSMA). BogotaD.C. February 19, 2019 to February 21, 2019. The certificate has an approval date of March 4, 2019.
- Internal Auditor Course – ISO 27001: 2013 – Information Security Management Systems (virtual 32 hours) Certifying SGS Colombia Bogotá D.C: - October 8, 2018 – November 5, 2018.
- Program of Leader Corpoica – EDIME (INALDE Bussines School Universidad de La Sabana) 60 hours Bogota D.C. – October 21 – December 2, 2015.
- Academic Mission: Beca Excelencia Académica -Curso Sobre Capital Intelectual Y Gestión Del Conocimiento – Universidad Externado De Colombia – Ica 2- Universidad Autónoma De Madrid - Madrid España 5 al 9 de september, 2016 moodle system september 12 – 18, 2016
- Academic Mission: PROGRAM “SILICON VALLEY – THE HEART OF THE HIGH-TECH WORLD IN THE 21 st CENTURY”, Universidad Externado de Colombia (Facultad de Administración de Empresas – Especialización en Gerencia) – IDATeam (IDA International Development Accelerator) San Francisco, California, EEUU, July 14 – 19, 2013.

Work Experience and Accomplishments

Organization ICONTEC – (DOE). Private – Environmental – Bogotá D.C. Position Lead Auditor (July 2019 – present).

Position: Lead auditor freelance of Clean Development Mechanism under the Kyoto Protocol, in validation and verification activities and technical expert in Agricultural and livestock issues (In Unit of Validation and Verification).

Lead Auditor and technical expert:

Verification “BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil” - 2021

Verification “BRASCARBON Methane Recovery Project BCA-BRA-08, Brazil” - 2021

Validation “BRASCARBON Methane Recovery Project BCA-BRA-13, Brazil” - 2020

Validation “BRASCARBON Methane Recovery Project BCA-BRA-13, Brazil” - 2020

Validation “BRASCARBON Methane Recovery Project BCA-BRA-15, Brazil” – 2020

Validation “BRASCARBON Methane Recovery Project BCA-BRA-09, Brazil” - 2020

Validation “BRASCARBON Methane Recovery Project BCA-BRA-04A, Brazil” – 2020

Organization Alexander von Humboldt Institute for Biological Research -Bogotá D.C. Consultant (January 2020 – December 2020)

Position: Consultant - Elaboration of the thematic and methodological contents of the document: “Guide of Productive Reconversion of agricultural activities in paramos”, to the productive systems of bovine milk and meat in wasteland ”

Organization SENA (Regional Coordination Group for Professional Training), Regional Directorate

Position Support for the Supervision and Auditing of agreements of the Strategy of Expansion of Coverage of the Regional Directorate (April, 2019 – December 2019)

Monitoring and comprehensive control of the derived agreements and framework agreements of the Expansion of Coverage program – both for the technical, administrative and legal components, as well as financial of the agreements. Systemic and comprehensive supervision

Organization GARSSA CONSULTING SAS. Audit and Oversight

Position Oversight Manager (August 2017 – January 2019)

Management and Coordination of Auditing of Public Projects (Leading work teams, which includes monitoring and control of agreements assigned to the Audit in the agricultural - Coordination of technical oversight team for over 20 projects co-financed by Ministries Commercial and Agricultural in subsectors such as animal husbandry, agroindustry, and environmental productive sector assigned by the firm - Support in Consulting services on Project Evaluation issues, as well as Training on related, audit, Supervision and Interventory topics – Planning, monitoring and evaluation of Technical Program – Technical support and orientation for oversight personnel

Organization AGROSAVIA (Colombian Agricultural Research Corporation)

Positio. Regional Innovation Coordinator (July 2015-June 2017)- Research Center Rionegro (Ant.)

-To promote the relations and articulation of actors of the SNCTA (National System of science agro-industrial technology), in regions and systems of innovation in the territories, - To promote networks in the centers among the actors of the system, in accordance with the guidelines of the corporation – To contribute to the implementation of the model of knowledge management in networks, updating of national Agenda of Research, technological Development and innovation - To incorporate innovation in terms of research, transfer and linkage activities of the corporation to be in the region “applied to measure”. Director in charge of the Research Center 1. Period from December 17, 2015 to January 8, 2016 2. Period from 18 July to 7 October 2016

Organization SENA (National Vocational Training Service), General Directorate Area of Innovation, Technology Development and Competitiveness

Position Group Leader Innovation and Technology Development (January 2012 – July 2015)
Support to the program coordinator for Innovation, Technology Development and Competitiveness in managing and designing SENA's agreements. – Support for the Supervision and Auditing - Review and quality check of legal advisors technical reports to the program coordinator. – Analyze information relevant for control and monitoring of contracting parties and follow-up on oversight mechanisms. Equally, support and advise the SENA on issues like technology corridors, innovation and technology development policies and roundtable on biotechnology and represent the organization in events related to those fields.

Position Support Group Coordinator Agreement Oversight (November 2011 – December 2012)

-Technical supervision of agreements by the group Innovation and Technology Development. – Coordination of technical and financial reports presented by the group's contractors. – Monitor agreements, elaborate status reports and issue corresponding recommendations. – Verify existing quality management systems and implementation of best practices in manufacturing, agriculture and environmental.

Organization Certificadora SGS Colombia SA Bogotá D.C.,

Position Tutor and Auditor, freelance (2007 – 2015) – Participation in product certification processes of quality standards in the agricultural and environmental sector. – Trainer and internal auditor for GlobalG.A.P., private sector associations and national regulations. – Elaboration of training material and conduct training in Audit Leadership and Internal Audits for private sector associations and public entities within the GlobalG.A.P and ICA (Colombian Institute of Agriculture) best practices framework.

Organization Universidad Nacional de Colombia – Centro de Investigación y Desarrollo (CID) de la Facultad de Ciencias Económicas Oversight Office for SENA Projects

Position Oversight Coordinator (July 2009 – July 2011) – Coordination of technical and financial oversight team for over 80 projects co-financed by the SENA in subsectors such as animal husbandry, agroindustry and mining. – Planning, monitoring and evaluation of Innovation Program. – Technical support and orientation for oversight personnel. – Representing the Office Director.

Organization Alcaldía de Bogotá (Office of the Mayor) Secretaria de Desarrollo Económico – Dirección de Desarrollo Económico Rural y Abastecimiento Alimentario (DERAA)

Position. Consultant (March 2007 – June 2009) – Development of policy guidelines and proposals for rural life in Bogotá, oriented towards sustainable production and valuation of environmental services within the implementation of the Public Policy on Rural Life and Food and Nutrition Security.- Support of grassroots organizations for the farmer's market platform, organic production, seed banks and conversion of production. Implementation of inter-agency agreements with District Secretaries of Environment and Health, the Alpina Foundation, Ministry of Agriculture, the Regional Environmental Authority of Cundinamarca (CAR), the National Institute of Food and Drug Surveillance and universities in areas such as green markets and organic production. – Technical advisory in sustainable practices for rural life in Bogotá and the Central Andean Region.

Organization Corporación Colombiana Internacional (CCI) Bogotá D.C.,

Position. Coordinator of Certification Unit (September 2005 – January 2007) – Management of the unit, accredited to certify organic products complying with national and international standards. – Advisory to the Ministry of Agriculture and Rural Development on elaboration of ecologic production standards. – Advisory to private sector animal husbandry on implementation of best practices, i.e. Pig Farmers Association's Guide on Best Practices, participant in the National Roundtable on Best Practices in Animal Husbandry of the Ministry. – Monitoring of companies, audits of over 60 projects, as well as training of inspectors and auditors working for animal production companies.

Position. Coordinator of Certification Program in the Area of Innovation and Quality (January 2005 August 2005) – Coordination tasks of the program that later became an independent business unit Certification Unit (see above).

Position Consultant Macro process Innovation and Quality (February 2004 – December 2005) – Field trips as auditor for the Certification of Ecological Products Program and diffusion of the program. – Elaboration of proposals for co-financing of activities related to the Macro process.

Organization Worker Cooperative of Environmental Professionals (PROAM) – Activities assigned by the Subdirector of Natural Resource Administration of the Regional Environmental Authority of Caldas (CORPOCALDAS) Manizales (Caldas)

Position. Project Coordinator Education and Participation of Citizens for the Protection of the Environment (February 2003 – December 2003) – Coordination and orientation of the project in accordance with legal guidelines contained in the National Policy on Environmental Education and based on the National Development Plan. – Lead technical advisory team. – Elaboration of proposals and management of the Technical Secretariat of the Department's Technical Interinstitutional Committee of Environmental Education. – Coordination of Community Environmental Promoters Project. – Advisory on land use planning in areas such as clean production, alternative agricultural production, agroecology in rural communities and agroindustries, and wildlife.

Organization. El Alcaravan Foundation – Association Cravo Norte (Occidental de Colombia: OXY Ecopetrol) – **Position** Coordinator Livestock (July 2002 – February 2003) – Coordination of technical staff in the Foundation's livestock projects and corresponding monitoring in municipalities of Saravena, Toledo, Arauquita and Arauca. – Coordination of activities of the farm owned by the Foundation and technical advisory on projects and the Foundation's users in the region. – Tutoring the veterinary medicine students that did their internship on the farm. – Establish and promote agroecological guidelines for the Foundation's lines of action in the rural sector.

Organization SENA, Regional Office Caldas -Manizales

Position. Teacher Area of Agriculture and Environment (April 2002 – May 2002) Teaching the course Captivity as part of the specialization program Technical Professional in Natural Resource Management.

Organization University of Caldas – Faculty of Agricultural Sciences – Degree Program Environmental Education. Manizales, Caldas

Position Teacher (April 2001 – March 2002) Teaching Environmental Resources Management I, planning and advisory on student's investigations.

Organization Empresa de Servicios Ambientales E.S.A. Ltda. Barranquilla, Atlántico

Position Support Professional Environmental Services (July 2000 – December 2000)

-Advisory on and elaboration of a document for environmental services and land use plans of riverside municipalities of the Magdalena River (Departments Atlántico, Bolívar and Cesar) and presentation of results to local authorities and contractors. – Elaboration of maps and documents related to the agricultural land use in the municipalities, both as diagnose and as an outlook (use, aptitude, conflicts, systems of production), using GIS and doing fieldtrips for data recollection, with emphasis environmental law.

Organization Alcaldía Municipal de Quinchía, Risaralda

Position Coordinator Land Use Plan (July 1998 – December 1999) – General coordination tasks in the elaboration of the municipal land use plan on accordance with the relevant legal framework.

Position. Director of UMATA – Unidad Municipal de Asistencia Técnica Agropecuaria (July 1993 January 1998) – As Director: Project Management, agricultural planning, project design and coordination of technical and state donational staff for the assistance to 500 small farmers in the municipality. – As Veterinary Zootechnician: Direct technical assistance in animal health and animal production (all relevant species) to livestock projects.

Position Veterinary Zootechnician, support professional (March 1993 – June 1993) – Livestock diagnosis and inventory and technical assistance (animal health and animal production).

Organization Las Malvinas Farm. – Marquetalia, Caldas

Position. Farm Manager (October 1992 – February 1993) – Administrative and technical tasks of general management, animal health and animal production (pure-blooded Brown Swiss and pigs in phases from breeding to fattening).

Publications

- Contribution of articles, technical notes and general information on Certified Ecological Production, Green Markets and Best Practices in Animal Husbandry to national newspapers, *Revista IFOAM* and national journals, i.e. *Carta Ganadera*, *Acovez*, *Fedegan* and on the CCI's website (2005 – 2007).
- “Guía de Buenas Prácticas Pecuarias para el Subsector Porcícola” (2005 – 2006); Co-author and Coordinator of the Agreement CCI – Asoporcicultores – FNP.
- “Protocolo de Buenas Prácticas Pecuarias” (2005); Co-author and tutor; Agreement CCI – Colciencias.
- “Guía para el Montaje de Sistemas de Control Interno dentro de un Sistema de Producción Ecológica” (2004), Co-author; Ministerio de Ambiente, Vivienda y Desarrollo Territorial, Grupo de Mercados Verdes – CCI, Subdirección de Innovación y Calidad; Bogotá.
- “Nuevas Especies de Bejucos ‘Mataganados’ en el Magdalena Medio” (Enero-Junio 2004); *Revista Veterinaria y Zootecnia de Caldas*, vol. 12, no. 1; Manizales.
- Articles on ecological stockbreeding in the journal of the *Comité de Ganaderos de Caldas* (Manizales) and the journal of *ANALAC (Sede Bogotá)*, from February to March 2003.
- Academic Module “Gestión Ambiental I” (2001); Co-author; Programa de Educación Ambiental de la Facultad de Ciencias Agropecuarias de la Universidad de Caldas; Manizales.
- “Alimentación Alternativa en Sistemas de Producción Piscícola en Fincas de Pequeños Productores” (1998-2000); Master's ☐ate .
- “Estudio del Complejo Mataganado en el Oriente Del Departamento de Caldas” (1992); Undergraduate ☐ate .

Coursework and Seminars, by subject (2007 – 2013)

Quality and Innovation

- Update: *ISO 19011:2011*; Centro de Capacitación SGS, Bogotá D.C.; February 2012.
- Training Workshop: *Módulo Base para Cultivos* and *Curso GRASP – Normativa GlobalG.A.P., versión 4*; Organized by FoodPLUS GmbH, GlobalG.A.P.; Hotel Ramada Herradura, San José de Costa Rica, Costa Rica; November 2010.
- Seminary: *Segundo Seminario Taller para la Industria Alimentaria Colombiana – INNOVAL 2010: Innovación en la Industria Alimentaria*; Alimentos, Axioma, LOGyCA; Bogotá D.C.; June/July 2010.
- Internal Training SGS: *International Food Standard (IFS)*, ☐ate do 5; Centro de Capacitación SGS, Bogotá D.C.; August 2008.
- Course: *Auditor Líder ISO 14001:2004*; Centro de Capacitación SGS, Bogotá D.C.; July 2008.
- Course: *Inspector Interno EUREPGAP*; Centro de Capacitación SGS, Bogotá D.C.; June 2007.

Competitiveness

- Course: *Competencias de la Empresa Porcícola Moderna*; Asociación Colombiana de Porcicultores – Fondo Nacional de la Porcicultura; Hotel Los Héroes, Bogotá D.C.; June 2008.

Fair Trade and Green Markets

- Forum: *Primer Foro Nacional e Internacional de Agricultura Ecológica*; Cámara de Comercio de Bogotá, Federorgánicos; Bogotá D.C.; May 2013.
- Forum: *Segundo Foro y Feria Regional de Comercio Justo*; Secretaría Distrital de Desarrollo Económico, Alcaldía Mayor de Bogotá; Centro de Convenciones Gonzalo Jiménez de Quesada, Bogotá D.C.; October 2007. (Participation in organizing team).

Rural Economic Development

- Course: *Elementos para la Formulación de un Plan de Desarrollo en Turismo Rural, con Participación Comunitaria*; IICA Colombia; Auditorio IICA, Bogotá D.C.; November 2007.

Oversight Action

- Seminary: *Seminario Internacional de Interventoría y Seguimiento de Proyectos Públicos “Control Eficiente con Compromiso Social”*; Centro de Investigaciones para el Desarrollo (CID), Facultad de Ciencias Económicas, Universidad Nacional de Colombia; Bogotá D.C.; August 2009.

Cleaner Production

- Seminary: *Seminario Internacional de Producción Más Limpia*; UNAD y Corporación Autónoma de Cundinamarca (CAR); Bogotá D.C.; October 2011.

Corporate Social Responsibility (CSR)

- Congress: *Tercer Congreso Pacto Global – Liderazgo en la Construcción de Desarrollo Sostenible*; Cámara de Comercio de Bogotá, Red Colombiana del Pacto Global; Bogotá D.C.; May 2013.

Food Security

- Seminary: *La Seguridad Alimentaria en Riesgo: La Perspectiva de las Ciudades*; Secretaría Distrital de Desarrollo Económico, Alcaldía Mayor de Bogotá; Bogotá D.C.; September 2008. (Participation in organizing team.)
- Exhibition (with academic agenda): *Segunda Feria de la Alimentación*; Secretaría Distrital de Desarrollo Económico, Alcaldía Mayor de Bogotá; Bogotá D.C.; October 2011. (Participation in organizing team.)

ANA ISABEL AUBAD LOPEZ**Technical reviewer in Sectoral Scope 13****MAIN PROFESSIONAL EDUCATION**

International Master (MSc.) “Material and Energy Flow Management”. Universidad Trier, Germany. Area of study in depth: “Use of solid waste for energy generation”. Master's thesis with the biogas company Kompogas. 2005

“ISO 14000 and ISO 9000 Quality Auditor”. Universidad de Antioquia in association with Bureau Veritas, Medellín, Colombia. 1999

“Environmental Engineer”. Escuela de Ingeniería de Antioquia, Envigado, Colombia. 1998

Internship - November 2009: company specialized in design, construction and operation of biogas plants: Chfour Biogas Inc. Ontario, Canada.

Internship- September 2008: company specialized in design, construction and operation of biogas plants: Agraferm Ag-Luxemburgo.

Internship- April-May 2007: companies specialized in design, construction and operation of biogas plants (Agraferm, Biogasnord, Ökobit). Germany.

Practical training – November 2004: “Local Administration of the Environment, Agenda 21 and sustainable development (2 phase)”. Life Academy, San José, Costa Rica.

Practical training – April-May 2002: “Local Administration of the Environment, Agenda 21 and sustainable development (1 phase)”. Life Academy, Karstad, Sweden.

Internship – July- August 1999: “Practical training on Environmental Management Systems and Cleaner Production”. Federal Swiss Institute for Research and Materials Testing (EMPA). St. Gallen, Switzerland.

PROFESSIONAL EXPERIENCE

- ICONTEC S.A. (2006–Today). External professional ISO 9001/14001/Chilean Technical Standards/Education/Climate Change (CDM, voluntary programs, carbon footprint)/Sustainable Development.
- Environmental engineer and project management company G.P.R. S.A., Chile. (2006–2011). Project Manager (main subjects: energy, biogas and waste management projects).
- Deuman S.A., Chile. (2007). Team work engineering for development and implementation of CDM – Kyoto Protocol projects.
- ISAGEN S.A. E.S.P, Colombia (2000–2006). Analysts of the national energy company.
- Fulda-Südwest“. Öko Institut (German Ecology Institute), Darmstadt-Germany. (July to September 2004). Co-realization of the feasibility study for the construction of an energy plant from the biomass potential of the region of Fulda.
- MVR Müllverwertung Rugenberger Damm GmbH & Co. KG, Hamburg-Germany. (December 2003 to February 2004). Environmental engineering (professional internship), waste incineration with co-generation plant.
- National Center of Cleaner Production and Environmental Technologies (CNPMLTA), Medellín-Colombia. (1999 – 2000). Environmental engineering.
- ISAGEN S.A. E.S.P, Colombia. (1997 – 1998). Professional practice, work team member responsible for designing the EMS based on ISO 14001.

EXPERIENCE IN CLIMATE CHANGE ACTIVITIES

Technical Reviewer:

- Validation of the Second Crediting Period for Providencia I: 1.8MW Small Hydro Power Generation Plant
- Verification of three periods for “Agua Fresca Multipurpose and Environmental Services Project”
- Validation of “Fuel Switching through change of furnaces at Imusa S.A.”
- Validation of “Pirgua Landfill Gas Recovery and Flaring”
- Validation of “Installation of a high-pressure/high-efficiency bagasse boiler to cogenerate heat and power”

- Validation of “Methane Gas Capture and Fuel Switching at Compañía Argentina de Levaduras S.A.I.C. Plant Project”
- Validation of “Cueva Maria Hydroelectric Expansion Project”
- Validation of “Montenegro Landfill Gas Recovery and Flaring”
- Validation of “La Vegona Hydroelectric project”
- Validation of “Chamalecón 280 Hydroelectric project”
- Validation of “Metaldom Fossil fuel switch from reheat furnace”
- Verification of five periods for “Doña Juana Landfill gas-to-energy project”
- Verification of “La Vuelta and la Herradura hydroelectric project”
- Validation “Pardos Small Hydro Plant and LOGICarbon CDM Project”
- Validation “Pequi and Sucupira SHPs and LOGICarbon CDM Project”
- Validation “Cambará and Embaúba SHPs and LOGICarbon CDM Project”
- Validation “Rio Bonito and Baitaca SHPs and LOGICarbon CDM Project”
- Verification of “Landfill Gas to Energy Facility at the Nejapa Landfill Site, El Salvador”
- Verification of “Co-composting of EFB and POME project”
- Verification of “Biogas Project, Olmeca III, Tecun Uman”
- Verification of “Los Algarrobos hydroelectric project”
- Verification of “La Venta II Project2
- Valitation of “Toachi – Pilaton Hydroelectric Project”
- Validation “EMGEA Small Hydropower (SHP) Run-of-the-River CDM Project Bundle”
- Validation “Marañon Hydroelectric Project”
- Verification “Los Algarrobos hydroelectric project”
- Verification “Bio energy in General Deheza –Electric power generation from peanut hull and sunflower husk-“
- Verification of VCS Scheme “Fuel-Switching Project from Fossil Fuels to Biomass in La Providencia, Arcor”
- Verification “BRASCARBON Methane Recovery Project BCA-BRA-02, Brazil”
- Verification “BRASCARBON Methane Recovery Project BCA-BRA-03, Brazil”
- Validation and Verification VCS “BRASCARBON Methane Recovery Project BCA-BRA-02, Brazil”
- Validation and Verification VCS “BRASCARBON Methane Recovery Project BCA-BRA-03, Brazil”
- Validation of “CTR Teresina landfill gas project”
- Validation of “CTR Maceio landfill gas project”
- Validation of “Santa Rita Hydroelectric Plant”
- Validation “Biogas Recovery And Heat Generation From Palm Oil Mill Effluent (Pome), Coopeagropal”
- Verification CDM “BK Energia Itacoatiara Project”
- Verification Gold Standard “BK Energia Itacoatiara Project”
- Validation Gold Standard “Cururos Wind Power Project-Chile” (Sustainability expert)
- Validation “Nuevo Mondoñedo Landfill Gas Recovery, Flaring and Energy Production”
- PRC and validation (new credit period) for: “BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil” and “BRASCARBON Methane Recovery Project BCA-BRA-08, Brazil”
- Verification of the 5th period and 1st period of the new credit period: Ciudad Juarez Landfill Gas to Energy Project
- Verification “DOÑA JUANA LANDFILL GAS-TO-ENERGY PROJECT” (Several periods)
- Post Registration Change BRASCARBON Methane Recovery Project BCA-BRA-08
- Post Registration Change BRASCARBON Methane Recovery Project BCA-BRA-05
- Renewal of Crediting Period BRASCARBON Methane Recovery Project BCA-BRA-08
- Renewal of Crediting Period BRASCARBON Methane Recovery Project BCA-BRA-05
- Verification BRASCARBON Methane Recovery Project BCA-BRA-14
- Verification BRASCARBON Methane Recovery Project BCA-BRA-13
- Verification Ciudad Juarez

- Verification BRASCARBON Methane Recovery Project BCA-BRA-04A, Brazil.
- Verification BRASCARBON Methane Recovery Project BCA-BRA-09, Brazil
- Verification BRASCARBON Methane Recovery Project BCA-BRA-15, Brazil
- Verification BRASCARBON Methane Recovery Project BCA-BRA-14
- Verification BRASCARBON Methane Recovery Project BCA-BRA-13
- Verification DOÑA JUANA LANDFILL GAS-TO-ENERGY PROJECT

Specialist (onsite visit) and Auditor:

- Verification of two periods “Biogas energy plant from palm oil mill effluent”
- Validation “Los Angeles Landfill Gas Flaring Project”
- Verification of two periods “Doña Juana Landfill gas-to-energy project”
- Verification “Landfill Gas to Energy Facility at the Nejapa Landfill Site, El Salvador”
- Verification “La Joya hydroelectric project”
- Verification “Hydroelectric Santa Ana”
- Verification “Biogas Project, Olmeca III, Tecún Uman”
- Displacement of the electricity of the national electric grid by the auto-generation of renewable energy in the Cañaveralejo Wastewater Treatment Plant in Cali, Colombia

Lead Auditor:

- Verification “BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil”
- Verification “BRASCARBON Methane Recovery Project BCA-BRA-07, Brazil”
- Verification “BRASCARBON Methane Recovery Project BCA-BRA-08, Brazil”
- Verification “BRASCARBON Methane Recovery Project BCA-BRA-04, Brazil”
- Verification “BRASCARBON Methane Recovery Project BCA-BRA-09, Brazil”
- Verification “BRASCARBON Methane Recovery Project BCA-BRA-15, Brazil”
- Verification “BRASCARBON Methane Recovery Project BCA-BRA-13, Brazil”, three verifications
- Verification “BRASCARBON Methane Recovery Project BCA-BRA-14, Brazil”, three verifications
- Validation “Biogas Project, Olmeca I, Santa Rosa”
- Verification “Co-composting of EFB and POME project”
- Validation “CTR Rosario Landfill Gas Project”
- Validation “CTR Feira de Santana Landfill Gas Project”
- Validation “SHP Itaguaçu CDM project (JUN 1146), Brazil”
- Verification “Doña Juana Landfill gas-to-energy project”, two periods
- Verification of two periods for “Biogas Project, Olmeca III, Tecún Uman”
- Verification “Methane recovery and effective use of power generation project Norte III-B Landfill”
- Introduction of the recovery and combustion of Methane in the existing sludge treatment system of the Cañaveralejo Wastewater Treatment Plant in Cali, Colombia (Post registration change PDD and three Verifications)
- Assessment Report for CDM proposed standardized baseline: “Standardized baseline for the sector of brick production in Colombia”. Client: Climate Change Division of the Ministry of Environment and Sustainable Development of Colombia.
- Post Registration Changes (PRC) for PDDs “BRASCARBON Methane Recovery Project BCA-BRA-04A, Brazil”, BRASCARBON Methane Recovery Project BCA-BRA-13, Brazil” and BRASCARBON Methane Recovery Project BCA-BRA-14, Brazil”
- Verification and Post Registration Change Ciudad Juarez Landfill Gas to Energy Project

Lead auditor in voluntary schemes:

- Validation and verification of VCS “BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil”
- Validation and verification of VCS “BRASCARBON Methane Recovery Project BCA-BRA-07, Brazil”

- Validation and verification of VCS “BRASCARBON Methane Recovery Project BCA-BRA-08, Brazil”
- Verification VCS of “Montañitas hydroelectric project”

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	BRASCARBON	Registered PDD version 10, dated on: 22/09/2020	https://cdm.unfccc.int/Projects/DB/RINA1339598748.57/view	UNFCCC website
2	ICONTEC	Validation Report issued by Icontec on 22/09/2020, version 3.	https://cdm.unfccc.int/Projects/DB/RINA1339598748.57/view	UNFCCC website
3	BRASCARBON ICONTEC	Monitoring report Seventh monitoring period of the first crediting period, version 01, dated on 25/09/2019 Verification report of the 2nd Monitoring Period version 1.1. Dated on 24/11/2019.	https://cdm.unfccc.int/Projects/DB/RINA1339598748.57/iProcess/ICONTEC1571253073.29/view	UNFCCC website
4	BRASCARBON	Monitoring report first monitoring period of the second crediting period. Submitted to UNFCCC, version 1, date: 12/01/2021 regarding the period from the 18st of June 2019 to the 31st of December 2020	https://cdm.unfccc.int/Projects/DB/RINA1339598748.57/view	UNFCCC website Project Participant
5	BRASCARBON	Monitoring report of the first Monitoring Period, version 02, date 09/04/2021 regarding the period from the 18st of June 2019 to the 31st of December 2020 Monitoring report of the first Monitoring Period, version 03, date 14/07/2021 regarding the period from the 18st of June 2019 to the 31st of December 2020	BCA-BRA-15 MR08_v2 tc.pdf BCA-BRA-15 MR08_v2 clean.pdf BCA-BRA-15 MR08_v3 clean.pdf BCA-BRA-15 MR08_v3 tc.pdf	Project Participant -PP
6	BRASCARBON	Emission Reductions Calculation file version 2 – date 09/04/2021 Emission Reductions Calculation file version 1 – date on 12/01/2021	CER Calculation MR08 - BCA-BRA-15_v2.xls CER Calculation MR08 - BCA-BRA-15.xls	Project Participant -PP
7	UNFCCC	Methodology: Methane recovery in animal manure management systems. AMS-III.D, version 21.0	https://cdm.unfccc.int/methodologies/SSCmetho	UNFCCC website

No.	Author	Title	References to the document	Provider
		File -EB96_repan09_AMS-III.Dv21.pdf	dologies/approved	
8	UNFCCC	Methodological tool (06) "Project emissions from flaring" (Version 03.0) File - am-tool-06-v3.0.pdf	https://cdm.unfccc.int/Reference/tools/index.html https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-06-v3.0.pdf/history view https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-06-v3.0.pdf	UNFCCC website
9	UNFCCC	CDM – E93-A04-STAN CDM project standard for project activities, version 02.0	https://cdm.unfccc.int/Reference/Standards/index.html	UNFCCC website
10	UNFCCC	CDM – EB93-A05-STAN CDM validation and verification standard for project activities version 02.0	https://cdm.unfccc.int/Reference/Standards/index.html	UNFCCC website
11	UNFCCC	CDM-EB93-A06-PROC CDM project cycle procedure for project activities, version 02.0	https://cdm.unfccc.int/Reference/Procedures/index.html#meth	UNFCCC website
12	UNFCCC	CDM-EB69-A06-GUID Guideline on the Application of Materiality in Verifications. Version 02.0	https://cdm.unfccc.int/Reference/Guidclarif/index.html	UNFCCC website
13	BRASCARBON	Operational Procedure: POP -08 – The flame detection is assured by following POP 08/13/ as the verification team assessed data collected on form 08.001. In addition the operation conditions of the equipment have been verified by PP	Describer	Project Participant -PP
14	Various	Technical and manufacturer specifications	<i>Equipment information through the websites (second sources information):</i> https://www.endress.com/en/field-instruments-overview/flow-measurement-product-overview/Product-Thermal-flowmeter-t-mass-65F http://www.landtecnica.com:for the portable biogas analyzer Landtec information https://issuu.com/alutal/docs/catalogo-tecnico	Project Participant -PP Others
15	UNFCCC	CDM-MR-FORM Monitoring Report form for CDM project activities –	https://cdm.unfccc.int/Reference/PDDs_Forms/i	UNFCCC website

No.	Author	Title	References to the document	Provider
		version 08.0	ndex.html https://cdm.unfccc.int/Reference/PDDs_Forms/index.html#sbs	
16	BRASCARBON	Sampling Plan	Sampling_Plan_BCA-BRA_15_MR08.xls	Project Participant -PP
17	BRASCARBON	Operational Procedure: POP-14 Formulated fee rations – Form 14.001	POP 14 - FORMULAÇÃO DE RAÇÃO rev1.pdf FORMULARIO 14.001 - BCA-BRA-15 - RAÇÃO - 2019.xlsx FORMULARIO 14.001 - BCA-BRA-15 - RAÇÃO - 2020.xlsx	Project Participant -PP
18	BRASCARBON	Form 01.001. Information with minute by minute temperature and biogas volume data stored in the PLC	BCA-221SP1-15 - Sítio Barreiro - 01-05-20 - TABELA DE DADOS.xls BCA-221SP1-15 - Sítio Barreiro - 01-08-20 - TABELA DE DADOS.xls BCA-221SP1-15 - Sítio Barreiro - 01-10-19 - TABELA DE DADOS.xls BCA-221SP1-15 - Sítio Barreiro - 02-03-20 - TABELA DE DADOS.xls BCA-221SP1-15 - Sítio Barreiro - 02-07-20 - TABELA DE DADOS.xls BCA-221SP1-15 - Sítio Barreiro - 02-08-19 - TABELA DE DADOS.xls BCA-221SP1-15 - Sítio Barreiro - 02-09-20 - TABELA DE DADOS.xls BCA-221SP1-15 - Sítio Barreiro - 02-11-20 - TABELA DE DADOS.xls BCA-221SP1-15 - Sítio Barreiro - 02-12-19 - TABELA DE DADOS.xls BCA-221SP1-15 - Sítio Barreiro - 03-02-20 - TABELA DE DADOS.xls BCA-221SP1-15 - Sítio Barreiro - 03-06-20 - TABELA DE DADOS.xls BCA-221SP1-15 - Sítio Barreiro - 03-07-19 - TABELA DE DADOS.xls BCA-221SP1-15 - Sítio Barreiro - 03-09-19 - TABELA DE DADOS.xls BCA-221SP1-15 - Sítio Barreiro - 03-10-20 - TABELA DE DADOS.xls	Project Participant -PP

No.	Author	Title	References to the document	Provider
			BCA-221SP1-15 - Sítio Barreiro - 03-11-19 - TABELA DE DADOS.xls BCA-221SP1-15 - Sítio Barreiro - 03-12-20 - TABELA DE DADOS.xls BCA-221SP1-15 - Sítio Barreiro - 04-01-20 - TABELA DE DADOS.xls BCA-221SP1-15 - Sítio Barreiro - 04-01-21 - TABELA DE DADOS.xls BCA-221SP1-15 - Sítio Barreiro - 04-04-20 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 01-05-20 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 01-08-20 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 01-10-19 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 02-03-20 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 02-07-20 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 02-08-19 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 02-09-20 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 02-11-20 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 02-12-19 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 03-02-20 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 03-06-20 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro -	

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			03-07-19 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 03-09-19 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 03-10-20 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 03-11-19 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 03-12-20 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 04-01-20 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 04-01-21 - TABELA DE DADOS.xls BCA-222SP1-15 - Fazenda Bom Retiro - 04-04-20 - TABELA DE DADOS.xls BCA-223SP1-15 - Granja Colorado - 01-05-20 - TABELA DE DADOS.xls BCA-223SP1-15 - Granja Colorado - 01-08-20 - TABELA DE DADOS.xls BCA-223SP1-15 - Granja Colorado - 01-10-19 - TABELA DE DADOS.xls BCA-223SP1-15 - Granja Colorado - 02-03-20 - TABELA DE DADOS.xls BCA-223SP1-15 - Granja Colorado - 02-07-20 - TABELA DE DADOS.xls BCA-223SP1-15 - Granja Colorado - 02-08-19 - TABELA DE DADOS.xls BCA-223SP1-15 - Granja Colorado - 02-09-20 - TABELA DE DADOS.xls BCA-223SP1-15 - Granja Colorado - 02-11-20 - TABELA DE	

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No.	Author	Title	References to the document	Provider
			<p>Mirante do Macuco - 01-05-20 - TABELA DE DADOS.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 01-08-20 - TABELA DE DADOS.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 01-10-19 - TABELA DE DADOS.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 02-03-20 - TABELA DE DADOS.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 02-07-20 - TABELA DE DADOS.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 02-08-19 - TABELA DE DADOS.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 02-09-20 - TABELA DE DADOS.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 02-11-20 - TABELA DE DADOS.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 02-12-19 - TABELA DE DADOS.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 03-02-20 - TABELA DE DADOS.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 03-06-20 - TABELA DE DADOS.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 03-07-19 - TABELA DE DADOS.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 03-09-19 - TABELA DE DADOS.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 03-10-20 - TABELA DE DADOS.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 03-11-19 - TABELA DE DADOS.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 03-</p>	

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			12-20 - TABELA DE DADOS.xls BCA-225SP1-15 - Sítio Mirante do Macuco - 04-01-20 - TABELA DE DADOS.xls BCA-225SP1-15 - Sítio Mirante do Macuco - 04-01-21 - TABELA DE DADOS.xls BCA-225SP1-15 - Sítio Mirante do Macuco - 04-04-20 - TABELA DE DADOS.xls BCA-227SP1-15 - Santa Rosa dos Ventos - 01-05-20 - TABELA DE DADOS.xls BCA-227SP1-15 - Santa Rosa dos Ventos - 01-08-20 - TABELA DE DADOS.xls BCA-227SP1-15 - Santa Rosa dos Ventos - 01-10-19 - TABELA DE DADOS.xls BCA-227SP1-15 - Santa Rosa dos Ventos - 02-03-20 - TABELA DE DADOS.xls BCA-227SP1-15 - Santa Rosa dos Ventos - 02-07-20 - TABELA DE DADOS.xls BCA-227SP1-15 - Santa Rosa dos Ventos - 02-08-19 - TABELA DE DADOS.xls BCA-227SP1-15 - Santa Rosa dos Ventos - 02-09-20 - TABELA DE DADOS.xls BCA-227SP1-15 - Santa Rosa dos Ventos - 02-11-20 - TABELA DE DADOS.xls BCA-227SP1-15 - Santa Rosa dos Ventos - 02-12-19 - TABELA DE DADOS.xls BCA-227SP1-15 - Santa Rosa dos Ventos - 03-02-20 - TABELA DE DADOS.xls BCA-227SP1-15 - Santa Rosa dos Ventos - 03-06-20 - TABELA DE DADOS.xls BCA-227SP1-15 - Santa Rosa dos Ventos - 03-07-19 - TABELA DE	

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19	BRASCARBON	Form 02.001: checklist for site inspection – forms updates	BCA-221SP1-15 - Sítio Barreiro - 31-12-19 - FORMULARIO 02.001.xls BCA-221SP1-15 - Sítio Barreiro - 31-12-20 - FORMULARIO 02.xls BCA-222SP1-15 - Fazenda Bom Retiro - 31-12-19 - FORMULARIO 02.001.xls BCA-222SP1-15 - Fazenda Bom Retiro - 31-12-20 - FORMULARIO 02.xls BCA-223SP1-15 -	Project Participant

No.	Author	Title	References to the document	Provider
		<p>POP 02 - Operational Procedure: POP – 2 INSPEÇÃO DA LOCALIDADE & MS% i,y</p>	<p>Granja Colorado - 31-12-19 - FORMULARIO 02.001.xls BCA-223SP1-15 - Granja Colorado - 31-12-20 - FORMULARIO 02.xls BCA-224SP1-15 - Sítio Água do Rosário - 31-12-19 - FORMULARIO 02.001.xls BCA-224SP1-15 - Sítio Água do Rosário - 31-12-20 - FORMULARIO 02.xls BCA-225SP1-15 - Sítio Mirante do Macuco - 31-12-19 - FORMULARIO 02.001.xls BCA-225SP1-15 - Sítio Mirante do Macuco - 31-12-20 - FORMULARIO 02.xls BCA-227SP1-15 - Santa Rosa dos Ventos - 31-12-19 - FORMULARIO 02.001.xls BCA-227SP1-15 - Santa Rosa dos Ventos - 31-12-20 - FORMULARIO 02.xls BCA-228SP1-15 - Fazenda São Francisco - 31-12-19 - FORMULARIO 02.001.xls BCA-228SP1-15 - Fazenda São Francisco - 31-12-20 - FORMULARIO 02.xls</p> <p>POP 2 - INSPEÇÃO DA LOCALIDADE rev2.pdf</p>	
20	BRASCARBON	Livestock inventory. Total number of animals, information collected on form 03.001 and 03.003 (the file name is Sistema de Controle de Animais, regarding each project site, nevertheless is the form 03.003)	<p>BCA-221SP1-15 - Sítio Barreiro - 30-12-19 - FORMULARIO 03.001.xls BCA-221SP1-15 - Sítio Barreiro - 30-12-20 - FORMULARIO 03.001.xls BCA-222SP1-15 - Fazenda Bom Retiro - 30-12-19 - FORMULARIO 03.001.xls BCA-222SP1-15 - Fazenda Bom Retiro -</p>	Project Participant

No.	Author	Title	References to the document	Provider
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		Sistema de Controle de Animais	BCA-053SP1-08 - Sítio Santa Cruz - 30-12-20 - ANIMAIS.xls BCA-054SP1-08 - Fazenda Esmeralda - 30-12-20 - Sistema de Animais.xls BCA-055SP1-08 - Fazenda São Carlos - 30-12-20 - Sistema de Cont. de Animais.xls BCA-056SP1-08 - Faz.	

No.	Author	Title	References to the document	Provider
			Sta Elisa - Site 1 - 30-12-20 - S. de C. de Animais.xls BCA-056SP2-08 - Faz. Sta Elisa - Site 2 - 30-12-20 - C. de Animais.xls BCA-078SP1-08 - Faz. São Jose Napoles - 30-12-20 - Cont. de Animais.xls BCA-079SP1-08 - Sitio Santo Antonio - Site 1 - 30-12-20 - Controle de Animais.xls BCA-079SP1-08 - Sitio Santo Antonio -Site 2 - 30-12-20 - ANIMAIS.xls	
21	BRASCARBON	Form 04.001. Information related to parameters biogas volume, WCH4, Pbiogas and Tbiogas -reports by farm	BCA-221SP1-15 - Sítio Barreiro - 02-12-19 - FORMULARIO 04.001.xls BCA-221SP1-15 - Sítio Barreiro - 03-06-20 - FORMULARIO 04.001.xls BCA-221SP1-15 - Sítio Barreiro - 03-12-20 - FORMULARIO 04.001.xls BCA-221SP1-15 - Sítio Barreiro - 04-01-21 - FORMULARIO 04.xls BCA-222SP1-15 - Fazenda Bom Retiro - 02-12-19 - FORMULARIO 04.001.xls BCA-222SP1-15 - Fazenda Bom Retiro - 03-06-20 - FORMULARIO 04.001.xls BCA-222SP1-15 - Fazenda Bom Retiro - 03-12-20 - FORMULARIO 04.001.xls BCA-222SP1-15 - Fazenda Bom Retiro - 04-01-21 - FORMULARIO 04.xls BCA-223SP1-15 - Granja Colorado - 02-12-19 - FORMULARIO 04.001.xls BCA-223SP1-15 - Granja Colorado - 03-06-20 - FORMULARIO	

No.	Author	Title	References to the document	Provider
			<p>04.001.xls BCA-223SP1-15 - Granja Colorado - 03- 12-20 - FORMULARIO 04.001.xls BCA-223SP1-15 - Granja Colorado - 04- 01-21 - FORMULARIO 04.xls</p> <p>BCA-224SP1-15 - Sítio Água do Rosário - 02- 12-19 - FORMULARIO 04.001.xls BCA-224SP1-15 - Sítio Água do Rosário - 03- 06-20 - FORMULARIO 04.001.xls BCA-224SP1-15 - Sítio Água do Rosário - 03- 12-20 - FORMULARIO 04.001.xls BCA-224SP1-15 - Sítio Água do Rosário - 04- 01-21 - FORMULARIO 04.001.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 02- 12-19 - FORMULARIO 04.001.xls BCA-225SP1-15 - Sítio Mirante do Macuco - 03- 06-20 - FORMULARIO 04.001.xls BCA-225SP1-15 - Sítio Mirante do Macuco - 03- 12-20 - FORMULARIO 04.001.xls BCA-225SP1-15 - Sítio Mirante do Macuco - 04- 01-21 - FORMULARIO 04.xls</p> <p>BCA-227SP1-15 - Santa Rosa dos Ventos - 02- 12-19 - FORMULARIO 04.001.xls BCA-227SP1-15 - Santa Rosa dos Ventos - 03- 06-20 - FORMULARIO 04.001.xls BCA-227SP1-15 - Santa Rosa dos Ventos - 03- 12-20 - FORMULARIO 04.001.xls BCA-227SP1-15 - Santa Rosa dos Ventos - 04- 01-21 - FORMULARIO 04.001.xls</p>	

No.	Author	Title	References to the document	Provider
			BCA-228SP1-15 - Fazenda São Francisco - 02-12-19- FORMULARIO 04.001.xls BCA-228SP1-15 - Fazenda São Francisco - 03-06-20- FORMULARIO 04.001.xls BCA-228SP1-15 - Fazenda São Francisco - 03-12-20- FORMULARIO 04.001.xls BCA-228SP1-15 - Fazenda São Francisco - 04-01-21- FORMULARIO 04.xls	
22	UNFCCC	Tool 14: Methodological tool: "Project and leakage emissions from anaerobic digesters" version 2 EB 96 annex 7	https://cdm.unfccc.int/Reference/tools/index.html https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-14-v2.pdf	UNFCCC website
23	UNFCCC	Form 08.001: flare temperature for all of the project sites	BCA-221SP1-15 - Formulario 08.001 - 01-2020.xlsx BCA-221SP1-15 - Formulario 08.001 - 02-2020.xlsx BCA-221SP1-15 - Formulario 08.001 - 03-2020.xlsx BCA-221SP1-15 - Formulario 08.001 - 04-2020.xlsx BCA-221SP1-15 - Formulario 08.001 - 05-2020.xlsx BCA-221SP1-15 - Formulario 08.001 - 06-2019.xlsx BCA-221SP1-15 - Formulario 08.001 - 06-2020.xlsx BCA-221SP1-15 - Formulario 08.001 - 07-2019.xlsx BCA-221SP1-15 - Formulario 08.001 - 07-2020.xlsx BCA-221SP1-15 - Formulario 08.001 - 08-2019.xlsx BCA-221SP1-15 - Formulario 08.001 - 08-	

No.	Author	Title	References to the document	Provider
			2020.xlsx BCA-221SP1-15 - Formulario 08.001 - 09- 2019.xlsx BCA-221SP1-15 - Formulario 08.001 - 09- 2020.xlsx BCA-221SP1-15 - Formulario 08.001 - 10- 2019.xlsx BCA-221SP1-15 - Formulario 08.001 - 10- 2020.xlsx BCA-221SP1-15 - Formulario 08.001 - 11- 2019.xlsx BCA-221SP1-15 - Formulario 08.001 - 11- 2020.xlsx BCA-221SP1-15 - Formulario 08.001 - 12- 2019.xlsx BCA-221SP1-15 - Formulario 08.001 - 12- 2020.xlsx BCA-222SP1-15 - Formulario 08.001 - 01- 2020.xlsx BCA-222SP1-15 - Formulario 08.001 - 02- 2020.xlsx BCA-222SP1-15 - Formulario 08.001 - 03- 2020.xlsx BCA-222SP1-15 - Formulario 08.001 - 04- 2020.xlsx BCA-222SP1-15 - Formulario 08.001 - 05- 2020.xlsx BCA-222SP1-15 - Formulario 08.001 - 06- 2019.xlsx BCA-222SP1-15 - Formulario 08.001 - 06- 2020.xlsx BCA-222SP1-15 - Formulario 08.001 - 07- 2019.xlsx BCA-222SP1-15 - Formulario 08.001 - 07- 2020.xlsx BCA-222SP1-15 - Formulario 08.001 - 08- 2019.xlsx BCA-222SP1-15 - Formulario 08.001 - 08- 2020.xlsx BCA-222SP1-15 - Formulario 08.001 - 09- 2019.xlsx	

No.	Author	Title	References to the document	Provider
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No.	Author	Title	References to the document	Provider
			<p>Formulario 08.001 - 10-2019.xlsx</p> <p>BCA-223SP1-15 - Formulario 08.001 - 10-2020.xlsx</p> <p>BCA-223SP1-15 - Formulario 08.001 - 11-2019.xlsx</p> <p>BCA-223SP1-15 - Formulario 08.001 - 11-2020.xlsx</p> <p>BCA-223SP1-15 - Formulario 08.001 - 12-2019.xlsx</p> <p>BCA-223SP1-15 - Formulario 08.001 - 12-2020.xlsx</p> <p>BCA-224SP1-15 - Formulario 08.001 - 01-2020.xlsx</p> <p>BCA-224SP1-15 - Formulario 08.001 - 02-2020.xlsx</p> <p>BCA-224SP1-15 - Formulario 08.001 - 03-2020.xlsx</p> <p>BCA-224SP1-15 - Formulario 08.001 - 04-2020.xlsx</p> <p>BCA-224SP1-15 - Formulario 08.001 - 05-2020.xlsx</p> <p>BCA-224SP1-15 - Formulario 08.001 - 06-2019.xlsx</p> <p>BCA-224SP1-15 - Formulario 08.001 - 06-2020.xlsx</p> <p>BCA-224SP1-15 - Formulario 08.001 - 07-2019.xlsx</p> <p>BCA-224SP1-15 - Formulario 08.001 - 07-2020.xlsx</p> <p>BCA-224SP1-15 - Formulario 08.001 - 08-2019.xlsx</p> <p>BCA-224SP1-15 - Formulario 08.001 - 08-2020.xlsx</p> <p>BCA-224SP1-15 - Formulario 08.001 - 09-2019.xlsx</p> <p>BCA-224SP1-15 - Formulario 08.001 - 09-2020.xlsx</p> <p>BCA-224SP1-15 - Formulario 08.001 - 10-2019.xlsx</p> <p>BCA-224SP1-15 - Formulario 08.001 - 10-</p>	

No.	Author	Title	References to the document	Provider
			2020.xlsx BCA-224SP1-15 - Formulario 08.001 - 11- 2019.xlsx BCA-224SP1-15 - Formulario 08.001 - 11- 2020.xlsx BCA-224SP1-15 - Formulario 08.001 - 12- 2019.xlsx BCA-224SP1-15 - Formulario 08.001 - 12- 2020.xlsx BCA-225SP1-15 - Formulario 08.001 - 01- 2020.xlsx BCA-225SP1-15 - Formulario 08.001 - 02- 2020.xlsx BCA-225SP1-15 - Formulario 08.001 - 03- 2020.xlsx BCA-225SP1-15 - Formulario 08.001 - 04- 2020.xlsx BCA-225SP1-15 - Formulario 08.001 - 05- 2020.xlsx BCA-225SP1-15 - Formulario 08.001 - 06- 2019.xlsx BCA-225SP1-15 - Formulario 08.001 - 06- 2020.xlsx BCA-225SP1-15 - Formulario 08.001 - 07- 2019.xlsx BCA-225SP1-15 - Formulario 08.001 - 07- 2020.xlsx BCA-225SP1-15 - Formulario 08.001 - 08- 2019.xlsx BCA-225SP1-15 - Formulario 08.001 - 08- 2020.xlsx BCA-225SP1-15 - Formulario 08.001 - 09- 2019.xlsx BCA-225SP1-15 - Formulario 08.001 - 09- 2020.xlsx BCA-225SP1-15 - Formulario 08.001 - 10- 2019.xlsx BCA-225SP1-15 - Formulario 08.001 - 10- 2020.xlsx BCA-225SP1-15 - Formulario 08.001 - 11- 2019.xlsx	

No.	Author	Title	References to the document	Provider
			BCA-225SP1-15 - Formulario 08.001 - 11- 2020.xlsx BCA-225SP1-15 - Formulario 08.001 - 12- 2019.xlsx BCA-225SP1-15 - Formulario 08.001 - 12- 2020.xlsx BCA-227SP1-15 - Formulario 08.001 - 01- 2020.xlsx BCA-227SP1-15 - Formulario 08.001 - 02- 2020.xlsx BCA-227SP1-15 - Formulario 08.001 - 03- 2020.xlsx BCA-227SP1-15 - Formulario 08.001 - 04- 2020.xlsx BCA-227SP1-15 - Formulario 08.001 - 05- 2020.xlsx BCA-227SP1-15 - Formulario 08.001 - 06- 2019.xlsx BCA-227SP1-15 - Formulario 08.001 - 06- 2020.xlsx BCA-227SP1-15 - Formulario 08.001 - 07- 2019.xlsx BCA-227SP1-15 - Formulario 08.001 - 07- 2020.xlsx BCA-227SP1-15 - Formulario 08.001 - 08- 2019.xlsx BCA-227SP1-15 - Formulario 08.001 - 08- 2020.xlsx BCA-227SP1-15 - Formulario 08.001 - 09- 2019.xlsx BCA-227SP1-15 - Formulario 08.001 - 09- 2020.xlsx BCA-227SP1-15 - Formulario 08.001 - 10- 2019.xlsx BCA-227SP1-15 - Formulario 08.001 - 10- 2020.xlsx BCA-227SP1-15 - Formulario 08.001 - 11- 2019.xlsx BCA-227SP1-15 - Formulario 08.001 - 11- 2020.xlsx BCA-227SP1-15 -	

No.	Author	Title	References to the document	Provider
			Formulario 08.001 - 12-2019.xlsx BCA-227SP1-15 - Formulario 08.001 - 12-2020.xlsx BCA-228SP1-15 - Formulario 08.001 - 01-2020.xlsx BCA-228SP1-15 - Formulario 08.001 - 02-2020.xlsx BCA-228SP1-15 - Formulario 08.001 - 03-2020.xlsx BCA-228SP1-15 - Formulario 08.001 - 04-2020.xlsx BCA-228SP1-15 - Formulario 08.001 - 05-2020.xlsx BCA-228SP1-15 - Formulario 08.001 - 06-2019.xlsx BCA-228SP1-15 - Formulario 08.001 - 06-2020.xlsx BCA-228SP1-15 - Formulario 08.001 - 07-2019.xlsx BCA-228SP1-15 - Formulario 08.001 - 07-2020.xlsx BCA-228SP1-15 - Formulario 08.001 - 08-2019.xlsx BCA-228SP1-15 - Formulario 08.001 - 08-2020.xlsx BCA-228SP1-15 - Formulario 08.001 - 09-2019.xlsx BCA-228SP1-15 - Formulario 08.001 - 09-2020.xlsx BCA-228SP1-15 - Formulario 08.001 - 10-2019.xlsx BCA-228SP1-15 - Formulario 08.001 - 10-2020.xlsx BCA-228SP1-15 - Formulario 08.001 - 11-2019.xlsx BCA-228SP1-15 - Formulario 08.001 - 11-2020.xlsx BCA-228SP1-15 - Formulario 08.001 - 12-2019.xlsx BCA-228SP1-15 - Formulario 08.001 - 12-	

No.	Author	Title	References to the document	Provider
			2020.xlsx	
24	UNFCCC	CDM-EB67-A06-GUID Guideline for Sampling and Surveys for CDM Project Activities and Programmes of Activities. Version 04 CDM. EB50- A 30 STAN Standard Sampling and surveys for CDM project activities and programmes of activities. Version 09.0	https://cdm.unfccc.int/Reference/Guidclarif/index.html https://cdm.unfccc.int/Reference/Standards/index.html	UNFCCC website
25	BRASCARBON	Formulated feed ration	Ração.PDF	Others Project Participant
26	BRASCARBON	Installation records	Formulario Instalação Calibração Vazão 2018 2020.PDF Formulario Instalação Calibração Vazão 2020 2022.pdf Formulario Instalação Termopar 2019 2020.pdf Formulario Instalação Termopar 2020 2021.pdf	Project Participant
27	BRASCARBON	POP Operational Procedure-15 Form 15.001 (Genetic source)	POP 15 - MONITORAMENTO DA GENÉTICA.pdf FORMULARIO 15.001 - BCA-BRA-15 - GENÉTICA - 2019.xlsx FORMULARIO 15.001 - BCA-BRA-15 - GENÉTICA - 2020.xlsx	Project Participant
28	AGROCERES FAZENDAS ROSSETTO	Purchase record provided by PP	Genetica.PDF	Others
29	ALUTAL	Calibration records of the thermocouples (installation records are described on reference 26) Certificado Thermocouple 2019 - 2020 Certificado Thermocouple 2020 – 2021 Files Termopar 2019 - 2020 Files Termopar 2020 - 2021	Declaracao ALUTAL - Termopar.jpg BCA-221SP1-15 - Medidor de Temperatura Serie 83909 e Certificado CA- 1568 19.pdf BCA-222SP1-15 - Medidor de Temperatura Serie 83911 e Certificado CA- 1569 19.pdf BCA-223SP1-15 -	Others

No.	Author	Title	References to the document	Provider
			<p>Medidor de Temperatura Serie 83912 e Certificado CA-1570 19.pdf BCA-224SP1-15 - Medidor de Temperatura Serie 83913 e Certificado CA-1571 19.pdf BCA-224SP1-15 - Medidor de Temperatura Serie 83914 e Certificado CA-1572 19.pdf BCA-227SP1-15 - Medidor de Temperatura Serie 83915 e Certificado CA-1573 19.pdf BCA-228SP1-15 - Medidor de Temperatura Serie 83916 e Certificado CA-1574 19.pdf</p> <p>BCA-221SP1-15 - Medidor de Temperatura Serie 81320 e Certificado CA 1664 20.pdf BCA-222SP1-15 - Medidor de Temperatura Serie 81325 e Certificado CA 1665 20.pdf BCA-223SP1-15 - Medidor de Temperatura Serie 81328 e Certificado CA 1666 20.pdf BCA-224SP1-15 - Medidor de Temperatura Serie 81335 e Certificado CA 1667 20.pdf BCA-225SP1-15 - Medidor de Temperatura Serie 81339 e Certificado CA 1668 20.pdf BCA-227SP1-15 - Medidor de Temperatura Serie 81341 e Certificado CA 1669 20.pdf BCA-228SP1-15 - Medidor de Temperatura Serie 81342 e Certificado CA 1670 20.pdf</p>	
30	Endress+Hause r	Calibration records of the Flow		Others

No.	Author	Title	References to the document	Provider
		Meter Formulario Instalacao o Calibraçao Certificado Flow Meter 2018-2020 Certificado Flow Meter 2020- 2022	<p>2018-2020:</p> <p>BCA-221SP1-15 - Sitio Barreiro - Medidor Vazao.pdf</p> <p>BCA-222SP1-15 - Fazenda Bom Retiro - Medidor Vazao.pdf</p> <p>BCA-223SP1-15 - Granja Colorado - Medidor Vazao.pdf</p> <p>BCA-224SP1-15 - Sitio Agua do Rosario - Medidor Vazao.pdf</p> <p>BCA-225SP1-15 - Sitio Mirante do Macuco - Medidor Vazao.pdf</p> <p>BCA-227SP1-15 - Santa Rosa dos Ventos - Medidor Vazao.pdf</p> <p>BCA-228SP1-15 - Fazenda Sao Francisco - Medidor Vazao.pdf</p> <p>2020-2022:</p> <p>BCA-221SP1-15 - Sitio Barreiro - Medidor de Vazão 1.PDF</p> <p>BCA-221SP1-15 - Sitio Barreiro - Medidor Vazao.pdf</p> <p>BCA-222SP1-15 - Fazenda Bom Retiro - Medidor Vazao.pdf</p> <p>BCA-223SP1-15 - Granja Colorado - Medidor Vazao.pdf</p> <p>BCA-224SP1-15 - Sitio Agua do Rosario - Medidor Vazao.pdf</p> <p>BCA-225SP1-15 - Sitio Mirante do Macuco - Medidor Vazao.pdf</p> <p>BCA-227SP1-15 - Santa Rosa dos Ventos - Medidor de Vazão 1.PDF</p> <p>BCA-227SP1-15 - Santa Rosa dos Ventos - Medidor Vazao.pdf</p> <p>BCA-228SP1-15 - Fazenda Sao Francisco - Medidor Vazao.pdf</p> <p>BCA-228SP1-15 - Fazenda SÒo Francisco - Medidor de Vazão 1.PDF</p>	
31	LANDTEC	Calibration records of the gas Analyzer	<p>BM</p> <p>10259_01082020.pdf</p> <p>BM</p>	Others

No.	Author	Title	References to the document	Provider
			10259_05022020.pdf BM 10259_08082019.pdf BM 10259_10042019.pdf	
32	BRASCARBON	Training records referring training for calibration and installation of the flow meter, issued by Endress+Hauser Controle e Automação LTDA.	Certificado Treinamento Brascarbon.pdf	Project Participant
33	BRASCARBON	Form 16.001: where each animal category is monitored during the year, according to the operational procedure POP 16 – Animal Weight Monitoring.	FORMULARIO 16 001 - BCA-BRA 15 - 2019.xls FORMULARIO 16 001 - BCA-BRA 15 - 2020.xls	Project Participant
34	BRASCARBON	Operational Procedure 07	POP 7 - CALCULO DA DENSIDADE O METANO rev6.pdf	Project Participant
35	UNFCCC	EB 66 Report Annex 47- Methodological Tool 11: "Assessment of the validity of the original/current baseline and to update the baseline at the renewal of a crediting period" (version 03.0.1)	https://cdm.unfccc.int/Reference/tools/index.html	UNFCCC website
36	BRASCARBON	Photografics Registers panoramic of each site project and calibration equipment 2021. <i>Fotos 3 PDD 15.xls</i>	<i>Site Visit Evidences UN6411 - BCA-BRA-15.docx</i> BCA-228S1-15 - Fazenda São Francisco - Vazao Totalizada. BCA-228S1-15 - Fazenda São Francisco - Numero Medidor de Vazao BCA-228S1-15 - Fazenda são Francisco - Numero Certificado Termopar BCA-228S1-15 - Fazenda São Francisco - Temperatura Flare BCA-222SP1-15 - Fazenda Bom Retiro - Medidor de vazao BCA-222SP1-15 - Fazenda Bom Retiro - Vazao Totalizada BCA-222SP1-15 - Fazenda Bom Retiro - Etiqueta Termopar BCA-222SP1-15 - Fazenda Bom Retiro - Temperatura Flare BCA-228S1-15 - Fazenda são Francisco - Chama Interna Flare	Project Participant
37	BRASCARBON	POP 12- Maintenance Form 12.001 - MANUTENÇÃO PREVENTIVA DA LOCALIDADE -	POP 12 - MANUTENÇÃO GERAL BCA-221SP1-15 - Sítio Barreiro - 31-12-19 -	Project Participant

No.	Author	Title	References to the document	Provider
		VERIFICAÇÕES MENSAIS	<p>TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls</p> <p>BCA-221SP1-15 - Sítio Barreiro - 31-12-20 - TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls</p> <p>BCA-222SP1-15 - Fazenda Bom Retiro - 31-12-19 - TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls</p> <p>BCA-222SP1-15 - Fazenda Bom Retiro - 31-12-20 - TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls</p> <p>BCA-223SP1-15- Granja Colorado - 31-12-19 - TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls</p> <p>BCA-223SP1-15- Granja Colorado - 31-12-20 - TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls</p> <p>BCA-224SP1-15 - Sítio Água do Rosário - 31-12-19 - TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls</p> <p>BCA-224SP1-15 - Sítio Água do Rosário - 31-12-20 - TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 31-12-19 - TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls</p> <p>BCA-225SP1-15 - Sítio Mirante do Macuco - 31-12-20 - TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls</p> <p>BCA-227SP1-15 - Santa Rosa dos Ventos - 31-12-19 - TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls</p> <p>BCA-227SP1-15 - Santa Rosa dos Ventos - 31-12-20 - TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls</p> <p>BCA-228SP1-15 - Fazenda São Francisco - 31-12-19 - TABELA</p>	

No.	Author	Title	References to the document	Provider
			DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls BCA-228SP1-15 - Fazenda São Francisco - 31-12-20 - TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls	
38	BRASCARBON	Operational Procedure 09	POP 9 - REMOÇÃO DO LODO DO BIODIGESTOR.pdf	Project Participan t
39	BRASCARBON	Operational Procedure 13	POP 13 - OBTENÇÃO DA PRESSÃO DO BIOGÁS rev2.pdf	Project Participan t
40	BRASCARBON	Operational Procedure 22	POP 22 - CONSUMO DE ENERGIA ELÉTRICA.pdf	Project Participan t
41	BRASCARBON	Operational Procedure 06	POP 06 - OBTENÇÃO DA TEMPERATURA DO BIOGÁS - TBIOGÁS	Project Participan t

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.	N/A	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.	E.3	Date: 07/04/2021
Description of CL				
Cover page MR:				
The version number of the PDD applicable to this monitoring report is version 10, not version 6 as described by PP.				
Please adjust it on cover page				
Project participant response				Date: 09/04/2021
Revised version 02 of the MR is dully corrected.				
Documentation provided by project participant				

MR version 02				
<table border="1"> <tr> <td>DOE assessment</td> <td>Date: 19/04/2021</td> </tr> <tr> <td colspan="2">The verification team assessed MR version 02 The PDD version was corrected on the cover page of the report, therefore, the finding is closed.</td> </tr> </table>	DOE assessment	Date: 19/04/2021	The verification team assessed MR version 02 The PDD version was corrected on the cover page of the report, therefore, the finding is closed.	
DOE assessment	Date: 19/04/2021			
The verification team assessed MR version 02 The PDD version was corrected on the cover page of the report, therefore, the finding is closed.				

CL ID	2	Section no.	E.3	Date: 07/04/2021
Description of CL				
<p>On MR - Table A.1. – Detailed physical location and identification of project site (on page 3), the Farm/site named Fazenda Colorado, it was not found.</p> <p>The other hand, on section C. Description of monitoring system in the parameter Wsite (on page 13- MR), is mentioned the association (Cooperativa Agropecuária São Gabriel do Oeste) that no correspond to the project.</p> <p>Please adjust the MR</p>				
Project participant response				Date: 09/04/2021
<i>Revised version 02 of the MR is dully corrected.</i>				
Documentation provided by project participant				
MR version 02				
DOE assessment				Date: 19/04/2021
<p>The audit team reviewed the MR version 2:</p> <p>On Table A.1 Detailed physical location and identification of project site of the MR was corrected by PP. The audit team assessed section A, finding information stated the Farm/site named as Fazenda Colorado.</p> <p>On section C. Description of monitoring system in the parameter Wsite was corrected.</p> <p>Therefore, the finding is closed.</p>				

CL ID	3	Section no.	E.6.2	Date : 07/04/2021
Description of CL				

MR. D.2 Data and parameters monitored:

The Parameter FE – Enclosed Flare Efficiency – on page 33 /MR, the item referred to Calculation method, the description the order of the bullets did not was assigned as is it on described in PDD version 10 and on page 12 of the MR.

Please, adjust it.

Project participant response	Date : 09/04/2021
<i>Revised version 02 of the MR is dully corrected</i>	
Documentation provided by project participant	
MR version 02	
DOE assessment	Date : 19/04/2021
Once the audit team evaluated the revised MR version 2, it was identified that the PP corrected the parameter on the Calculation method item.	
The find was closed.	

CL ID	4	Section no.	E.5	Date : 07/04/2021
Description of CL				
In MR Section E. Calculation of emission reductions or net anthropogenic removals:				
<p>- E.1. Calculation of baseline emissions or baseline net removals: The equation 1: BE_y Baseline emissions in year y (t CO₂e), is not in accordance with AMS-III.D version 21.0; missing in the summation sign the correspondent sub-index(j,LT). Please to clarify in MR document. /MR/ page 55.</p> <p>- E.2 Calculation of project emissions or actual net removals The equation 3: the parameter $PE_{transp,y}$ Emissions from incremental transportation in the year “y” (tCO₂e), as per relevant paragraph in AMS-III.F; it is not accordance with AMS-III.D version 21.0 /MR/ on page 56.</p> <p>-The equation 4: $PE_{PL,y}$ Emissions due to physical leakage of biogas in year “y” (t CO₂e), is not in accordance with AMS-III.D version 21.0; missing in the summation sign the correspondent sub-index. Please to clarify in document. /MR/ on page 57.</p> <p>- E.4. Calculation of emission reductions or net anthropogenic removals. Equation 6.1 (page 60) and Parameter ERY_{ex-post} - Ex-post emission reductions achieved by the project activity based on monitored values for the year “y”. the data Calculation method (on pages 38), the description equation ERY_{ex-post} it is not accordance with AMS-III.D version 21.0 (equation 10).</p>				
Project participant response				Date : 09/04/2021
<i>Revised version 02 of the MR is dully corrected.</i>				

Documentation provided by project participant	
MR version 02	
DOE assessment	Date : 19/04/2021
The audit team reviewed the MR version 2 and verified that were corrected the equations, throughout the document especially on section E.	
The finding was closed.	

CL ID	5	Section no.	E.6.2	Date: 07/04/2021
Description of CL				
The Calculation spreadsheets on CER MR08 - BCA-BRA-15.xls: Comparison NLT,y and Comparison Wsite have named titles as "Average in the monitoring period (1st of January 2018 to 31st December 2018)"				
Please, review and adjust the titles				
Project participant response				Date: 09/04/2021
Revised version 02 of the CER Calculation spreadsheet is dully corrected.				
Documentation provided by project participant				
CER calculation spreadsheet v2				
DOE assessment				Date: 19/04/2021
The verification team assessed the CER Calculation Spreadsheet version 02, was corrected the spreadsheets named Comparison NLT,y and Comparison Wsite, therefore, the finding is closed.				

Table 3. CAR from this verification

CAR ID	01	Section no.	E.8.5	Date : 07/04/2021
Description of CAR				
<p>On Cover page MR: The Monitoring Report version 1 indicated that "Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period" is achieved on 580 days; The auditor team identify that the duration of this monitoring period corresponded of 563 days (18/06/2019 to 31/12/2020 (first and last days included)).</p> <p>Similarly, the Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD, the PP defined 580 days; The auditor team identify that the duration of this monitoring period corresponded of 563 days.</p> <p>In this case, the number of days will also change the Amount of GHG emission reductions or net anthropogenic GHG removals achieved by project activity in this monitoring period and described on CER calculation spreadsheet.</p> <p>PP is requested to clarify the actual days applicable, and to correct throughout the Monitoring Report (cover page, tables, and section D.3.b. Collected data, page 54), as well as, the reported values the amount of GHG emission reductions on CER calculation spreadsheet.</p>				
Project participant response				Date : 09/04/2021

<i>Revised version 02 of the Monitoring Report and CER Calculation spreadsheet were dully corrected.</i>	
Documentation provided by project participant	
MR version 02 and CER calculation spreadsheet v2	
DOE assessment	Date : 19/04/2021
<p>The verification team assessed MR version 02 finding correctness on cover letter regarding the applicable about the days by the project activity in this follow-up period, which is achieved in 563 days, and the "Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD" changed on CER and therefore on MR.</p> <p>The finding is closed.</p>	

CAR ID	02	Section no.	E.5	Date : 07/04/2021
Description of CAR				
<p>On section D. Data and parameters is not fully in line with the Registered PDD version 10:</p> <p>The following parameters should be supplemented:</p> <p>D.1 Data and parameters fixed ex ante, on page 19, 24 /MR: $MCF_j - MS\%_{BI,j} - GWP_{CH_4} - UF_b$</p> <p>D.2 Data and parameters to monitored, on page 25- 53 /MR:</p> <p>T_f - SITE INSPECTION - $N_{LT,y} - N_{da,y} - N_{p,y} - BG_{burnt,y} - W_{CH_4,y} - T_{biogas} - D_{CH_4,y} - QDM - ER_{y,ex-post} - FFR - P_{biogas} - GENETIC SOURCE - MS\%_{i,y} - FCH_{4,m} - FVR_{G,h} - fv_{CH_4,RG,h} - nd_y - VSL_{T,y} - Q_{manure,j,LT,y} - SVS_{j,LT,y} - Flame_m$</p> <p>The following parameters are described different of the described in the PDD version 10, on page 49 - 52/ MR:</p> <p>$GE_{LT} - DE_{LT} - UE - ASH - ED_{LT} - EG_Y - EE_Y$</p> <p>Please review and adjust on the Monitoring Report each one parameter on MR version 1 Vs. the registered PDD. Please adjust it throughout the document.</p>				
Project participant response				Date : 09/04/2021
<i>Revised version 02 of the MR is dully corrected.</i>				
Documentation provided by project participant				
MR version 02				
DOE assessment				Date : 19/04/2021
<p>Once the revised MR version 2, were assessed by the audit team, it was verified the parameters' that were corrected, throughout on MR according to PDD version 10.</p> <p>The finding was closed.</p>				

Table 4. FAR from this verification

FAR ID	01	Section No.	E.6.2	Date: 14/07/2021
Description of FAR				
<p>The UNFCCC secretariat (13/07/2021), requests an explanation of the reasons why the parameter The flame is detected in minute m ($Flame_m$), is measured indirectly by thermocouple and is not measured by a fixed installation optical flame detector that is required.</p> <p>According with paragraph 361(a) of VVS-PA relative to "...registered monitoring plan has been properly implemented and followed by the project participants...". The PP is requested to explain the reasons why the Flamem parameter was measured by thermocouple.</p>				
Project participant response				Date: 14/07/2021
<p><i>Revised version 03 of the MR explained it (page 54):</i></p> <p><i>"...Due to the project design of the flare, it is unfeasible and unviable to install an optical UV or IR equipment hence the compliance with this parameter is accomplished through an indirect measurement, using the flare temperature minute by minute readings through the system's thermocouple readings which are available in real time in the station CLP as well as I all the CLP records which were used to calculate other parameters in this Monitoring Report. These thermocouples are also used to determine the parameters "Combustion temperature of the flare" and also "Flare Efficiency".</i></p> <p><i>Additionally, the station has an ignition system that automatically ignites a spark every 5 seconds, assuring that any flow of gas sent to the flares will be continuously burnt.</i></p> <p><i>However, there could be situations where a record of "Combustion temperature of the flare" in a minute is below 500oC, for example because the flare was turned on and achieving a temperature of 500oC from the ambient temperature is not instantaneously. In order to secure that environmental integrity of the ERs being claimed, a conservative approach has been adopted where the flare efficiency for the an entire certain hour is assumed as zero if there is any minute-record of "Combustion temperature of the flare" below 500oC within this certain hour.</i></p> <p><i>Therefore, BRASCARBON understands that the methods and approaches applied to indirectly measure the parameter "Flame,m" do not decrease the accuracy of monitoring of this parameter and the approach applied to assume a flare efficiency equals to zero secures that the GHG emission reductions will not be over-estimated..."</i></p>				
Documentation provided by project participant				
MR version 03				
DOE assessment				Date: 15/07/2021

Once the revised MR version 3, were assessed by the audit team, it was verified the parameter that was answered, throughout additional comment on MR according to PDD version 10 and according with the of version 03 of the tool Project emissions from flaring, in its step 2 – Determination of flare efficiency, for determining the efficiency of combustion of enclosed flares there is the option to apply a default value or determine the efficiency based on monitored data. The operational procedure POP 8 – Flare efficiency was developed to monitor and calculate the flare efficiency.

Even though, the parameter $Flame_m$ the PDD/10/page 61 and the tool 6 indicate them in *Measurement procedures (if any)* that:

“Measure will be made using a fixed installation optical flame detector”, and the methodology tool 06 consider: “Measure using a fixed installation optical flame detector: Ultra Violet detector or Infra-Red or both”, the most appropriate equipment for the measurement of the $Flame_m$ parameter for Brascarbon projects is fixed by Thermocouple, as well as, the PP explains it.

The audit team confirm the parameter $Flame_m$ is fully complied with each one of the items requires QA/QC procedures such as:

- Check the records in the generated documents. records on the regular maintenance of the Flare according to the appropriate industry standards and / or the manufacturer's specifications in order to ensure measurement accuracy meet the results required for this parameter,
- Equipment shall be maintained and calibrated in accordance with manufacturer's recommendations; the PP explained that they considers “that the parameter flame m is measured through a minute-by-minute assessment using the system's thermocouple readings which are available in real time, in the station CLP as well as I all the CLP records which were used to calculate other parameters in this Monitoring Report. Due to the project design of the flare, this parameter is accomplished through an indirect measurement
- Others parameters associated to **Flare efficiency** such as: The flare efficiency for the minute m ($\eta_{flare,m}$) The temperature of the flare ($TEG.m$), and specification for the flare ($SPEC_{flare}$), they are accomplish with monitoring plan project.
- In addition the POP-08 Monitoring Operating Procedure was developed to calculate the flame and is implemented by Brascarbon.

Although there is an inconsistency between the monitoring plan and the monitoring system verified in the project, the project designed and the fact that it is an enclosed flare, does not allow the installation of an equipment as the one requested (optical UV and/or IR sensor). Additionally, this system together with the applied approach (efficiency equal to zero if any giving record in any giving minute for any giving site is less than 500oC) ensure that the information recorded by the PP is accurate and conservative and does answer to the parameter request of flame detection in the minute m (YES or NO), indirectly by the assessment of the minute-by-minute thermocouple records.

Finally, ICONTEC accepts the response based on the above and a FAR is raised for analysis in an upcoming verification of this second accreditation period, alternatives will be recommended such as: including a revision of the monitoring plan or a possible deviation of the methodology.