BRASCARBON METHANE RECOVERY PROJECT BCA-BRA-16

Document Prepared by Colombian Institute for Technical Standards and Certification – ICONTEC International

Martha Corredor

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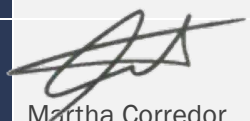
Contact	Carrera. 37 #52-95, Bogotá D.C. Telephone (57)-601-6078888 IP 1382 Email- mcorredor@icontec.org Website - https://www.icontec.org
Approved By	 Martha Corredor Validation and Verification Manager
Work Carried Out By	Adriana M Bermudez (TL & verifier) Erika Urrego (TR)

Summary:

- A description of the project

  The objective´s project is to mitigate and recover animal effluent related Greenhouse Gas (GHG) by improving the Animal Waste Management System practices in the confined animal (Swine) feed operations in the different cities located at the Mato Grosso do Sul state, central Brazil, developed by BRASCARBON.

  The project is categorized as Project Less than or equal to 300,000 tonnes of CO2e per year, using the VCS Standard_v.4.3.

  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 Project Activity consists in the construction of a new covered in-ground anaerobic reactor (digester) that will utilize the organic material currently treated in the wastewater opened lagoon, of the confined animal operations to produce biogas. All manure will be sent daily directly to digester not exceeding 24 hours in the barns.

  The expected result of this project is a significant reduction of GHG emissions compared to those emissions that would have occurred in the absence of the project and also promotion of sustainable swine production farms, bringing environmental and social benefits, moving from a high-GHG animal waste management system practice to anaerobic digester with capture and combustion of resulting biogas. The project proponent estimates 55,356 tCO2e / year and 383,706 tCO2e over the first 7 years crediting period will be reduced from the baseline scenario as a result of the installation of the project activity.

  The starting date of the crediting period is: 02/01/2021 until 01/01/2028 (seven years period twice renewable for a total of 21 years, VCS Standard v.4.3 section 3.8.1.)

- A description of the validation and verification

  Brascarbon Consultoria, Projetos e Representação Ltda commissioned ICONTEC International to perform the validation and verification assessment of the first monitoring period (02/01/2021 to 31/01/2022 (first and last days included) of the proposed project activity “BRASCARBON Methane Recovery Project BCA-BRA-16, Brazil (Reference Number VCS: 2998), on the basis the scope of the VCS Program that include of UNFCCC criteria contained in Article 12 of the Kyoto Protocol, the approved CDM methodology AMS-III.D. "Methane recovery in animal manure management systems" (version 21.0) is applied to quantify the GHG removals achieved in this project.

This project BCA-BRA-16, Brazil (Reference Number VCS: 2998) is being developed in conjunction with the validation and 1st periodic of verification.

- The purpose and scope of validation and verification

  The purpose of the validation and verification assessment was to have an independent third-party assessment of the proposed the beginning of first crediting period form 02/01/2021 until 01/01/2028. the validation involves the assessment of: project conformance to VCS standards/programs, project conformance to the applied methodology.

  The validation In order to confirm that the project activity, as documented, is sound reasonable and meets the identified criteria, the validation involves the assessment of: project conformance to VCS standards/programs, project conformance to the applied methodology, including the procedure for the demonstration of additionality specified in the methodology; and likelihood that methods a procedures set out in the project description will generate verifiable GHG data and information when implemented and consisted of the following phases: i) a desk review of the project design and the baseline and monitoring plan; ii) On site – inspection to 9 sites of project iii) the resolution of outstanding issues and the issuance of the final validation report and opinion. The Validation is part of the VCS project cycle and will finally result in a conclusion by the executing VVB whether a project activity is valid to be submitted for registration to VCS registry.

  The verification scope encompassed by the audit team is defined an independent and objective assessment of the GHG emission reductions that have occurred as a result of the implementation of the project activity during a defined monitoring period. The verification process consisted of the following four phases: I. Desk review of the monitoring documentation, validation report and relevant information II. Telephonic interviews with project personnel responsible of the operation and monitoring of the proposed project activity. III. On Site Inspection. IV..Resolution of outstanding issues and the issuance of the final verification and report previously technical review.

  In the course of the validation and verification process 13 findings were raised, all of the successfully closed.

- The method and criteria used for validation and verification

  Validation and Verification is conducted using ICONTEC uses a risk-based approach to focus and determine the detailed scope of the verification.

  The key risks and materiality assessment associated with the compliance of the project implementation with the registered project design document, compliance of the monitoring plan with the monitoring methodology including applicable tools, compliance of monitoring activities with the registered monitoring plan, compliance with the calibration frequency requirements for measuring instruments, assessment of data and calculation of emission reductions and post registration changes are elements that are critical for meeting the verification criteria for achieving real, measurable, long- term as well as additional GHG reductions in CDM and Voluntary markets (as VCS inter alia if apply).

The verification criteria Consider the regulatory documents of the carbon standard to be evaluated, primary and secondary information sources and information relevant for executing the project, the procedures in line with the requirements specified in the latest version of the VCS Validation and Verification Manual and applying auditing techniques.

The validation/verification team assessed the project activity's compliance against the VCS Guide Version 4.2, the selected CDM methodology and the joint project description and monitoring report. The project is eligible under Project Scope 13. The validation/verification criteria followed the guidance documents provided by VCS included the following:

VCS Standard v4.3, since it involves methane avoidance. Also, it is in conformity with point 4 as well since it applies a methodology approved under an approved GHG program (CDM). VCS Program Guide Version 4.2 and the applied CDM methodology "Methane recovery in animal manure management systems" (version 21.0). The following tools were also used: Methodological Tool: "Project and leakage emissions from anaerobic digesters" (version 02) Methodological Tool: "Project emissions from flaring" (version 04)

- The number of findings raised during validation and verification

  In the course of the validation and verification, 1 Corrective Action Requests (CARs), 12 Clarification Requests (CLs) were raised and successfully closed. The assessment is included in the report.

- Any uncertainties associated with the validation and verification

  There are no restrictions of uncertainty for both validation and verification.

- Summary of the validation and verification conclusions

  Brascarbon. has commissioned the ICONTEC International to carry out the Verified Carbon Standard (VCS) validation joint with 1st periodical verification of the project, " Brascarbon Methane Recovery Project BCA-BRA-16 " (VCS ID 2998) with regard to the relevant requirements of VCS standard Version 4.3. CTI confirms all validation and verification activities including objectives, scope and riteria, level of assurance, project description, monitoring and monitoring report adhere to VCS Version 4.1 and all associated updated as documented in this report, are complete.

  ICONTEC concludes that the project activity " Brascarbon Methane Recovery Project BCA-BRA-16 " in Brazil, as described in the Joint-Project-Description-Monitoring-Report version 4.1 of BCA- BRA _16v6 of 13-October-2022, and Joint-Project-Description-Monitoring-Report version 4.1 of BCA- BRA _16v7 of 17-February-2023 meets all relevant requirements for VCS validation and verification activity and correctly applied the methodology AMS-III.D. Version 21.0. Hence ICONTEC is able to provide positive validation opinion as per the requirement of VCS and further certify that the GHG emission reduction from the project during the monitoring period from 02-January-2021 to 31-January-2022 amount to 55,246 tCO2e VCUs.

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1 INTRODUCTION

1.1 Objective

Brascarbon Consultoria, Projetos e Representação Ltda commissioned ICONTEC International to perform the validation and verification assessment to carry out the Verified Carbon Standard (VCS) validation joint with 1st periodical verification of the first monitoring period (02/01/2021 to 01/31/2022 (first and last days included of the proposed project activity "BRASCARBON Methane Recovery Project BCA-BRA-16, Brazil (Reference Number VCS: 2998)

The purpose of the validation and verification assessment was to have an independent third-party assessment of the proposed the beginning of first crediting period form 02/01/2021 until 31/01/2028. The validation was performed by the audit team on the basis all defined criteria set for the registration under the VCS hat include of UNFCCC criteria for the Clean Development Mechanism.

The validation involves the assessment of: project conformance to VCS standards/programs, project conformance to the applied methodology, including the procedure for the demonstration of additionality specified in the methodology; and likelihood that methods a procedure set out in the project description will generate verifiable GHG data and information when implemented and consisted of the following phases: a desk review of the project design and the baseline and monitoring plan. The Validation is part of the VCS project cycle and will finally result in a conclusion by the executing VVB whether a project activity is valid to be submitted for registration to VCS registry.

The verification scope encompassed by the audit team is defined an independent and objective assessment of the GHG emission reductions that have occurred as a result of the implementation of the project activity during a defined monitoring period.

The validation and verification process consisted of the following four phases I. Desk review of monitoring documentation, validation report and relevant information; ii. Telephone interviews with project personnel responsible for the operation and monitoring of the proposed project activity. III.) On-site inspection at 9 project sites located in the state of Mato Grosso (Brazil). IV.) Resolution of outstanding issues and issuance of final verification report and pre-technical review.

The validation & verification process consisted of the following three phases: I. Desk review of the monitoring documentation, validation report and relevant information; ii) information II). Telephonic interviews with project personnel responsible of the operation and monitoring of the proposed project activity. III) On site – inspection to 9 sites of project. III. Resolution of

outstanding issues and the issuance of the final verification and report previously technical review.

1.2 Scope and Criteria

The scope of the validation is defined as an independent and objective review of the Description & Monitoring Report VCS: Brascarbon Methane Recovery Project BCA- BRA-16_v3 /1/: the baseline of the proposed project activity and the monitoring plan and other relevant documents presented further in appendix 3 of this validation & verification report. The information in these documents was assessed against VCS Validation and Verification Standard, Kyoto Protocol Requirements, UNFCCC rules and the applicable methodology. The validation team, based on the specific instructions in the VVS, employed a risk- based and step-wise approach when conducting the validation, focusing on the identification of significant risks for project implementation and the calculation of the emission reductions.

The project activity examined under this validation on site of the process involves the GHG emission reductions through an animal waste management system. The system was put in place as a mean to treat animal waste generated from swine confined feed operations. Effluents generated from swine production are treated in biodigesters which, on its turn, consists of a covered in-ground anaerobic reactor capable of anaerobically treat effluent originated at the swine production operation. Finally, effluents treated on biodigesters produce biogas to be destroyed through a flaring system. The validation for registration to VCS registry included an assessment on those specific features of the project activity.

The verification scope encompassed by the audit team is defined an independent and objective assessment of the GHG emission reductions.

The validation and verification process consisted of the following four phases:

I. Desk review of the monitoring documentation, registered PD-MR, and relevant information

II. On-site visit to 9 farms (total project sites): visit to each of the farms identified by numbers 300 to 308, tour of all sites, confirmation of georeferencing, identification of control equipment, flare, biodigester status and recorded field information.

III. Interviews with the director, manager and project staff responsible for the operation and monitoring of the proposed project activity.

IV. 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 Project Description & Monitoring report form version 4.1 –Brascarbon Methane Recovery Project BCA-BRA-16_v5 /1/.

The review of the monitoring documentation, 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 D&MR (version 4) /1/. Lastly, the emission reductions were correctly calculated by PP, 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 in verification:

VCS project:	BRASCARBON Methane Recovery Project BCA-BRA-04A, Brazil (Reference Number: 2998)
Reporting period:	2 January 2021 to the 31st of January 2022
Baseline emissions:	83,602 tCO_2e (Total Methane destroyed: 69,092 tCO_2e)
Project emissions:	28,356 tCO_2e
Leakage:	0 tCO_2e
Emission Reductions:	55,246 tCO_2e

ICONTEC as VVB entity in charge of carrying out the validation and verification activity considered as main documents are the Joint-Project Description & Monitoring Report CER Calculations and ER/2/, and tools that requires; the obtained information reviewed against the criteria stated in VCS standard Version 4.3/10/ and the approved baseline and monitoring methodology AMS-III.D. version 21.0/3/.

The validation and verification were based on the requirements VCS Program /5/6/7/8/9/10/51.

The scope of the verification allows to identify the behaviour of a project in full execution, monitoring system and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan; the GHG emission reductions data and express a conclusion with a reasonable level of assurance about whether he reported GHG emission reductions data are free from material misstatement; the reported GHG emissions data is sufficiently supported by evidence.

ICONTEC International likewise have expertise in multiples standards to Verification and auditor is conducted as well as the procedures in line with the requirements specified in the VCS Program and accredited in ISO series, the ISO 14064-3 requirements and applying auditing techniques. The verification team assessed and determined that the implementation and operation of the project activity, and steps to report GHG emission reductions comply with the VCS rules.

1.3 Level of Assurance

Indicate the level of assurance of the validation and verification.

Since the calculated emission reductions in PD–MR/1/ are 55,246 tCO2e (395 days), the applicable materiality threshold is 2,762.03 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 /2/ 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 stated by UNFCCC on applicable criteria /3/4/19/52/ and VCS Program/5/6/7/8/9/10/51.

1.4 Summary Description of the Project

Brascarbon Consultoria, Projetos e Representação Ltda. commissioned ICONTEC in order to perform the validation and verification assessment for of the first monitoring period (02/01/2021 to 31/01/2022 (first and last days included) of the proposed project activity "BRASCARBON Methane Recovery Project BCA-BRA-16, Brazil (Reference Number VCS: 2998), and first credit period located in Brazil the State of in the cities located at the Mato Grosso do Sul state, central Brazil. The validation assessment was carried out through a process of document review based on the D&MR Version 03/01/ dated on 6/06/2022, in this validation report, and the subsequent modifications to the revised PD-MR are visible on the version 06/1/ dated 13/10/2022.

The scope of the validation is defined as an independent and objective review of the PD-MR version 5/1/, the baseline of the proposed project activity and the monitoring plan and other relevant documents presented further in appendix 3 of this validation report. The information in these documents was assessed against the applicable methodology according to VCS standard. The validation team, based on the specific instructions in the VCS Standard/10/, employed a risk- based and step-wise approach when conducting the validation, focusing on the identification of significant risks for project implementation and the calculation of the emission reductions in order to determine the baseline, project emission, leakage emissions and the total emission reductions ex ante.

The project activity examined under this validation process involves the GHG emission reductions through an animal waste management system. The system was put in place as a mean to treat animal waste generated from swine confined feed operations. Effluents generated from swine production are treated in biodigesters which, on its turn, consists of a covered in-ground anaerobic reactor capable of anaerobically

treat effluent originated at the swine production operation. Finally, effluents treated on biodigesters produce biogas to be destroyed through a flaring system.

The verification for first monitoring period (02/01/2021 to 31/01/2022 (first and last days included) and verification with crediting period included an assessment on those specific features of the project activity with the verification criteria and conclude that the project has been implemented as planned and as it has been described in the latest version of PD-MR (version 5) /1/. Lastly, the emission reductions were correctly calculated based on the PD, 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.

In conclusion, the Project Participant and the documents attached as part of the validation for the first crediting period meet all the relevant VCS standards and verifications for the first monitoring period 02/01/2021 to 31/01/2022 (first and last days included) as well as, provided to register of the first crediting period (seven years from 02/01/2021 to 01/01/2028). of the proposed project activity "BRASCARBON Methane Recovery Project BCA-BRA-16, Brazil (Reference Number VCS: 2998),

2 VALIDATION AND VERIFICATION PROCESS

2.1 Method and Criteria

ICONTEC for the development of validation and verification under the VCS standard, takes into account the guidelines given in the ISO standard such as ISO 14064 -3: 2006 as follow: "Greenhouse gases — Part 3: Specification with guidance for the verification and validation of greenhouse gas statements" and Therefore, validation and verification of the project description and verification of the monitoring plan and the reported project results were measured for compliance against the following criteria:

- VCS Standard, v4.3/10/
- VCS Program Guide, v4.0/9/
- VCS Program Definitions, v4.1/8/
- VCS-Joint-Project-Description-Monitoring-Report-Template-v4.1/5/

. VCS-Joint-Project- Validation & Verification -Report-Template-v4.1/6/

The validation and verification process derived from all items in the validation and verification criteria stated above. Field inspection and techniques based on the project parameters, scope and best professional judgement of the validation and verification team in order to meet a reasonable level of assurance. The validation and verification consisted of the following three phases:

- Document review
- On-site assessment
- The resolution of outstanding issues and the issuance of the final joint validation and verification report and certification.

The validation and verification process derived from all items in the validation and verification criteria stated above. Field inspection and techniques based on the project parameters, scope and best professional judgement of the validation and verification team in order to meet a reasonable level of assurance.

2.2 Document Review

As mentioned in the summary and in Chapter 1 of this report, the validation process is composed of several stages, one of the main ones being the documentary review. This documents review included an examination of the project design details, baseline scenario, additionality, ex ante and monitoring data and parameters, and quantification of GHG emission reductions, and ex- post as monitoring or to the basic conditions and technical data. As part of the activities carried out, the audit team performed documental review of the calculation files /2/ 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.

The implementation of a project's documentation and registration system is key to respond to the concerns of a third party independent of the project, either on site or remotely.

On the other hand, the traceability of project information is achieved through a valid registration system with updated information.

On the other hand, the traceability of the project information is done through a valid registration system with updated information, either historical (for validation) or follow-up and monitoring if it is for verification.

In this particular case, for this project, which refers to the validation and verification process jointly, it implies as much information as possible in both the validation and verification components. The validation and verification were performed basing on the documents check and site inspection/measurements, refer

to the section 3 and 4 of this report for the validation and verification process detail and corresponding documents review.

In this particular case, for this project that refers to the validation and verification process jointly, it implies having as much information as possible in both the validation and verification components.

In validation includes having available for the validator/verifier professional as much information as possible such as: contracts with farms, licenses, installation of equipment and materials for the construction of biodigesters (for example), training certificates, equipment inventories, maintenance, among others.

In the case of verification, the review includes the monitoring and calculation system, with field verification of the functionality of the registration system, handling of information by the operating team and traceability of this information, among others. The references used in the course of this validation and verification are summarized in Appendix 3.

2.3 Interviews

Describe the interview process and identify personnel, including their roles, who were interviewed and/or provided information additional to that provided in the project description, monitoring report and any supporting documents.

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 first crediting period; On site, the operational conditions were discussed in an interview with Mr Sinomar F. dos Santos, and Ricardo Tavares. In addition, an interview with Mr Mario Pacifico Brascarbon Director, was held to assure the implementation of the project activity. Lastly, interviews performed while carrying out the on-site visit to project sites the director and the regional technicians assure the understanding of the project´s environment, operation and data acquisition, comparing these aspects against the D&MR /1/ as well as the applicable requirements.

ICONTEC maintained permanent communication with Mr Mario Silva Legal Representative of the contracting entity and Mr. David Garcia, Brascarbon CDM Manager, in order to confirm all information provided to register of the first crediting period (seven years from 02/01/2021 to 01/01/2028).

The dates and subjects of the discussed: On site, telephonic and WhatsApp based interviews conducted with the PP are described as follows.

No	Interviewee			Date	Subject	Team çmember
	Last name	First name	Affiliation			
1	Pacifico	Mario	Brascarbon Director	12/16/09/ 2022	Description and operation of the project activity -Implementation status of the project -Monitoring system	Adriana Bermudez
2	Garcia	David	Brascarbon CDM Manager	13 /09/2022– 20/09/2022	-Baseline GHG emissions -Project GHG emissions -Leakage GHG emissions -GHG emission reductions -Reviewing of the spread sheets -Materiality basement	Adriana Bermudez
3				20/09/2022	Verification and data cross checking. -Materiality assessment -Calibration performance	
4				26 /09/2022- 6/10/2022	-Implementation status of the project -General conditions of the monitoring of the project activity -Monitoring equipment in operation - POPs	
5	Dos Santos Tavares.	Sinomar F.,	Regional Technician	13/09/2022	-General conditions of the monitoring of the project activity	Adriana Bermudez

No	Interviewee			Date	Subject	Team çmember
	Last name	First name	Affiliation			
		Ricardo			-Monitoring equipment in operation -Description of activities and functions -Biogas analyser handling - data and files	
6	Garcia	David	Brascarbon CDM Manager	26/09/20226/10/2022	-Verification of the application of the Sampling Plan -Verification and data cross checking.	Adriana Bermudez

2.4 Site Inspections

The validation and verification site inspection were conducted on 12 – 16 September -2022. A ground inspection of the project was conducted during the site visit and the validation and verification team interviewed project implementer representative and operation staffs.

The visit was realized Project site / State of Mato Grosso do Sul state, Brazil and was visited the 9 sites (100% project.)

During the site inspection, the project was inspected and documents evidence were checked, details as following table:

Date: 12-09-2022 ~16-September-2022 Duration of on-site inspection: 13 September- 2022				
No.	**Activity performed on- site**	**Site location**	**Date**	**Team member**
1.	Opening meeting Interview with PP Representative,	São Paulo / Brazil	13/09/2022	Adriana Bermudez

2	On-site inspection Project site /farm Interview with Operation Staff	Mato Grosso do Sul /Brazil	13/09/2022	Adriana Bermudez
3	Documents check	Campo Grande /Brazil	13;15 /09/2022	Adriana Bermudez
4	Finding Summary /	Campo Grande	13; 16/09/2022	Adriana Bermudez
5	Close Meeting / Interview with PP Representative, Opening meeting Interview with PP Representative,	São Paulo / Brazil	16/09/2022	Adriana Bermudez

Field Itinerary 13 September-2022

BCA-300MS1-16	Fazenda Paraiso do alto	Mario Pacifico da Silva	Rio Verde De Mato Grosso
BCA-306MS1-16	Granja Grando	Nilson Jose de Jesus	Rio Verde De Mato Grosso
BCA-303MS1-16	Lote 28 - PA - Assentamento Campanario	Valderi Valentini	São Gabriel do Oeste
BCA-307MS1-16	Assentamento Campanario	Edemar Sanagioto	São Gabriel do Oeste
BCA-304MS1-16	Assentamento Campanario - Lote 55	Antenor Barbosa de Oliveira	São Gabriel do Oeste
BCA-305MS1-16	Fazenda Nossa Senhora Aparecida II	Jair Antonio Borgamann	São Gabriel do Oeste
BCA-302MS1-16	Granja Serra Dourada I	Jair Antonio Borgamann	São Gabriel do Oeste
BCA-308MS1-16	Fazenda Quinhao A	Mario Pacifico da Silva	São Gabriel do Oeste
BCA-301MS1-16	Fazenda São Sebastiao Gleba 6	Maria Ines Caviglioli	Bandeirantes

2.5 Resolution of Findings

The identification of findings in the validation and verification report or documents is fundamental in a project, because it allows to improve, correct or take a decision that benefits the normal development of the project and fulfils its objective.

The resolution of outstanding issues, the findings raised and described in appendix 4 further in this validation and verification report, and the subsequent modifications to the revised PD-MR version 3 and 4 are visible on the PD-MR version 5/1/ dated 13/10/2022. The Material discrepancies identified in the course of the validation and verification are addressed either as CARs, CLs or FARs

A Corrective Action Request (CAR) is established where:

The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;

The VCS Version 4.1 requirements have not been met;

There is a risk that the emission reductions cannot be monitored or calculated.

A Clarification Request (CL) will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A Forward Action Request (FAR) will be issued when certain issues related to project implementation should be reviewed during the next verification.

A detailed list of the CARs CLs and FAR raised and discussed in the course of this validation and verification is included in Appendix 4 of this report.

In the course of the validation 1 Corrective Action Requests (CARs), 12 Clarification Requests (CLs) were raised and successfully closed. The assessment is included in the report.

2.5.1 Forward Action Requests

This is the joint validation and first verification, thus therefore no FAR raised previously.

3 VALIDATION FINDINGS

3.1 Project Details

- *Project type, technologies and measures implemented, and eligibility of the project*

Type:

The project is accordance with item 3.9 Project Scale – VCS Standard v.4.3 /10/ the projects are categorized by size according to their estimated average annual GHG emission reductions or removals. This Project size categorizations as:

Projects: Less than or equal to 300,000 tonnes of CO2e per year.

The Project applies the Methodology AMS-III.D – "Methane recovery in animal manure management systems" (Version 21.0). For more information on this methodology, please refer to the link: http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html

The following tools were also used:

Methodological Tool: "Project and leakage emissions from anaerobic digesters" (version 02) /19/
Methodological Tool: "Project emissions from flaring" (version 04) /4/

- Eligibility conditions of the project according to VCS Standard /10/:

The PP has described and justified how the project is eligible under the scope of the VCS Program in Joint- PD-MR as per the section 2.1.1 of VCS standard Version 4.1 includes:

1. The six Kyoto Protocol greenhouse gases (The project activity generates GHG emission reductions including Methane (CH4).

2. Project activities supported by a methodology approved under the VCS Program through the methodology approval process.

3. Project activities supported by a methodology approved under an approved GHG program.

The scope of the VCS Program excludes projects that can reasonably be assumed to have generated GHG emissions primarily for the purpose of their subsequent reduction, removal or destruction. It is important to mention that the present project, subject to validation and verification /1/ has not generated GHG emissions mainly for the purpose of their subsequent reduction, elimination or destruction.

In conclusion, the project is eligible to the scope of the VCS Program.

technologies and measures implemented:

The project activity is in compliance with the point 1 of section 2.1 of VCS Standard v4.2, since it involves methane avoidance. Also, it is in conformity with point 4 as well since it applies a methodology approved under an approved GHG program (CDM).

- *Project design, including eligibility criteria for grouped projects*

The project is not a grouped project, it's a sole project which will comprises a total of 9 farms (fixed number for all the crediting period of the project), has further detailed in point 1.11, which will produce an estimated total of 55,246 tCO2e/year. Hence, the project is a multiple project activity instance.

- *Project proponent and other entities involved in the project*

The Organization is Brascarbon Consultoria, Projetos e Representação Ltda –

The Contact person is David Garcia -Manager - located Rua Amália de Noronha, 151, CJ 502, 05410-010 São Paulo, SP, Brazil

Telephone +55 11 98959 4171

Email: david.garcia@brascarbon.com.br

There are no other Entities involved in the project

- *Ownership*

According with the section 3.6 of the VCS Standard, the project description shall be accompanied by one or more of the following types of evidence establishing project ownership accorded to the project proponent(s), or program ownership accorded to the jurisdictional proponent(s), as the case may be (see the VCS Program document Program Definitions for definitions of project ownership and program ownership).

The PP is in compliance with the ownership criteria since it is in line with option 3 of the above-mentioned points. As evidence, Brascarbon has contracts with all the swine producers included in the project is the sole owner of the project since all the contracts both with the sites included in the project activity as well as all the actions which will occur under the VCS programme are all Brascarbon responsibility for the length of the project activity.

The ownership of the sites that are part of the project was presented to the audit team through individual 5-year renewable contracts. The list of documents is referenced in appendix 3 of this report.

- *Project start date*

The date on which the project began generating GHG emission reductions or removals; equal to “Project Start Date” is 28/12/2020, date in which the first farm begun the Stat-up and Tests phase.

- *Project crediting period*

The starting date of the crediting period is: 02/01/2021 until 01/01/2028 (seven years period), twice renewable for a total of 21 years.

- *Project scale and estimated GHG emission reductions or removals*

The scale is Project and estimated GHG emission reductions or removals estimated GHG emission reductions or removals It is a follow*:*

Year	Estimated GHG emission reductions or removals (tCO_2e)
2021	51,570
2022	55,356
2033	55,356
2024	55,356
2025	55,356
2026	55,356
2027	55,356
Total estimated ERs	383,706
Total number of crediting years	7
Average annual ERs	54,815

- *Project location*

The project activity has several project sites (9) but it is important to highlight that it is not a grouped project. It is located in the Central Region/State of Mato Grosso do Sul, cities of Jateí, Caarapó and Gloria de Dourados. The geographical location of the project sites is shown in Figure 2 with specifics detailed in Table 2.of the PD-MR - BCA- BRA-16_v5./1/

- *Conditions prior to project initiation*

Prior to the implementation of the project activity, the confined animal wastewater, which consists of fresh water mixed with manure and urine that accumulates in pits under or beside the barns, is transported to one open lagoon for evaporation, fed by gravity pipeline systems. The organic material degraded in the primary treatment lagoon is digested, thereby producing significant amounts of methane. These systems emit methane (CH4) resulting from anaerobic decomposition process. The scenario existing prior to the implementation of the project activity is the same as the baseline scenario.

Each farm will have one biodigester which will send the biogas through a pipe where it will be located the flow meter. The biogas will then be burned in an enclosed flare and all data stored in a Control Logic Program (CLP).

The project uses current available technology in the country for methane capture and destruction and the project design engineering reflect current good practices. The biodigester technology results in a

significantly better performance than the open lagoons used in the baseline scenario. The implementation of biodigester instead of open lagoon needs special skills with respect to design of the facility and operation and maintenance of flare and operation control (pressure, temperature, flow etc) that will be provided by specialized technicians.

- *Project compliance with applicable laws, statutes and other regulatory frameworks*

The project sites are installed in already operating facilities of swine production. All the swine producers in the state of Mato Grosso do Sul are required, by the Environmental Agency of the sate (IMASUL) to have operating licenses in order for them to continue to exercise their activity.

The project activity is installed in a prior operating facility – swine farm. The implementation of the project does not require any dedicated or specific license or environmental assessment study due to its project design.

The baseline scenario is also the sole legal requirement for all the farms and by having that it is assured that the site is in compliance with all the laws and other legal requirements.

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It is important to highlight that the project activity is an upgrade on the effluent treatment system required by the law (open lagoons) and that each farm has the requirement to have a valid license in order to be eligible for a Brascarbon project.

Additionally, Brascarbon also performed a due diligence to all the assuring that the sites involved in the project are in compliance with all the any relevant local, regional and national laws, statutes and regulatory frameworks.

- *Participation under other GHG programs:*
  - *Projects registered (or seeking registration) under other GHG program(s)*

This project has not been registered and is not seeking registration under any other GHG Programs.

  - *Rejection by other GHG programs*

Not applicable. This project is not requesting registration in any other GHG Programs nor has the project been rejected by any other GHG programs.

- *Other forms of credit:*
  - *Emissions trading programs and other binding limits*

The project activity is not included in an emission trading program or any other mechanism that includes GHG allowance trading.

- *Other forms of environmental credit sought or received and eligible to be sought or received*

The project activity has not created any other form of environmental credit. This project has not been registered in any other credited activity.

The project does not intend to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under this VCS project.

- *Sustainable development contributions*

According to Brazil's Inter-Ministerial Commission on Global Climatic Change, manure management is an important issue that needs to be solved. The swine waste storage and treatment systems in Brazil consists of open tanks, open digesting and ponds (anaerobic lagoons) once they are the most economic and viable system approved to manage the manure.

in confined animals feed operations. Economic barriers are very common because can invest only in the confined feed operations and with no need to invest in waste management systems. Financial resources are always used to maintain the confined feed operation working. Also, waste treatment involves low technology, as open lagoons need less employees and technicians for operation and maintenance. For these reasons the project is additional, and more details can be found in the section 3.5.

Just few producers invest in bio-digesters to have a modern waste management system. The material cumulated in the open lagoons is normally distributed by pumps or gravity and applied to crops and pastures. EMBRAPA stimulated by the Expansion and Waste Treatment Program of the State of Santa Catarina by giving instructions and providing publications to help the producers and agro-industries to implement projects or systems to control the animal waste management protecting the eco-system.

Failure to do so will spread existing disease continually (i.e. increased (insect) pest populations, problems with allergies and livestock disease). With the purpose of avoiding this problem, Brazil has in recent years, required all confined animals feed operations to change from single to multi- lagoon systems, introducing a Good Practices in confined animal feed operations and even more recently has required them to line the bottom of their primary sedimentation lagoon to prevent effluent infiltration.

In 2005, the swine population in Mato Grosso do Sul state was 855,000. Considering that a typical hog produces 4.9 kilograms of effluent daily (Table 3), annually some 4.2 million metric tons of hog waste are produced in this state alone. Introducing a progressive animal waste management practices throughout this region of Brazil could result in an annual reduction of approximately 655 thousand tons of carbon dioxide equivalent (CO2e/year).

- *Additional information relevant to the project, including:*
  - *Commercially sensitive information*

It is confirmed that no commercially sensitive information relevant to the project description has been excluded from the public version of the project description.

(Provide an overall conclusion regarding whether the description in the project description is accurate, complete, and provides an understanding of the nature of the project.)

(It is verified that the summary description of the project in section 1.1 is in line with the Joint- PD-MR template requirements and all the information has been provided and verified as correct).

3.2 Participation under Other GHG Programs

This project has not been registered and is not seeking registration under any other GHG Programs.

Not applicable. This project is not requesting registration in any other GHG Programs nor has the project been rejected by any other GHG programs.

The project has neither been registered nor seeking registration under any other GHG programs which has been confirmed via checking the UNFCCC/52/and other GHG schemes' website. It is verified that the project is seeking registration only in VCS program Guide/9/.

3.3 Safeguards

3.3.1 No Net Harm

The purpose of the project is to reduce the negative environmental impacts of an intensive pig production system, which means that in itself does not generate a negative impact. The PP identifies in PD-MR version 5/1/ the possible obstruction of the Biodigester and for this they have the installation of a bypass to divert the waste, which was evidenced at the time of the visit of the audit team.

Now, due to the operation of the gas capture and burning system itself, unforeseen events may occur, such as contamination of surface and subway waters in the event of errors in the construction of the oxidation ponds and the preparation of the land for the installation of the biodigester. Before construction and installation, the PP takes into account the possible risks and determines soil quality and soil conditions (in the region there is a predominance of clay soils, which ensure low infiltration problems), as well as the engineering measures required to reduce these risks.

On the other hand, also the visual contamination and current use of the soil, in the case that they were close to an area of environmental protection; however, the area where the project is located, is an area for agricultural and agro-industrial production so there is no conflict of use; at the visual level they have already

been implementing the planting of live fences to reduce the impact and for biosafety separate the production systems of other existing in the region.

3.3.2 Local Stakeholder Consultation

The PP presented communications with stakeholders since 2020, and stated in the diagnostic document /1/ that it reported on the construction of the project, without receiving a response from them, however, there was positive evidence that they had received the communication, through email supports /51/. Therefore, the management carried out by the PP is identified, showing that the PP has been attentive to communicate any situation with the project and that so far there have been no design changes or situations that merit a structural change in each of the project sites.

According to the VCS v.4.3 standard, in sections 3.17.6 to 3.17.9, during the public comment period (a 30-day period), the date on which the project is listed on the project line is specified. The project proponent notified the validation/verification body that the action they had taken was to publish the project, which was available for public comment from 01/07/2022 to 31/07/2022. You can see the link here: (https://registry.verra.org/app/projectDetail/VCS/2998).

No comments were received during this period, which has been verified by checking the dedicated website as mentioned above.

3.3.3 Environmental Impact

In general and to speak of negative environmental impact we have to consider the natural resources that may be affected and also the human population involved in the project and that has a direct or indirect relationship with it.

In this sense in extreme cases and under the analysis of possible scenarios, we can establish that in general a methane capture project under techniques such as the use of biodigesters and the flaring of Methane Gas, establishes the need to seek the least possible affectation, according to the mentioned by Arboleda, J.A.(2008), Cabrera, K.M.(2010), Cendales, E.D. (2011), Conesa,V. (1993), cited by Tobon, A (2017),:

Impacts on atmospheric elements:

- Increased levels of gas or particle immission, due to the fact that the project handles or treats organic waste and as a consecuen-cia of the anaerobic treatment, odors are generated as well as in the whole process of using the biodigester, affecting the surrounding population.

Impacts on geology and geomorphology:

- Its nature is positive, due to the implementation of infrastructures for waste treatment and utilization preventing the disposal of organic waste in the open air and the utilization of methane gas in contained locations.

Impacts on hydrology:

- Impacts on surface water bodies: the biodigester will generate local point discharges that could contaminate surface water bodies. The effect is considerable because the leachates generated by the biodigester need to be managed.

Impacts on vegetation:

- Affections by pollutants (metals, particles, etc.). Increased risk of fire; biodigesters due to methane gas storage, and temperatures above 40 °C can cause an explosion or spark due to the same static that can cause an explosion or risk to vegetation due to fires.

Impacts on the landscape

- Visibility and visual intrusion: there will be a construction site that will contrast with the surrounding landscape, especially due to the use of synthetic materials, tiles and civil construction that contrasts with the landscape, reflected in a change of landscape structure (shapes, color contrasts).

Impacts on the population

- Health effects: The collection, handling, and transport of organic waste to the biodigesters may pose an occupational risk to operators due to inadequate handling, but it is also positive when compared to the waste dumped directly into the environment, which would cause more harm to people. The use of biodigesters to obtain methane gas has a positive impact on health because it replaces charcoal and firewood, which has a positive impact on people's respiratory health, a positive point of technological innovation for the rural sector.

Impacts on cultural factors

- Changes in accessibility: implementation of technology for obtaining gas, leaving behind the traditional form of gas-wood or firewood pipes for cooking food.

Impacts on the territorial and institutional system:

- Especially in the modification of the area of influence of services and equipment in relation to conflicts with other plans and programs.

In the state of Mato Grosso do Sul, the environmental authority IMASUL reported (https://www.imasul.ms.gov.br/wp-content/uploads/2015/06/Relatório-Final-completo.pdf) on the opportunities of using biodigesters as an appropriate technology for organic waste management in the region to reduce the negative environmental impact resulting from intensive farming.

As such, no specific negative statement was found for the region that the government related to the current project. In fact, it is considered necessary for the region to have biodigesters for proper waste management and to reduce contamination of water, soil and air resources.

For its part, the PP presents in its PD-MR version 5 /1/ an analysis of the possible impacts that the project could generate, but there are no known concrete real situations in this regard.

On the other hand, each project site has environmental licenses issued by IMASUL that clearly indicate the possibility of managing this type of project.

3.3.4 Public Comments

Brascarbon issued a virtual invitation to interested parties, which was also addressed to the general public on May 12, 2020, and held direct one-on-one meetings with the owners of the sites that are part of the project. The PP has been available to address any concerns but has not received any comments. It is important to consider that in recent years, due to the pandemic, the way of communicating has changed, but even more so the way of working directly with the general public, in addition to the activities that are purely field activities.

We can say that the communication strategies have been sufficient and, in the way, possible according to the project. It was evidenced by the audit team that conducted an on-site visit last September that Brascarbon maintains an excellent relationship with the people of interest and with the general public.

3.3.5 AFOLU-Specific Safeguards

N/A

3.4 Application of Methodology

3.4.1 AMS-III.D Methane recovery in animal manure management systems

The VCS Standard_v.4.3 that includes by this project – Sectoral Scope 13/10/: Waste handling and disposal:

- AMS-III.D: Methane recovery in animal manure management systems version 21.0/3/52
- Project emissions from flaring (version 04.0)/4/;
- Project and leakage emissions from anaerobic digesters (version 02.0)/19/;
- ISO 14064- 2:2006, ISO 14064-3:2006

3.4.2 Applicability

The AMS-III.D: Methane recovery in animal manure management systems version 21.0/3/page 3, 4 and 5 was considered that this methodology is only applicable under the following conditions:

Applicability conditions (2.2.3 a to e. AMS-III Dv.21)	Validation Assessment	Conclusions
(a) The livestock population in the farm is managed under confined conditions	It is confirmed that the swine population at the sites (9) within the project boundaries is managed under confined conditions. The project sites each comprise confined and intensively managed swine systems. This has been verified by inspecting the sites and checking the GPS coordinates per site /46/.	Methodology is applicable
(b) Manure or the streams obtained after treatment are not discharged into natural water resources (e.g. river or estuaries), otherwise "AMS-III.H Methane recovery in wastewater treatment" shall be applied;	All sites have a system of discharge to oxidation ponds, therefore the delivery to water bodies is not performed, it becomes a perfect cycle for the use of fecal matter and to improve the incorporation to the soil later as fertilizer, will not discharged into natural water resources. This has been verified by inspecting the sites and checking the GPS coordinates and current licenses per site /1/ 42/46/	Methodology is applicable
(c) The annual average temperature of baseline site where anaerobic manure treatment facility is located is higher than 5 °C;	The projects are located in a tropical and subtropical rainforest that assures environmental temperature higher than 21 ºC, humidity higher than 87%, which	Methodology is applicable

	assures that the water temperature is higher than 5ºC. This is verified by site inspection /46	
(d) In the baseline scenario the retention time of manure waste in the anaerobic treatment system is greater than one month, and if anaerobic lagoons are used in the baseline, their depths are at least 1 m;	The retention time of the manure ensures that the production and utilization cycle of the manure is not interrupted. The depth was higher than 1 meter, and has been verified by measurements taken on each farm. This information was verified on -site per farm /1/46/	Methodology is applicable
(e) No methane recovery and destruction by flaring or combustion for gainful use takes place in the baseline scenario.	At each of the project sites, the purpose of the Brascarbon is not to recover methane, but rather to burn the gas generated by flaring. This was verified on site at each of the sites registers and interviews with director and technical /1/15/18/46/.	Methodology is applicable

The project activity shall satisfy the following conditions: (2.2.4 a to c. AMS-III Dv.21)	Validation Assessment	Conclusions
(a) The residual waste from the animal manure management system shall be handled aerobically, otherwise the related emissions shall be taken into account as per relevant procedures of "AMS-III.AO Methane recovery	The residual wastes It will be applied in the soil, according with the proper conditions and procedures, being assured that no methane emissions are resulting from this application. The project involves the use of treated effluent for irrigation in farms and application of stabilized sludge on	Methodology is applicable

through controlled anaerobic digestion". In the case of soil application, proper conditions and procedures (not resulting in methane emissions) must be ensured;	crops irrigation in farms, without any anaerobic conditions. This is verified by site inspection of the project implementation and checking /1/46	
(b) Technical measures shall be used (including a flare for exigencies) to ensure that all biogas produced by the digester is used or flared;	The project sites each comprise confined and intensively managed swine systems. An enclosed flare will be used in the project and also sized to support high temperatures. A continuous sparkling system is installed in the combustion chamber of the flare. This is verified by site inspection of the flare, and checking records and fields/1/2/46/	Methodology is applicable
(c) The storage time of the manure after removal from the animal barns, including transportation, should not exceed 45 days before being fed into the anaerobic digester. If the project proponent can demonstrate that the dry matter content of the manure when removed from the animal barns is larger than 20%, this time constraint will not apply.	This situation is assured due to the fact that the barns are directly connected to the biodigesters and considering the common farms practices where each day the barn is washed and all waste is removed by the water flushing system sent to the digester. This complies with para 4(c) of AMS-III.D version 21.0. The Confined Animal Feed Operation Practices follows recommendations from EMBRAPA (Empresa Brasileira de Agricultura e Agropecuária) to get high standards of sanitary conditions in the confined operations. These recommendations can be found at EMBRAPA web site where all producers use as a guideline. This is verified by site inspection with interviews to Brascarbon´s director and technical fields/1/2/46/	Methodology is applicable

The project activity shall satisfy the following conditions: (2.2. 5 a to 9. AMS-III Dv.21)	Validation Assessment	Conclusions
5. Projects that recover methane from landfills shall use "AMS-III.G Landfill methane recovery" and projects for wastewater treatment shall use AMS-III.H. Projects for composting of animal manure shall use "AMS-III.F Avoidance of methane emissions through composting". Project activities involving co-digestion of animal manure and other organic matters shall use the methodology "AMS-III.AO Methane recovery through controlled anaerobic digestion".	the project doesn't involve any landfill activity. The project activity recovers methane generated in the treatment of swine manure by installing methane recovery and combustion systems (biodigester). This complies with paragraph 5 of AMS-III.D version 21.0. This is verified by site inspection and interviews to Brascarbon´s director and technical /1/2/46/	Not involved
6. Utilization of the recovered biogas in one of the options detailed in AMS-III.H is also eligible under this methodology. The respective procedures in AMS-III.H shall be followed in this regard. If the recovered biogas is used to power auxiliary equipment of the project activity, it should be taken into account accordingly, using zero as its emission factor; however, energy used for such purposes is not eligible as an SSC CDM Type I project component.	The PP does not use the recovered biogas. Therefore there is no energy used for such purposes. This is verified by on site inspection and interviews to Brascarbon´s director and technical /1/2/46/	Not involved
7. New facilities (Greenfield projects) and project activities involving capacity additions compared to the	The expected emission reduction sourced from methane recovery is 55,356	Methodology is applicable

baseline scenario are only eligible if they comply with the related and relevant requirements in the "General guidelines for SSC CDM methodologies".	tCO2e/yr /2/, which is lower than the threshold of 60,000 tCO2e/yr. Therefore, the Project is in line with "General Guidelines to SSC CDM methodologies"/3/.	
8.The requirements concerning demonstration of the remaining lifetime of the replaced equipment shall be met as described in the "General guidelines for SSC CDM methodologies".	The project is a greenfield project is verified by site inspection and checking the sites /1/2/46. no replaced equipment involved.	Not involved
9. Measures are limited to those that result in aggregate emission reductions of less than or equal to 300.000 t CO2 per year of the project activity.	The project activity is a Type Less than or equal to 300,000 tonnes of CO2e per year.- according to VCS Standard /10/ . This is verified by VVB – files and records /1/2/10/ 15	VCS Standard Applicable

The AMS-III.D: Methane recovery in animal manure management systems version 21.0/3/ is the most commonly used because it handles in an integrated way the management in relation to agricultural production and specifically with its application in companies with intensive production system.

Swine production, having an alternative to reduce greenhouse gas emissions, especially methane, through projects with biodigester technology, such as those developed by Brascarbon in Brazil, provides a solution to the negative environmental impact of the farm and the AMS-III.D methodology has all the components to perform the analysis and the necessary calculations to clearly identify the reduction of greenhouse gas emissions.

Regarding the tools applied, the project also uses the Methodological Tool:

Project emissions from flaring (version 04.0) - Tool 6 /4/ - This tool provides procedures to calculate project emissions from flaring of a residual gas (Methane us the component with the highest concentration in the biogas flared. Project emissions for the calculation of the project emissions of the project activity in site, which is applicable after its implementation. The project uses enclosed flare system which has been confirmed by site inspection of the flare/46/. Is Applicable.

"Project and leakage emissions from anaerobic digesters" (version 02) Tool 14/19/,which states that the leakage emissions associated with the anaerobic digester (LEAD,y) depend on how the digestion is managed. Since the storage of digested or the composting of digested is occurring within the project boundary, these emissions were considered as part of the project emissions. Is Applicable.

3.4.3 Project Boundary

The project boundary includes the physical and geographical sites of the livestock, of the manure generation and management systems and of the equipment installed which recover and flare the methane It is confirmed via on-site inspection and checking the PD-MR/1/2/46.

The project boundary consists, of the barns where the livestock is held, the biodigester which was built within the barns and the open lagoons (which already existed as baseline scenario prior to the project implementation), the monitoring system and flare and finally the open lagoons.

The organic material degraded in the primary treatment lagoon is digested, thereby producing significant amounts of methane. These systems emit methane (CH4) resulting from anaerobic decomposition process. Since the baseline treatment process is, as stated, open lagoons, all the methane production, resulting from the organic matter decomposition is, in the baseline scenario, emitted to the atmosphere.

Hence, the source of the project emissions, in the baseline scenario, is the wastewater resultant from the cleaning of the barns where the animals are held. This effluent, heavily charged with organic matter, would be conducted, prior to the project activity, to the open lagoons, where the organic matter would be decomposed, originating methane emissions directly to the atmosphere. With the project activity, this methane emission is avoided through the flaring of the biogas.

The main GHG emission sources and gases included in the project boundary are determined as per the applied methodology, GHG sources included and excluded from the project boundary is defined as correct, This was verified in the field and verified with the biogas analyser/18/ handled by the technician in the region, in addition to the records.

The PP in Figure 3 of PD-MR version 7 /1/ presents the details of the use of the biodigester at each project site, as well as the path of the effluent and its final destination once biogas burning takes place. Similarly, the PP corrects the description of the item regarding the emissions from the open lagoons, which are not included, and the emissions from flaring /1/53/.

The results of applying the equations indicated in methodology AMS-III.D for each of the parameters described in section 4.2; can be found in the file ER Calculation Spreadsheet BCA-BRA-16-.xls. and PD-MR version 07 of 17/02/2023/1/2/.

It is concluded that the project boundary and selected sources are correctly justified for the project.

3.4.4 Baseline Scenario

The Joint-PD-MR /1/ applies the baseline scenario given by section 4.3 of the AMS-III.Dv.21/3/.

According to the methodology AMS.III.D version 21.0 and data from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 4, chapter 10. The option (a) was used to determinate the amount of the waste that would decay anaerobically in the absence of the project activity.

The PP report in Join -PD-MR /1/ that the final draft of this section was completed on 25/03/2020. The name of entity determining the baseline is Brascarbon which was a project participant at this time, as well as the project developer.

The baseline for this project activity is defined as the amount of methane that would be emitted to the atmosphere during the crediting period in the absence of the project activity.

Hence, the baseline scenario determined in the Joint-PD-MR/1/45/ is verified as correct and in line with applied methodology/3/.

3.4.5 Additionality

Joint DP-MR/1 applies the method of demonstrating additionality contained in section 4.2 of AMS-III.D v.21/3/. According to this methodology, project activities can demonstrate additionality by demonstrating that there are no regulations in the host country, applicable to the project site, requiring the collection and destruction of methane from livestock manure.

Therefore, the audit team conducted a search for information on laws and regulations related to the project in Brazil, and found no information on any regulations requiring the collection and destruction of methane from swine manure.

Furthermore, in Joint Validation and Verification Report VCS version 4.1 (BCA-BRA-16 version 5) /1/, the PP discloses the economic investment of establishing a biodigester and methane flaring system, where it is proven that three times more costs are generated when investing in this type of systems: digester + flare, compared to an open lagoon system.

The PP has provided the state regulation for the installation and operation of swine farms (RESOLUÇÃO-SEMADE-N.-09-2015-alt-2020 (Mato Grosso do Sul state legislation for operational license)). In this document it is listed the requirements each producer needs to comply in order to have their operation fully licensed. In TITULO III, articles 5 and 6 the categories of the installations are classified. In Anexo I it is stated all the required documentation for the obtaining of the different licenses (installation and operation) and in Anexo III it is stated the requirement for the irrigation (from the open lagoon) and for the specific requirements for swine farms. The installation of a bio digestion system if beyond the host country (and state) regulation and therefore additional./53/54/

Additionally, on November 3, 2021, the governor Reinaldo Azambuja and the Secretary of Environment, Economic Development, Production and Family Farming, Jaime Verruck, signed a decree on Wednesday, November 3rd, regulating the State Law No. 4,555, of July 15, 2014, which establishes the State Policy on Climate Change - PEMC in Mato Grosso do Sul and the MS Carbon Neutral State Plan - PROCLIMA.[1]/55/

The MS Carbon Neutral State Plan - PROCLIMA aims to establish a set of actions and measures the responsibility of the government, economic activities, and society in general so that, within the territory of Mato Grosso do Sul, greenhouse gas emissions will be neutralized starting in 2030, anticipating the goal established in the Paris Agreement by 20 years./55/

If emissions of greenhouse gases are reduced or eliminated in the sector declared as carbon neutral, an additional environmental benefit would be generated, as the emissions that would have otherwise occurred would be avoided. Therefore, declaring a sector as carbon neutral is related to the concept of environmental additionality, as it aims to generate additional environmental benefits that would not have occurred without the implementation of measures to reduce greenhouse gas emissions.

Therefore, the project is automatically considered additional in accordance with the methodology applied/3/.

3.4.6 Quantification of GHG Emission Reductions and Removals

For validation of the estimated GHG emission reductions in the Joint-PD-MR/1/ and ER calculation sheet/3/, the audit team has downloaded from the UNFCCC website the applicable version of the CDM methodology and all referenced methodological tools/4/19/52.

Via verify the Joint-PD-MR/1/, The audit team confirmed the ex-ante calculation of ERs is done as per the applied methodology (AMS-III.D. ver. 21.0) and related methodological tools as listed in section 3.4.1 with follow steps listed below.

The calculation of Ers is done as per the applied methodology (AMS-III.D., ver. 21.0)/3/.

The estimated amount of GHG Emission reductions of the project is 383.706 tCO2e for the first crediting period (7 years) from 02/01/2021 to 01/01/2028, resulting in estimated annual average GHG emission reductions of 55,356 tCO2e. These figures were calculated using the methodology AMS-III.D v.21/3/ and the applicable tools /4/:

[1] https://www.imasul.ms.gov.br/ms-oficializa-plano-estado-carbono-neutro-em-2030-e-vai-para-cop-26-com-metas-ousadas/

- Quantification of baseline emissions

The baseline for this project activity is defined as the amount of methane that would be emitted to the atmosphere during the crediting period in the absence of the project activity. In this case an open anaerobic lagoon is considered as the baseline and estimated emissions are determined as follows:

Baseline emissions (Bey) are calculated by using one of the following two options/3/page 6:

(a) Using the amount of the waste or raw material that would decay anaerobically in the absence of the project activity, with the most recent IPCC tier 2 approach (please refer to the chapter 'Emissions from Livestock and Manure Management' under the volume 'Agriculture, Forestry and other Land use' of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories). For this calculation, information about the characteristics of the manure and of the management systems in the baseline is required. Manure characteristics include the amount of volatile solids (VS) produced by the livestock and the maximum amount of methane that can be potentially produced from that manure (Bo);

(b) Using the amount of manure that would decay anaerobically in the absence of the project activity based on direct measurement of the quantity of manure treated together with its specific volatile solids (SVS) content.

Option a) was chosen.

- E.1. Calculation of baseline emissions or baseline net removals:

The equation 1 (Methodology AMS-III.D): Bey Baseline emissions in year y (t CO2e):

$$BE_y = GWP_{CH4} \times D_{CH4} \times UF_b \times \sum_{j,LT} MCF_j \times B_{0,LT} \times N_{LT,y} \times VS_{LT,y} \times MS\%_{BL,j}$$

Where:

- BE_y = Baseline emissions in year y (t CO2e)
- GWP_{CH4}= Global Warming Potential (GWP) of CH4 applicable to the crediting period (28) (t CO2e/t CH4)
- D_{CH4} = CH4 density (0.00067 t/m^3 at room temperature (20 oC) and 1 atm pressure)
- LT = Index for all types of livestock
- j = Index for animal manure management system
- $MCFj$ = Annual methane conversion factor (MCF) for the baseline animal manure management system j
- $B_{0,LT}$ = Maximum methane producing potential of the volatile solid generated for animal type LT (m^3 CH4/kg-dm
- $N_{LT,y}$ = Annual average number of animals of type LT in year y (numbers)

- $VS_{LT,y}$ = Volatile solids production/excretion per animal of livestock LT in year y(on a dry matter weight basis, kg-dm/animal/year)
- $MS\%_{Bl,j}$ = Fraction of manure handled in baseline animal manure management
- $UF\ b$ = Model correction factor to account for model uncertainties (0.94)[1]

Described by PP in its PD-MR version 5/1/ the methodology refers that the "Volatile solids (VS) are the organic material in livestock manure and consist of both biodegradable and non-biodegradable fractions. For the calculations the total VS excreted by each animal species is required. The preferred method to obtain VS is to use data from nationally published sources. These values shall be compared with IPCC default values and any significant differences shall be explained. If data from nationally published sources are not available, country-specific VS excretion rates can be estimated from feed intake levels, via the enhanced characterisation method (tier 2) described in section 10.2 in 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 chapter 10. If country specific VS values are not available IPCC default values from 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4, chapter 10 table 10 A-4 to 10 A-9 can be used provided that the project participants assess the suitability of those data to the specific situation of the treatment site particularly with reference to feed intake levels"

Brazil does not have any national published values nor sources to obtain the default values need. Hence, the VS values chosen for the current project were the 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4, chapter 10 table 10 A-7 and 10 A-8 for the Region Western Europe since they have proven to be the more suitable for the specific situation of the treatment site particularly with reference to feed intake levels.

The genetics used in the project are originally from that region and the values presented are the more similar when compared with the specific project site values. The same situation occurs with the feed intake level, which is than reflected in the specific animal weight, being the IPCC values for Western Europe swine the more adjusted and suited to the project sites.

Therefore, the parameter VSLI,y will be calculated according with the following methodology consideration "In case default IPCC values for VS are adjusted for a site-specific average animal weight, it shall be well explained and documented.".

Where:

(Equation 3 – Methodology AMS III.D v21)

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

Where:

Wsite Average animal weight of a defined livestock population at the project site (kg)

Wdefault Default average animal weight of a defined population, this data is sourced from IPCC 2006 (kg)

Vsdefault Default value for the volatile solid excretion rate per day on a dry-matter basis for a defined livestock population (kg dm/animal/day)

ndy Number of days in year “y” where the treatment plant was operational.

According to paragraph 17 (d) from AMS-III.D version 21.0, B0 or VS values applicable to developed countries can be used provided the following four conditions are satisfied:

The genetic source of the livestock originates from an Annex I Party;

For this project, the genetics and nutrition adopted for these farms as so as in western Europe. More details or information of the genetics can be obtained at the producers or at the Associação Brasileira dos Criadores de Suinos (Brazilian Swine Association) – http://www.abcs.org.br/ and also at COOASGO (Cooperativa de São Gabriel do Oeste). The audit team confirmed on-site the type of animals being used and received pig inventory records, genetic, diet and feeding certificates for all the farms that are part of the project. /1/2/3/17/22/25/.

The data used for the baseline emission reduction calculation is the product of the monitoring activities and the meters readings. All the data were issued by automatically systems and crosschecked by the lead auditor with the row data collected by the Regional Technician.

- Quantification of project emissions

According to the simplified baseline and monitoring methodology (AMS.III.D – version 21.0), project emissions consist of:

1. (a) Physical leakage of biogas in the manure management systems which includes production, collection and transport of biogas to the point of flaring/combustion or gainful use (PEPL,y);
2. (b) Emissions from flaring or combustion of the gas stream (Peflare,y);
3. I CO2emissions from use of fossil fuels or electricity for the operation of all the installed facilities (PEpower,y).
4. (d) CO2 emissions from incremental transportation distances (PEtransp,y)
5. (e) Emissions from the storage of manure before being fed into the anaerobic digester (PEstorage,y)

Equation 5 (equation 6 of the meth)

The formula used for the calculations of the project emissions is consistent with the registered PD-MR /1/. According to applicable methodology /3/, PE calculations require the use of this equation number (5) as follows:

$$PE_y = PE_{PL,y} + PE_{flare,y} + PE_{power,y} + PE_{transp,y} + PE_{storage,y}$$

Where:

PEy – Project emissions in year “y” (tCO2e)

PEPL,y – Emissions due to physical leakage of biogas in year “y” (tCO2e)

PEflare,y – Emissions from flaring or combustion of the biogas stream in the year “y” (tCO2e)

PEpower,y – Emissions from the use of fossil fuel or electricity for the operation of the installed facilities in the year "y" (tCO2e)

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 us 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

PEtransp,y – Emissions from incremental transportation in the year y (tCO2e), as per relevant paragraph in AMS-III.O

ICONTEC confirmed that there is not transportation and therefore no emissions related.

PEstorage,y – Emissions from the storage of the manure in the year "y" (tCO2e)

ICONTEC confirmed that there is no manure storage and therefore no emissions related. The audit team assessed the operational conditions of the proposed project activity and concluded the management of manure does not include storage or transport of the effluent s of swine production operations.

Where:

(A) missions due to physical leakage of biogas can be determinate as follows:

Equation 6 (equation 7 of the meth)

Where:

PEPL,y – Emissions due to physical leakage of biogas in year "y" (tCO2e)

GWPCH4 – Global Warming Potential (GWP) of CH4 (28)

DCH4 – CH4 density (0.00067 t/m3 at room temperature (20 oC) and 1 atm pressure).

LT – Index for all types of livestock

J – Index for animal waste management system

B0,LT – Maximum methane producing potential of the volatile solid generated for animal type "LT" (m3 CH4/kg dm)

NLT,y – Annual average number of animals of type "LT" in year "y" (numbers)

VSLT,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%i,y – Fraction of manure handled in system "i" in year "y"

Emissions from flaring determinate as follows:

According with the tool Project emissions from flaring version 4 /4/, the calculation procedure in this tool determines the project emissions from flaring the residual gas (PEflare,y) based on the flare efficiency (ηflare,m) and the mass flow of methane to the flare (FCH4,RG,m). The flare efficiency is determined for each minute m of year y based either on monitored data or default values.

The project emissions calculation procedure is given in the following steps:

STEP 1: Determination of the methane mass flow of the residual gas;

STEP 2: Determination of the flare efficiency;

STEP 3: Calculation of project emissions from flaring.

Step 1: Determination of the methane mass flow in the residual gas

The "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" shall be used to determine the following parameters

The following requirements apply:

(a) The gaseous stream tool will be applied to the residual gas;

(b) The flow of the gaseous stream will be measured continuously;

(c) CH4 is the greenhouse gas i for which the mass flow will be determined;

(d) The simplification offered for calculating the molecular mass of the gaseous stream is valid (equations 3 and 17 in the tool); and

(e) The time interval t for which mass flow should be averaged is every minute m.

According with the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" version 03, The mass flow of a greenhouse gas i in a gaseous stream (Fi,t) is determined through measurement of the flow and volumetric fraction of the gaseous stream.

Option A was chosen

The flow measurement on a dry basis is not doable for a wet gaseous stream. Therefore, it is necessary to demonstrate that the gaseous stream is dry to use this option. According with the tool, there are two ways to do this:

(a) Measure the moisture content of the gaseous stream ($CH_{2O,t,db,n}$) and demonstrate that this is less or equal to 0.05 kg H_2O/m^3 dry gas; or

(b) Demonstrate that the temperature of the gaseous stream (Tt) is less than 60oC (333.15 K) at the flow measurement point.

(c) The temperature of the biogas is less than 60oC, and that will be demonstrated during the monitoring of the parameter, according with the MP.

Step 2: Determination of flare efficiency

The flare efficiency depends on the combustion efficiency of in the flare and the time that the flare is operating. For determining the efficiency of enclosed flares project participants shall choose to determine the efficiency based on monitored data or the option to apply a default value. For open flares a default value must be applied. The time the flare is operating is determined by using a flame detector and, for the case of enclosed flares, in addition the monitoring requirements provided by the manufacturer's specifications for operating conditions shall be met.

In the case of enclosed flares, project participants may choose between the following two options to determine the flare efficiency for minute m ($\eta flare,m$) and shall document in the CDM-PD which option is selected:

(a) Option A: Apply a default value for flare efficiency;

(b) Option B: Measure the flare efficiency.

Option A was chosen

Option A: Default value

The flare efficiency for the minute m ($\eta flare,m$) is 90% when the following two conditions are met to demonstrate that the flare is operating:

(a) The temperature of the flare (TEG.m) and the flow rate of the residual gas to the flare (FRG,m) is within the manufacturer's specification for the flare (SPECflare) in minute m; and

(b) The flame is detected in minute m (Flamem).

Otherwise $\eta flare,m$ is 0%.

It is important to highlight that the flares are considered a low height so, in line with the tool, a conservative approach should be applied, and 10 percentile points should be subtracted to the flare efficiency. Hence the flare efficiency adopted in the current PD will be the default value of 80%.

In line with the monitoring plan, if any minute of any hour presents a temperature value below 500oC the entire hour will be discount form the CER calculation. 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.

Step 3: Calculation of project emissions from flaring

Project emissions from flaring are calculated as the sum of emissions for each minute m in year y, based on the methane mass flow in the residual gas (FCH4,RG,m) and the flare efficiency (ηflare,m), as follows:

Equation 7 (equation 15 of the Tool 6)

$$PE_{flare\,y} = GWP_{CH4} \times \sum_{m=1}^{525600} F_{CH4,RG,m} \times (1 - \eta_{flare\,m}) \times 10^{-3}$$

Where:
PEflare,y – Project emissions from flaring of the residual gas stream in year y, tCO 2e
GWPCH4 – Global Warming Potential of methane valid for the commitment period, tCO2e/tCH4
FCH4,RG,m – Mass flow rate of methane in the residual gas in the minute m, kg/m
ηflare, m – Flare efficiency in the minute m

- Quantification of leakage

According to the simplified baseline and monitoring methodology AMS-III.D - version 21/3/ and the tool "Project and leakage emissions from anaerobic digesters" (version 02) /19/, no leakage calculation is required if the storage of digestate or the composting of digestate is occurring within the project boundary, these emissions will be considered as project emissions, (in line with paragraph 25 of the tool).

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.

- Summary of net GHG emission reductions or removals
- The verification team assessed the whole set of data and calculations of GHG emission reductions /2/ resulting from the project activity by the application of selected methodology, formulae and default values applied both for the claimed and unclaimed period monitored.

According to PD-MR /1/ the last version, the estimated annual GHG emission reductions/removals of the project are is 382.487 tCO2e for the first crediting period (7 years) from 02/01/2021 to 01/01/2028,

resulting in estimated annual average GHG emission reductions of 55,356 tCO2e. These figures were calculated using the methodology AMS-III.D v.21/3/ and the applicable tools /4/.

- Emission Reductions.

The equation 1

- $ER_{y,estimated} = BE_y - PE_y$

Where:

• ERy – Emission reductions in t CO2e/year

• BEY – The annual baseline methane emissions in t CO2e/year PE Y = project emissions in t CO2e/year

The emission reductions which will be achieved by the project activity ex post will be determined through direct measurement of the amount of methane flared. The emission reductions achieved in any year will be the lowest value of the following:

Equation 1.1

$$ER_{y,ex\text{-}post} = min[(BE_{y,ex\text{-}post} - PE_{y,ex\text{-}post}),(MD_y - PE_{power,y,ex\text{-}post})]$$

Where:

ERy,ex-post – Emission reductions achieved by the project activity based on monitored values for year y (tCO2e)

BEy ex post – Baseline emissions calculated using equation 1 (for projects using option in paragraph 17(a) and using ex post monitored values of NLT,y and if applicable VSLT,y for year y (tCO2e). For projects using option in paragraph 17(b), the ex post monitored values for Qmanure,j,LT,y and SVSj,LT,y are used.

PEy,ex post – Project emissions calculated using Equation 5 (equation 6 of the meth) using ex post monitored values of NLT,y ,MS%i,y and if applicable VSLT,y for year y (tCO2e)

MDy – Methane captured and destroyed or used gainfully by the project activity in year y (tCO2e)

PEpower,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 (tCO2e)

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 /2/ 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.

As a general crosscheck of the data, ICONTEC verified the backup system of the company and cross checked the information of the CERs spread-sheet /2/ 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.

The Methane captured and destroyed (MDy) in the current monitoring period: 68,325 MDy (t CO2e)

- Uncertainties associated with the calculation of emissions

UFb - the Model correction factor to account for model uncertainties (0.94) (FCCC/SBSTA/2003/10/Add.2, page 25) https://unfccc.int/resource/docs/2003/sbsta/10a02.pdf. Is a parameter applied by the PP to determinate the Baseline equations.

The calculations of baseline GHG emissions have been carried out in accordance with the formulae and methods described in the PD-MR /1/ and the applied methodology. Appropriate use UFb parameter the formulae applied in the PD- MR and the CER calculation were correctly justified.

- Documentation used as the basis for assumptions and sources of data

The ER calculation/2/ has been duly checked. ICONTEC has further checked the Joint-PD-MR /1/against the latest version of the applicable methodology /3/. the referenced methodological tools /4/19/51/for consistency.

The validation & verification team assessed weather all data sources and assumptions are appropriate, and calculations are correct and applicable to the proposed CDM project activity, and will result in an accurate or otherwise conservative estimate of the emission reductions. With respect to the data and parameters which will be monitored or estimated on implementation and hence become available only after renewal of the crediting period of the project activity, the validation team confirmed that the estimates provided in the revised PD-MR version 5 /1/ for these data and parameters are reasonable.

3.4.7 Methodology Deviations

There are no any methodology deviations applied to the project.

3.4.8 Monitoring Plan

1. **Data and parameters available at validation**

Parameter	Description	Value	Source
$VS_{default}$	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	IPCC 2006, vol 4, chapter 10, Tables 10A-7 and 10A-8. – http://www.abcs.org.br/43
MC_{Fj}	Annual methane conversion factor for the baseline animal waste management system "j".	79%	IPCC 2006, vol. 4, chapter 10, Tables 10.17.
$MS_{\%BI,j}$	Fraction of manure handled in baseline animal manure management system "j".	1	PP
GWP_{CH4}	Global warming potential of Methane (CH_4) – tCO2e/tCH4	28	The value has been verified by checking IPCC Fifth Assessment Report (AR5)/34/ against the VCS standard version 4.3/41/.
$B_{0,LT}$	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

Parameter	Description	Value	Source
UF_b	Model correction factor to account for model uncertainties	0.94	FCCC/SBSTA/2003/10/Add.2, page 25. Available on the website: http://unfccc.int/resource/docs/2003/sbsta/10a02.pdf
SPECflare	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 m3/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

The audit team was able to verify the ex-ante parameters used and specified in the D&MR /1/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 GHG emission reductions calculated and stated on the calculation file /6/.

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 /3/, VS figures applicable to developed countries can be used since the following conditions are satisfied:

1) 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 /15 / – Genetics and the supplier /24/ provides with animals at the producers or at the Associação Brasileira dos Criadores de Suinos (Brazilian Swine Association) – http://www.abcs.org.br/ and also at COOASGO ((Cooperativa Agropecuária São Gabriel do Oeste), which in turn provides to the different project sites having a traceable record of the animal type. As it has been found through written statement/,

2) •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: 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, brans, flours, minerals, vitamins, growth promoters etc. The rations are adjusted to different stages of swine production /12/ /20/ /28/. 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 COOASGO, the animal producer's association and therefore, feeding operations are controlled.

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 /12/, in compliance with the monitoring plan of the PD-MR. 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

3) •The project specific animal weights are more similar to developed country IPCC default values: The animal weights are described in the calculation file /43/ 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.

2. Data and Parameters Monitored

During the verification process, the audit team assessed the whole set of monitoring parameters relevant to the proposed project activity (as listed in chapter 6. 6.1 of the PD-MR /1/ and the figures as reported 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 PD-MR /1/ are described as follows:

1. Parameter:	T_f
Description:	Combustion temperature of the flare (enclosed flares)
Value:	In the spreadsheet calculation file version 3(CER Calculation MR01 – BCA-BRA-16_v.3/2/ on folder Mdy-Pepower,y,ex-post.
Used Equipment:	ALUTAL Standard Thermocouple, Accuracy Class; ± 1.5°C or ± 0.25%. . Equipment of each project site is described in section C of the D& MR/1/5
Source of Data and Frequency:	Flare temperature is measured once per minute through thermocouples and recorded by the PLC system (Programmable Logic Control). On its turn, records are monthly collected by the Regional Technician through flash memory. Data collected is gathered monthly and kept on form: 01.001, also known as "Tabela de Dados" /15/. In addition, the QA/QC officer according to the internal procedure verifies Data collected. Every 1-minute measurement and registration by a Control Logic Program (CLP) According to the Monitoring Operational Procedure POP-01 /15
Data Cross Checking:	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. The audit team on -site take photographs and received current photographic records taken by the PP and taken, evidence related to equipment in operation, such as panoramic views and records of thermocouples at the project sites / 23/25/26/46. It was also verified collected temperature form 08-001 /20/data by considering methane content of biogas against form 01.001 /15/ as well as the emission reduction calculation file /2/.
Consistency Between the QA/QC defined in the Methodology:	It was verified PP fulfils the proposed QA/QC procedures on applicable methodology and presented PD-MR /1/. The records of temperature /16/ /18/ 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 /10/, 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 PD:	QA/QC procedures taken by the project activity are in line with the proposed procedures on PD-MR /1/ as well as applicable methodology /3/ /4/ /19/ 51.

Conclusion:	The overall conclusion on the matters of Parameter T_f is that the parameter is properly applied according to the monitoring plan, the PD-MR/1/ and in accordance with the applied methodology. In addition, provided information (data and figures) is consistent with the primary and secondary information source used to verify the information as well as the information verified on-site.

2.Parameter:	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 /2/ in the folder Bey ex-post – Pey ex-post, and PD-MR /1/
Used Equipment:	Not Applicable
Source of Data and Frequency:	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 PD-MR 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 /30/ 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 COOASGO´ (Cooperativa de São Gabriel do Oeste) and provided to the PP. COOASGO is the Pig Producers Association to whom the farms contained in the PD are associated. its main role is to act as a third party responsible for the assurance of all the logistics associated with the swine producers, providing the animal nutrition, genetics and all the overall animal weight.
Data Cross Checking:	Reported data was verified by comparing different figures of calculation file /2/ and raw data on form 16.001 /30/, finding no differences between figures. • Pig standard weights, available on the website: https://www.embrapa.br/documents/1355242/0/C urso+Suinocultura+-+Apostila.pdf. Source: EMBRAPA Empresa Brasileira de Pesquisa Agropecuária (as in English: Agricultural Research Brasilian Corporation) allowing a crosscheck of the values provided in the form 16.001, used for the monitoring and control of the parameter Wsite,

	• Purchase records /28/ are provided as part of the support documents. • Livestock inventory – form 03.003/17 per site Through the above primary and secondary sources, PP and VVB confirm the consistency between the reported Wsite values and the indirect information, in line with the methodological framework /3/. 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.
Consistency Between the QA/QC defined in the Methodology:	Data collection and its subsequent use for calculations follows requirements set out on applicable methodology /3/. ICONTEC confirmed, based on interviews that the data collection is carried out quarterly per year by COOASGO (following the association's internal procedures) to the PP are cross-checked against two different credible sources: - reference figures from EMBRAPA (an undisputed Brazilian Agricultural Research Corporation nationally recognized for the these scope) for each category; and - the figures provided by COOASGO when each of the swine batches exits each farm (each batch stays around 5 to 6 months per farm), as explained below. Here FAZENDAS 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. 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.
Consistency Between the QA/QC established by the Project Participants in the PD:	QA/QC is performed as described in the PD-MR; PP correctly measured the actual animal weight at the various project sites.
Conclusion:	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 /3/ and provisions on PD-MR Monitoring of the parameter was monitored in accordance with the revised PD -MR and therefore, 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.

	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. 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 /3/. 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 The audit team confirmed and verified that figures of parameter Wsite 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 PD-MR /1/.

3.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-02/16/44
Used Equipment:	Not Applicable
Source of Data and Frequency:	According to the PD-MR version 5 /1// the frequency of site visits is annually; The site inspection is monitored by the use of the form 02.001/14/. 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.
Data Cross Checking:	Information provided on Form 02.001 and POP 2 /16/ was crosschecked against information by visit on site, relevant sources verified since the archives presented by PP and telephonic interviews and videocall. The audit team received made a field visit on September 13 2022 and took a photographic record of the site of each of the farms, equipment, operating system, status of the biodigestor and records /46/ it also confirmed the georeferenced location of the sites / 36 /.
Consistency Between the QA/QC defined in the Methodology:	Site inspection is performed in the required frequency (according to applicable methodology /3/); furthermore, site inspection is done for each and every project site.
Consistency Between the QA/QC established by the Project Participants in the PD	PP does site inspection on the frequency described on PD-MR v5 /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.

4.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) /17/, 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 /17/ 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 /17/.
Data Cross Checking:	Information provided on excel files of the form 03.001 /17/, were cross-checked by comparing figures on Calculation file /6/ as well as livestock inventory stated in the MR stated on form 03.003 /17/
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 PD:	QA/QC measures taken by PP for the different project sites are in line with proposed QA/QC measures described on PD-MR.
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 PD-MR..

5.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 /2/.
Used Equipment:	Flow Meter, Endress+Hauser thermal mass flow meter t-trend – ATT12 A99D31A4D1 MODEL, /27/Accuracy class ± 5% of factory full scale. Equipment of each project site is described in section 6.1 of. The PD-MR/1/
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 Sinomar dosSantos on a monthly basis and stored on forms 04.001 /18/, and 01.001 /15/.

	Related equipment measures the actual biogas volume on wet basis. As the flow meter registers the biogas that is directed to the flare cumulatively (and that is also the data registered in the PLC), the $BG_{burnt,y}$ is calculated by differential with the previous biogas volume reading.
Data Cross Checking:	Flow meter operation was verified crosschecking the calculation file /2/ against form 04.001 /18/ and form 01.001 /15/, /20/, against. In addition the regional technician confirmed the origin of data and the procedure of collection as described in MR /5/.
Consistency Between the QA/QC defined in the Methodology:	QA/QC procedures follow mandatory requirements from applicable methodology.
Consistency Between the QA/QC established by the Project Participants in the PD:	QA/QC procedures are in line with proposed procedures on PD-MR
Conclusion:	Calculation of the parameter was correctly addressed as the audit team confirmed. Furthermore, PP correctly applied procedures defined on PD-MR. 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.

6.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 /2/ and PD-MR /1/.
Used Equipment:	Biogas Check Portable Digital Analyzer from Geotech/Landtech. Accuracy CH4: ±1.5 ºC or 0,25% • CH4: ± 0.5% from 0-5% CH4 content; ± 1.0% from 5-15% CH4 content; ± 3.0% from 15%-full scale CH4 content • Temperature: ± 0.2oC (Biogas check analyzer accuracy) ± 0.5oC (temperature probe accuracy) • Pressure: ± 4mbar typically and ±15 mbar maximum Equipment is described in section 5.2 PD-MR/1/

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. Data is collected through a Portable Gas Analyzer and reported in form 04.001 /18/ at the suitable monitoring frequency: monthly. Since methodology /3/ requires that parameter WCH4,y to be measured with the confidence level defined on PD-MR /1/ , 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 /3/), 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. As assessed on the Sampling Plan /12/
Data Cross Checking:	Data collected and reported through calculation file /2/ was crosschecked against Form 04.001 /18/ 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 /3/ 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 /3/ and stated /1/
Consistency Between the QA/QC established by the Project Participants in the PD:	QA/QC activities were carried out as defined on PD-MR as well as monitoring plan and, as required by methodology /3/. 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 PD-MR/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 /12/ is in accordance with the methodological requirements for sampling /24/ the methane content of the biogas described in the applicable methodology /3/ /4/52/ and POP 5/36.

7.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 /2/ and PD-MR /1/
Used Equipment:	Biogas Check Portable Digital Analyser from Geotech/Landtech. Accuracy Temperature: ± 0.2ºC (Biogas check analyser accuracy) ± 0.5oC (temperature probe accuracy) /11/. Equipment is described in section 6.1 of PD-MR/1/.
Source of Data and Frequency:	Data is collected in form 04.001 /18/ 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 /3/ requires that parameter WCH4,y be measured with a 90/10 confidence level, PP correctly designed and applied a sampling plan /12/, the one was developed by using the "Guidelines for sampling and survey" /21/.
Data Cross Checking:	Data collected and reported through calculation file /2/ was crosschecked against Form 04.001 /18/ provided for the verification process and regarding all of the project sites, therefore assuring the integrity of data available for the monitoring period. No differences were found between stated figures within the different data sources.
Consistency Between the QA/QC defined in the Methodology:	QA/QC activities were carried out as defined on PD-MR/1/ as well as monitoring plan and, as required by methodology /3/ and Guidelines for sampling /21/. 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 PD:	QA/QC activities were carried out as defined on PD-MR as well as monitoring plan and, as required by methodology /3/.
Conclusion:	The parameter has been measured consequently with mandatory requirements as well as stated on PD-MR /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 and is used th– POP-05 - at the Brascarbon Operational Procedure Manual

8.Parameter:	$D_{CH4,y}$
Description:	Density of the methane combusted
Value:	The values of the parameter can be found in the calculation file /2/ and MR /1/. Used formula: $D_{CH4,y} = \frac{P_n}{\frac{R_u}{MM_{RG,h}} \times T_n}$ DCH4,y: Density of methane in the biogas (kg/m3) Pn: Pressure of biogas (Pa) Ru: Universal Gas Constant (8314 Pa.m3/Kmol.K) MMRGh: Molecular mass of methane (16.04 kg/kmol) Tn: Biogas temperature (K)
Used Equipment:	Not applicable
Source of Data and Frequency:	POP 07.001 /31/ states the monitoring procedure and data regarding pressure and temperature are collected with the frequency determined in the sampling plan /12/, the one is in line with the sampling and survey framework /21/ /24/.
Data Cross Checking:	Formulae used in the calculation file /2/ was crosschecked against mandatory formulae stated in the methodological tool /4/ 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 /3/.
Consistency Between the QA/QC established by the Project Participants in the PD:	QA/QC procedures applied are in line with provisions on PD and applicable requirements.
Conclusion:	Methane density was correctly calculated by PP, applying the and methodological tool /4/ and according to POP 07/31.

9.Parameter:	Q_{DM}
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 09/33. 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 PD:	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.

10.Parameter:	FE ($\eta_{flare,h}$)
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 /2/ and MR /1/.
Used Equipment:	Enclosed Flare, is used in the entire project in addition a thermocouple
Source of Data and Frequency:	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. Enclosed flare (low height) is used in the entire project. Brascarbon registers the gas flow sent to the flares and the combustion temperature of the flares every minute. According to the methodology /3/ and Tool 6 /4/: the PP selected option A of tool 6 as follow:

	A 80% efficiency for a specific hour is considered if the following conditions are met for all minutes in that specifiers: (i) all temperature records are above or equal to 500o Celsius and (ii) the temperature of the flare (TEG.m) and the flow rate of the residual gas to the flare (FRG,m) are within the man'facturer's specification for the flare (SPECflare). (iii) The flame is detected in minute m (Flamem). 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 man'facturer's specification (SPECflare). 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. Information related to flare efficiency of each hour for 24 hours per day is registered on the form 08.001 /20/ and obtained through a macro applied to form 01.001 /15/ (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%).
Data Cross Checking:	As part of the verification activities, the verification team assessed the form 08.001 /20/ 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 /2/, finding no differences between stated figures. The audit team verified that during the first control period the flare mainly operated within the range of the man'facturer's specifications and when it was below 500ºC the VCUs were discounted as indicated in paragraph 18 of tool 6./4/.
Consistency Between the QA/QC defined in the Methodology:	PP took into account applicable requirements as well as registered PD-MR /1/ and performed QA/QC according to applied methodology /3/ and the Tool 06 version 4 /4/. The

	verification process included a dully assessment on flare temperature records /18/, 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. Taking into account that the methodology defines in its tool 6/4 the justification for the use of this parameter to determine the combustion efficiency of the FE, the PP selected option A: default value and paragraphs 21, 22 and 23 which sta”I that:...." The flare efficiency for minute m (flare,m) is 90% when the following two conditions are met to demonstrate that the flare is operating: (a) The flare temperature (TEG,m) and the waste gas flow rate to the flare (FRG,m) are within the ’anufacturer's operating specifications for the flare (SPECflare) at minute m; and (b) Flame is detected at minute m (Flamem). 22. Otherwise, flare,m is 0%. 23. For enclosed flares that are defined as low flare, the flare efficiency will be adjusted, as a conservative approach, by subtracting 10 perce”Ile points..." For this reason, and although it meets the above conditions, the PP conservatively applied this parameter in that the default applied value is 80%, ”nstead of 90%." Since manufacturer specifications /11/ have been presented by PP which stated: “system is made to the natural flow of biogas, which works under atmospheric pressure, without forced ventilation systems for biogas once the flare is designed and customized for each farm working exclusively with the atmospheric pressure”. The monitoring equipment has been put in operation and, the verification team assesses all relevant information related to the parameter, it is concluded the parameter has been correctly monitored and determined and it follows the proposed monitoring plan described at the revised and approved PD.
Consistency Between the QA/QC established by the Project Participants in the PD:	Q/A/QC included maintenance (replacement) procedures as described on PD, 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 /3/ /4/. 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:	$ER_{y,ex\text{-}post}$
Description:	Ex-post emission reductions achieved by the project activity based on monitored values for the year "y".
Value:	The values of $ER_{y,ex\text{-}post}$ can be found in the spread-sheet calculation file /2/ and PD-MR /1/
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 ($ER_{y,ex\text{-}post} = \min[(BE_{y,ex\text{-}post} - PE_{y,ex\text{-}post}),(MD_y\text{-}PE_{power,y,ex\text{-}post})]$, in order to calculate the parameter on a yearly basis. Ad in accordance with the methodology /3/.
Data Cross Checking:	Figures of Baseline emissions (Bey,ex-post), project emissions (Pey,ex-post) and methane captured and destroyed (Mdy) Reported on MR and CERs calculation file /3/ 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 Pey,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 PD and applicable methodology /3/.
Consistency Between the QA/QC defined in the Methodology:	QA/QC activities are in line with the applicable methodology /3/.
Consistency Between the QA/QC established by the Project Participants in the PD:	During the monitored period QA/QC activities have been carried out in accordance to PD.
Conclusion:	Emission reductions calculation comply with mandatory requirements set out on methodology AMS-III.D version 21.0, applicable tool, and revised PD-MR /1/, including the revised monitoring plan for the validation and verification period. The Monitoring operational procedure POP-17/42.

12.Parameter:	FFR
Description:	Formulated feed rations
Value:	Not applicable
Used Equipment:	Not Applicable
Source of Data and Frequency:	Data provided on form 14.001 /14/ (internal control document) was crosschecked by the audit team against records of animal feed rations /22/.
Data Cross Checking:	Information provided on PD-MR, and support documents /1//22/
Consistency Between the QA/QC defined in the Methodology:	Keeping records and supplier evidence are in line with methodology /3/ requirements.
Consistency Between the QA/QC established by the Project Participants in the PD	PP followed proposed QA/QC procedures on PD, 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 PD /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.

13.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 /2/ and PD-MR /1/
Used Equipment:	Biogas Check Portable Digital Analyzer from Geotech/Landtech. Accuracy. Pressure: ± 4mbar typically and ±15 mbar maximum. Equipment is described in section 6.1/1/
Source of Data and Frequency:	Data is periodical collected in form 04.001 /18/ and the monitoring frequency is monthly by the regional technician as verified by the audit team through telephonic interview. Since methodology /3/ 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 /23/, calibration records of the gas analyzer /31/ the one is in line with methodology /3/.
Data Cross Checking:	Data provided through calculation file /2/ was crosschecked against Form 04.001 for every project site. No differences were found between stated figures on different data sources. Data was also crosschecked against records available on each project site
Consistency Between the QA/QC defined in the Methodology:	QA/QC is in line with requirements determined by the applicable methodology /3/ and Measurement according with Operational Procedure POP-13 /34/.
Consistency Between the QA/QC established by the Project Participants in the PD:	QA/QC activities were carried out as defined on PD-MR as well as approved monitoring plan and, as required by methodology /3/.
Conclusion:	The parameter has been measured consequently with mandatory requirements as well as stated on PD-MR /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.

14.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 /25/ according to Operational Procedure POP-15 /24/. In addition, there is consistency between procedures and provisions on Methodology /3/.
Consistency Between the QA/QC established by the Project Participants in the PD:	Procedures for the monitoring period of reference are in accordance with PD-MR.

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 /25/ genetic source.

15.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 /16/; the actual fraction is monitored on annually based on daily measurement and monthly aggregation
Data Cross Checking:	Information provided on PD- MR /1/ 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 /3/.
Consistency Between the QA/QC established by the Project Participants in the PD:	Site visit inspections are carried out by PP as determined on PD /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.

16.Parameter:	Nda,y
Description:	Number of days animal is alive in the farm, in year "y"
Value:	The values Nda,y can be found in the calculation file /2/ - same parameter NLT,y
Used Equipment:	Not Applicable

Source of Data and Frequency:	The animal inventory records are kept in formulario 03.003 /17/. 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) /17/, 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 /17/.
Data Cross Checking:	Information provided on excel files of the form 03.001 /17/, were crosschecked by comparing figures on Calculation file /2/ 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 PD:	QA/QC measures taken by PP for the different project sites are in line with proposed QA/QC measures described on PD-MR.
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 PD.

17.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 /2/
Used Equipment:	Not Applicable
Source of Data and Frequency:	The animal inventory records are kept in formulario 03.003. 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) /17/, 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 /17/.
Data Cross Checking:	Information provided on excel files of the form 03.001 /17/, were crosschecked by comparing figures on Calculation file /2/ 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 PD:	QA/QC measures taken by PP for the different project sites are in line with proposed QA/QC measures described on PD 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 PD-MR/1/.

18.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 /2/ and PD-MR version 5/1/.
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 /20/ as a result of the PLC data collection. Parameter figure is used for calculations on calculations file /2/.
Data Cross Checking:	Reported figures for the different project sites were crosschecked against form 08.001 /20/ 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 /3/
Consistency Between the QA/QC established by the Project Participants in the PD:	The QC officer as defined on PD verifies calculations.
Conclusion:	The parameter was monitored in accordance with the approved PD /1/ as well as required by the applicable methodology /7/.

19.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 PD-MR /1/
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 /2/ 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 /3/, using figures applicable to developed countries.
Consistency Between the QA/QC established by the Project Participants in the PD:	The QC officer as defined on PD verifies calculations. QA/QC activities were carried out as defined on PD as well as approved monitoring plan and, as required by methodology /3/. and the PP internal procedure POP 14 /14/, Form 02.001 /16/.
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.

20.Parameter:	$Q_{manure\ LT,y}$
Description:	Quantity of manure treated from livestock type LT at animal manure management system j
Value:	100%
Used Equipment:	Not Applicable

Source of Data and Frequency:	Annually based on daily measurement and monthly aggregation. Form 02.001/16/, Brascarbon Report System
Data Cross Checking:	Data, procedures and figures verified crosschecking information provided on PD-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 /3/.
Consistency Between the QA/QC established by the Project Participants in the PD:	The regional technician as well as the QA/QC officer used form 02.001 as described in the registered PD-MR /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.

21.Parameter:	AI_l
Description:	Annual average interval between manure collection and delivery for treatment at a given storage device l
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 PD:	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.

22.Parameter:	$Flame_m$
Description:	Flame detection on flare in the minute m
Value:	Figures reported on form 08.001 /20/ Ultraviolet flame sensor Model C7035
Used Equipment:	Enclosed flare
Source of Data and Frequency:	Monitoring system Brascarbon - Once per minute. Flame detection of flare in the minute m ON/OFF
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 /15/
Consistency Between the QA/QC defined in the Methodology:	Calibration procedures and frequencies /27/ /28/29/ /32/ as well as maintenance activities /19/
Consistency Between the QA/QC established by the Project Participants in the PD:	Continuous monitoring of operational conditions within the manufacturers' specifications and maintenance (maintenance procedures are stated on form 02.001 /16/)
Conclusion:	The flame detection is assured by following POP 08 as the verification team assessed data collected on form 08.001 /23/ and CER /6/.

3.5 Non-Permanence Risk Analysis

N/A

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project is implemented by Brascarbon Consultoria, Projetos e Representação Ltda. and include as purpose to mitigate and recover animal effluent related Greenhouse Gas (GHG) by improving the Animal Waste Management System practices in the confined animal feed operations in the different sites located at the Mato Grosso do Sul state, central Brazil.

The project is currently in its first year and a half of operation and aims to reduce tCO2 emissions generated in intensive swine production systems in the state of Mato Grosso, which on average can reach 151 tCO2 /day (on average) according to the baseline. The project is expected to achieve an annual emission reduction of 55,356 tCO2e and a total emission reduction of 382,487 tCO2e during the first 7-year renewable crediting period.

The measures that were adopted to verified correspond to:

No discrepancy between project execution and project description was observed at the time of verification. what was stated by the PP in the PD corresponds to what was found in the field and to the records submitted by the PP to the audit team.

The implementation status of the monitoring plan and the completeness of monitoring, including the suitability of the implemented monitoring system (i.e., process and schedule for obtaining, recording, compiling and analyzing the monitored data and parameters).

There were no material discrepancies between the actual monitoring system and the monitoring plan established in the project description and methodology applied.

The project has not participated or been rejected in any other GHG program since the previous validation or verification.

The project has not received or applied for any other form of environmental credit, and this is its first validation and verification.

-The reduction of GHG emissions generated by the project has not been included in any emissions trading program or any other mechanism that includes GHG emissions trading.

Relative to – if the project has implemented the activities that result in the SD contributions described in the monitoring report, the PP has expressed that the project has contributed to Socio – Economic and environmental Sustainability but in the PD-MR/1/1.17.1 mentioned it that the project is not required to report sustainable development contributio–s.: Regarding - whether the project has implemented the activities that give rise to the SD contributions described in the monitoring report, the CP has stated that the project has contributed to socio-economic and environmental sustainability and points out some of the

most important aspects of that contribution in terms of natural resource management, odor pollution control, water flows and general staff welfare, but in PD-MR/1/1.17.1 it is mentioned that the project is not required to report on sustainable development contributions in its monitoring procedures. Regardless and according with the company operational procedures, the sustainable development practices are included. The audit Team confirm that the measures that Brascarbon has taken in the project site, contributes by itself to the sustainable development of the state of Mato Grosso do Sul.

In conclusion:

The project has been implemented as described in the project description:

• The objective of this project is to reduce and recover Greenhouse Gases (GHG) related to animal effluents by improving the practices of the Animal Waste Management System in confined animal feed in the different cities located in the state. of Mato Grosso do Sul, central Brazil, developed by BRASCARBONO.

• The project is a non-clustered project activity, which will use a technology based on covered storage cells at room temperature (lagoon) with sufficient capacity to create an adequate Hydraulic Retention Time (HRT). The system also includes a piped biogas collector, from the digester to the flare system.

• The torch is enclosed and controlled by a PLC (Programmable Logic Controller) data logger in which the combustion temperature is stored every minute in the system. This system will record the combustion temperature every minute to determine the efficiency of the flare according to the specifications of the flare. A thermocouple installed in the torch is connected to the PLC to control the combustion temperature. The spark system in the flare is automatic. Every second, the system turns on. The biogas flow will also be controlled by a PLC in which the system records the flow every minute.

The PP implemented each and every one of the stages of the project as described in the PD and with thecapacity and characteristics initially indicated in it.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

By means of on-site inspection and documents review, ICONTEC can ensure that during 1st monitoring period, the project was implemented in accordance with the Joint-PD-MR/1/.

This verification covers the period from 02-January-2021 to 31-January-2022 (including both days). 55,246 tCO2e emission reductions are achieved during this monitoring period.

The main timeline of the project is as below table, which has been confirmed in the PD -MR/1/, monthly production summary table/14/ against the on-site inspection.

Activity - dates of project 2998:

According to table 1 – PD-MR version 5/1/:

Start construction: June to September 2020 (all sites)

Start date: 28/12/2020 -date in which the first farm begun the Stat-up and Tests phase.

Start date of the crediting period – 02 January 2021

The audit team realized visit on-site to each one by sites of project and found that project /46/ the biodigester system and the flare, are recently building and No evidence of events or situations, which may impact the applicability of the applied methodology, occurred during this monitoring period. On the basis of site visit and the reviewed project documentation it can be confirmed that the realized technology, the project equipment, as well as the monitoring and metering equipment, the project has been implemented and operated as applied monitoring methodology and monitoring plan described in the Joint-PD-MR and the monitoring system is fully functional to generate Verified Carbon Units (VCUs) without any double counting for this monitoring period from 02 January 2021 to 31-January-2022.

Basic technical details of the project have been provided in the Joint-PD-MR /1/ which has been verified during sites visit /46/.

There are no any methodology deviations relevant.

In conclusion, the verification Team was able to confirm that the project implementation is in accordance with the project description contained in the Joint-PD-MR/1/.

4.3 of Evidence to Determine GHG Emission Reductions and Removals

Refer to above sections 3.4.8 for the detail assessment of each monitoring parameters and Appendix 3 for the supporting evidence used to determine the GHG emission reductions.

For each reported data, the evidence is provided and verified as sufficient and quality is appropriate. Also, the cross-checks have been performed on the reported data with different source of evidence. The information flow from data generation and aggregation, to recording, calculation and final transposition into the monitoring report has been assessed by the Audit Team for each parameter and also the calibration have been conducted as per the frequency of monitoring equipment defined in the Joint-PD-MR/1/ and CER /2/.

Therefore, it is concluded that the evidence verified is ample and sufficient and thus the evidence can be used to determine the GHG reductions and removals for this monitoring period.

5 VALIDATION AND VERIFICATION CONCLUSION

Validation

The audit team performed the validation of the renewal of the crediting period of the project "BRASCARBON Methane Recovery Project BCA-BRA-16, Brazil" (registration number 2998) located in Brazil. The validation was performed on the basis of VCS Standard criteria and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project description documentation submitted to ICONTEC by the PP provided enough evidence to determine the validity of the original baseline scenario since The PP followed the stepwise approach stated in the methodological Tool Assessment of the validity of the original/current baseline /1/2/, while the audit team validated its correct application and the update of the baseline.

The project correctly applies the baseline and monitoring methodology "AMS-III.D: Methane recovery in animal manure management systems (version 21)", identifying the parameters to be monitored and the monitoring plan necessary to correctly monitor the project emissions, leakage emissions and emission reductions. Furthermore, the figures of the calculations of the total baseline emissions 576,173 t CO2e), Project emissions per year (192,467 t CO2e), Leakage emission (0 t CO2e)) and Emission Reductions (383,706 t CO2e), of the entire period (first crediting period, seven (7) years from 02/1/2021 to 01/1/2028) are obtained following the applicable methodology as well as the methodological tools applicable. Complementary the calculations of the emission reductions are consistent and do not present material misstatements in accordance to of the VCS Standard/5.

In summary, the fulfilment of the specific requirements and methodological framework requirements were satisfactory assesses. Hence, it is the ICONTEC validation opinion to recommend the approval of the first the crediting period.

Verification

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-16, Brazil (Reference number 2998) as well as the quantitative and qualitative information provided in the PD- MR version 06 /1/ against the applicable VCS rules and requirements //5 – 10/51/ and the applicable methodological framework /4/ /19/ /21/. The verification process allows the audit team to conclude, the proposed project activity compiles with the VCS requirements. The audit team confirms that, verification activities used as a basis for the assessment of the first monitoring period (from 2 of January 2021 to the 31st of January 2022).

The audit team crosscheck data and information provided by the PP and reported in the PD-MR /1/ and calculation file /2/. 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.

Verification period: From 02-01-2021 to 31-01-2022

Verified GHG emission reductions and removals in the above verification period by vintage is:

Year	Baseline emissions or removals (tCO2e)	Project emissions or removals (tCO2e)	Leakage emissions (tCO2e)	Net GHG emission reductions or removals (tCO2e)
2021	77,127	26,057	0	51,070
2022	6,472	2,294	0	4,178
Total	**83,602**	**28,356**	**0**	**55,246**

ICONTEC confirms that the project is implemented as described in the validated Description & Monitoring Report VCS Version 4.0 (PD-MR version 5)/1/. 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.

APPENDIX 1: DOCUMENTS REVIEWED OR REFERENCED

Abbreviations	Full texts
–RC	Brascarbon - Brascarbon Consultoria, Projetos e Representação Ltda
CAR	Corrective Action Request
CDM	Clean Development Mechanism
Ers	Emission Reductions
CERs	Certified Emission Reductions
CL	Clarification request
CO2e	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
PCL	Programmable Logic Control
POP	Operational Procedure
PP	Project Participants
PRC	Post Registration Changes
PSO	Project Site owner
GWP_{CH4}	Global Warming Potential of Methane
UNFCCC	United Nations Framework Convention on Climate Change
PD-MR	Project Description- Monitoring Report VCS
VVB	Validation/Verification Bodies (VVBs)

APPENDIX 2: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

ADRIANA MERCEDES BERMUDEZ BEDOYA

CDM LEAD AUDITOR AND TECHNICAL EXPERT (SECTORAL SCOPE 13)

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 9 years

- Training ISO 14064-2:2020 and 14064-3:2020 Part 2: Specification with guidance, at project level, for quantification, monitoring and reporting of emission reductions or enhancement of greenhouse gas removals – and Part 3 related to specification of guidance for validation and verification of Greenhouse Gas reporting. Certificadora Icontec Internacional Bogotá D.C: February – September 2022.
- Training in ISO 14064-1:2019 – Greenhouse Gases – Part 1: GHG Inventory: specification with guidance, at the organization level, for the quantification and reporting of greenhouse gas emissions and removals and ISO 14064-2:2019 – Part 2: Specification with guidance, at the project level, for the quantification, monitoring and reporting of emission reductions or increases in greenhouse gas removals – Icontec International Certifier Bogotá D.C.: February – April 2021.
- Translated with www.DeepL.com/Translator (free version)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 Traininig – 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

Verification "BRASCARBON Methane Recovery Project BCA-BRA-15, Brazil" – 2021

Verification "BRASCARBON Methane Recovery Project BCA-BRA-09, Brazil" – 2021

Verification "BRASCARBON Methane Recovery Project BCA-BRA-04A, 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 National Secretariat for Social Pastoral / Caritas Colombia Position: National Proj–ct Specialist - 18/08/2021 – 30/06/2022 -Coordinator of the projects

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

Organization SENA (Regional Coordination Group for Professional Training), Region–l Directorate - Supervision and Auditing of agreements of the Strategy of Expansion of Coverage of the Regional Directorate (April, 2019 – December 2019)

Organization GARSSA CONSULTING SAS. Audit and Oversight -Oversight Manager (August 2017 – January 2019)

Organization AGROSAVIA (Colombian Agricultural Research Corporation -Regional Innovation Coordinator (July 2015-June 2017)- Research Center Rionegro (Ant.)

-

Organization SENA (National Vocational Training Service), General Directorate Area of Innovation, Technology Development and C–mpetitiveness - Position Group Leader Innovation and Technology Development (January 2011 – July 2015).

Organization Certificadora SGS Colombia SA Bogotá D.C., - Tutor and Auditor, freelance (2007 – 2015)

Organization Universidad Nacional de Colombia – Centro de Investigación y Desarrollo (CID) de la Facultad de Ciencias Económicas Oversight Office for–SENA Projects - Oversight Coordinator (July 2009 – July 2011)

Organization Alcaldía de Bogotá (Office of the Mayor) Secretaria de Desarrollo Económico – Dirección de Desarrollo Económico Rural y Abastecimiento Alimentario (DERAA)- Consultant (March 2007 – June 2009).

Organization Corporación Colombiana Internacional (CCI) Bogotá D.C., -Coordinator of Certification Unit (September 2005 – January 2007) – Management of the unit, accredited to certify organic products complying with national and international standards. – Consultant Macro process Innovation and Quality (February 2004 –August 2005) –

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

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. –

Organization SENA, Regional Office Cal–as -Manizales - 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 -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 - Support Professional Environmental Services (July 2000 – December 2000)

Organization Alcaldía Municipal de Quinchía, Risaralda -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. - Director of UMATA – Unidad Municipal de Asistencia Técnica Agropecuaria (July 1993 January 1998) –

Organization Las Malvinas Farm. – Marquetalia, Caldas- Farm Manager (October 1992 – February 1993) – Administrative and technical tasks of general management,

ERIKA LUCIA URREGO ORTIZ

TECHNICAL REVIEWER (SECTORAL SCOPE 13)

MAIN PROFESSIONAL EDUCATION

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

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

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

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

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

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

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

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

PROFESSIONAL EXPERIENCE

- Corporation Oil palm sustainable of Colombia (June 2022 – to date)

Leader of Protocol Oil palm sustainable of Colombia

- ICONTEC (2006 – June 2022)

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

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

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

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

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

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

- Regional Environmental Authority (CAR Sumapaz) 1998 – 2001

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

EXPERIENCE IN CDM ACTIVITIES

Lead auditor on validation CDM:

1. Validation of Macano Small Hydro Power Plant, Panamá

2. Validation of Montenegro Landfill Gas Recovery and Flaring, Colombia

3. Validation of Monteria Landfill Gas Recovery and Flaring, Colombia

4. Validation of Pirgua Landfill Gas Recovery and Flaring, Colombia

5. Validation of Tunjita Diversion Hydroelectric Project, Colombia

6. Validation of El Toqui wind power project, Chile

7. Validation of Los Angeles Landfill Gas Flaring Project, Colombia

8. Validation of Ferreira Gomes Hydro Power Plant CDM Project, Brazil

9. Validation of BRASILM 1 – Avoidance of Methane Emissions through Composting of Manure Waste, Brazil

10. Validation of CGR Catanduva Landfill Gas Project, Brazil

11. Validation of Macaubas Landfill Gas Project, Brazil

12. Validation of Palmaceite Wastewater Treatment and Biogas Utilization Project, Colombia

13. Validation of Teresina Landfill Gas Project, Brazil

14. Validation of Maceio Landfill Gas Project, Brazil

15. Validation of SHP Morro Azul CDM Project (JUN1164), Colombia

16. Validation Doña Teresa Small hydro prower plant, Colombia

17. Validation Biogas recovery and heat generation from Palm Oil Mill Effluent (POME), Coopeagropal. Costa Rica.

18. Validation Panuco Bagasse Cogeneration Project. México.

Lead auditor on verification CDM:

1. Verification of Biogas energy plant from palm oil mill effluent, Guatemala 2

2. Verification of Doña Juana Landfill gas-to-energy project, Colombia

3. Verification of Tres Valles Cogeneration Project, Honduras

4. Verification of Landfill Gas to Energy Facility at the Nejapa Landfill Site, El Salvador, El Salvador

5. Verification of La Venta II, México

6. Verification of Jepirachi Wind Power Project, Colombia

7. Verification of Santa Ana Hydroelectric Project, Colombia

8. Verification of BRASCARBON Methane Recovery Project BCA-BRA-01, Brazil

9. Verification of BRASCARBON Methane Recovery Project BCA-BRA-02, Brazil

10. Verification of BRASCARBON Methane Recovery Project BCA-BRA-03, Brazil

11. Verification of Ciudad Juarez Landfill gas-to-energy Project, México.

Lead auditor renewal crediting period:

2006. Monte Rosa Bagasse Cogeneration Project (MRBCP)

Lead auditor on other schemes:

1. Validation VCS de Reforestación de áreas de pastura en la Sociedad Agrícola de Interés Social "José Carlos Mariátegui" – Proyecto Joven Forestal, Perú.

2. Validation Gold Standard Energy Efficiency at Ladrillera Alcarraza, Colombia.

3. Validation Gold Standard de Paramonga Bagasse Boiler Project, Perú.

4. Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-02, Brazil

5. Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-03, Brazil

6. Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil

7. Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-07, Brazil

8. Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-08, Brazil

Specialist

1. Validation of ECC methane capture and combustion from AWMS at dairy farms in Mexico – I, México

2. La Calera Biodigesters Project, Perú

Technical Review

1. Validation of Fuel Switching through change of furnaces at Imusa S.A., Colombia

2. Validation of Cervecería Hondureña Methane Capture Project, Honduras

3. Validation of Paysandú Clean Energy, Uruguay

4. Validation of Securitization and Carbon Sinks Project, Chile

5. Validation of METALDOM Fossil fuel switch from reheat furnace, República Dominicana

6. Validation of Reforestation of degraded/degrading land in the Caribbean Savannah of Colombia, Colombia

7. Validation of Co-composting of organic residues in ORO ROJO's Palm Oil Mill at Sabana de Torres, Colombia

8. Validation of EMGEA Small Hydropower (SHP) Run-of-the-River CDM Project Bundle, Colombia

9. Validation of Energy efficiency at Malvinas Gas Plant, Perú

10. Validation of Marañon Hydroelectric Project, Perú

11. Validation of Santa Rita Hydroelectric Plant, Guatemala

12. Verification of Bio energy in General Deheza –Electric power generation from peanut hull and sunflower husk-, Argentina

13. Validation of Biogas project, Olmeca I, Santa Rosa, Guatemala

14. Validation of CTR Rosario Landfill Gas Project, Brazil

15. Validation of SHP Itaguacu CDM Project (JUN 1146), Brazil

16. Validation of Taurichuco Hydropower Project, Perú

17. Validation of Feira de Santana Landfill Gas Project, Brazil

18. Validation of Doña Juana Landfill gas-to-energy Project, Colombia

19. Renovación Inversiones Hondurenas Cogeneration Project

20. Validación SHPs Tambaú, das Pedras and Rio do Sapo CDM Project (JUN1132), Brazil

21. Validación SHPs Poço Fundo and Providência CDM Project (JUN1133), Brazil

22. Validación Santa Rita Hydroelectric Plant, Colombia

23. Validation Conservation and reforestation of degraded areas in Barbosa, Colombia

24. Verification Doña Juana Landfill gas-to-energy Project, Bogotá, Colombia.

25. Verificación Monomeros nitrous oxide abatement project. Barranquilla, Colombia.

26. Verification BRT Bogotá, Colombia: TransMilenio Phase II to IV

27. Verification BRT Macrobus Guadalajara, Mexico

28. Verification Inversiones Hondurenas Cogeneration Project, Honduras.

29. Verification Incauca S. A. Fuel Switch from Coal to Green Harvest Residues CDM Project. Colombia.

30. Verification Brascarbon 14, -Brazil.

APPENDIX 3: DOCUMENTS REVIEWED OR REFERENCED

	Author	Title	References to the document	Provider
1	BRASCARBON	Joint Project Description & Monitoring Report: VCS Version 4.1 (PD-MR) Brascarbon Methane Recovery Project BCA- BRA-16_v3 PD-MR (PD and MR) Brascarbon Methane Recovery Project BCA- BRA-16_v4 PD-MR (PD and MR) Brascarbon Methane Recovery Project BCA- BRA-16_v5 Brascarbon Methane Recovery Project BCA- BRA-16_v6	Dated on: 20/06/2022: BCA-BRA-16_v3_tc.pdf BCA-BRA-_v3_clean.pdf Dated on: 03/10/2022: BCA-BRA-16_v4_tc.pdf BCA-BRA-_v4_clean.pdf Dated on: 13/10/2022: BCA-BRA-16_v5_tc.pdf BCA-BRA-_v5_clean.pdf BCA-BRA-16_v6_tc.pdf BCA-BRA-_v6_clean.pdf	PP

	Author	Title	References to the document	Provider
		Brascarbon Methane Recovery Project BCA- BRA-16_v7	Dated on: 17/02/2023: BCA-BRA-16_v7_tc.pdf BCA-BRA-_v7_clean.pdf	
2	BRASCARBON	CER Calculation file version 1: CER Calculation MR01 – BCA-BRA Emission Reductions Calculation: ER Calculation Spreadsh-16 _____ CER Calculation file version 2: CER Calculation MR01 – BCA-BRA-16_v.2 CER Calculation MR01 – BCA-BRA-16_v.3	Date 20/06/2021 Date 13/10/2021 Date 17/02/2023	Project Participant -PP
3	UNFCCC	Methodology: Methane recovery in animal manure management systems. AMS-III.D, version 21.0 File -EB96_repan09_AMS-III.Dv21.pdf	https://cdm.unfccc.int/methodologies/SSCmethodologies/approved	UNFCCC website
4	UNFCCC		https://cdm.unfccc.int/Reference/tools/index.html	UNFCCC website

	Author	Title	References to the document	Provider
		Methodological tool (06) "Project emissions from flaring" (Version 04.0) File – am-tool-06-v4.0.pdf	https://cdm.unfccc.int/methodologies/Pamethodologies/tools/am-tool-06-v4.0.pdf/history_view https://cdm.unfccc.int/methodologies/Pamethodologies/tools/am-tool-06-v4.0.pdf	
5	VERRA	Template	VCS-Joint-Project-Description-Monitoring-Report-Template-v4.1	VCS Website
6	VERRA	Template	Joint Validation & Verification Report: VCS Version 4.1	VCS Website
7	VERRA	Registration and Issuance Process version 4.0	Registration and Issuance Process version 4.0	VCS Website
8	VERRA	VCS Program Definitions	VCS Program Definitions, v4.1	VCS Website
9	VERRA	VCS Program Guide	VCS Program Guide, v4.2	VCS website
10	VERRA	VCS Standard	VCS Standard, v4.3	VCS website
11	Various	Technical and manufacturer specifications	*Equipment information through the websites (second sources information):* *https://www.endress.com/en/field-instruments-overview/flow-measurement-product-overview/Product-Thermal-flowmeter-t-mass-65F* *http://www.landtecna.com:*	Project Participant -PP Others

	Author	Title	References to the document	Provider
			for the portable biogas analyzer Landtec information *https://issuu.com/alutal/docs/catalogo-tecnico*	
12	BRASCARBON	Sampling Plan (parameters WCH4,y and fvCH4,RG)	Sampling_Plan_BCA-BRA_16_MR01.xlsx	Project Participant -PP
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	POP 8 – Calculo Da Eficiencia Do Flare.pdf	Project Participant -PP
14	BRASCARBON	Operational Procedure: POP-14	POP 14 – Formulação De Ração rev1.pdf	Project Participant -PP
15	BRASCARBON	Form 01.001. Information with minute by minute temperature and biogas volume data stored in the PLC	BCA-300MS1-16 – Fazenda Paraiso do Alto – TABELA DE DADOS.xls BCA-300MS1-16 – Fazenda Paraiso do Alto – TABELA DE DADOS.xls BCA-301MS1-16 – Fazenda São Sebastião Gleba 6 – TABELA DE DADOS.xls BCA-302MS1-16 – Granja Serra Dourada I – TABELA DE DADOS.xls BCA-303MS1-16 – Lote 28 PA Assent. Camp. -TABELA DE DADOS.xls	Project Participant -PP

	Author	Title	References to the document	Provider
			BCA-304MS1-16 – Assentaemnto Campanario – Lote 55 - TABELA DE DADOS.xls BCA-305MS1-16 – Faz. N. Senh. Aparec. II - TABELA DE DADOS.xls BCA-306MS1-01 – Granja Grando - TABELA DE DADOS.xls BCA-307MS1-16 – Assentamento Campanario - TABELA DE DADOS.xls BCA-308MS1-16 – Quinhao A - TABELA DE DADOS.xls	
		Operational Procedure: POP-01	POP 1 – OBTENÇÃO DA TEMPERATURA DE COMBUSTÃO_v8.pdf	
16	BRASCARBON	POP 02 – Operational Procedure: POP – 2 INSPEÇÃO DA LOCALIDADE & MS% I,y	POP 2 – INSPEÇÃO DA LOCALIDADE_v6.pdf	Project Participant
17	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)	BCA-300MS1-16 – Fazenda Paraiso do Alto – 31-01-22 – FORMULARIO 03.001.xls BCA-301MS1-01 – Fazenda São Sebastião Gleba 6 – 31-01-22 – FORMULARIO 03.001.xls BCA-302MS1-01 – Granja Serra Dourada I – 31-01-22 – Form 03.001.xls BCA-303MS1-16 – Lote 28 PA Ass. Camp. – 31-01-22 – Form 03.001.xls BCA-304MS1-16 – Assentamento Campanario – Lote 55 – 31-01-22 – Form 03.001.xls	Project Participant

	Author	Title	References to the document	Provider
			BCA-305MS1-16 – Faz. N. Senh. Aparec. II – 31-01-22 – FORMULARIO 03.001.xls BCA-306MS1-16 – Granja Grando – 31-01-22 – Form 03.001.xls BCA-307MS1-16 – Assentamento Campanario – 31-01-22 – FORMULARIO 03.001.xls BCA-308MS1-16 – Fazenda Quinhao A - 30-12-21 – Form 03.001.xls BCA-308MS1-16 – Fazenda Quinhão A - 31-01-22 – Form 03.001.xls BCA-300MS1-16 – Fazenda Paraiso do Alto – 30-12-21 – FORMULARIO 03.001.xls BCA-301MS1-16 – Fazenda São Sebastião Gleba 6 – 30-12-21 – FORMULARIO 03.001.xls BCA-302MS1-16 – Granja Serra Dourada I – 30-12-21 – Form 03.001.xls BCA-303MS1-16 – Lote 28 PA Assentamento Campanario – 30-12-21 – Form 03.001.xls BCA-304MS1-16 – Assentamento Campanario – Lote 55 – 30-12-21 – Form 03.001.xls BCA-305MS1-16 – Faz. N. Senh. Aparec. II – 30-12-21 – FORMULARIO 03.001.xls BCA-306MS1-16 – Granja Grando – 30-12-21 – Form 03.001.xls	

	Author	Title	References to the document	Provider
		Sistema de Controle de Animais Operational Procedure: POP-03	BCA-307MS1-16 – Assentamento Campanario – 30-12-21 – FORMULARIO 03.001.xls POP 3 – CONTAGEM DE ANIMAIS_v6.pdf	
18	BRASCARBON	Form 04.001. Information related to parameters biogas volume, WCH4, Pbiogas and Tbiogas - reports by farm	BCA-308MS-16 – Quinhao A - 03-02-22 – FORMULARIO 04 001.xls BCA-308MS-16 – Quinhao A - 02-12-21 – FORMULARIO 04 001.xls BCA-308MS-16 – Quinhao A - 03-06-21 – FORMULARIO 04 001.xls BCA-301MS1-16 – Fazenda São Sebastião Gleba 6 – 04-02-22 – FORMULARIO 04.001.xls BCA-302MS1-16 – Granja Serra Dourada I – 04-02-22 – FORMULARIO 04 001.xls BCA-303MS1-16 – Lote 28 PA Assent. Camp. – 04-02-22 – FORMULARIO 04 001.xls BCA-304MS1-16 – Assent. Camp. – Lote 55 – 04-02-22 – FORMULARIO 04 001.xls BCA-305MS1-16 – Faz. N. Senh. Aparec. II – 04-02-22 – FORMULARIO 04.001.xls BCA-306MS1-16 – Granja Grando – 04-02-22 – FORMULARIO 04 001.xls BCA-307MS1-16 – Assentamento Campanario – 04-02-22 – FORMULARIO 04.001.xls	

	Author	Title	References to the document	Provider
			BCA-301MS1-16 – Fazenda São Sebastião Gleba 6 – 01-12-21 – FORMULARIO 04.001.xls BCA-301MS1-16 – Fazenda São Sebastião Gleba 6 – 04-06-21 – FORMULARIO 04.001.xls BCA-302MS1-16 – Granja Serra Dourada I – 04-06-21 – FORMULARIO 04 001.xls BCA-302MS1-16 – Granja Serra Dourada I – 04-12-21 – FORMULARIO 04 001.xls BCA-303MS1-16 – Lote 28 PA Assent. Camp. – 04-06-21 – FORMULARIO 04 001.xls BCA-303MS1-16 – Lote 28 PA Assent. Camp. – 04-12-21 – FORMULARIO 04 001.xls BCA-304MS1-16 – Assentaemnto Campanario – Lote 55 – 04-12-21 – FORMULARIO 04 001.xls BCA-304MS1-16 – Assentamento Campanario – Lote 55 – 04-06-21 – FORMULARIO 04 001.xls BCA-305MS1-16 – Faz. N. Senh. Aparec. II – 01-12-21 – FORMULARIO 04.001.xls BCA-305MS1-16 – Faz. N. Senh. Aparec. II – 04-06-21 – FORMULARIO 04.001.xls BCA-306MS1-16 – Granja Grando – 04-06-21 – FORMULARIO 04 001.xls	

	Author	Title	References to the document	Provider
		Operational Procedure: POP-04	BCA-306MS1-16 – Granja Grando – 04-12-21 – FORMULARIO 04 001.xls BCA-307MS1-16 – Assentamento Campanario – 01-12-21 – FORMULARIO 04.001.xls BCA-307MS1-16 – Assentamento Campanario – 04-06-21 – FORMULARIO 04.001.xls POP 4 – MEDIÇÃO DO VOLUME DE BIOGÁS_v6.pdf	
19	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
20	BRASCARBON	Form 08.001: flare temperature for all of the project sites	BCA-300MS1-16 – Formulario 08.001 – 01-2022.xlsx BCA-300MS1-16 – Formulario 08.001 – 02-2021.xlsx BCA-300MS1-16 – Formulario 08.001 – 03-2021.xlsx BCA-300MS1-16 – Formulario 08.001 – 04-2021.xlsx BCA-300MS1-16 – Formulario 08.001 – 05-2021.xlsx BCA-300MS1-16 – Formulario 08.001 – 06-2021.xlsx	

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21	UNFCCC	CDM–EB67-A06-GUID Guideline for Sampling and Surveys for CDM Project Activities and Programmes of Activities. Version 04	https://cdm.unfccc.int/Reference/Guidclarif/index.html	UNFCCC website
22	BRASCARBON	Formulated feed ration Operational Procedure: POP-14	– Formulario Racao COOASGO.pdf – Formulario Racao COOASGO 1.pdf POP 14 – FORMULAÇÃO DE RAÇÃO_v4.pdf	Others Project Participant
23	BRASCARBON	Installation records	6ª – BCA-300MS1-16 – Instalação Termopar e Medidor de vazao.pdf 6B – BCA-301MS1-16 – Instalação Termopar e Medidor de Vazão.pdf 6C – BCA-302MS1-16 – Instalação Termopar e Medidor de Vazao.pdf 6D – BCA-303MS1-16 – Istalaçao Termopar e Medidor de vazao.pdf 6E – BCA-304MS1-16 – Instalação Termopar e Medidor de vazao.pdf	Project Participant

	Author	Title	References to the document	Provider
			6F – BCA-305MS1-16 – Instalação Termopar e medidor de vazao.pdf 6G – BCA-306MS1-16 – Instalação Termopar e medidor de vazao.pdf 6H – BCA-307MS1-16 – Instalação Termopar e Medidor de vazao.pdf 6I – BCA-308MS1-16 – Instalaçao Termopar e medidor de vazao.pdf 7ª – BCA-300MS1-16 – Instalação Termopar e Medidor de vazao.pdf 7B – BCA-301MS1-16 – Instalação Termopar e Medidor de Vazão.pdf 7C – BCA-302MS1-16 – Instalação Termopar e Medidor de Vazao.pdf 7D – BCA-303MS1-16 – Istalaçao Termopar e Medidor de vazao.pdf 7E – BCA-304MS1-16 – Instalação Termopar e Medidor de vazao.pdf 7F – BCA-305MS1-16 – Instalação Termopar e medidor de vazao.pdf 7G – BCA-306MS1-16 – Instalação Termopar e medidor de vazao.pdf 7H – BCA-307MS1-16 – Instalação Termopar e Medidor de vazao.pdf 7I – BCA-308MS1-16 – Instalaçao Termopar e medidor de vazao.pdf 8 – PDD 16 – Instalação Termopar 2022 2023.pdf	
24	BRASCARBON	POP Operational Procedure-15	POP 15 – MONITORAMENTO DA GENÉTICA_v3.pdf	Project Participant

	Author	Title	References to the document	Provider
25	COOASGO (Cooperativa Agropecuária São Gabriel do Oeste),	Purchase record provided by PP and Declarations	1 – Ultima Compra Matriz Genetica.pdf 2 – Declaracao Processo Genetica.pdf 3 – Declaracao Proce–so Peso.pdf 7 - PHOTO-2022-09-17-11-15-11.jpg	Others
26	ALUTAL / LAURY FRAN	Installation and calibration Thermocouple and Thermopar Calibration records of the thermocouples (installation records) PDD 16 – Medidor de Temperatura 2021 – 2022	**2021-2022** BCA-300MS1-16 – Instalação Termopar e Medidor de vazao.pdf BCA-300MS1-16 – Medidor de Temperatura Serie 455097 e Certificado CA 1704 20.pdf BCA-301MS1-16 – Instalação Termopar e Medidor de Vazão.pdf BCA-301MS1-16 – Medidor de Temperatura Serie 455100 e Certificado CA 1707 20.pdf BCA-302MS1-16 – Instalação Termopar e Medidor de Vazao.pdf BCA-302MS1-16 – Medidor de Temperatura Serie 483443 e Certificado CA 1737 20.pdf BCA-303MS1-16 – Istalaçao Termopar e Medidor de vazao.pdf BCA-303MS1-16 – Medidor de Temperatura Serie 483441 e Certificado CA 1735 20.pdf BCA-304MS1-16 – Instalação Termopar e Medidor de vazao.pdf	Others

	Author	Title	References to the document	Provider
		PD 16 – Medidor de Temperatura 2022 – 2023	BCA-304MS1-16 – Medidor de Temperatura Serie 483436 e Certificado CA 1730 20.pdf BCA-305MS1-16 – Instalação Termopar e medidor de vazao.pdf BCA-305MS1-16 – Medidor de Temperatura Serie 455099 e Certificado CA 1706 20.pdf BCA-306MS1-16 – Instalação Termopar e medidor de vazao.pdf BCA-306MS1-16 – Medidor de Temperatura Serie 483435 e Certificado CA 1729 20.pdf BCA-307MS1-16 – Instalação Termopar e Medidor de vazao.pdf BCA-307MS1-16 – Medidor de Temperatura Serie 455098 e Certificado CA 1705 20.pdf BCA-308MS1-05 – Medidor de Temperatura Serie 483447 e Certificado CA 1741 20.pdf BCA-308MS1-16 – Instalaçao Termopar e medidor de vazao.pdf **2022-2023:** BCA-300MS1-16 – Medidor de Temperatura Serie 320330 e Certificado CA-6912-21.pdf BCA-301MS1-16 – Medidor de Temperatura Serie 320331 e Certificado CA-6913-21.pdf BCA-302MS1-16 – Medidor de Temperatura Serie 320332 e Certificado CA-6914-21.pdf	

	Author	Title	References to the document	Provider
			BCA-303MS1-16 – Medidor de Temperatura Serie 320333 e Certificado CA-6915-21.pdf BCA-304MS1-16 – Medidor de Temperatura Serie 320334 e Certificado CA-6916-21.pdf BCA-305MS1-16 – Medidor de Temperatura Serie 320335 e Certificado CA-6917-21.pdf BCA-306MS1-16 – Medidor de Temperatura Serie 320336 e Certificado CA-6918-21.pdf BCA-307MS1-16 – Medidor de Temperatura Serie 320337 e Certificado CA-6919-21.pdf BCA-308MS1-16 – Medidor de Temperatura Serie 320338 e Certificado CA-6920-21.pdf	
27	Endress+Hauser	Declaration: thermal flow meter calibration Calibration records of the Flow Meter Formulario Instalaçao o Calibraçao	Declaracao Medidores Vazao.pdf BCA-300MS1-16 – Certificado Medidor de Vazão Endress Houser.pdf BCA-303MS1-16 – Certificado Medidor de Vazão Endress Houser.pdf BCA-305MS1-16 – Certificado Medidor de Vazao Endress Houser.pdf BCA-306MS1-16 – Certificado Medidor de Vazão Endress Houser.pdf	Others

	Author	Title	References to the document	Provider
			BCA-307MS1-16 – Certificado Medidor de Vazao Endress Houser.pdf BCA-308MS1-16 – Certificado Medidor de Vazão Endress Houser.pdfBCA-135MS1-04 – Medidor de Vazão.PDF BCA-301MS1-16 – Certificado Medidor de Vazao Endress Houser.pdf BCA-302MS1-16 – Certificado Medidor de Vazao Endress Houser.pdf BCA-302MS1-16 – Certificado Medidor de Vazão endress Houser.pdf	
28	LANDTEC	Calibration records of the gas Analyzer	BM11043_27062021.pdf BM11043_28122021.pdf BM11043_29122020.pdf	Others
29	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
30	BRASCARBON	POP 16 – Animal Weight Monitoring.	*POP 16 – PESO MÉDIO DOS ANIMAIS EM CONFINAMENTO_v3.pdf*	Project Participant
31	BRASCARBON	Operational Procedure 07	POP 7 – CALCULO DA DENSIDADE O METANO_v8.pdf	Project Participant

	Author	Title	References to the document	Provider
32	BRASCARBON	POP 12- Maintenance Form 12.001 – MANUTENÇÃO PREVENTIVA DA LOCALIDADE – VERIFICAÇÕES MEN SAIS	POP 12 – MANUTENÇÃO GERAL_v4.pdf BCA-093MS1-04 – Lote 13 – 31-12-19 – TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls BCA-093MS1-04 – Lote 13 – 31-12-20 – TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls BCA-104MS1-04 – Fazenda CE quinhão A – 31-12-19 – TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls BCA-104MS1-04 – Fazenda CE quinhão A – 31-12-20 – TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls BCA-105MS1-04 – Lote 29 Assentamento Campanário – 31-12-19 – TABELA DE MANUTENÇÃO 12.xls BCA-105MS1-04 – Lote 29 Assentamento Campanário – 31-12-20 – TABELA DE MANUTENÇÃO 12.xls BCA-108MS1-04 – Fazenda Nossa Senhora Aparecida – 31-12-19 – TABELA DE MANUTENÇÃO 12.xls BCA-108MS1-04 – Fazenda Nossa Senhora Aparecida – 31-12-20 – TABELA DE MANUTENÇÃO 12.xls BCA-110MS1-04 – Fazenda Cachoeira – 31-12-19 – TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls	Project Participant

	Author	Title	References to the document	Provider
			BCA-110MS1-04 – Fazenda Cachoeira – 31-12-20 – TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls BCA-132MS1-04 – Fazenda Capim Branco – 31-12-19 – TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls BCA-132MS1-04 – Fazenda Capim Branco – 31-12-20 – TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls BCA-135MS1-04 – Fazenda São Sebastião – Gleba 05 – 31-11-20 – TABELA DE MANUTENÇÃO 12.xls BCA-135MS1-04 – Fazenda São Sebastião – Gleba 05 – 31-12-19 – TABELA DE MANUTENÇÃO 12.xls BCA-142MS1-04 – Lote 88 Assentamento Campanário – 31-12-19 – TABELA DE MANUTENÇÃO 12.xls BCA-142MS1-04 – Lote 88 Assentamento Campanário – 31-12-20 – TABELA DE MANUTENÇÃO 12.xls BCA-165MS1-04 – Granja Potreirito – 31-12-19 – TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls BCA-165MS1-04 – Granja Potreirito – 31-12-20 – TABELA DE MANUTENÇÃO 12 1 12 2 12 3 12 4.xls	

	Author	Title	References to the document	Provider
			BCA-170MS1-04 – Granja Arco-Iris – Laranja Azeda – 31-12-19 – TABELA DE MANUTENÇÃO 12.xls BCA-170MS1-04 – Granja Arco-Iris – Laranja Azeda – 31-12-20 – TABELA DE MANUTENÇÃO 12.xls	
33	BRASCARBON	Operational Procedure 09	POP 9 – REMOÇÃO DO LODO DO BIODIGESTOR_v5.pdf	Project Participant
34	BRASCARBON	Operational Procedure 13	POP 13 – OBTENÇÃO DA PRESSÃO DO BIOGÁS_v6.pdf	Project Participant
35	BRASCARBON	Operational Procedure 22	POP 22 – CONSUMO DE ENERGIA ELÉTRICA.pdf	Project Participant
36	BRASCARBON	Operational Procedure 5	POP 5 – MEDIÇÃO DA FRAÇÃO DE METANO_v7.pdf	Project Participant
37	BRASCARBON	Operational Procedure 6	POP 6 – OBTENÇÃO DA TEMPERATURA DO BIOGÁS_v6.pdf	Project Participant
38	BRASCARBON	Operational Procedure 8	POP 8 – CALCULO DA EFICIENCIA DO FLARE_v8.pdf	Project Participant
39	BRASCARBON	Operational Procedure 9	POP 9 – REMOÇÃO DO LODO DO BIODIGESTOR_v5.pdf	Project Participant
40	BRASCARBON	Operational Procedure 10	POP 10 – REDUÇÕES DAS EMISSÕES_v5.pdf	Project Participant
41	BRASCARBON	Operational Procedure 11	POP 11 – TREINAMENTO GERAL DAS OPERAÇÕES_v4.pdf	Project Participant

	Author	Title	References to the document	Provider
42	BRASCARBON	Operational Procedure 17	POP 17 – REDUÇÕES DAS EMISSÕES EXPOST_v6.pdf	Project Participant
43	BRASCARBON	Operational Procedure 24	POP 24 – DIAS FUNCIONAMENTO_v2.pdf	Project Participant
44	BRASCARBON Project site Owners / State of Mato Grosso do Sul state, Brazil.	Operation Licenses of the project sites	1 – BCA-300MS1-16 – Fazenda Paraiso do Alto – L. O..pdf 1 – BCA-301MS1-16 – Fazenda São Sebastião Lote 6 – L.O.pdf 1 – BCA-302MS1-16 – Granja Serra Dourada I – LO.pdf 1 – BCA-303MS1-16 – Lote 28 – PA – Assentamento Campanario – LO.pdf 1 – BCA-304MS1-16 – Assentamento Campanario – Lote 55 – LO.pdf 1 – BCA-305MS1-16 – Fazenda Nossa Senhora Aparecida II – LO.pdf 1 – BCA-306MS1-16 – Granja Grando – LO.pdf 1 – BCA-307MS1-16 – Assentamento Campanario – LO.pdf 1 – BCA-308MS1-16 - Fazenda Quinhao A LO.pdf 1 – BCA-308MS1-16 - LO.pdf 2 – BCA-301MS1-16 – Fazenda São sebastião Lote 6 – Prot. Renov..pdf 2 – BCA-302MS1-16 – Granja Serra Dourada I – LO.pdf	Others/ Project Participant -PP

	Author	Title	References to the document	Provider
45	Intergovernmental Panel on Climate Change	IPCC Guidelines	2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book	www.ipcc-nggip.iges.or.j p
46	On-site Audit Team	Photographs of Project Site	Photographs of this per site(9), all the monitoring devices and main equipment, farms by validation and verification. Photographic reco–ds of: - GPS–- Coordinates - altitude - Pig production buildings - State of the biodigester - Oxidation lagoons - Burner and torch in operation - Thermocouple in operation -Physical execution -Ultraviolet flame detectors and solar panel - Alutal recording equipment - Flow meter - piping - installations included - analyzer in implementation - Monitoring (form 04.001 filled out according to POP 04) - Monitoring records by the technician. - Visual observation of the general condition of the area, cleanliness, ease of access. -Physical separation of the methane capture and flaring a–ea.	On-site Audit Team

	Author	Title	References to the document	Provider
			-Signage - identification of the site	
47	BRASCARBON	Photographs of Project Site	Photographic records taken by the PP	PP
48	BRASCARBON	Physical –mplementation - Ultraviolet Flame Detectors and–solar panel	1 - Alvenari– PDD 16.pdf 2 - Revestiment– PDD 16.pdf 3 - Sistema de Controle – queima.pdf 4 - Sist–ma de Ignição - Ignitor –u Zs80i.pdf 5 - Especificação Tecnica Detcetor de cha–a UtraVioleta - C7027A-Flame-Detecto[a]s–Manual.pdf 6A --BCA-300MS1-16 - Instalação Termopar e Medidor d– vazao.pdf 6B --BCA-301MS1-16 - Instalação Termopar e Medidor d– Vazão.pdf 6C --BCA-302MS1-16 - Instalação Termopar e Medidor d– Vazao.pdf 6D --BCA-303MS1-16 - Istalaçao Termopar e Medidor d– vazao.pdf 6E --BCA-304MS1-16 - Instalação Termopar e Medidor d– vazao.pdf 6F --BCA-305MS1-16 - Instalação Termopar e medidor d– vazao.pdf 6G --BCA-306MS1-16 - Instalação Termopar e medidor d– vazao.pdf 6H --BCA-307MS1-16 - Instalação Termopar e Medidor d– vazao.pdf 6I --BCA-308MS1-16 - Instalaçao Termopar e medidor de vazao.pdf	PP

	Author	Title	References to the document	Provider
49	BRASCARBON	Communication's – Stakeholders	1 - Envio Convite Secretaria Agricultra Banªe–rantes.pdf 1A - Confirmação Recebimento Convite Secretaria Agricultura Band–irantes.pdf 2 - Enviª –onvite.pdf 2A - Confirmação Rec–bimento.pdf 3 - Envio Convite Ambiªn–al SGO.pdf 3A - Confirmação recebimento Ambie–tal SGO.pdf 4 - Envio Convite Sindicªt– Rural.pdf 4A - Confirmção Recebimento convite sindi–o rural.pdf 5 - Envio Convite Camara Municipal ªi– Verde.pdf 5A - Confirmação recebimento Camara municipal–o verde.pdf 6 - Envio Convite Camara muªi–al SGO.pdf 6A - Confirmação de Recebimento convite camara mun–pal SGO.pdf 7 - Envio Convite Impªe–sa SGO.pdf 7A - Confirmação Recebimento Convite Imprensa SGO.pdf	PP
50	BRASCARBON	Farm owner contracts	–CA 300 MS1 16 - Contrato de CERs.pdf –CA 300 MS1 16 - Contrato de Comodato.pdf	

	Author	Title	References to the document	Provider
			–CA 301 MS1 16 - Contrato de CERs.pdf –CA 301 MS1 16 - Contrato de Comodato.pdf –CA 302 MS1 16 - Contrato de CERs.pdf –CA 302 MS1 16 - Contrato de Comodato.pdf –CA 303 MS1 16 - Contrato de CERs.pdf –CA 303 MS1 16 - Contrato de Comodato.pdf –CA 304 MS1 16 - Contrato de CERs.pdf –CA 304 MS1 16 - Contrato de Comodato.pdf –CA 305 MS1 16 - Contrato de CERs.pdf –CA 305 MS1 16 - Contrato de Comodato.pdf –CA 306 MS1 16 - Contrato de CERs.pdf –CA 306 MS1 16 - Contrato de Comodato.pdf –CA 307 MS1 16 - Contrato de CERs.pdf –CA 307 MS1 16 - Contrato de Comodato.pdf –CA 308 MS1 16 - Contrato de CERs.pdf	

	Author	Title	References to the document	Provider
			–CA 308 MS1 16 - Contrato de Comodato.pdf	
51	VCS	VCS	https://verra.org/project/vcs-program/	Website
52	UNFCCC	UNFCCC	https://cdm.unfccc.int	Website
53	VCS	VCS	Email De: Verra Secretariat <secretariat@verra.org> 16/02/ 2023 Asunto: [CASE:15295] Project ID 2998 - Brascarbon Methane Recovery Project BCA-BRA-16 - VCS - Registration and verification approval requested	ICONTEC PP
54	BRASCARBON	BRASCARBON	RESOLUÇÃO-SEMADE-N.-09-2015-alt-2020.pdf	PP
55	IMASUL	MS oficializa Plano Estado Carbono Neutro em 2030 e vai para COP 26 com metas ousadas	https://www.imasul.ms.gov.br/ms-oficializa-plano-estado-carbono-neutro-em-2030-e-vai-para-cop-26-com-metas-ousadas/	ICONTEC

APPENDIX 4: CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUESTS

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

FAR ID	N/A	Section no.		Date:
Description of FAR				
Project participant response				Date:
Documentation provided by project participant				
VVB assessment				Date:

Table 2. CL from this validation and verification

CL ID	01	Section no.	1	Date: 29/09/2022
Description of CL				

Overall: In the Description & Monitoring Report: Contents page 2 and 3, please update the table of contents upon completion of the corrections. Projects Details. 1.1 Summary Description of the project page 6, it is duplicate the phrase - the sentence "Methodological tool: "Combustion emissions project" (version 03) is duplicated, please correct.

Project participant response	**Date:** 03/10/2022
The document Brascarbon Methane Recovery Project BCA-BRA-16_v4 was dully corrected.	

Documentation provided by project participant
Brascarbon Methane Recovery Project BCA-BRA-16_v4

VVB assessment	**Date:** 06/10/2022
The PD-MR is checked, ICONTEC confirmed that the clarification has been corrected, CL 01 is closed.	

CL ID	02	**Section no.**	1.12	**Date:** 29/09/2022
Description of CL				
On 1.12 Project Location- Table 2. – Detailed physical location and identification of project site, the item GPS coordinates not identify to site name “assentamiento campanario” and the site “Lote 28 - PA assentamiento campanario” the GPS Coord do not match. Please adjust the data in the table 2				

Project participant response	**Date:** 03/10/2022
The document Brascarbon Methane Recovery Project BCA-BRA-16_v4 was dully corrected.	

Documentation provided by project participant
Brascarbon Methane Recovery Project BCA-BRA-16_v4

VVB assessment	Date: 06/10/2022
The PD-MR is checked, ICONTEC confirmed that the clarification has been corrected CL 2 is closed	

CL ID	03	Section no.	4.1 – 4.2	Date: 29/09/2022
Description of CL				
In the Description & Monitoring Report Version 4.0 Section 4. Estimated GHG Emission Reductions and removals 4.1 Baseline Emission: - Equation 4.1The Described Parameters: $BEy,ex\ post$ and $PEy,ex\ post$ are not in accordance with the AMS-III.D version 21.0 (equation 10)methodology/42 and the other hand, this equation is duplicated on page 60. 4.2 Project Emissions. - Equation 5. Calculation of project emissions or actual net removals the parameter PEtransp,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 /D&M/53 page. - Equation B5 is not found /58 page Please adjust in this section and it throughout the document if is necessary .				
Project participant response				**Date:** 03/10/2022
The document Brascarbon Methane Recovery Project BCA-BRA-16_v4 was dully corrected.				
Documentation provided by project participant				
Brascarbon Methane Recovery Project BCA-BRA-16_v4				
VVB assessment				**Date:** 06/10/2022
Once the audit team evaluated version 4 of the PD& MR, it was verified that the Equations were corrected with AMS-III.D version 21. The CL 3 is closed.				

CL ID	04	Section no.	4.1 – 4.2	Date: 29/09/2022
Description of CL				
In the Description & Monitoring Report, section 4.1 the table 9 - Annual average number of animals of type, de Numbers no correspond with the data of CER Calculation MR01 - BCA-BRA-16.xls. Tables as follow: • Table 9 – Parameters and factors for the specific animal category/49/. • Table 12 /58 – the title is "Total project activity emissions for the year 2021", however is the same table 9 to 2021 and does not match the information in the excel spreadsheet "Comparison NLT,y". • Table 13 /59 – the title is "Total project activity emissions per for year ", however the subtitle is "Baseline Emissions per year". Please, review and adjust the tables.				
Project participant response				**Date:** 03/10/2022
The document Brascarbon Methane Recovery Project BCA-BRA-16_v4 was dully corrected				
Documentation provided by project participant				
Brascarbon Methane Recovery Project BCA-BRA-16_v4				
VVB assessment				**Date:** 06/10/2022
The tables were corrected, in the document. The finding is closed. CL 04 is closed				

CL ID	05	Section no.	4.1	Date: 29/09/2022
Description of CL				
In Description & Monitoring Report, equation 1 Bey /43 and 50 / is presented repeatedly, as well as, the Table 10/51/ is called "Baseline Emissions for year 2021" both are wrong. Table 10 is the same table 9 on animal category - NLT, with different values. Please review and correct or delete the tables and equations and leave the ones that apply.				

Project participant response	Date: 03/10/2022
The document Brascarbon Methane Recovery Project BCA-BRA-16_v4 was dully corrected.	
Documentation provided by project participant	
Brascarbon Methane Recovery Project BCA-BRA-16_v4	
VVB assessment	**Date:** 06/10/2022
The PD-MR is checked, ICONTEC confirmed that the clarification has been corrected, CL 05 is closed.	

CL ID	06	Section no.	4.1	Date: 29/09/2022
Description of CL				
In the Description & Monitoring table 11 don ´t match with the parameter BEy in the ER Calculation spreadsheet BCA-BRA-16, to sites: BCA-304MS1-16, Lote 55 - Assentamento Campanario and BCA-306MS1-16 Granja Grando Please, review and adjust the table.				
Project participant response				**Date:** 03/10/2022
The document Brascarbon Methane Recovery Project BCA-BRA-16_v4 was dully corrected.				
Documentation provided by project participant				
Brascarbon Methane Recovery Project BCA-BRA-16_v4				
VVB assessment				**Date:** 06/10/2022
The PD-MR is checked, ICONTEC confirmed that the table has been corrected, CL 06 is closed.				

CL ID	07	Section no.	CER	Date: 29/09/2022
Description of CL				
The Calculation spreadsheets on CER Calculation MR01 - BCA-BRA-16.xls: on spreadsheet "BEy ex-post - PEy ex-post" he has the named titles as "BCA-BRA-13" Please, review and adjust the titles of the spreadsheet.				
Project participant response				**Date:** 03/10/2022
The document ER and CER Calculation Spreadsheet BCA-BRA-16 was dully corrected. Since it was just a typo the PP did not change the version of the document.				
Documentation provided by project participant				
CER Calculation Spreadsheet BCA-BRA-16				
VVB assessment				**Date:** 06/10/2022
The verification team assessed the ER and CER Calculation Spreadsheet were corrected the spreadsheets. the finding is closed. CL 07 is closed				

CL ID	08	Section no.	5.2	Date: 29/09/2022
Description of CL				
In the Description and Monitoring Report Version 4.0 Section 5. Monitoring the parameter NLT,y/77/ in the item "Description of applied measurement methods and procedures" it mentions the operating procedure POP-03 and in "comments" the POP -02. Please clarify if both can be applied to this parameter.				
Project participant response				**Date:** 03/10/2022
The correct POP is POP-03, it was just a typo. The document Brascarbon Methane Recovery Project BCA-BRA-16_v4 was dully corrected.				
Documentation provided by project participant				
Brascarbon Methane Recovery Project BCA-BRA-16_v4				
VVB assessment				**Date:** 06/10/2022
The PD-MR is checked, ICONTEC confirmed that the clarification has been corrected, CL 08 is closed.				

CL ID	09	Section no.	5.2	Date: 29/09/2022
Description of CL				
In the Description and Monitoring Report Version 4.0 Section 5. Monitoring of the parameter Data / Parameter Qmanure,LT,y/p. 102/ in the item "Description of the measurement methods and procedures applied" The PP mentions that it is carried out as: "Supervision in the field", it has no further comments or explanatory information. The methodology applied in the project is AMS-III. D – "Methane recovery in animal manure management systems" (Version 21.0) Please adjust it throughout the document (other parameters) if necessary.				
Project participant response				**Date:** 03/10/2022
The document Brascarbon Methane Recovery Project BCA-BRA-16_v4 was dully corrected.				
Documentation provided by project participant				
Brascarbon Methane Recovery Project BCA-BRA-16_v4				
VVB assessment				**Date:** 06/10/2022
The PD-MR is checked, ICONTEC confirmed that the paremeter has been corrected, CL 09 is closed.				

CL ID	10	Section no.	5.3	Date: 29/09/2022
Description of CL				
In the Description and Monitoring Report Version 4.0 Section 5.3 Monitoring Plan /page 124/ a) the COOASGO (Associação de Suinocultores de Glória de Dourados e Região) is the one that provides the 9 associated farms with the required technical and genetic service. The pp mentioned another association Please adjust it throughout the document (other parameters) if necessary..				
Project participant response				**Date:** 03/10/2022
The correct POP is POP-03, it was just a typo. The document Brascarbon Methane Recovery Project BCA-BRA-16_v4 was dully corrected.				
Documentation provided by project participant				

Brascarbon Methane Recovery Project BCA-BRA-16_v4.
VVB assessment **Date:** 06/10/2022
The PD-MR is checked, ICONTEC confirmed that ASSUGLORIA was replaced by COOASGO, then, has been corrected. CL 10 is closed.

CL ID	11	**Section no.**	6.3	**Date:** 29/09/2022
Description of CL				
On Section 6.3 Project Emissions the Table 17 - Project Emissions (PEy,ex-post) in the current monitoring period the table 17 - "Emissions from the project (PEy, ex-post) in the current monitoring period "/148/ no information found for the site fazenda Quinhao A. Please adjust.				
Project participant response				**Date:** 03/10/2022
The document Brascarbon Methane Recovery Project BCA-BRA-16_v4 was dully corrected.				
Documentation provided by project participant				
Brascarbon Methane Recovery Project BCA-BRA-16_v4				
VVB assessment				**Date:** 06/10/2022
The PD-MR is checked, ICONTEC confirmed that the table has been corrected, CL 11 is closed.				

CL ID	12	**Section no.**	5.1	**Date:** 29/09/2022
Description of CL				

In the Description and Monitoring Report Version 4.0 Section 5.1 Monitoring Plan. Data and parameters available in Validation /page 83/ The parameter. DCH4, and "Density of Methane Flared" - Annex 13 is mentioned in the comments as a reference tool for determining project emissions of flared gases containing methane. Please adjust the comment taking into account the AMSIII.D v.21 methodology and tool 6.

Project participant response	**Date:** 03/10/2022
The document Brascarbon Methane Recovery Project BCA-BRA-16_v4 was dully corrected.	
Documentation provided by project participant	
Brascarbon Methane Recovery Project BCA-BRA-16_v4	

VVB assessment	**Date:** 06/10/2022
The PD-MR is checked, ICONTEC confirmed that the parameter has been corrected, CL 12 is closed.	

Table 1. CAR from this validation and verification

CAR ID	01	Section no.	1.1	Date: 29/09/2022
Description of CL				
In the Description and Monitoring Report Version 4.0 Section 1.1, The Project Participant estimates 55,356 tCO2e / year and 387,492 tCO2e over the first 7 years crediting period will be reduced from the baseline scenario as a result of the installation of the project activity. (page 5 del 1 Project details - 1.1 summary description of the project) - BCA- BRA -16 v3. However, it mentioned in 1.10 Project Scale and Estimated GHG Emission Reductions or Removals, The PP estimates 55,356 tCO2e / year and 382,487 tCO2e over the first 7 years crediting- Please to clarify				
Project participant response				Date: 03/10/2022
The document Brascarbon Methane Recovery Project BCA-BRA-16_v4 was dully corrected.				
Documentation provided by project participant				
Brascarbon Methane Recovery Project BCA-BRA-16_v4				
VVB assessment				Date: 06/10/2022
The PD-MR is checked, ICONTEC confirmed that the CAR has been corrected. CAR 01 is closed.				

Table 4.FAR from this verification

FAR ID	N/A	Section no.		Date:
Description of FAR				
Project participant response				Date:
Documentation provided by project participant				
VVB assessment				Date: