COMPOSTING OF ORGANIC WASTE PROJECT IN GUANGXI

Document Prepared By LGAI Technological Center, S.A. (Applus+ Certification)

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Summary:

LGAI Technological Center, S.A. (hereafter referred to as "Applus+ Certification") has been commissioned by Beijing Ruifang Technology Co., Ltd to perform the verification of greenhouse gas emission reductions of the project activity "Composting of organic waste project in Guangxi" (VCS Ref. No. 2603, hereafter referred to as "the project activity") reported in the monitoring report /1/ during monitoring period 06/01/2020 to 31/12/2022.

The project activity has been validated by Applus+ Certification based on the VCS PD /3/ version 4.1 dated 15/06/2022 and reported in the validation report No. A+SH_SYST_VCS_VAL_7721 /4/, version 01.3, completed on 15/06/2022 which is available at https://registry.verra.org/app/projectDetail/VCS/2603.

The project activity is newly built composting plant which designed to treat organic wastes to produce organic fertilizer located in Guangxi Zhuang Autonomous Region, P. R. China. The project activity includes two project activity instances. One is located at Tiandong Petrochemical Industrial Park, Tiandong County, Baise City (hereafter referred to as Instance 1), another one is located at the Yizhou District, Hechi City (hereafter referred to as Instance 2). The instances 1 is designed to treat 400,000 tonnes wet organic waste per year and produce 300,000 tonnes fertilizer per year. The instances 2 is designed to treat 150,000 tonnes wet organic waste per year and produce 110,000 tonnes fertilizer per year. In absence of the project, the organic wastes would have been dumped in the landfill sites. This new project will avoid CH_4 emissions from the disposal of the waste in a landfill site in absence of the Project. It's estimated that the project activity could achieve GHG emission reductions of 6,199,571 tCO_2e emission reduction during the first 7 years' crediting period, at an average amount of 885,653 tCO_2e per year.

The purpose and scope of this verification is to ensure that reported emission reductions are complete and accurate in accordance with applicable VCS standards and relevant UNFCCC requirements in order to be certified. A desk review and a site visit have been conducted to verify the data submitted in the monitoring report /1/. Applus+ Certification confirms the following has been reviewed:

- Monitoring plan included in the registered VCS PD /3/ version 4.1 dated 15/06/2022;
- Validation report No. A+SH_SYST_VCS_VAL_7721 /4/ version 01.3, dated 15/06/2022;

- ACM0022: Alternative waste treatment process, version 03.0 /7/
- VCS standards version 4.5 and guidance version 4.4, as well as relevant UNFCCC requirements;
- All information and references relevant to the project activity's resulting in emission reductions.

During this verification, no finding was identified related to the monitoring, implementation or operations of the project activity in relation to relevant VCS standards, guidance and UNFCCC requirements and relevant host party criteria and the applied baseline and monitoring methodology etc.

Applus+ Certification confirms that the project is implemented in accordance with the registered PD /3/. The monitoring plan complies with the applied methodology ACM0022 /7/ version 03.0 and the monitoring has been carried out in accordance with the registered PD. The monitoring system is in place and the emission reductions are calculated without material misstatements. The level of assurance of the verification is reasonable. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information reviewed and evaluated Applus+ Certification confirms that the implementation of the project has resulted in 1,417,023 tCO_2e emission reductions during period 06/01/2020 to 31/12/2022.

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1 INTRODUCTION

1.1 Objective

LGAI Technological Center, S.A. (Applus+ Certification) has been commissioned by Beijing Ruifang Technology Co., Ltd to perform the verification of greenhouse gas emission reductions of the project activity "Composting of organic waste project in Guangxi" (VCS Ref. No. 2603) reported in the Monitoring Report /1/ during monitoring period 06/01/2020 to 31/12/2022.

LGAI Technological Center, S.A. (Applus+ Certification) as the verification body of the project activity has been accredited as a DOE by UNFCCC and also meets the competence requirements as set out in ISO 14065:2020.

The objective of verification is to have an independent review and ex post determination by a Validation and Verification Body (VVB) of the monitored reductions in GHG emissions that have occurred as a result of the registration of VCS project. Certification is the written assurance by the VVB that, during a specific time period, a proposed VCS project activity achieved the reductions in anthropogenic emissions by sources of GHGs as verified.

The objective of this verification/certification is to verify and certify emission reductions, reported for the "Composting of organic waste project in Guangxi" in China for the period 06/01/2020 to 31/12/2022.

1.2 Scope and Criteria

The verification scope is defined as an independent and objective review of the registered PD, the Project's baseline study and Monitoring Report (MR) and other relevant documents. The information in these documents is reviewed against VCS Version 4.5 requirements, UNFCCC rules and associated interpretations.

The verification is not meant to provide any consulting towards the client. However, stated requests for forward actions and/or corrective actions may provide input for improvement of the Project monitoring towards reductions in the GHG emissions.

1.3 Level of Assurance

The verification report is based on the VCS-PD, VCS Monitoring Report (MR), supporting evidences made available to the verifier and information collected through performing interviews and during the on-site assessment.

The verification conclusion is assured a reasonable level of assurance.

1.4 Summary Description of the Project

Project title	Composting of organic waste project in Guangxi
VCS reference number	2603
Project Participants	Guangxi Liyuanbao Science and Technology Co., Ltd. (Project Owner, host country, P. R. China)
Location of the project	Instance 1: Tiandong Petrochemical Industrial Park, Tiandong County, Baise City, Guangxi Zhuang Autonomous Region, P. R. China Geographic coordinates: longitude of 107°08′35″ E and latitude of 23°39′17″ N Instance 2: Tan Cun Village, Huaiyuan Town, Yizhou District, Hechi City, Guangxi Zhuang Autonomous Region, P. R. China Geographic coordinates: longitude of 108°26′52″ E and latitude of 24°34′19″ N
Project start date	Construction start date: 19/03/2018 (instance 1) and 20/04/2018 (instance 2) Operation start date: 06/01/2020 (instance 1) and 15/01/2020 (instance 2)
Version of PD	VCS PD Version 4.1, dated 15/06/2022
Monitoring period	06/01/2020 to 31/12/2022
First monitoring report	Version 1.0, dated 23/04/2023
Final monitoring report	Version 4.0, dated 07/02/2024
Applied Methodology/Version	ACM0022, version 03.0

Scope/Technical Area	13/13.1 Scope 13: Waste handling and disposal

The project activity is newly built composting plant which designed to treat organic wastes to produce organic fertilizer located in Guangxi Zhuang Autonomous Region, P. R. China. The project activity includes two project activity instances. One is located at Tiandong Petrochemical Industrial Park, Tiandong County, Baise City (hereafter referred to as Instance 1), another one is located at the Yizhou District, Hechi City (hereafter referred to as Instance 2). The instances 1 is designed to treat 400,000 tonnes wet organic waste per year and produce 300,000 tonnes fertilizer per year. The instances 2 is designed to treat 150,000 tonnes wet organic waste per year and produce 110,000 tonnes fertilizer per year. In absence of the project, the organic wastes would have been dumped in the landfill sites. This new project will avoid CH_4 emissions from the disposal of the waste in a landfill site in absence of the Project. It's estimated that the project activity could achieve GHG emission reductions of 6,199,571 tCO_2e emission reduction during the first 7 years' crediting period, at an average amount of 885,653 tCO_2e per year.

The project activity has been validated by Applus+ Certification based on the VCS PD /3/ version 4.1 dated 15/06/2022 and reported in the validation report No. A+SH_SYST_VCS_VAL_7721 /4/, version 01.3, completed on 15/06/2022 which is available at https://registry.verra.org/app/projectDetail/VCS/2603.

2 VERIFICATION PROCESS

2.1 Method and Criteria

Verification was conducted using Applus+ Certification's procedures in line with the requirements specified in the VCS Standard version 4.5, CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant UNFCCC requirements and applying standard auditing techniques.

Applus+ Certification completed a strategic review and risk assessment of the projects activities and processes in order to gain a full understanding of:

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

Applus+ Certification verified the implementation of the monitoring plan and the data presented in the Monitoring Report /1/ for the period in question. This involved a site visit and a desk review of the Monitoring Report. This Verification Report describes the findings of this assessment.

The information of the assessment team is included in below:

Assessment team

According to the applicable sectoral scope / technical area and experience in the sectoral or national business environment, Applus+ Certification has composed an assessment team in compliance with the Contract Review and Assessment Team appointment rules in the internal Quality Management System of Applus+ Certification as well as in compliance with the applicable requirements in the Accreditation Standard.

The composition of the Assessment Team (Applus+ Certification's validation team) has been approved by Applus+ Certification during the Contract Review process ensuring that the required skills and capabilities are covered.

The qualification levels for Assessment Team members that are assigned by aforementioned appointment rules are as presented below:

- Lead Auditor (LA).
- Auditor (A).
- Technical Expert (TE).
- Technical Reviewer (TR).
- Any of the above-mentioned roles in training (iT, e.g. AiT for auditor in training).

- The Sectoral Scopes / Technical Areas required knowledge linked to the applied methodology(ies) is covered by the Assessment Team as shown below:

Name	Qualification	Coverage of scope	Coverage of Technical Area	Host country experience
Doris Dai	LA/TE	Y (1.1 and 13.1)	Y	Y
Simon Shen	TR/TE	Y (1.1 and 13.1)	Y	Y

Doris Dai (Master's Degree in Environmental Sciences, Bachelor's Degree in Environmental Technology) is an Auditor appointed by Applus+ Certification (LGAI Technological Center, S.A) for the GHG project assessment and auditing. She has more than 6 years of work experience in CDM/VCS project assessment and more than 2 years of working experience in GS4GG project assessment. Before she joined Applus+ LGAI, she has been working for CTI Certification as senior GHG Auditor for 3.5 years.

Mr. Simon Shen (Master's Degree in Thermal Energy Engineering, Bachelor's Degree in Environmental Engineering) is an Auditor appointed by Applus+ LGAI for the GHG project assessment, auditing and technical review. He has more than 8 years of work experience in CDM/GS4GG/VCS project assessment and review with Applus+, apart from the years of experience working as GHG Auditor and ISO 9001/14001 in TUV SUD for 3.5 years before he joined Applus+. Mr. Simon Shen has extensive experience also as former Applus+ Shanghai CDM Technical Manager. Since 2014, Mr. Simon Shen works as an external individual in Applus+. At the time, he participated in plenty of Chinese CCER audits and enterprises carbon emissions verifications.

2.2 Document Review

The VCS monitoring report /1/ version 1.0 dated 23/04/2023, version 4.0 dated 07/02/2024 and the emission reduction calculations spreadsheet /2/, were assessed as part of the verification. In addition, the VCS PD /3/ version 4.1 dated 15/06/2022 in particular the baseline estimations and the monitoring plan, the VCS Validation Report /4/ dated 15/06/2022, as well as relevant documents, were reviewed. A detailed document reviewed are listed in Appendix 1 of the report.

2.3 Interviews

A physical site visit interview was made by the assessment team on 11-12/09/2023, The key personnel interviewed through the sit visit are summarized in the table below:

Interviewed personnel	Role	Organization	Subject
Mr. Dong Yuanwei	Operation Director	Guangxi Liyuanbao Science and Technology Co., Ltd. (Instance 1)	Operation of the project activity; Implementation of the monitor plan of the project activity; Data collection and data achievement; Calibration of meters and equipment maintenance; Data collection and ER calculation.
Mr. Li Youjing	Operator	Guangxi Liyuanbao Science and Technology Co., Ltd. (Instance 1)	
Mr. Luo Dongzheng	Operation Director	Guangxi Liyuanbao Science and Technology Co., Ltd. (Instance 2)	
Mr. Wei Bingzu	Operator	Guangxi Liyuanbao Science and Technology Co., Ltd. (Instance 2)	
Ms. Wang Wenli	Villager	Tiandong County (Instance 1)	
Ms. Fu Rui	Villager	Tiandong County (Instance 1)	
Mr. Zhao Xinying	Villager	Fudong Village (Instance 2)	
Ms. Liang Xiaoyan	Villager	Anma Village (Instance 2)	

2.4 Site Visits

The assessment team performed the on-site verification (Tiandong County, Baise City, Guangxi Zhuang Autonomous Region, P. R. China for instance 1 and Tan Cun Village, Huaiyuan Town, Yizhou District, Hechi City, Guangxi Zhuang Autonomous Region, P. R. China for instance 2) on 11-12/09/2023 respectively. The interviewed personnel including the role and organization and objective are listed in above table in the section 2.3, please refer to above for details.

2.5 Resolution of Findings

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

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

a) Non-compliance with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;

b) Modifications to the implementation, operation and monitoring of the project activity has not been sufficiently documented by the project participants;

c) Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;

d) Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

The assessment team shall raise a Clarification Request (CL) if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

All CARs and CLs raised during verification shall be resolved prior to submitting a request for issuance.

There is no CARs and CLs raised for this monitoring period for the project.

2.5.1 Forward Action Requests

None FAR was raised during the verification process. Also, there are no remaining from former validation.

2.6 Eligibility for Validation Activities

Not applicable as LGAI Technological Center, S.A. holds the accreditation for the validation and verification for projects under scope 1 and 13.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

Through reviewing the registered PD /3/ and validation report /4/, it was validated that the project has been registered as a VCS project with reference No. 2603 which is available at https://registry.verra.org/app/projectDetail/VCS/2603. The project does not participate in other emissions trading program by checking public information on Internet, interviewing with project owner and statement issued by project owner.

During the period from 06/01/2020 to 05/01/2027 as the VCS crediting period, the project would claim only for VCUs.

Therefore, Applus+ Certification consider the project is eligible to participate under the VCS Program as there is no double counting for the emission reduction during any period.

3.2 Methodology Deviations

Not applicable as no deviation for methodology.

3.3 Project Description Deviations

A project description deviation was raised during this monitoring period, In the registered PD, the monitoring equipment for $P_{n,j,x}$ is expected to be electronic platform scale with accuracy of class III, however for instance 1, electronic balance was used for monitoring, According to "JJG1036-2022 Electronic Balance", electronic balance could monitor weight and its accuracy includes class I, II, III. Therefore, the assessment consider it is acceptable that to use electronic balance instead of electronic platform scale for monitoring for $P_{n,j,x}$. This is in line with the requirements of national standards.

It is confirmed that this deviation will not impact the methodology applicability, will not impact the project additionality and will not impact the emission reduction calculations.

3.4 Grouped Project

Not applicable as not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

By means of on-site visit, the assessment team confirms that all physical features of the proposed project activity proposed in the registered VCS PD /3/ are in place and the PP has operated the project as per registered VCS PD /3/. The project activity includes two project activity instances, one is located at Tiandong Petrochemical Industrial Park, Tiandong County, Baise City (hereafter referred to as Instance 1), another one is located at the Yizhou District, Hechi City (hereafter referred to as Instance 2). The instances 1 is designed to treat 400,000 tonnes wet organic waste per year and produce 300,000 tonnes fertilizer per year. The instances 2 is designed to treat 150,000 tonnes wet organic waste per year and produce 110,000 tonnes fertilizer per year. The instance 1 started construction on 19/03/2018 commissioned on 06/01/2020, the instance 2 started construction on 20/04/2018 and commissioned on 15/01/2020 verified by checking information on the VCS website and site visit. There are no changes on the key equipment and technology since the validation of the project. No special event which would affect the monitoring of the project has been observed during the monitoring period.

By checking online information and interview with the project owner, it is confirmed that the project was only registered under VCS and won't apply for any carbon credits or environmental credits under any other scheme.

The project has not received or sought any other form of environmental credit or has become eligible to do so since validation or previous verification.

The GHG emission reductions or removals generated by the project have not become included in an emissions trading program or any other mechanism that includes GHG allowance trading.

As per Clarification to VCS program rules and requirements issued on 31/05/2023, projects are not required to complete the sections in the affected VCS project templates that relate to Scope 3 emissions double claiming until the effective date of the revised requirements of 01/01/2024. Thus no related information presented for current monitoring period.

The project would contribute to sustainable development in as below:

- The project will avoid GHG emissions by treatment organic waste that would have been dumped in landfill site. Thus, will effectively improve the living circumstances for local people.
- This project will also improve soil condition by providing organic fertilizer for local people, boosting farm crop production and promote the incomes of local farmers.
- This project could provide job opportunities for local people, which is beneficial for local livelihood.

Moreover by checking public information, staff roaster of project /16/ and site visit, following information has been confirmed:

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	By building composting plant, this project has prevented the release of 1,417,023 tCO_2 into the atmosphere during this monitoring period.	From the start date of project operation to the end date of this monitoring period, 1,417,023 tCO_2 emissions are avoided.
2	12.4	12.4.2 (b) proportion of hazardous waste treated, by type of treatment	Implemented activities to increase	The solid waste disposed by this project is 1,066,343 ton (instance 1) and 393,784 ton (instance 2).	From the start date of project operation to the end date of this monitoring period, 1,460,127 ton solid waste are disposed.
3	8.3	8.3.1 Proportion of informal employment in total employment, by sector and sex	Implemented activities to increase	The project provides 38 job opportunities for local people in this monitoring period	The project provides 38 long-term job opportunities for local people.

The technical parameters have been verified with the nameplates /9 / as below:

Number	Equipment	Instance 1	Instance 2
1	Belt conveyor	Type: LYBSSJ Rated power: 3 kW	Type: LYSSJ Rated power: 5.5 kW, 4.0 kW
2	Blender	Type: LYJBJ Rated power: 45 kW	Type: LYJBJ Rated power: 55 kW
3	Crusher	Type: LYLPJ Rated power: 45 kW	Rated power: 45 kW
4	Palletizer	Type: LYBMDJ Rated power: 22.5 kW	Rated power: 30 kW

By comparing the actual ER claimed in this monitoring period with the estimate in the registered PD, the actual emission reductions (1,417,023 tCO_2e) are lower than what is stated in the registered PD (i.e. 1,549,461 tCO_2e). The assessment team consider this is acceptable as conservativeness.

Therefore, the assessment team confirmed the ER in this monitoring period is not overestimated.

The assessment team confirmed that there is no proposed or actual change to the project design during this monitoring period.

The assessment team confirmed the correction of audit history indicated in the PD through checking information on VERRA website and related documents.

All required equipments and procedures are available and implemented in an appropriate manner.

All necessary monitoring instruments are installed. All required instruments including standby and operating procedures for the same have been implemented in an appropriate manner.

The project is completely operational and the same has been confirmed on-site. Neither mistakes nor malfunction on main meters have been observed during this monitoring period.

4.2 Safeguards

4.2.1 No Net Harm

By checking the EIA summary and conclusion provided in the registered PD, it is confirmed that the impact caused by composting on the surrounding ecosystem and residents, water, and atmosphere etc. is very little, there would be no net harm caused due to the project activity. Also, the EIA of the project are approved by the government.

Also, no potential environment or social economic matter was found during the site visit. The project is composting project and thus no net harm observed in air or water quality on-site. Moreover, based on

the site visit, it is confirmed that measurements had been token to mitigate the potential impacts on environment and no negative environmental and socio-economic impacts has been found during this monitoring period.

4.2.2 Local Stakeholder Consultation

A survey was carried out through the information publication, distributing and collecting responses to questionnaires targeting on local residents, builders and members of the local authorities. The project owner introduced the proposed project, and then a survey was arranged through a one-page questionnaire, which was designed to be easily filled in. The opinions expressed by the stakeholders were recorded and are available on request.

The stakeholder meeting and the survey showed that the proposed project receives strong support from the local community. They all believe the proposed project will promote local economic development and agree with the project development and construction.

Communications with Local stakeholders was being carried out at periodic intervals. There are no negative comments received for the project.

All such conclusion has been verified through site visit and check registered PD.

4.3 AFOLU-Specific Safeguards

Not applicable as non-AFOLU project.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

The monitoring has been carried out in accordance with the monitoring plan contained in the VCS PD /3/. All parameters were monitored and determined as per the monitoring plan which is listed in below table:

Data / Parameter:	f_y
Data unit:	/
Description:	Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere in year y
Purpose of the data:	Calculation of baseline emissions
Parameter value:	0
Source of data used:	Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere in year y is determined by Technical code for Municipal solid waste sanitary landfill (GB50869-2013) /17/

Information flow:	Not applicable
Monitoring method, frequency and equipments:	By checking technical code for Municipal solid waste sanitary landfill (GB50869-2013), it is confirmed although in clause 11.1.3 and clause 11.5.1 states landfill gas should be utilized (for gas that can be utilized) or flared (for gas that cannot be utilized) but both clause are considered as recommendation. According to "2021 Urban Construction Statistical Yearbook" /18/ and "2021 Urban and Rural Construction Statistical Yearbook" /19/, in the cities, there are a total of 1,407 harmless treatment plants, of which only 282 landfill sites have collected and used landfill gas or burned it or disposed the waste in other ways; in the counties, a total of 1,441 harmless treatment plants, of which only 61 landfill sites have collected and used landfill gas or burned it or disposed the waste in other ways. Based on the above evidence, it is able to confirm that: the provisions on methane recovery and utilization specified in GB 50869-2013 have not been systematically enforced, and it is a common phenomenon in China that methane in solid waste disposal sites is discharged into the atmosphere without any use.
Calibration:	Not applicable
QA/QC procedure:	Data record will be archived for a period of 2 years after the crediting period to which the records pertain.
Means of verification:	Not applicable

Data / Parameter:	$RATE_{COMPLIANCE,t}$
Data unit:	/
Description:	Rate of compliance with a regulatory requirement to implement the alternative waste treatment t implemented in the project activity
Purpose of the data:	Calculation of baseline emissions
Parameter value:	0
Source of data used:	Rate of compliance with a regulatory requirement to implement the alternative waste treatment t implemented in the project activity is determined by Technical code for Municipal solid waste sanitary landfill (GB50869-2013) /17/
Information flow:	Not applicable

Monitoring method, frequency and equipments:	By checking technical code for Municipal solid waste sanitary landfill (GB50869-2013), it is confirmed although in clause 11.1.3 and clause 11.5.1 states landfill gas should be utilized (for gas that can be utilized) or flared (for gas that cannot be utilized). According to "2021 Urban Construction Statistical Yearbook" /18/ and "2021 Urban and Rural Construction Statistical Yearbook" /19/, in the cities, there are a total of 1,407 harmless treatment plants, of which only 282 landfill sites have collected and used landfill gas or burned it or disposed the waste in other ways; in the counties, a total of 1,441 harmless treatment plants, of which only 61 landfill sites have collected and used landfill gas or burned it or disposed the waste in other ways. Based on the above evidence, it is able to confirm that: the provisions on methane recovery and utilization specified in GB 50869-2013 have not been systematically enforced, and it is a common phenomenon in China that methane in solid waste disposal sites is discharged into the atmosphere without any use.
Calibration:	Not applicable
QA/QC procedure:	Data record will be archived for a period of 2 years after the crediting period to which the records pertain.
Means of verification:	Not applicable

Data / Parameter:	$DOC_{f,y}$
Data unit:	Weight fraction
Description:	Fraction of degradable organic carbon (DOC) that decomposes under the specific conditions occurring in the SWDS for year y
Purpose of the data:	Calculation of baseline emissions
Parameter value:	Instance 1: $DOC_{biomass,y}$ = 0.7 * 12 / 16 * 0.29 / (0.5 * 32%) = 0.95 $DOC_{manure,y}$ = 0.7 * 12 / 16 * 0.35 / (0.54 * 37%) = 0.92 $DOC_{food\ waste,y}$ = 0.7 * 12 / 16 * 0.43 / (0.61 * 40%) = 0.93 Instance 2: $DOC_{biomass,y}$ = 0.7 * 12 / 16 * 0.31 / (0.51 * 33%) = 0.97 $DOC_{manure,y}$ = 0.7 * 12 / 16 * 0.36 / (0.53 * 38%) = 0.94 $DOC_{food\ waste,y}$ = 0.7 * 12 / 16 * 0.42 / (0.62 * 39%) = 0.91 The data of $DOC_{f,y}$ are fixed during the crediting period.

Source of data used:	This parameter was calculated by Biochemical methane potential for the residual waste type j disposed or prevented from disposal (BMP_j), Fraction of methane in the SWDS gas (F) and Fraction of degradable organic carbon in the waste type j (weight fraction) (DOC_j) as below: $DOC_{f,y} = 0.7 * 12 / 16 * BMP_j / (F * DOC_j)$ For the monitoring of all these 3 monitoring parameters, please refer to the below of the report.
Information flow:	Not applicable
Monitoring method, frequency and equipments:	This parameter was calculated by Biochemical methane potential for the residual waste type j disposed or prevented from disposal (BMP_j), Fraction of methane in the SWDS gas (F) and Fraction of degradable organic carbon in the waste type j (weight fraction) (DOC_j) as below: $DOC_{f,y} = 0.7 * 12 / 16 * BMP_j / (F * DOC_j)$ For the monitoring of all these 3 monitoring parameters, please refer to the below of the report.
Calibration:	Not applicable
QA/QC procedure:	Data record will be archived for a period of 2 years after the crediting period to which the records pertain.
Means of verification:	Not applicable

Data / Parameter:	BMP_j
Data unit:	tCH_4/t waste
Description:	Biochemical methane potential for the residual waste type j disposed or prevented from disposal
Purpose of the data:	Calculation of baseline emissions
Parameter value:	Instance 1: $BMP_{biomass} = 0.29$ $BMP_{manure} = 0.35$ $BMP_{food} = 0.43$ Instance 2: $BMP_{biomass} = 0.31$ $BMP_{manure} = 0.36$ $BMP_{food} = 0.42$ The data of BMP_j are fixed during the crediting period.

Source of data used:	Biochemical methane potential for the residual waste type j disposed or prevented from disposal are sourced from Material inspection report /23/
Information flow:	The value of parameter was sourced from Material inspection report issued by Liyuanbao Ecological Big Data Co., LTD dated 26/08/2019 for instance 1 and Material inspection report issued by Liyuanbao Ecological Big Data Co., LTD dated 27/08/2019 for instance 2. The data from Material inspection report would be used for ER calculation and fixed in the whole crediting period.
Monitoring method, frequency and equipments:	The value of parameter was sourced from Material inspection report issued by Liyuanbao Ecological Big Data Co., LTD dated 26/08/2019 for instance 1 and Material inspection report issued by Liyuanbao Ecological Big Data Co., LTD dated 27/08/2019 for instance 2. The inspection was done by Liyuanbao Ecological Big Data Co., LTD against related National Standard and Liyuanbao Ecological Big Data Co., LTD is a accredited institution for inspection accredited by Guangxi Zhuang Autonomous Region Bureau of Quality and technical Supervision.
Calibration:	Not applicable
QA/QC procedure:	Data record will be archived for a period of 2 years after the crediting period to which the records pertain.
Means of verification:	Data of the parameter was verified by checking Material inspection report. All data is in line with Material inspection report; Information flow was verified by checking Material inspection report, and all information are consistent; Monitoring method was verified by site visit, checking Material inspection report, all monitoring method meets the description in the PD.

Data / Parameter:	F
Data unit:	volume fraction
Description:	Fraction of methane in the SWDS gas (volume fraction)
Purpose of the data:	Calculation of baseline emissions
Parameter value:	Instance 1: $F_{biomass}$ = 0.5 F_{manure} = 0.54 F_{food} = 0.61 Instance 2:

	$F_{biomass}$ = 0.51 F_{manure} = 0.53 F_{food} = 0.62 The data of F are fixed during the crediting period.
Source of data used:	Fraction of methane in the SWDS gas (volume fraction) are sourced from Material inspection report /23/
Information flow:	The value of parameter was sourced from Material inspection report issued by Liyuanbao Ecological Big Data Co., LTD dated 26/08/2019 for instance 1 and Material inspection report issued by Liyuanbao Ecological Big Data Co., LTD dated 27/08/2019 for instance 2. The data from Material inspection report would be used for ER calculation and fixed in the whole crediting period.
Monitoring method, frequency and equipments:	The value of parameter was sourced from Material inspection report issued by Liyuanbao Ecological Big Data Co., LTD dated 26/08/2019 for instance 1 and Material inspection report issued by Liyuanbao Ecological Big Data Co., LTD dated 27/08/2019 for instance 2. The inspection was done by Liyuanbao Ecological Big Data Co., LTD against related National Standard and Liyuanbao Ecological Big Data Co., LTD is a accredited institution for inspection accredited by Guangxi Zhuang Autonomous Region Bureau of Quality and technical Supervision.
Calibration:	Not applicable
QA/QC procedure:	Data record will be archived for a period of 2 years after the crediting period to which the records pertain.
Means of verification:	Data of the parameter was verified by checking Material inspection report. All data is in line with Material inspection report; Information flow was verified by checking Material inspection report, and all information are consistent; Monitoring method was verified by site visit, checking Material inspection report, all monitoring method meets the description in the PD.

Data / Parameter:	DOC_j
Data unit:	/
Description:	Fraction of degradable organic carbon in the waste type j (weight fraction)
Purpose of the data:	Calculation of baseline emissions
Parameter value:	Instance 1:

	$DOC_{biomass}$ = 32% DOC_{manure} = 37% DOC_{food} = 40% Instance 2: $DOC_{biomass}$ = 33% DOC_{manure} = 38% DOC_{food} = 39%
Source of data used:	Fraction of degradable organic carbon in the waste type j (weight fraction) are sourced from Material inspection report /23/
Information flow:	The value of parameter was sourced from Material inspection report issued by Liyuanbao Ecological Big Data Co., LTD dated 26/08/2019 for instance 1 and Material inspection report issued by Liyuanbao Ecological Big Data Co., LTD dated 27/08/2019 for instance 2. The data from Material inspection report would be used for ER calculation and fixed in the whole crediting period.
Monitoring method, frequency and equipments:	The value of parameter was sourced from Material inspection report issued by Liyuanbao Ecological Big Data Co., LTD dated 26/08/2019 for instance 1 and Material inspection report issued by Liyuanbao Ecological Big Data Co., LTD dated 27/08/2019 for instance 2. The inspection was done by Liyuanbao Ecological Big Data Co., LTD against related National Standard and Liyuanbao Ecological Big Data Co., LTD is a accredited institution for inspection accredited by Guangxi Zhuang Autonomous Region Bureau of Quality and technical Supervision.
Calibration:	Not applicable
QA/QC procedure:	Data record will be archived for a period of 2 years after the crediting period to which the records pertain.
Means of verification:	Data of the parameter was verified by checking Material inspection report. All data is in line with Material inspection report; Information flow was verified by checking Material inspection report, and all information are consistent; Monitoring method was verified by site visit, checking Material inspection report, all monitoring method meets the description in the PD.

Data / Parameter:	W_x
Data unit:	t

<table>
<tr><td>Description:</td><td>Total amount of solid waste disposed or prevented from disposal in the SWDS in year x</td></tr>
<tr><td>Purpose of the data:</td><td>Calculation of baseline emissions</td></tr>
<tr><td>Parameter value:</td><td>Instance 1:
06/01/2020 - 31/12/2020: 341,965
01/01/2021 - 31/12/2021: 357,385
01/01/2022 - 31/12/2022: 366,993
Instance 2:
06/01/2020 - 31/12/2020: 125,079
01/01/2021 - 31/12/2021: 132,608
01/01/2022 - 31/12/2022: 136,097</td></tr>
<tr><td>Source of data used:</td><td>Total amount of solid waste disposed or prevented from disposal in the SWDS in year x are all sourced from Monthly Report /10/ issued by the project owner.</td></tr>
<tr><td>Information flow:</td><td>For instance 1:
1 weighbridge installed at project site was measured continuously, recorded monthly and archived electronically. At 24:00 of each day in the monitoring period, the raw data of weighbridge are recorded by project owner, the project owner would form monthly report based on the meter readings.
The data for Monthly Report have been sent to the CDM consulting company for reporting of GHG emission reduction.
For instance 2:
1 weighbridge installed at project site was measured continuously, recorded monthly and archived electronically. At 24:00 of each day in the monitoring period, the raw data of weighbridge are recorded by project owner, the project owner would form monthly report based on the meter readings.
The data for Monthly Report have been sent to the CDM consulting company for reporting of GHG emission reduction.</td></tr>
<tr><td>Monitoring method, frequency and equipments:</td><td>The parameter was measured continuously and recorded monthly by 2 weighbridges installed at project site (for both instance 1 and 2). See below for the information of 2 weighbridges verified by site visit and checking calibration certificates /12/:
<table>
<tr><th>Equipment</th><th>Type</th><th>Serial Number</th><th>Accuracy</th></tr>
<tr><td>Weighbridge (Instance 1)</td><td>D2008</td><td>13406</td><td>Class III</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td></td><td>
<table>
<tr><td>Weighbridge (Instance 2)</td><td>SCS-120</td><td>010688</td><td>Class III</td></tr>
</table>
The type, serial number and accuracy have been confirmed by site visit.
</td></tr>
<tr><td>Calibration:</td><td>
The calibration information are shown as below /12/:
<table>
<tr><th>Equipment</th><th>Calibration date</th><th>Valid until</th></tr>
<tr><td rowspan="4">Weighbridge (Instance 1)</td><td>19/11/2019</td><td>18/11/2020</td></tr>
<tr><td>13/11/2020</td><td>12/11/2021</td></tr>
<tr><td>09/11/2021</td><td>08/11/2022</td></tr>
<tr><td>03/11/2022</td><td>02/11/2023</td></tr>
<tr><td rowspan="4">Weighbridge (Instance 2)</td><td>12/12/2019</td><td>11/12/2020</td></tr>
<tr><td>24/11/2020</td><td>23/11/2021</td></tr>
<tr><td>10/11/2021</td><td>09/11/2022</td></tr>
<tr><td>24/06/2022</td><td>23/06/2023</td></tr>
</table>
For instance 1, the calibration was conducted by accredited third parties which are Shenzhen Tiansu Calibration and Testing Co., Ltd. /13/ which was accredited by China National Accreditation Service for Conformity Assessment (CNAS).
For instance 2, the calibration was conducted by accredited third parties which are Hechi City Yizhou district metrological verification and testing institute /13/ which was accredited by Market Supervision Administration.
</td></tr>
<tr><td>QA/QC procedure:</td><td>Data record will be archived for a period of 2 years after the crediting period to which the records pertain.</td></tr>
<tr><td>Means of verification:</td><td>
Data of the parameter was verified by checking Monthly Report. All data is in line with Monthly Report;
Information flow was verified by checking Monthly Report, and all information are consistent;
Monitoring method was verified by site visit, checking calibration certificates, all monitoring method meets the description in the PD;
Calibration was verified by checking calibration certificate, all calibration of monitoring equipment meets the requirement indicated in the PD.
</td></tr>
</table>

Data / Parameter:	$P_{n,j,x}$
Data unit:	Weight fraction

<table>
<tr><td>Description:</td><td>Weight fraction of the waste type j in the sample n collected during the year x</td></tr>
<tr><td>Purpose of the data:</td><td>Calculation of baseline emissions</td></tr>
<tr><td>Parameter value:</td><td>Instance 1:
$P_{biomass,y}$ = 76.4%
$P_{manure,y}$ = 13.9%
$P_{food,y}$ = 6.9%
Instance 2:
$P_{biomass,y}$ = 77.2%
$P_{manure,y}$ = 16.7%
$P_{food,y}$ = 6.2%</td></tr>
<tr><td>Source of data used:</td><td>Weight fraction of the waste type j in the sample n collected during the year x are all sourced from Monthly Report /10/ issued by the project owner.</td></tr>
<tr><td>Information flow:</td><td>For instance 1:
1 electronic balance installed at project site was measured continuously, recorded monthly and archived electronically. At 24:00 of each day in the monitoring period, the raw data of electronic balance are recorded by project owner, the project owner would form monthly report based on the meter readings.
The data for Monthly Report have been sent to the CDM consulting company for reporting of GHG emission reduction.
For instance 2:
1 electronic platform scale installed at project site was measured continuously, recorded monthly and archived electronically. At 24:00 of each day in the monitoring period, the raw data of electronic platform scale are recorded by project owner, the project owner would form monthly report based on the meter readings.
The data for Monthly Report have been sent to the CDM consulting company for reporting of GHG emission reduction.</td></tr>
<tr><td>Monitoring method, frequency and equipments:</td><td>The parameter was measured continuously and recorded monthly by 1 electronic balance for instance 1 and 1 electronic platform scale for instance 2 installed at project site (for both instance 1 and 2). See below for the information of 1 electronic balance for instance 1 and 1 electronic platform scale for instance 2 verified by site visit and checking calibration certificates /12/:
<table>
<tr><th>Equipment</th><th>Type</th><th>Serial Number</th><th>Accuracy</th></tr>
</table>
</td></tr>
</table>

<table>
<tr><td></td><td>
<table>
<tr><td>Electronic balance (Instance 1)</td><td>FA2004N</td><td>Y201510175</td><td>Class III</td></tr>
<tr><td>Electronic platform scale (Instance 2)</td><td>TCS-150-66</td><td>T3248673</td><td>Class III</td></tr>
</table>
The type, serial number and accuracy have been confirmed by site visit.
</td></tr>
<tr><td>Calibration:</td><td>
The calibration information are shown as below /12/:
<table>
<tr><th>Equipment</th><th>Calibration date</th><th>Valid until</th></tr>
<tr><td rowspan="4">Electronic balance (Instance 1)</td><td>01/08/2019</td><td>31/07/2020</td></tr>
<tr><td>09/07/2020</td><td>08/07/2021</td></tr>
<tr><td>02/07/2021</td><td>01/07/2022</td></tr>
<tr><td>27/06/2022</td><td>26/06/2023</td></tr>
<tr><td rowspan="4">Electronic platform scale (Instance 2)</td><td>13/12/2019</td><td>12/12/2020</td></tr>
<tr><td>01/12/2020</td><td>30/11/2021</td></tr>
<tr><td>10/11/2021</td><td>09/11/2022</td></tr>
<tr><td>24/06/2022</td><td>23/06/2023</td></tr>
</table>
For instance 1, the calibration was conducted by accredited third parties which are Shenzhen Tiansu Calibration and Testing Co., Ltd. /13/ which was accredited by China National Accreditation Service for Conformity Assessment (CNAS).
For instance 2, the calibration was conducted by accredited third parties which are Hechi City Yizhou district metrological verification and testing institute /13/ which was accredited by Market Supervision Administration.
</td></tr>
<tr><td>QA/QC procedure:</td><td>Data record will be archived for a period of 2 years after the crediting period to which the records pertain.</td></tr>
<tr><td>Means of verification:</td><td>
Data of the parameter was verified by checking Monthly Report. All data is in line with Monthly Report;
Information flow was verified by checking Monthly Report, and all information are consistent;
Monitoring method was verified by site visit, checking calibration certificates, all monitoring method meets the description in the PD;
Calibration was verified by checking calibration certificate, all calibration of monitoring equipment meets the requirement indicated in the PD.
</td></tr>
</table>

Data / Parameter:	Z_x
Data unit:	/
Description:	Number of samples collected during the year x
Purpose of the data:	Calculation of baseline emissions
Parameter value:	For each instance: 36 for biomass 36 for manure 36 for food
Source of data used:	Number of samples collected during the year x are all sourced from Monthly Report /10/ issued by the project owner.
Information flow:	The project owner will record the sample information in the Monthly Report /10/.
Monitoring method, frequency and equipments:	Once sample was token, sample information would be recorded in the Monthly Report /10/.
Calibration:	Not applicable
QA/QC procedure:	Data record will be archived for a period of 2 years after the crediting period to which the records pertain.
Means of verification:	Data of the parameter was verified by checking Monthly Report. All data is in line with Monthly Report; Information flow was verified by checking Monthly Report, and all information are consistent.

Data / Parameter:	$EC_{PJ,comp,y}$ ($EC_{PJ,j,y}$)
Data unit:	MWh/yr
Description:	Quantity of electricity consumed for composting in year y
Purpose of the data:	Calculation of project emissions
Parameter value:	Instance 1: 2,652.336 MWh Instance 2: 619.450 MWh

<table>
<tr><td>Source of data used:</td><td>Quantity of electricity consumed for composting in year y are all sourced from Monthly Report /10/ issued by the project owner, Electricity Transaction Notes (ETNs) /11/ issued by project owner covering monitoring period.</td></tr>
<tr><td>Information flow:</td><td>For instance 1, 1 electricity meter installed at project site was measured continuously, recorded monthly and archived electronically. At 24:00 hr of last day of each month, the staff from project owner will record 1 electricity meters' readings and fill out Monthly Report. The staff from power grid company will record the meter readings of meter then transcribes the data into Electricity Transaction Notes (ETNs).
The data for Monthly Report and ETNs have been sent to the CDM consulting company for reporting of GHG emission reduction. The conservative one would be used for ER calculation.
For instance 2, 1 electricity meter installed at project site was measured continuously, recorded monthly and archived electronically. At 24:00 hr of last day of each month, the staff from project owner will record 1 electricity meters' readings and fill out Monthly Report. The staff from power grid company will record the meter readings of meter then transcribes the data into Electricity Transaction Notes (ETNs).
The data for Monthly Report and ETNs have been sent to the CDM consulting company for reporting of GHG emission reduction. The conservative one would be used for ER calculation.</td></tr>
<tr><td>Monitoring method, frequency and equipments:</td><td>The parameter was measured continuously and recorded monthly by 2 electricity meters installed at project site (for instance 1 and instance 2). See below for the information of 2 electricity meters verified by site visit and checking calibration certificates /12/:
<table>
<tr><th>Meter</th><th>Type</th><th>Serial Number</th><th>Accuracy</th></tr>
<tr><td>Electricity meter (instance 1)</td><td>DSSD331</td><td>611P1A05109275</td><td>0.2s</td></tr>
<tr><td>Electricity meter (instance 2)</td><td>DSSD331</td><td>001700010644</td><td>0.2s</td></tr>
</table>
The type, serial number and accuracy have been confirmed by site visit.</td></tr>
<tr><td>Calibration:</td><td>The calibration information are shown as below /12/:
<table>
<tr><th>Meter</th><th>Calibration date</th><th>Valid until</th></tr>
<tr><td rowspan="2">Electricity meter (instance 1)</td><td>30/10/2019</td><td>29/10/2020</td></tr>
<tr><td>26/10/2020</td><td>25/10/2021</td></tr>
</table></td></tr>
</table>

		21/10/2021	20/10/2022
		17/10/2022	16/10/2023
	Electricity meter (instance 2)	04/11/2019	03/11/2020
		02/11/2020	01/11/2021
		29/10/2021	28/10/2022
		26/10/2022	25/10/2023
	The calibration was conducted by accredited third parties which are Guangxi electric energy measurement and testing center Nanning inspection office /13/ which was accredited by Market Supervision Administration.		
QA/QC procedure:	Data record will be archived for a period of 2 years after the crediting period to which the records pertain.		
Means of verification:	Data of the parameter was verified by checking Monthly Report and ETNs. All data is in line with Monthly Report and ETNs; Information flow was verified by checking Monthly Report and ETNs, and all information are consistent; Monitoring method was verified by site visit, checking calibration certificates, all monitoring method meets the description in the PD; Calibration was verified by checking calibration certificate, all calibration of monitoring equipment meets the requirement indicated in the PD.		

Parameters available at validation stage:

Below data has been verified against the data sources and the PD, for the rest of parameters are not used in the calculation of ER in this monitoring period.

Parameter title	Description	Data	Source
φ	Default value for the model correction factor to account for model uncertainties	0.85	Emissions from solid waste disposal sites (version 08.0) /20/
OX	Oxidation factor (reflecting	0.1	IPCC /15/

<table>
<tr><td></td><td>the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)</td><td colspan="3"></td><td></td></tr>
<tr><td>GWP_{CH4}</td><td>Global Warming Potential of methane</td><td colspan="3">28</td><td>IPCC /15/</td></tr>
<tr><td>F</td><td>Fraction of methane in the SWDS gas (volume fraction)</td><td colspan="3">0.5</td><td>IPCC /15/</td></tr>
<tr><td>MCF</td><td>Methane correction factor</td><td colspan="3">0.8</td><td>IPCC /15/</td></tr>
<tr><td>k_j</td><td>Decay rate for the waste type j</td><td></td><td>Waste type j</td><td>Tropical (MAT>20°C
Wet (MAP>1,000mm)</td><td>IPCC /15/</td></tr>
<tr><td></td><td></td><td>Slowly degrading</td><td>Pulp, paper and cardboard (other than sludge)</td><td>0.07</td><td></td></tr>
<tr><td></td><td></td><td></td><td>Wood, wood products and straw</td><td>0.035</td><td></td></tr>
<tr><td></td><td></td><td>Moderately degrading</td><td>Other(non-food) organic</td><td>0.17</td><td></td></tr>
</table>

			putrescible garden and park waste		
		Rapidly degrading	Food, food waste, beverages and tobacco (other than sludge)	0.40	
$EF_{grid,CM,y}$	Emission factor for electricity generation for SCPG in year y	0.50885			2019 Baseline Emission Factors for Regional Power Grids in China dated 29/12/2020 published by China DNA /14/
$EF_{CH4,default}$	Default emission factor of methane per tonne of waste composted (wet basis)	0.002			Project and leakage emissions from composting (version 02.0) /21/
$EF_{N2O,default}$	Default emission factor of nitrous oxide per tonne of waste composted (wet basis)	0.0002			Project and leakage emissions from composting (version 02.0) /21/

GWP_{N20}	Global Warming Potential of N_20	265	IPCC /15/
$TDL_{k,y}$	Average technical transmission and distribution losses for providing electricity to SCPG in year y	3	Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (version 03.0) /22/
$TDL_{j,y}$	Average technical transmission and distribution losses for providing electricity to source j in year y	20	Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (version 03.0) /22/

In conclusion, the assessment team confirmed GHG emission reductions and removals have been quantified correctly in accordance with the project description and applied methodology.

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

The monitoring has been carried out in accordance with VCS PD /3/ dated 15/06/2022.

As a result of verification of the ER calculation process, the assessment team confirmed that all the parameters required for the determination of the emission reductions have been included in the MR Report and ER Calculation Spreadsheet /2/ and are consistent with the applied methodology ACM0022 version 03.0 and the monitoring plan. The parameters are complete in this monitoring period.

By checking the original record, crosscheck with the supporting evidence issued from other party than project owner, checking calibration related documents and interview with project owner through the site visit, the VVB is able to confirm there are no transposition errors between data sets. All data are consistent in all data sets.

After verifying the reported figures with the raw data sources, it's confirmed that the values of the parameters from the raw data sources are consistent with those quoted in the ER Calculation Spreadsheet and the MR Report. The verification process for the same has been clearly described above in section 4.4 of the report.

4.6 Non-Permanence Risk Analysis

Not applicable as a non-AFOLU project.

5 VERIFICATION OPINION

Applus+ Certification has been commissioned by Beijing Ruifang Technology Co., Ltd to perform the verification of greenhouse gas emission reductions of the project activity "Composting of organic waste project in Guangxi" (VCS Ref. No. 2603).

The management of Guangxi Liyuanbao Science and Technology Co., Ltd. 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 Plan in the VCS PD /3/ dated 15/06/2022.

Our verification approach was based on the requirements as defined under the applicable VCS standards and relevant UNFCCC requirements. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification can confirm that:

- the project is implemented and operated as per the registered PD;
- the monitoring plan in the registered PD is as per the applied methodology;
- the monitoring complies with the registered PD;
- the monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable VCS and CDM requirements;
- the installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately;
- the monitoring system is in place and generates GHG emission reductions data;
- the GHG emission reductions are calculated without material misstatements.

In our opinion, the GHG emission reductions for "Composting of organic waste project in Guangxi" during the monitoring period 06/01/2020 to 31/12/2022 as reported in Monitoring Report, prepared on the basis of the project's Monitoring Plan are fairly stated. Based on the information we have seen and evaluated, we confirm the following statement:

Verification period: From 06/01/2020 to 31/12/2022 (divided into 3 vintage periods).

Verified GHG emission reductions or removals in the above reporting period:

Verification period: From 06/01/2020 to 31/12/2022

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
2020 (06/01/2020-31/12/2020)	*287,702*	*51,563*	*0*	*236,139*
2021 (01/01/2021-31/12/2021)	*538,066*	*54,001*	*0*	*484,065*
2022 (01/01/2022-31/12/2022)	*752,410*	*55,591*	*0*	*696,819*
Total	***1,578,178***	***161,155***	***0***	***1,417,023***

Year	*Ex-ante emissions reductions/removals*	*Achieved emissions reductions/removals*	*Percent difference*	*Justification for the difference*
2020 (06/01/2020-31/12/2020)	*258,332*	*236,139*	*-8.59%*	*The actual emission reductions are less than the ex-ante emission reductions. Because the actual treated waste amount is less than the ex-ante value.*
2021 (01/01/2021-31/12/2021)	*533,489*	*484,065*	*-9.26%*	*The actual emission reductions are less than the ex-ante emission reductions. Because the actual treated waste amount is less than the ex-ante value.*
2022 (01/01/2022-31/12/2022)	*757,640*	*696,819*	*-8.03%*	*The actual emission reductions are less than the ex-ante emission reductions. Because the actual treated waste amount is less than the ex-ante value.*

Total	*1,549,461*	*1,417,023*	*-8.55%*	*The actual emission reductions are less than the ex-ante emission reductions. Because the actual treated waste amount is less than the ex-ante value.*

APPENDIX 1: REFERENCE LIST

1. Monitoring report, Version 1.0, dated 23/04/2023; Version 4.0, dated 07/02/2024

2. ER calculation spreadsheet

3. VCS PD, version 4.1, dated 15/06/2022

4. VCS Validation report, No. A+SH_SYST_VCS_VAL_7721, version 01.3, completed by Applus+ Certification

5. VCS standard version 4.5, dated on 29/08/2023

6. Statement issued by project owner

7 Approved methodology ACM0022: Alternative waste treatment process, version 03.0

8 CDM Monitoring procedure

9 Nameplate of the equipment

10 Monthly Report covering the monitoring period

11 Electricity Transaction Notes (ETNs) covering the monitoring period

12 Calibration certificates of weighbridges covering the whole monitoring period issued by Shenzhen Tiansu Calibration and Testing Co., Ltd.;

Calibration certificates of weighbridges covering the whole monitoring period issued by Hechi City Yizhou district metrological verification and testing institute;

Calibration certificates of electronic platform scales covering the whole monitoring period issued by Shenzhen Tiansu Calibration and Testing Co., Ltd.;

Calibration certificates of electronic platform scales covering the whole monitoring period issued by Hechi City Yizhou district metrological verification and testing institute;

Calibration certificates of electricity meters covering the whole monitoring period issued by Guangxi electric energy measurement and testing center Nanning inspection office

13 Accreditation certificates for Shenzhen Tiansu Calibration and Testing Co., Ltd. issued by China National Accreditation Service for Conformity Assessment (CNAS);

Accreditation certificates for Hechi City Yizhou district metrological verification and testing institute issued by Market Supervision Administration;

Accreditation certificates for Guangxi electric energy measurement and testing center Nanning inspection office issued by Market Supervision Administration;

Accreditation certificates for Liyuanbao Ecological Big Data Co., LTD issued by Guangxi Zhuang Autonomous Region Bureau of Quality and technical Supervision

14 2019 Baseline Emission Factors for Regional Power Grids in China dated 29/12/2020 published by China DNA

15 IPCC

16 Staff roaster of project

17 Technical code for Municipal solid waste sanitary landfill (GB50869-2013)

18 2021 Urban Construction Statistical Yearbook

19 2021 Urban and Rural Construction Statistical Yearbook

20 Emissions from solid waste disposal sites, version 08.0

21 Project and leakage emissions from composting, version 02.0

22 Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation, version 03.0

23 Material inspection report issued by Liyuanbao Ecological Big Data Co., LTD

24 JJG1036-2022 Electronic Balance