



**Verified Carbon
Standard**

PICHACAY LANDFILL GAS RENEWABLE ENERGY PROJECT



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

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Work carried out by	Lead Auditor / Technical Expert: Mr. Marco A. Ratton Technical Reviewer / Technical Expert: Mr. Denny Xue

Summary:

LGAI Technological Center, S.A. (hereafter referred to as “Applus+ Certification”) was commissioned by EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM to perform the 5th periodic verification of greenhouse gas (GHG) emission reductions for the project-based initiative registered under VCS (VCS project activity) titled “Pichacay Landfill Gas Renewable Energy Project” (VCS Ref. No. 1883) (hereafter referred to as “the VCS project activity”). Applus+ Certification verification assessment and its verification opinion are based on information and data reported in the latest version of the Monitoring Report ^{/1/} for the monitoring period from 01-January-2024 to 31-December-2024 of the VCS project activity (hereby termed as “the considered monitoring period”). GHG emission reductions for the considered monitoring period are claimed as Verified Carbon Units (VCU) under guidelines, rules and procedures of the Verified Carbon Standard (VCS) (version 4.7) ^{/5/}.

The VCS project activity was both previously validated and had its 1st periodic verification performed by the Validation and Verification Body (VVB) EPIC Sustainability Services Private Limited (EPIC). The 2nd, 3rd and 4th periodic verification assessment for the project activity was previously performed by Applus+ Certification. Details for the VCS project activity is available online at the VERRA/VCS: registry (<https://registry.verra.org/app/projectDetail/VCS/1883>)¹.

The VCS project activity encompasses the installation and operation of a landfill gas (LFG) collection and utilization initiative at the Pichacay landfill. The Pichacay landfill site is located in the district of Santa Ana, city of Cuenca, province of Azuay in Ecuador. As part of the VCS project activity, collected LFG is utilized as gaseous fuel for electricity generation in the project’s electricity generation infrastructure encompassing engine-generator sets. As per the design of the VCS project activity, collected LFG may also be combusted in a high temperature flare (under circumstances when the engine-generator set(s) are not under operation). As per the project design, the total combined nameplate installed capacity of the VCS project activity is about 3.4 MW (consisting of 4 sets with individual nameplate installed capacity of 0.85 MW each to be gradually installed). As confirmed by the Applus+ Certification’s verification team and as appropriately outlined in the Monitoring Report ^{/1/}, the engine-generator set installed and under normal operation during the considered monitoring period has its original power reduced from 1 MW to 0.85 MW under operational circumstances because of the high altitude of the site where the VCS project activity is implemented, as appropriately described in both latest version of the Monitoring Report ^{/1/} and VCS PD ^{/2/}.

As outlined in the Monitoring Report ^{/1/}, the following significant events were reported:

- The 1st installed engine-generator set was in operation from 1-January-2024 to 9-January-2024, from 14-January-2024 to 14-February and from 19-December-2024 to 31-December-2024.

¹ It is important to note that from 26-August-2021 to 31-December-2022 (not considered in the current monitoring period, but clarified for sake of completeness), the VCS project activity is not claiming VCUs for this specific monitoring period. According to the latest version of the Monitoring Report the VCS project activity received a performance incentive from the Andean Development Corporation in the frame of the PBC (Performance Based Climate) Facility. This information was confirmed by Applus+ Certification verification team after assessing the Performance agreement between the Andean Development Corporation, the Municipal Decentralized Autonomous Government of Cuenca and EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM (issued in 26-August-2021) ^{/46/}.

As confirmed by Applus+ Certification verification team by assessing the Performance agreement ^{/46/}, the CAF verification reports ^{/47/} and CAF monitoring reports ^{/49/}, there is no risk of double counting. Further assessment is presented in Section 4.1.

- The 2nd engine-generator set was in operation from 23-February-2024 to 19-December-2024
- Both the 1st and the 2nd installed engine-generator sets were in operation simultaneously during several hours on 19-December-2024.
- During the considered monitoring period, the following events resulted in reduced or zero electricity generation:
 - On 9-January-2024, there was an emergency shutdown of the 1st engine-generator set caused by low pressure in cylinders 1 and 16. Cylinder 1 was replaced, and the piston rings of cylinder 16 were renewed to restore optimal performance. The 1st engine-generator set has returned its operations on 14-January-2024.
 - On 8-February-2024, the 1st engine-generator set shut down due to gas leakage from the exhaust manifold. The downtime was also used to perform the 1,000-hour preventive maintenance. The 1st engine-generator set successfully restored its operations at 22:40 on 8-February-2024.
 - Between 14-February-2024 and 25-February-2024, the 30,000 hours scheduled maintenance was performed on the 1st engine-generator set.
 - On 14-February-2024, a planned shutdown of the 1st engine-generator set was carried out to perform the 30,000-hour major maintenance. The maintenance of the 1st engine-generator set was completed successfully on 26-February-2024, and the unit was restarted without any issues. However, minutes after the startup and before reaching idle speed, a loud internal noise was detected. The 1st engine-generator set was immediately shut down and a visual inspection was performed. After an in-depth evaluation, it was confirmed that the crankshaft had suffered severe damage, rendering the unit permanently unavailable.
 - The maintenance of the 1st engine-generator set from 14-February-2024 on, was scheduled to coincide with the repair of the 2nd engine-generator set, which had suffered a major incident in May-2023. The electricity generation from 23-February-2024 to 25-February-2024 corresponds to pre-commercial operation testing of the 2nd engine-generator set. Following the failure of the 1st engine-generator set, the 2nd engine-generator set remained the only available unit from 26-February-2024 to 19-December-2024.
 - On 5-March-2024 a scheduled maintenance shutdown of the 2nd engine-generator set took place following 100 hours of operation after a major repair. The shutdown began at 05:08, and the unit was brought back online at 19:12.
 - On 24-March-2024 there was a shutdown of the 2nd engine-generator set due to group overvoltage. The issue was addressed on 25-March-2024.
 - On 14-May-2024 there was an emergency shutdown of the 2nd engine-generator set caused by a biogas pipeline rupture at the Pichacay landfill, caused by heavy machinery, leading to a temperature increase in the 2nd engine-generator set. As a result, cylinders 1 and 7 sustained damage and melted. The cylinders have been fully repaired, and a preventive maintenance service corresponding to 2,500 operating hours was performed. The installation became operational again on 17-May-2024.
 - On 22-July-2024 there was an emergency shutdown of the 2nd engine-generator set due to overheating, affecting cylinders 3, 5, and 7, which showed low compression. The damaged cylinders were fully repaired, and a general engine decarbonization was performed to restore optimal operating conditions. The installation became operational again on 31-July-2024.

- On 17-September-2024 there was a shutdown of the 2nd engine-generator set due to overspeed. The 2nd engine-generator set became again operational on 18-September-2024.
- On 19-October-2024 there was a shutdown of the 2nd engine-generator set due to exhaust gases leakage in the turbo-compressor. The event occurred at 06:30, the 2nd engine-generator set operation was restored at 22:20.
- On 31-October-2024 there was a shutdown of the 2nd engine-generator set due to overspeed. Damage was observed in cylinder 8. The event occurred at 00:02, and the 2nd engine-generator set operation was restored on the same day at 18:20.
- On 29-November-2024 there was a shutdown of the 2nd engine-generator set due to overspeed. The event occurred at 09:15, the 2nd engine-generator set operation was restored at 23:00.
- On 19-December-2024, the 1st engine generator set was repaired and started operation again. At this date both engine generator sets were in operation for about 8 hours. After that, the 2nd engine-generator set stopped operation and was not in operation anymore in year 2024.

Despite not being considered in the current monitoring period from 01-January-2024 to 31-December-2024, the 3rd engine-generator set is expected to be installed by the year 2026 and the installation date of the 4th engine-generator set has not been confirmed yet.

The Pichacay landfill serves as permanent disposal site for Municipal Solid Waste (MSW) generated in the municipality of Cuenca in Ecuador. The VCS project activity promotes real and permanent GHG emission reductions both through destruction of methane (due to combustion of collected LFG in the engine-generator set(s) of the project's electricity generation infrastructure) and by displacing electricity that would otherwise be generated (in the same amount) in the absence of the VCS project activity (baseline scenario) by existent grid-connected electricity generation facilities (incl. fossil fuel fired power plants) and addition of new power generation sources within the National Electricity Grid of Ecuador.

The purpose and scope of the VCS verification assessment is to ensure that reported emission reductions for a VCS project activity within a considered monitoring period are deemed/sufficiently complete, accurate and determined based on appropriate monitoring and calculation approaches under conformance with applicable VCS standard regulatory documents ^{/5/} and applied baseline and monitoring methodology, in order to be certified. Extensive document desk review, interviews with representatives of the project proponents and additional complementary auditing measures were conducted by the verification team appointed by Applus+ Certification in order to verify and confirm the correctness and appropriateness of information and data included in the Monitoring Report ^{/4/}.

Applus+ Certification confirms the following documentation has been reviewed:

- Monitoring plan included in the registered VCS Project Description (VCS-PD) ^{/2/} (in the particular case of the VCS project activity "Joint VCS PD and Monitoring Report (monitoring period from 27-July-2017 to 31-December-2018) for the VCS project activity (version 3.2, dated 07-July-2019)");
- The Validation Report for the VCS project activity ^{/3/} (in the particular case of the VCS project activity: "Joint Validation Report and Verification Report (monitoring period from 27-July-2017 to 31-December-2018) (version 1.0, dated 27-August-2019)");
- Monitoring Report ^{/4/} for the monitoring period from 01-January-2024 to 31-December-2024 for the VCS project activity (version 1.4, dated 19-August-2025)");
- CDM baseline and monitoring methodology AMS-III.G - Landfill methane recovery (version 10.0) ^{/6/}
- CDM baseline and monitoring methodology AMS-I.D: «Grid connected renewable electricity generation» (version 18.0) ^{/7/}

- VCS standard (version 4.7) ^{/5/} and VCS guidance Validation and Verification Manual (version 3.2) ^{/4/}, as well as relevant applicable UNFCCC CDM requirements.
- All information and references relevant to the VCS project activity resulting in emission reductions.

As part of the performed verification assessment, a set of seven (7) Corrective Action Requests (CARs) and one (1) Clarification Request (CL) were identified/raised by the appointed Applus+ Certification's verification team. All of such CARs and CL were confirmed as being appropriately addressed by the project proponents through the completion of a revised latest version of the Monitoring Report ^{/1/} for the considered monitoring period.

Applus+ Certification hereby confirms that in general the VCS project activity is implemented and has operated within the considered monitoring period from 01-January-2024 to 31-December-2024 under conformance with project design details established in its previously completed and registered VCS PD ^{/2/}.

As also confirmed by the Applus+ Certification's verification team, the design of the monitoring plan for the VCS project activity is under conformance with applicable requirements of the applied CDM baseline and monitoring methodologies AMS-III.G (version 10.0) ^{/6/} and AMS-I.D (version 18.0) ^{/7/} + applied CDM methodological tools.

Furthermore, as also confirmed by the Applus+ Certification's verification team, monitoring related activities for the VCS project activity have been carried out during the considered monitoring period under full conformance with requirements and guidance of the monitoring plan as per the registered VCS PD ^{/2/}. The monitoring system for the VCS project activity is in place and has been operated in a way that emission reductions achieved are correctly determined based on available monitoring data without material misstatements and under a deemed reasonable level of assurance.

Based on assessed and reviewed information, Applus+ Certification hereby confirms that the implementation of the project and its operation resulted in achieved GHG emission reductions of 33,233 tCO₂e during the monitoring period from 01-January-2024 to 31-December-2024 (including both days).

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1 INTRODUCTION

1.1 Objective

LGAI Technological Center, S.A. (Applus+ Certification) was commissioned by the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM to perform the 5th periodic verification assessment of GHG emission reductions for the VCS project activity titled “Pichacay Landfill Gas Renewable Energy Project” (VCS Ref. No. 1883) for the monitoring period from 01-January-2024 to 31-December-2024 as reported in the completed Monitoring Report ^{/1/}.

LGAI Technological Center, S.A. (Applus+ Certification) in the position of the selected Validation and Verification Body (VVB) responsible for performing the VCS verification assessment is accredited both as a VVB under VCS and as a Designated Operational Entity (DOE) under the CDM for the technical scope the VCS project activity falls into (Technical scope 13/13.1²). Applus+ Certification also meets applicable competence requirements as established in Standard ISO 14065. These aspects and status qualify Applus+ Certification to act as a VVB responsible for performing the periodic verification assessment for the VCS project activity.

The objective of the verification assessment is to have an independent review and ex-post determination by an appointed VVB of determined reductions of GHG emissions that have occurred as a result of the registration of VCS project and its operation during a considered monitoring period. Certification is the written assurance by the VVB/DOE that, during a considered monitoring period, a VCS project activity achieved reductions in anthropogenic emissions by sources of GHGs under a reasonable level of assurance.

The objective of this verification/certification assessment is to verify and certify emission reductions, reported for the VCS project activity “Pichacay Landfill Gas Renewable Energy Project”, for the monitoring period from 01-January-2024 to 31-December-2024.

1.2 Scope and Criteria

The VCS verification scope is defined as an independent and objective review of the content of the registered VCS PD ^{/2/} (incl. the project’s baseline study), Monitoring Report (MR) for the considered monitoring period and other relevant documents. The information in these documents is reviewed inter alia against requirements of VCS Standard (version 4.7)^{5/}.

² While the registered VCS PD ^{/2/} also refers to the calculation approach of the CDM baseline and monitoring methodology AMS-I.D: “Grid connected renewable electricity generation” ^{/7/} for the determination of baseline emissions due to electricity generation by the VCS project activity, this particular small-scale CDM baseline and monitoring methodology fits under Technical Scope 1.1.

The VCS verification assessment is not meant to provide any consulting towards the project proponent and/or any other Party. However, stated requests for forward actions and/or corrective actions may eventually provide input(s) for improvement of the project monitoring.

1.3 Level of Assurance

In line with applicable VCS requirements and under conformance with Standard ISO 14064-3:2019 ^{/8/}, a reasonable level of assurance was defined and was followed for the performance of the verification assessment for the VCS project activity.

By taking into account applicable guidance from the CDM Guideline - Application of materiality in verifications (version 02.0) ^{/18/}, VCS Standard (version 4.7) ^{/5/} and Validation and verification manual (version 3.2) ^{/4/} materiality was considered in conducting the verification.

As part of the performance of the verification assessment, the previously elaborated verification plan ^{/23/} was directly applied (without being revised) in order to have potentially detected errors, omissions or misstatements being addressed through additional (and not previously planned) audit/verification procedures during the sub-sequential phases of the performance of verification assessment (e.g. document desk review, interviews with representatives of the project proponent, identification and resolution of outstanding issues (CARs and CLs), etc.).

As per monitoring and QA/QC procedures applied as part of operation of the VCS project activity, as confirmed by the Applus+ Certification's verification team, emission reductions are accounted only for monitoring data that is deemed correct, authentic and reliable (based proof of measurements performed by calibrated and well-maintained monitoring equipment/instruments, checking of correctness and reasonability in recorded/reported monitoring data (e.g. data values within an acceptable/plausible range)).

In this context it is also crucial to note that, as also confirmed by the Applus+ Certification's verification team, in case of identification of uncertainties related to correctness/reasonability of reported monitoring data for a particular time period (e.g. continuous measurements related monitoring for a particular minute) as part of the monitoring of the VCS project activity, the monitoring procedure applied by the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM ensures that no emission reductions for such particular time period are claimed/accounted under such circumstances (thus minimizing risks of overestimations of claimed GHG emission reductions).

Furthermore, it is also crucial to note that as per the monitoring and GHG calculation approaches that are valid for the VCS project activity (as established in the registered VCS PD ^{/2/} and the applied CDM baseline and monitoring methodology + applicable methodological tools) no sampling procedure and no sampling-based monitoring are valid/required for the determination of achieved emission reductions.

Finally, it is also relevant to note that, as a response to risks identified during the planning phase of the verification, for minimizing the risks of having incorrect monitoring data (measurement records) being considered in the context of the calculation and reporting of achieved emission reductions (in a way that calculated emission reductions are overestimated), the verification assessment encompassed the performance of a checking of authenticity of all electricity generation related monitoring data as follows:

Data authenticity check: As part of the performed verification assessment, the Applus+ Certification's verification team was able to confirm that the emission reduction calculation spreadsheet ^{/15/} completed by the host country project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM is basically MS-Excel spreadsheet that, in theory, could have recorded data being easily edited/modified (intentionally or unintentionally). Thus, this spreadsheet, if inappropriately edited, could potentially tamper reported monitoring records, thus resulting in unreal and incorrect calculation and reporting of emission reductions achieved by the VCS project activity during the considered monitoring period. In order to ensure that all emission reductions calculations are entirely and correctly based on authentic and real monitoring records valid for the considered monitoring period, a data authentic checking was performed as part of the verification assessment. Such checking aimed to ensure that only authentic and unmodified monitoring data records were used by the project proponent for performing the emission reduction calculation for the considered monitoring period (thus ensuring that measurement records made available in the MS-Excel format "raw data" input files ^{/16/} and measurement records reported in the emission reduction spreadsheet was not intentionally or unintentionally edited/modified during the generation or handling of this file).

In summary, Applus+ Certification has established an internal quality control process in order to ensure, as part of its technical assessment, that information and values provided in the Monitoring Report ^{/1/} are materially correct and fairly represent the implementation status and operation of the VCS project activity within the considered monitoring period, is completed under conformance with applicable VCS requirements + specific requirements of the applied CDM methodology being also sufficiently met for the calculation and reporting of GHG quantification and monitoring activities within the considered monitoring period.

1.4 Summary Description of the Project

Project title	Pichacay Landfill Gas Renewable Energy Project
VCS reference number	1883
Project Participant	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM
Other entities involved in the project	EMAC EP (Main partner of project proponent) BGP Engineers B.V. (Main partner of project proponent, project developer) BTG Biomass Technology Group B.V. (Consultant)
Location of the project	The landfill hosting the VCS project activity is the Pichacay landfill, which is located at Santa Ana, Cuenca, Azuay, Ecuador. The project's geographical coordinates are as follows: Longitude: -78.9314400 Latitude: -2.9660411
Project start date	Construction date: constructed and commissioned between the years 2014 and 2017. Operation start date: 27-July-2017.
Project Crediting Period	10-year renewable crediting period from 27-July-2017 to 26-July-2027.
Version of VCS PD	Version 3.2, dated 07-July-2019
Monitoring period	01-January-2024 to 31-December-2024
Initial version of the Monitoring Report	Version 1.0, dated 18-April-2025
Final version of the Monitoring Report	Version 1.4, dated 19-August-2025

Applied Methodology/Version	AMS-III.G - Landfill methane recovery (version 10.0) /6/ 3
Scope/Technical Area	13/13.1 ⁴

The VCS project activity encompasses the installation and operation of a landfill gas (LFG) collection and utilization initiative at the Pichacay landfill, with collected LFG being priority used as gaseous fuel for electricity generation. The Pichacay landfill site is located in the district of Santa Ana, city of Cuenca, province of Azuay in Ecuador. The total combined installed capacity of the VCS project activity is about 3.4 MW (consisting of 4 sets with each capacity of 0.85 MW of which only 2 were installed and under commercial operation until the end of the considered monitoring period) ⁵.

During the considered monitoring period, the VCS project activity promoted real and permanent GHG emission reductions both by destruction of methane (through combustion of collected LFG in the engine-generator sets of the project's electricity generation infrastructure) and by displacing electricity that would otherwise be generated in the absence of the VCS project activity (baseline scenario) by existent grid-connected electricity generation facilities (incl. fossil fuel fired power plants) and addition of new power generation sources within the National Electricity Grid of Ecuador. No flaring of collected LFG occurred during the considered monitoring period.

³ While the CDM baseline and monitoring methodology AMS-III.G /6/ refers to the calculation approach of the CDM baseline and monitoring methodology AMS-I.D: «Grid connected renewable electricity generation» /7/ for the determination of baseline emissions due to electricity generation by the project activity applying AMS-III.G, the VCS PD /2/ for the project activity thus appropriately also refers to version 18.0 of AMS-I.D /7/.

⁴ While the registered VCS PD /2/ also refers to the calculation approach of the CDM baseline and monitoring methodology AMS-I.D: «Grid connected renewable electricity generation» /7/ for the determination of baseline emissions due to electricity generation by the VCS project activity, this particular small-scale CDM baseline and monitoring methodology fits under Technical Scope 1.1.

⁵ As confirmed by Applus+ Certification's verification by watching/visualizing (more than once) the content of the set of sequential live videos (movies) + photographs (pictures) /9/ produced during the remote site visit on 08-April-2025, the Applus+ Certification's verification team was able to have a comprehensive and complete remote assessment of installed capacity status of the VCS project activity as if the team were on-site.

Moreover, the following events were described in the Monitoring Report:

Date	Event
From 1-January-2024 to 9-January-2024, from 14-January-2024 to 14-February and from 19-December-2024 to 31-December-2024	Operational period of the engine-generator 1
From 23-February-2024 to 19-December-2024	Operational period of the engine-generator 2
9-January 2024	Emergency shutdown of engine-generator 1 caused by low pressure in cylinders 1 and 16. Cylinder 1 was replaced, and the piston rings of cylinder 16 were renewed to restore optimal performance. The installation became again operational on 14-January-2024
8-February-2024	Engine-generator 1 shut down due to gas leakage from the exhaust manifold. The downtime was also used to perform the 1,000-hour preventive maintenance. Unit operation was successfully restored at 22:40 on the same day
From 14-February-2024 and 25-February-2024	30,000 hours scheduled maintenance was performed on engine-generator 1
14-February-2024	Planned shutdown of engine-generator 1 was carried out to perform the 30,000-hour major maintenance. The maintenance of engine-generator 1 was completed successfully on February 26, 2024, and the unit was restarted without any issues. However, minutes after the startup and before reaching idle speed, a loud internal noise was detected. Engine-generator 1 was immediately shut down and a visual inspection was performed. After an in-depth evaluation, it was confirmed that the crankshaft had suffered severe damage, rendering the unit permanently unavailable
From 26-February-2024 to 19-December-2024	Engine-generator 2 remained the only available unit due to maintenance of engine-generator 1.
5-March-2024	Scheduled maintenance shutdown of engine-generator 2 took place following 100 hours of

	operation after a major repair. The shutdown began at 05:08, and the unit was brought back online at 19:12
24-March-2024	Shutdown of engine-generator 2 due to group overvoltage. The issue was resolved on 25-March-2024
From 14-May-2024 to 17-May-2024	Emergency shutdown of engine-generator 2 caused by a biogas pipeline rupture at the landfill site, caused by heavy machinery, leading to a temperature increase in engine-generator-2. As a result, cylinders 1 and 7 sustained damage and melted. The cylinders have been fully repaired, and a preventive maintenance service corresponding to 2,500 operating hours was performed.
From 22-July-2024 to 31-July-2024	Emergency shutdown of engine-generator 2 due to overheating, affecting cylinders 3, 5, and 7, which showed low compression. The damaged cylinders were fully repaired, and a general engine decarbonization was performed to restore optimal operating conditions.
From 17-September-2024 to 18-September-2024	Shutdown of engine-generator 2 due to overspeed.
19-October-2024	Shutdown of engine-generator 2 due to exhaust gases leakage in the turbo-compressor
31-October-2024	Shutdown of engine-generator 2 due to overspeed. Damage was observed in cylinder 8
29-November-2024	Shutdown of engine-generator 2 due to overspeed
19-December-2024	Engine generator 1 was repaired and started operation again. This day both engine generators were in operation for about 8 hours. After that, engine-generator 2 stopped operation and was not started anymore in 2024.

Applus+ Certification's verification team has confirmed the above-mentioned information after assessing the emission reductions spreadsheet ^{/15/} and also the "*Operador Nacional de Electricidad*" (National Electricity Operator) (CENACE) primary monitoring records ^{/16/}. Moreover, Applus+ Certification's verification team has confirmed that VCUs achieved during the considered monitoring period were correctly calculated according to the provided evidence and confirming the above-mentioned operational information.

The VCS project activity was previously validated by a Validation and Verification Body (VVB) accredited under VERRA/VCS. Details and related documents are available online (<https://registry.terra.org/app/projectDetail/VCS/1883>).

2 VERIFICATION PROCESS

2.1 Method and Criteria

The VCS verification assessment was performed by applying Applus+ Certification's rules and procedures in line with the requirements specified in the VCS Standard (version 4.7) ^{/5/}, the latest version of the CDM Validation and Verification Standard for project activities (version 03.0) ^{/21/} and relevant UNFCCC requirements (whenever applicable) as well as through the application of standard auditing techniques. As part of performed VCS verification assessment, Applus+ Certification performed a strategic review and risk assessment of the VCS project activity and processes in order to gain a full understanding of:

- Activities, aspects and circumstances associated with all the sources contributing to the project related GHG emissions (baseline and project emissions) and emission reductions.
- Protocols and methodological approaches are used to measure and/or determine GHG emissions associated with these sources.
- Collection and handling of monitoring data.
- Controls on the gathering, processing, recording and reporting of monitoring data.
- Means of verifying reported monitoring data; and
- Compilation of the Monitoring Report ^{/4/}.

The appointed Applus+ Certification's verification team verified the implementation and operationalization of the monitoring plan for the VCS project activity during the considered monitoring period and performed a detailed assessment of monitoring data reported in the Monitoring Report ^{/1/}. This assessment work was fully based on a desk review of the content of the Monitoring Report, interviews with representatives of the project proponents and additional auditing measures.

Information details about the assessment team are presented below:

Appointed verification 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 verification 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 verification team members 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 Scope / Technical Area required knowledge linked to the applied methodology (ies) is covered by the Assessment Team as shown below:

Verification Team:

Name	Qualification	Coverage of scope	Coverage of technical Area	Host country experience	Attendance to the On-Site Assessment
Marco A. Ratton	LA/TE	Y	Y	Y	N

Technical Review and Approval Team:

Name	Qualification
Denny Xue	Technical Reviewer / Technical Expert
Agustín Calle de Miguel	Report Approver

The curricula vitae of the Applus+ Certification's verification team members are provided below:

Mr. Marco A. Ratton:

Marco A. Ratton is based in Brazil and has acted as a GHG auditor since 2007. He holds vast experience with independent assessments of GHG project activities within the area of renewable energies, solid waste management and effluent treatment implemented in Latin America and other regions. He also has previous working experience with planning of municipal waste management as well as educational background in mechanical fabrication and manufacturing technologies, economics and environmental management & policy. He has undergone extensive training on GHG validation and verification and is a qualified Expert for Sectoral Scope 13 under Technical Area “Waste management” and Sectoral Scope 1, among others and in accordance with procedures of Applus+. He also has years-long previous experience of conducting ISO 9001/14001 assessments.

Mr. Denny Xue:

Mr. Denny Xue (master's degree in environmental engineering, Bachelor's Degree in Thermal Engineering) is a GHG auditor appointed by Applus+ Certification for performing GHG project assessments, auditing and technical reviews. He has more than 6 years of work experience in CDM/GS4GG/VCS project assessment and technical review with Applus+ Certification. Before he joined Applus+ LGAI, he worked for Shanghai Chuanji Investment and Management which is a CDM consultancy company as a project manager for CDM project development. Mr. Denny Xue is based in Shanghai, China. Mr. Denny Xue participates in the project's technical review team.

2.2 Document Review

The Applus+ Certification's verification team conducted a comprehensive and detailed desk review of all documents initially provided by the project proponent + other publicly available documents that are relevant for the verification assessment. The main assessed documents are listed below:

- The registered VCS PD ^{/2/} for the 10-year renewable crediting period of the VCS project activity “Pichacay Landfill Gas Renewable Energy Project”, including the corresponding Validation Report ^{/3/}
- The initial version of the Monitoring Report for the 5th verification of the VCS project activity ^{/1/}
- The applied CDM baseline and monitoring methodologies AMS-III.G.: Landfill methane recovery (version 10.0) ^{/6/} and AMS-I.D “Grid connected renewable electricity generation” (version 18.0) ^{/7/}+ the following methodological tools:

- Tool 04 - “Emissions from solid waste disposal sites” (version 08.0) ^{/26/}
- Tool 05 - “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0) ^{/27/}
- Tool 06 - “Project emissions from flaring” (version 02.0.0) ^{/28/}
- Tool 07 - “Tool to calculate the emission factor for an electricity system” (version 05.0) ^{/24/}
- Tool 32 - “Positive list of technologies” (version 01.0) ^{/25/}
- Relevant decisions, clarifications and guidance from the CMP of the Kyoto Protocol and the CDM Executive Board;
- Any other information and references relevant to the VCS project activity’s resulting emission reductions (e.g. IPCC reports, data on electricity generation in the national grid or laboratory analysis and national regulations).

Besides the above-mentioned documents, the Applus+ Certification’s verification team also assessed other additional documents that were required to assess the accuracy of the emission reduction calculations presented in the Monitoring Report ^{/1/}.

A detailed list of all assessed documents is included in Appendix 1 (Documents reviewed or referenced) of this Verification Report.

The desk review for the initial version of the Monitoring Report for the 5th verification of the VCS project activity ^{/1/} and the registered VCS PD ^{/2/} included the following assessments:

- a review of data and information presented in the Monitoring Report to verify their completeness;
- a review of the monitoring plan from the registered VCS PD ^{/2/} and applied CDM baseline and monitoring methodology (AMS-III.G (version 10.0) ^{/6/}), paying particular attention to the required frequency for measuring, recording and reporting of monitoring data. Requirements related to the quality of monitoring instruments/equipment (including calibration requirements, and the QA/QC procedures) were also observed;
- an evaluation of data management and the QA/QC system in the context of their influence on the generation and reporting of ERs.

2.3 Interviews

Applus+ Certification's verification team has performed a remote inspection of the VCS project activity on 08-April-2025, with the following interviews being performed:

Interviewed personnel	Role / organization	Subject
Mr. Martijn Vis	Senior Consultant, BTG Biomass Technology Group B.V.	Interviews remotely performed using Skype application and encompassing the following topics (+ production/generation of set of sequential live videos (movies) + photographs (pictures) ^{/46/} to allow confirmation/assessment of the Applus + verification team for the topics): - General implementation and operational aspects of the VCS project activity. - Technical equipment and operational issues for installed equipment. - Specifications and operational details of monitoring and measurement equipment/instruments. - Calibration procedures for installed monitoring instruments/equipment. - Quality management system and related compliance with valid QA/QC procedures. - Implementation and operation of the project's monitoring plan. - Monitoring data handling and management (incl. data gathering, recording and reporting). - Data uncertainty and residual risks.
Mr. David Gonzalez	Director, EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM	

		- Performance of emission reduction calculations. - Procedural aspects of the verification. - Performance of related maintenance and repair events. - Performance of the crosschecking procedures according to the monitoring plan.
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Moreover, the Applus+ Certification's verification team has performed additional interviews, as part of VCS requirements, on 09-April-2025 with the following representatives of local neighbourhoods:

- Mr. Paul San Martin, security officer, lives less than 1 km from the Pichacay landfill. Mr. San Martin emphasized about the importance of the lasting partnership the project developer EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has with the local community.
- Mr. Alisson Villa, works at the Instituto Latinoamericano, lives less than 1 km from the Pichacay landfill. Mr. Villa informed the Applus+ Certification's verification team about the improvements in the local roads/accesses performed by EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM.

In summary, the environmental, social and economic benefits of the VCS project activity were announced by all the interviewees, with no negative aspects being identified.

2.4 Site Visits

No on-site inspection (with the physical presence of the Applus+ Certification's verification team) was conducted as part of the performed verification assessment. This adopted procedure is in line with the requirements of VCS Standard (version 4.7) ^{/5/} as follows:

"4.1.12 A site visit that includes a visit to facilities and/or project areas shall be conducted at verification under the following circumstances:

- 1) The first verification of the project after validation;*
- 2) Verifications that include project baseline reassessments; and*

3) Verifications that assess a project description deviation where the deviation impacts the applicability of the methodology, additionality or the appropriateness of the baseline scenario”.

Since the verification assessment is not considered under any of the above-mentioned scenarios, the remote inspection is regarded as correct and in accordance with VCS rules and procedures.

The Applus+ Certification’s verification team thus performed its document review and interviews with representatives of the project proponents (of which details are included in Sections 2.2 and 2.3 respectively) by incorporating the following additional checking/assessments (complementary auditing measures):

- *Remotely (online) watching by the Applus+ Certification’s verification team of set of sequential live videos (movies) + photographs (pictures) produced/generated by member of project operational staff located on-site (allowing remote complete and comprehensive assessment and observations for the VCS project activity):*

Upon previous request from the Applus+ Certification’s verification team, the representatives of the project proponent organized the production of a sufficiently complete set of sequential live videos (movies) + photographs (pictures) ^{/46/} produced/generated online in the project site with the goal of making it possible to the Applus+ Certification’s verification team to remotely assess and confirm the implementation and operation of the VCS project activity (as if the verification team were on-site).

The set of sequential live videos (movies) + photographs (pictures) ^{/46/} were watched/visualized online by the Applus+ Certification’s verification team while being produced/generated on 08-April-2025 and were later fully made available to Applus+ Certification for further assessment/watching and archiving as auditing evidence. By watching/visualizing (more than once) the content of the set of sequential live videos (movies) + photographs (pictures) ^{/9/}, the Applus+ Certification’s verification team was able to have a comprehensive and complete remote assessment of the VCS project activity as if the team were on-site. The produced set of sequential live videos (movies) + photographs (pictures) ^{/46/} (recorded as .mp4 video format files and .jpg picture format) include/show the following:

- Details of the whole project’s infrastructure promoting collection and utilization of LFG for electricity generation (e.g. LFG pipeline, centrifugal blower, flare, engine-generators and other equipment of the project’s electricity generation infrastructure, etc.);
- Details about all monitoring instruments/equipment (of which the latest version of the Monitoring Report ^{/1/} refers to),
- Details about the functioning of the process for gathering, recording and archiving of monitoring data (i.e. measurement records for electricity generated by the VCS project activity).

Watching and visualizing the set of sequential live videos (movies) + photographs (pictures) ^{/46/} sufficiently and successfully provided to the appointed Applus+ Certification's verification team the following assessment outcomes:

- The possibility of having a complete and transparent remote visualization of the current implementation and operation of the VCS project activity (as if the Applus+ Certification's verification team were on site), thus making it possible to the verification team to confirm the correctness of information included in the Monitoring Report ^{/1/} and registered VCS PD ^{/2/} regarding both the implementation of the VCS project activity (project design) and its operation.
- The possibility of having a complete and transparent remote visualization of the implementation and operation of available information and data flows/procedures for generating, gathering, aggregation, recording and reporting data for the ex-post determined monitoring parameters (as if the Applus+ Certification's verification team were on site), thus making it possible to the verification team to confirm the correctness and appropriateness of related data gathering, processing, recording and data recording by the available project's monitoring infrastructure as well as to confirm correctness of related information included in the Monitoring Report ^{/1/} and registered VCS PD for the VCS project activity ^{/2/}.
- The possibility of performing a remote (but comprehensive) checking of all project's monitoring instruments/equipment (including confirmation of occurred performance of appropriated related calibration events in such instruments/equipment) as well as checking of monitoring practices as part of the operation of the VCS project activity vis-à-vis related requirements of the registered VCS PD ^{/2/} as well as the applied CDM baseline and monitoring methodology. Such checking included confirmation of existence and archiving in the project site of original documents (e.g. certificates of calibration) in the project site + additional documentation used for cross-checking of calculation and information, with electronic format copies of such documents and evidence being also made available to the Applus+ Certification's verification team for its remote assessment (as part of the performed desk review assessment phase).
- The possibility of performing a comprehensive checking of the project's quality control and quality assurance (QA/QC) procedures in place to prevent and/or identify and/or correct errors or omissions in the reported monitoring parameters.

Based on its accumulated expertise and experience with assessments for other similar project-based initiatives, it is Applus+ Certification's opinion that objectives to be expected for a physical on-site inspection to the project site were sufficiently reached by the Applus+ Certification's verification team through watching online (and later re-watching for further assessment/review) of the set of sequential live videos (movies) ^{/46/}.

In summary, by taking all above-presented aspects into account vis-à-vis applicable VCS; the Applus+ Certification's verification team judged that performing the above-described additional checking's/assessments (complementary auditing measures) instead of performing the previously scheduled physical on-site inspection to the project site is deemed acceptable and sufficient to have the overall quality and completeness of the performed verification assessment not being negatively affected.

2.5 Resolution of Findings

As an outcome of a VCS verification process, the appointed verification team may raise different types of findings for identified issues.

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

- Non-compliance with applicable requirements from the monitoring plan and/or applied baseline and monitoring methodology is identified in applied monitoring and/or reported in the Monitoring Report ^{/1/} and/or reporting and has not been sufficiently documented by the VCS project proponent, or if the evidence provided to prove conformity is insufficient.
- Occurred modifications to the implementation, operation and monitoring of the VCS project activity occurred and were not sufficiently documented and/or reported in the Monitoring Report ^{/1/}.
- Errors, inconsistencies and/or mistakes in applying assumptions, data and/or calculations of emission reductions (that impact the quantity of emission reductions) are identified.
- Issues previously identified in Forward Action Request (FAR) as part of validation or previously performed verification assessment for the VCS project activity (which would be required to be considered/addressed for the monitoring period encompassed by the verification assessment) are not addressed by the project proponent.

The Applus+ Certification's verification team shall raise a Clarification Request (CL) if information is insufficient or not sufficiently clear 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.

As part of the performed verification assessment, seven (7) CARs and one (1) CL were raised by the Applus+ Certification's verification team. No FAR were raised as part of the performed verification assessment. The description of the raised findings, the responses of the project proponent and the assessment of such responses by the Applus+ Certification's verification team is presented in Appendix 2.

2.5.1 Forward Action Requests

No Forward Action Request (FAR) was raised as part of the performed VCS verification assessment. Furthermore, there are no FAR previously raised (as part of the previously performed validation assessment for the VCS project activity) which would be required to be considered/addressed for the considered monitoring period encompassed by the VCS verification assessment.

2.6 Eligibility for Validation Activities

This section is not applicable since Applus+ Certification holds the accreditation for Validation of projects under the Sectoral Scopes the VCS project activity falls into.

3 VALIDATION FINDINGS

3.1 Methodology Deviations

Not applicable. There are no methodology deviations identified during the current monitoring period.

3.2 Project Description Deviations

Not applicable. There are no project description deviations identified during the current monitoring period.

3.3 New Project Activity Instances in Grouped Projects

Not applicable.

3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes

☒ No

4 VERIFICATION FINDINGS

4.1 Project Details

Item	Evidence gathering activities, evidence checked, and assessment conclusion:				
Audit history	By assessing the Validation Report ^{/3/} , the registered VCS PD ^{/2/} and the Verra website project search page (https://registry.verra.org/app/projectDetail/VCS/1883), the Applus+ Certification's verification team has confirmed the following information included in Section 1.2 of the Monitoring Report ^{/4/} :				
	Audit type	Period	Program	Validation/v erification body name	Number of years
	Validation	28-August-2019	VCS	EPIC Sustainability Services Private Limited	10 years
	1 st Verification	27-July-2017 to 31-December-2018	VCS	EPIC Sustainability Services Private Limited	1 year, 5 months and 5 days
	2 nd Verification	01-January-2019 to 31-December-2020	VCS	LGAI Technological Center, S.A. (Applus+ Certification)	1 year, 11 months and 31 days
	3 rd Verification	01-January-2021 to 25-August-2021	VCS	LGAI Technological Center, S.A. (Applus+ Certification)	7 months and 24 days
	4 th Verification	01-January-2023 to 31-December-2023	VCS	LGAI Technological Center, S.A. (Applus+ Certification)	1 Year

	5 th Verification	01-January- 2024 to 31- December- 2024	VCS	LGAI Technological Center, S.A. (Applus+ Certification)	1 Year
Double counting and participation under other GHG programs	The compliance of the VCS project activity with the applicable rules of “Participation under other GHG Programs” from VCS Standard (version 4.7) ^{/5/}: <i>“3.23.1 Project participants shall not seek credit for the same GHG emission reduction or removal under the VCS Program and another GHG program. Projects issuing GHG credits from different time periods under the VCS Program and another GHG program shall also conform with the rules and requirements in the Registration and Issuance Process”.</i> The Applus+ Certification verification team also checked publicly information and registration details valid for the registries/programs below and also confirmed that the VCS project activity has not previously sought registration in such registries/programs (and therefore was not rejected by such registries/programs either): - The International REC Standard (https://www.irecstandard.org/) - Global Carbon Council (GCC) (https://www.globalcarboncouncil.com/) - CERCARBONO (Certified Carbon Standard) (https://www.cercarbono.com/) Other forms of credit: The Applus+ Certification verification team was also able to confirm that the GHG emission reductions generated and/or yet to be generated by the VCS project activity (including GHG emission reductions generated during the considered monitoring period) will not be used for compliance with any emissions trading program or used to meet binding limits on GHG emissions in any compliance or voluntary GHG emission trading program or other binding limit mechanism. This was also confirmed by the Applus+ Certification verification team through assessment of a declaration signed by the project developers, which is enclosed to the Monitoring Report ^{/1/}. Currently there is no compliance or voluntary GHG emission trading program or other binding limit mechanism in the host-				

country Ecuador for which GHG emission reductions promoted by the VCS project activity would be eligible under.

Moreover, the Applus+ Certification verification team has confirmed that the applicability requirements 3.23.3 to 3.23.11 from the VCS Standard (version 4.7), which are also related to double counting and participation under other GHG Programs are not applicable since, as mentioned above, the VCS project activity is not registered under other GHG programs, nor has it previously sought registration in other registries/programs.

According to the latest version of the Monitoring Report, the VCS project activity received a performance incentive from the Andean Development Corporation in the frame of the PBC Facility. Therefore, for the period valid for such agreement (from 26-August-2021 to 31-December-2022), the VCS project activity is not claiming emission reductions under the VCS. Moreover, the VCS project activity is not claiming (nor will claim in the future) emission reductions for the periods prior to 26-August-2021 and after 31-December-2022 under the CAF agreement. This was confirmed by the Applus+ Certification's verification team through assessment of the following evidence:

- Performance agreement between the Andean Development Corporation, the Municipal Decentralized Autonomous Government of Cuenca and EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM (issued in 26-August-2021) /46/
- CAF verification and monitoring reports /49/
- Public Deed of command granted by: Municipal public company based in Cuenca EMAC EP in favor of a mixed company EMAC-BGP /45/

As confirmed by Applus+ Certification verification team, the PBC facility is classified as "GHG related environmental credits system", as defined in accordance with the VCS Program Definitions (version 4.5) /44/:

"A system for the crediting, issuance of instruments, or acknowledging activities that could be interpreted as having GHG emission reduction or carbon dioxide removal value. Examples of a GHG-related environmental credit system include, but are not limited to, energy attribute certificates (EAC); renewable energy certificates (REC); Guarantee of Origin (GO); or renewable thermal certificates (RTC). GHG related environmental credits system".

	The chosen approach by the project proponent is considered as correct and in accordance with applicable VCS rules and procedures in order to avoid double counting. Moreover, after assessing the content of related documentation provided /46/ /47/ /45/, the Applus+ Certification's team has confirmed that information presented in Section 1.10.1 of the Monitoring Report sufficiently addresses requirement 3.23.2 of the VCS Standard (version 4.7) /5/ as follows: <i>"1) Name and contact information of administrator,</i> <i>2) Details of participation under the program,</i> <i>3) Details of the vintage period(s), volume(s), serial number(s), and all other relevant identification information for emissions reductions and removals included,</i> <i>4) Evidence that the same reductions and removals seeking credit under the VCS Program have not been and will not be counted, used, or credited under the GHG program, or evidence confirming the cancellation and non-use of credits issued under the other GHG program".</i>
No double claiming with emissions trading programs or binding emission limits	The Applus+ Certification's verification team has confirmed that the VCS project activity is not registered/included in any other emissions trading program nor has any binding emission limit, as indicated above.
No double claiming with other forms of environmental credit	The Applus+ Certification's verification team has confirmed that the VCS project activity has not sought, received nor is planning o receive credits from other GHG-related environment credit system.
Supply chain (scope 3) emissions double claiming	The Applus+ Certification's verification team has confirmed that neither the project proponent nor any authorized representative of the VCS project activity are buyers/sellers of products whose emissions footprint are changed by the VCS project activity.
Sustainable development contributions	Applus+ Certification's verification team has assessed the following sustainable development contributions of the VCS project activity as described in the Monitoring Report /1/: - SDG 13: 33,233 tCO₂e. The overall correctness of the presented figure was confirmed by Applus+ Certification's verification team by assessing the emission reductions calculation spreadsheet /15/.

	- SDG 8: 11 job opportunities. The Applus+ Certification's verification team has confirmed this information after assessing the EMAC - BGP ENERGY COMPANIA DE ECONOMIA MIXTA CEM (Ecuador) Employment indicators" /48/, - SDG 7: 6,220.17 MWh. The overall correctness of the presented figure was confirmed by Applus+ Certification's verification team by assessing the emission reductions calculation spreadsheets /4/.
Additional information relevant to the project	There is no commercially sensitive information valid for the considered monitoring period.

4.2 Safeguards and Stakeholder Engagement

4.2.1 Stakeholder Identification

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Stakeholder identification	As confirmed by the Applus+ Certification verification team after assessing the related evidence: Facilitation Report, consultation process and social participation /43/ and the Environmental Impact Assessment /50/, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has correctly followed the applicable rules in order to identify the related stakeholders according VCS Standard (version 4.7) /5/. Moreover, the stakeholder makeup has not changed since validation as confirmed by Applus+ Certification verification team after assessing both Monitoring Report /1/, Validation Report /3/, Stakeholder consultation report 2013 /42/ and the registered VCS PD /2/.
Legal or customary tenure/access rights	As confirmed by the Applus+ Certification verification team after assessing the evidence "2.EBE Commodate.pdf" /45/, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has correctly followed the applicable rules in order to describe legal or customary tenure/access rights according VCS Standard (version 4.7) /5/.

Stakeholder diversity and changes over time	As confirmed by the Applus+ Certification verification team after assessing the Stakeholder makeup census issued by INEC - Instituto Nacional de Estadísticas y Censos (National Institute of Statistics and Census) ^{/41/} , the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has correctly described the stakeholder diversity and changes over time based on a reliable evidence provided by an official national institute of statistics, thus following the applicable rules according VCS Standard (version 4.7) ^{/5/} .
Expected changes in well-being	As confirmed by the Applus+ Certification verification team after assessing the Environmental Impact Assessment ^{/50/} , the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has correctly followed the applicable rules in order to describe the expected changes in well-being according VCS Standard (version 4.7) ^{/5/} . Moreover, the expected changes in well-being have not changed since validation as confirmed by Applus+ Certification's verification team after assessing both Monitoring Report ^{/1/} , Validation Report ^{/3/} and the registered VCS PD ^{/2/} .
Location of stakeholders	As confirmed by the Applus+ Certification verification team after assessing the related evidence: Stakeholder consultation report 2013 ^{/42/} and the Environmental Impact Assessment ^{/50/} , the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has correctly followed the applicable rules in order to describe the location of stakeholders according VCS Standard (version 4.7) ^{/5/} . Moreover, the stakeholder location has not changed since validation as confirmed by Applus+ Certification verification team after assessing both Monitoring Report ^{/1/} , Validation Report ^{/3/} and the registered VCS PD ^{/2/} .
Location of resources	As confirmed by the Applus+ Certification's verification team through assessment of (i) the previously issued and approved Environmental Impact Assessment ^{/50/} , (ii) the environmental license (EIA approval letter) issued by Coordinador Nacional de Regulación del Sector Eléctrico (National Coordinator of Electrical Sector Regulation) ^{/31/} and by also taking into account the nature of the project activity, it is reasonable to assume that there are no territories or resources owned by local stakeholders nor to which they have customary access.

4.2.2 Stakeholder Consultation and Ongoing Communication

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Ongoing consultation	Ongoing channels of communication were confirmed as being established by the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM as assessed by Applus+ Certification's verification team in the Environmental management plan 2019 /39/. The related evidence contains a Community relations plan, moreover, under measure 1.6.1: <i>"For external environmental-social communication, there will be a system of registration, control and monitoring of requirements (observations, suggestions, complaints, requests) from social actors, which will be considered to improve the social and environmental management of the Project"</i>, also according to the Community relations plan, improvements in social and environmental management are to be implemented where appropriate (Measures MV71 and MV72). As outlined in Section 2.1.2 of the Monitoring Report, as part of the proposed measures, in 2024 identified stakeholders were invited to visit the VCS project activity to discuss activities, any doubt or any issue related to the VCS project. It is the opinion of the Applus+ Certification's verification team that the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM sufficiently demonstrated all actions taken in respect of both the stakeholder consultation and ongoing communications. Established mechanisms for ongoing communication with stakeholders allow stakeholders to raise concerns about potential impacts during project implementation and operation.
Date(s) of stakeholder consultation	29-October-2023 as confirmed by Applus+ Certification's verification team through assessment of related information in the VCS PD.
Communication of monitored results	As confirmed by the Applus+ Certification verification team, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has established a procedure for communicating the monitored results which comprises an onsite tour visit followed by a presentation of project results and later a Q&A session.
Consultation records	As confirmed by the Applus+ Certification verification team, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM

	has recorded the stakeholder consultation in the document “informe de cumplimiento del plan de relaciones comunitarias”/38/.
Stakeholder input	As confirmed by the Applus+ Certification verification team, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has recorded the stakeholder input in the document “informe de cumplimiento del plan de relaciones comunitarias”/38/.

4.2.3 Free, Prior, and Informed Consent

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Consent	As confirmed by the Applus+ Certification verification team, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has followed the applicable rules in order to give legal structure to guarantee free, prior and informed consent according to Article 14, 95 96, 97 and 398 of the Constitution of the Republic of Ecuador; and Book VI of Environmental Quality Unified Text of Secondary Environmental Legislation (TULAS), Chapter 3, Article 20 on social participation. Moreover, a specialized facilitator Soc. Arevalo Jaime Ayala has contributed to the stakeholder consultation as seen in the document “Informe de facilitación, proceso de consulta y participación social.pdf” /43/.
Outcome of FPIC discussion	In summary, there is no disrespect by the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM to stakeholders’ rights to participate in and/or in terms of consenting to consultation as part of project design and implementation. The project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has respected stakeholders’ rights to participate in and consent to consultation as part of project design, its implementation and its so far occurred continuous operation as confirmed by Applus+ Certification’s team in both documents “informe de cumplimiento del plan de relaciones comunitarias” /38/ and “Informe de facilitación, proceso de consulta y participación social.pdf” /43/.

4.2.4 Grievance Redress Procedure

Item	Evidence gathering activities, evidence checked, and assessment conclusion
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Grievance received and steps taken to resolve the grievance including the outcomes of the resolution	The Applus+ Certification's verification team has confirmed the procedure for addressing stakeholder's grievances (which comprises "Suggestion boxes" located at the landfill administration office and the power plant operation office) and also the procedures described in the Compliance Report of the Community Relations Plan ^{/38/}, that the development process was correctly described in Section 2.1.4. of the Monitoring Report in conformance with applicable VCS requirements.
Grievance redress procedure	It is the opinion of the Applus+ Certification's verification team that the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM developed a sufficient complete grievance redress procedure to address disputes with stakeholders that may arise during project planning and implementation (which comprises "Suggestion boxes" located at the landfill administration office and the power plant operation office and also the procedures described in the Compliance Report of the Community Relations Plan ^{/38/} and also in the evidence Technical Standard for Handling Questions, Complaints, Suggestions, Information Requests, and Commendations ^{/38/}). Such procedure sufficiently included processes for receiving, hearing, responding and attempting to resolve grievances within a reasonable time period, taking into account culturally appropriate conflict resolution methods. The procedure and documentation of disputes resolved through the procedure was confirmed by the Applus+ Certification's verification team as being made publicly available.

4.2.5 Public Comments

Comments received	Actions taken by the project proponent	Evidence gathering activities, evidence checked, and assessment conclusion
No comments were received so far since the opening of the “public comments period” as part of the Validation stage (period from 10-April-2019 – 10-May-2019).	No action was necessary as no comments have been received from stakeholders so far.	The Applus+ Certification’s verification team has confirmed, through assessment of the project’s webpage at the Verra Registry, that no comments were received during the public comments period. Moreover, by assessing the grievance book (which is available at the central office of the Pichacay landfill) and also by conducting interviews with project representatives during the performed remote inspection, Applus+ Certification also confirmed that no comments have been received so far.

4.2.6 Risks to Local Stakeholders and the Environment

4.2.6.1 Management Experience

As appropriately outlined in the Monitoring Report, David Gonzalez the manager of the VCS project activity has sufficient experience working 9.5 years for EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM, of which 4.5 years as managing director as confirmed by Applus+ Certification verification team by assessing the evidence “31 David Gonzalez Director project EBE 13-May-2019” /37/.

Moreover, as also outlined in the Monitoring Report, Martijn Vis is involved with the VCS project activity as carbon consultant in charge of project documentation, and managing the registration, and subsequent monitoring and verification processes with the company BTG Biomass Technology Group BV (which has been developing emission reductions projects Since the year 1998, as confirmed by Applus+ Certification’s verification team after assessing the BTG web page /55/).

4.2.6.2 Risk Assessment

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Natural and human induced risks to stakeholders' wellbeing	As confirmed by the Applus+ Certification verification team after assessing the related evidence: Environmental management plan ^{/39/} and the Environmental Impact Assessment ^{/50/}, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has correctly followed the applicable rules to describe risks related to Natural and human induced risks to stakeholders' wellbeing according VCS Standard (version 4.7) ^{/5/}. As assessed by Applus+ Certification's verification team all identified impacts/risks and its related measures are correctly listed in Environmental management plan ^{/39/}.
Risks to stakeholder participation	As confirmed by the Applus+ Certification verification team after assessing the related evidence: Environmental management plan ^{/39/} and the Environmental Impact Assessment ^{/50/}, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has correctly followed the applicable rules to describe risks related to stakeholder participation according to VCS Standard (version 4.7) ^{/5/}. As assessed by Applus+ Certification's verification team all identified impacts/risks and its related measures are correctly listed in Environmental management plan ^{/39/}.
Working conditions	As confirmed by the Applus+ Certification verification team after assessing the related evidence: Environmental management plan ^{/39/} and the Environmental Impact Assessment ^{/50/}, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has correctly followed the applicable rules to describe risks related to working conditions according to VCS Standard (version 4.7) ^{/5/}. As assessed by Applus+ Certification's verification team all identified impacts/risks and its related measures are correctly listed in Environmental management plan ^{/39/}. Moreover, as also confirmed by Applus+ Certification's verification team rigid procedures are implemented at both the Pichacay landfill and the project activity, as can be demonstrated at company's guidelines "Internal labour regulations" ^{/36/}. This program and procedure are under conformance with national Labor regulations such as "Codigo del trabajo" (translated as "Guidelines for working conditions") ^{/35/}.

Safety of women and girls	As confirmed by the Applus+ Certification verification team after assessing the related evidence: Environmental management plan ^{/39/} and the Environmental Impact Assessment ^{/50/}, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has correctly followed the applicable rules to identify risks related to safety of women and girls according to VCS Standard (version 4.7) ^{/5/}. As appropriately outlined in the Monitoring Report, there are no specific risk identified related to safety of women and girls, however, as outlined in the company's guidelines "Internal labour regulations" ^{/36/}, it is a corporate policy (with controls being implemented) having good working conditions being ensured safety of woman and girls as part of the operation of its companies. This program and procedure are under conformance with national Labor regulations such as "Codigo del trabajo" (translated as "Guidelines for working conditions") ^{/35/}.
Safety of minority and marginalized groups, including children	As confirmed by the Applus+ Certification verification team after assessing the related evidence: Environmental management plan ^{/39/} and the Environmental Impact Assessment ^{/50/}, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has correctly followed the applicable rules to identify risks related to safety of minority and marginalized groups, including children according to VCS Standard (version 4.7) ^{/5/}. As appropriately outlined in the Monitoring Report, there are no specific risk identified related to safety of women and girls, however, as outlined in the Monitoring Report, there are no specific risk identified related to safety of minority and marginalized groups, including children. By taking into account the type, design and location of the VCS project activity (incl. the social and economic context of such location), the Applus+ Certification's verification team is of the opinion (based on its expertise and experience with similar/comparable project-based initiatives also implemented worldwide) that it is deemed reasonable and acceptable to assume that there are no children, and minority and marginalized groups in the location of the VCS project activity for which risks would need to be identified and/or for which related mitigation measures would need to be implemented due to the project design, its occurred implementation and so far occurred continuous operation. The above-mentioned information is under conformance with national Labor regulations such as "Codigo del trabajo" (translated as "Guidelines for working conditions") ^{/35/}.

Pollutants (air, noise, discharges to water, generation and release of hazardous materials and chemical pesticides and fertilizers)	As confirmed by the Applus+ Certification verification team after assessing the related evidence: Environmental management plan ^{/39/} and the Environmental Impact Assessment ^{/50/}, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has correctly followed the applicable rules to describe risks related to Pollutants (air, noise, discharges to water, generation and release of hazardous materials and chemical pesticides and fertilizers according to VCS Standard (version 4.7) ^{/5/}. As assessed by Applus+ Certification's verification team all identified impacts/risks and its related measures are correctly listed in Environmental management plan ^{/39/}.
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4.2.7 Respect for Human Rights and Equity

4.2.7.1 Labor and Work

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Discrimination	As appropriately outlined in the Monitoring Report, there are no risk identified. Rigid procedures to avoid discrimination implemented at both the Pichacay landfill and the project activity can be demonstrated at company's guidelines "Internal labour regulations" ^{/36/} , which was assessed by the Applus+ Certification's verification team. This program and procedure are under conformance with national Labor regulations such as "Codigo del trabajo" (translated as "Guidelines for working conditions") ^{/35/} .
Sexual harassment	As appropriately outlined in the Monitoring Report, there are no risk identified. Rigid procedures to avoid sexual harassment implemented at both the Pichacay landfill and the project activity can be demonstrated at company's guidelines "Internal labour regulations" ^{/36/} , which was assessed by the Applus+ Certification's verification team. This program and procedure are under conformance with national Labor regulations such as "Codigo del trabajo" (translated as "Guidelines for working conditions") ^{/35/} .
Gender equity in labor and work	As appropriately outlined in the Monitoring Report, there are no risk identified regarding gender equity, as also confirmed after assessed by Applus+ Certification's verification team in the company's guidelines "Internal labour regulations" ^{/36/} , in its article 5 describes that in the selection of workers it is prohibited by the employer for workers to as

	applicants about pregnancy tests and/or results, marital status, or select regarding age, sex, ethnicity, gender identity, etc.
Forced labor	As appropriately outlined in the Monitoring Report, there are no risk identified regarding forced labor, as also confirmed by Applus+ Certification's verification team in the document "Codigo del trabajo" (translated as "Guidelines for working conditions") /35/, defines that human trafficking, forced labor and child labor is not allowed by law, as stated in the Codificación 17 Registro Oficial Suplemento 167 de 16-dic.-2005 (labor law) that is directly applicable to EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM.
Child labor	As appropriately outlined in the Monitoring Report, there are no risk identified regarding child labor, as also confirmed by Applus+ Certification's verification team in the document "Codigo del trabajo" (translated as "Guidelines for working conditions") /35/, defines that human trafficking, forced labor and child labor is not allowed by law, as stated in the Codificación 17 Registro Oficial Suplemento 167 de 16-dic.-2005 (labor law) that is directly applicable to EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM.
Human trafficking	As appropriately outlined in the Monitoring Report, there are no risk identified regarding human trafficking, as also confirmed by Applus+ Certification's verification team in the document "Codigo del trabajo" (translated as "Guidelines for working conditions") /35/, defines that human trafficking, forced labor and child labor is not allowed by law, as stated in the Codificación 17 Registro Oficial Suplemento 167 de 16-dic.-2005 (labor law) that is directly applicable to EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM.

4.2.7.2 Human Rights

Risks identified	Evidence gathering activities, evidence checked, and assessment conclusion
No risks identified.	As appropriately outlined in the Monitoring Report, human rights principles in Ecuador are protected by the Human Rights declaration in Ecuador (https://www.registrocivil.gob.ec/wp-content/uploads/2015/04/DECLARACION%20DE%20LOS%20DERECHOS%20HUMANOS.pdf legislation). This national legislation is under conformance with principles and rationale of the International Bill of Human Rights and universal instruments relating to human rights,

	The Applus+ Certification's verification team conducted an investigation in an Ecuadorian web portal which lists legal procedural consultation and initiated court cases (https://procesosjudiciales.funcionjudicial.gob.ec/busqueda) in order to check whether the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM is involved in any prosecuting cases or court cases involving human rights offenses. No case was found involving EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM. Moreover, the Sustainability Reports ^{/34/} for the years 2018, 2019, 2020 and 2021 were also accessed in order to confirm the existence of procedures or internal policies directly related to human rights. In summary, it is sufficiently confirmed that human rights have been respected as part of the project operation, its implementation and its so far occurred continuous operation. It is also sufficiently confirmed that the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has respected human rights as set out in the International Labour Organization's Declaration on Fundamental Principles and Rights at Work as part of project design, its implementation and so far occurred continuous operation.
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4.2.7.3 Indigenous Peoples and Cultural Heritage

Risks identified	Evidence gathering activities, evidence checked, and assessment conclusion
No risks identified.	Not applicable. As confirmed by Applus+ Certification's verification team through assessment of the EIA for the construction of the Pichacay landfill ^{/50/}, there are no sites of cultural heritage in the area of influence of this landfill site. In summary, there are no identified indigenous people for which respect would need to be recognized and for which protection of the rights would need to be ensured in line with applicable international human rights law, and the United Nations Declaration on the Rights of Indigenous People and ILO Convention 169 on Indigenous and Tribal Peoples as part of the project design, its implementation and its so far occurred continuous operation. Furthermore, as also confirmed by the Applus+ Certification's verification team, there are no cultural heritages to be preserved

and/or protected consistent with indigenous people practices and/or UNESCO Cultural Heritage conventions as part of the project design, its implementation and its so far occurred continuous operation.

4.2.7.4 Property Rights

Risks identified	Evidence gathering activities, evidence checked, and assessment conclusion
No risks identified.	As confirmed by the Applus+ Certification's verification team through assessment of the previously issued and approved Environmental Impact Assessment (EIA) Report for the construction and operation of the Pichacay landfill ^{/50/} (which addresses legal aspects such as rights to territories and/or resources) there are no issues related to rights to territories and/or resources which could be caused or triggered by the previously occurred construction of the Pichacay landfill and/or later occurred implementation and operation of the VCS project activity (which does not adversely affect the operational conditions of the Pichacay landfill and does not adversely affect the social-economical and legal aspects of region of influence of this landfill under any circumstance). Therefore, it is the opinion of the Applus+ Certification's verification team that the issue of rights to territories and/or resources was appropriately addressed/justified in Section 2.3.4. of the Monitoring Report by presenting the documented evidence of ownership and property rights issued by the General State Attorney of Ecuador ^{/33/} and under conformance with applicable VCS requirements.

4.2.7.5 Benefit Sharing

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Summary of the benefit sharing plan	Not applicable. As appropriately outlined in Section 2.3.5 of the Monitoring Report, the project activity does not impact property rights. However, as assessed by Applus+ Certification's verification team has assessed the document Social Responsibility Agreement for Co-management of the new Landfill ^{/32/} and also the state law Contribution to Local Development Projects ^{/30/} confirming that EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has benefit sharing agreements that contributes with the local community as confirmed in the documented

	evidence Social Responsibility Agreement for Co-management of the new Landfill /29/. As described in the Monitoring Report and also confirmed by Applus+ Certification's verification team, The EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has a benefit sharing agreement, established in the following evidence: Social responsibility agreement EMAC 27-May-2001 /29/, Social responsibility agreement EMAC – addendum 15-December-2011 /32/ and the second version of Social responsibility agreement EMAC – 2nd version 23-June-2016 /77/.
Benefit sharing during the monitoring period	As appropriately outlined in Section 2.3.5 of the Monitoring Report, the benefit sharing program of EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has been implemented. Nowadays, no concrete projects in operation but all amount collected is kept by the parish of Santa Ana as required by the program.

4.2.8 Ecosystem Health

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Impacts on biodiversity and ecosystems	As confirmed by the Applus+ Certification verification team after assessing the related evidence: Environmental management plan /39/ and the Environmental Impact Assessment /50/, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has correctly followed the applicable rules to describe the impacts and associated risks on biodiversity and ecosystems according VCS Standard (version 4.7) /5/. As also confirmed by Applus+ Certification's team, the Monitoring Report correctly identify risks in accordance with the Environmental Impact Assessment /50/ and also lists the measures to prevent and mitigate impacts on biodiversity and ecosystems in accordance with Environmental management plan /39/ as follows: - clearing activities take place manually only within the area of use (measure 1.1.8) - cleared vegetation will be chipped and located in areas surrounding the intervention sites (measure 1.1.9)

- plant material resulting from maintenance will not interrupt channels and bodies of surface water (measure 1.1.11)
- no use of herbicides, and manual maintenance of the vegetation (measure 1.1.12)
- animals are not killed but collected and relocated to surrounding areas (measure 1.1.13)
- in facility and infrastructure development, surrounding slopes will be protected (measure 1.1.14)
- during project development, the company will minimize the impact on soil, by using existing roads and rails where possible, and by planning infrastructure optimally to avoid erosion (not on slopes). (measures 1.1.15 to 1.1.17)
- in case soil has to be removed in the formation of facilities and/or infrastructure for the project, it has to be stored properly and used for rehabilitation of the soil after the project does not need the facilities and infrastructure anymore (measure 1.1.18)
- after the intervention, uncontrolled soil erosion has to be prevented by measures such as coronation ditches, gradient switches, sediment barriers and slope stabilization (measure 1.1.19)
- the use and disposal of dielectric insulation liquids is forbidden (measure 1.1.20)
- the Environmental management plan also contains a *Contingency plan* (§1.2) to respond to environmental emergencies such as fire, transport accidents with dangerous materials, and hydrocarbon spills/leaks (measures 1.2.1 to 1.2.7)
- the company has a contingency kit to respond to emergencies due to hydrocarbon spills/leaks, and these spills/leads will be removed (measures 1.2.8 to 1.2.9)
- prohibition of collection of flora species for commercial purposes, introduction of exotic species, burning of vegetation or any matter, capture and intentional harassment of wildlife (measure 1.3.4)
- quarterly updates on environmental topics (measure 1.3.5), training on emergency response (measure 1.3.6)
- prohibits hunting and fishing activities towards its workers (measure 1.3.8)
- material obtained from the removal of soil in the formation of facilities/infrastructure for the project activities are stored

	properly and used in the subsequent process of rehabilitation of the area (measure 1.7.1) - once the intervened areas are no longer required for project activities its environmental rehabilitation will proceed (measure 1.7.2), by revegetation (measure 1.7.3), using native species (measure 1.7.4). Soil contaminated with hydrocarbons/chemicals (if any) is removed, and compacted soil is de-compacted, once the project activity has finished (measure 1.7.5) - monitor the rehabilitated intervened areas to verify the effectiveness of the actions taken (measure 1.9.7) inspections of operational and abandoned areas covering at least the following elements: perimeter ditches, coronation ditches, slopes, sites with erosion, existence of waste, equipment, internal vegetation and state of surrounding vegetation (measure 1.9.8)
Soil degradation and soil erosion	As confirmed by the Applus+ Certification verification team after assessing the related evidence: Environmental management plan ^{/39/} and the Environmental Impact Assessment ^{/50/}, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has correctly followed the applicable rules to describe the impacts and associated risks on soil degradation and soil erosion according VCS Standard (version 4.7) ^{/5/}. As also confirmed by Applus+ Certification's team, the Monitoring Report correctly identify risks in accordance with the Environmental Impact Assessment ^{/50/} and also lists the measures to prevent and mitigate impacts on soil degradation and soil erosion in accordance with Environmental management plan ^{/39/} as follows: - ensures that legal provisions for fuel management are followed, i.e. waterproofed and roofed buckets ensuring the containment of a volume of at least 110% of the largest capacity tank (measure 1.1.4) - chemicals are handled and stored according to their MSDS Material Safety Sheets (measures 1.1.5 to 1.1.6). - equipment, machinery and vehicles must be maintained properly to avoid among others oil leaks (measure 1.1.7) - in facility and infrastructure development, surrounding slopes will be protected (measure 1.1.14) - during project development, the company will minimize the impact on soil, by using existing roads and rails where

possible, and by planning infrastructure optimally to avoid erosion (not on slopes). (measures 1.1.15 to 1.1.17)

- in case soil has to be removed in the formation of facilities and/or infrastructure for the project, it has to be stored properly and used for rehabilitation of the soil after the project does not need the facilities and infrastructure anymore (measure 1.1.18)
- after the intervention, uncontrolled soil erosion has to be prevented by measures such as coronation ditches, gradient switches, sediment barriers and slope stabilization (measure 1.1.19)
- the use and disposal of dielectric insulation liquids is forbidden (measure 1.1.20)
- the Environmental management plan also contains a *Contingency plan* (§1.2) to respond to environmental emergencies such as fire, transport accidents with dangerous materials, and hydrocarbon spills/leaks (measures 1.2.1 to 1.2.7)
- the company has a contingency kit to respond to emergencies due to hydrocarbon spills/leaks, and these spills/leads will be removed (measures 1.2.8 to 1.2.9)
- the Environmental management plan contains a *Training plan* (§ 1.3) requiring quarterly updates on environmental topics (measure 1.3.5) and the organization of training on emergency response (measure 1.3.6)
- the Environmental management plan contains an *Occupational health and safety plan* (§1.4) taking care that the fuel storage area will comply with fire prevention and protection regulations, and that an emergency response kit for hydrocarbon spills is available (measure 1.4.10)
- vehicles and machinery will have an emergency response kit for hydrocarbon spills and a portable fire extinguisher (measure 1.4.11)
- regular inspections of the fuel oil, and grease storage area to verify on tank integrity, corrosion leaks etc. are held (measure 1.4.12)
- the *Waste management plan* (§ 1.5 of the Environmental management plan) contains several measures for proper waste management by amongst others, segregation between hazardous and non-hazardous waste (measure 1.5.1), prevention and minimizing waste generation (measure 1.5.2),

proper record keeping, storage, delivery and disposal (measures 1.5.3 to 1.5.7)

- care is taken that debris for construction (measure 1.5.9) and industrial effluents (measure 1.5.11) are handled and treated properly
- actions are carried out to minimize the generation of waste (measure 1.5.12)
- *The Rehabilitation plan for affected areas* (§1.7 of the Environmental management plan) takes care that material obtained from the removal of soil in the formation of facilities/infrastructure for the project activities are stored properly and used in the subsequent process of rehabilitation of the area (measure 1.7.1)
- once the intervened areas are no longer required for project activities its environmental rehabilitation will proceed (measure 1.7.2), by revegetation (measure 1.7.3), using native species (measure 1.7.4)
- soil contaminated with hydrocarbons/chemicals (if any) is removed, and compacted soil is de-compacted, once the project activity has finished (measure 1.7.5)
- if contamination of soil is detected, remediation services will be carried out in the affected area (measure 1.7.6) and the remediated soil will be disposed of outside the project or delivered to a company with an environmental license for final disposal (measure 1.7.7)
- *The Area abandonment and delivery plan* (§ 1.8 of the Environmental management plan) takes care that in case of definite closure of the project, the company will ensure the non-existence of environmental liabilities through laboratory test of the water and soil components (measure 1.8.1)
- the environmental liabilities report will be sent to the environmental control authority (measure 1.8.2), and leave the location of its facilities as it was initially found (measures 1.8.3 to 1.8.4)
- *The Monitoring and follow up plan*, §1.9 of the Environmental management plan, describes that the company will self-monitor the soil on the outside of the area where fuels, oil and greases are stored (measure 1.9.5)
- monitor the rehabilitated intervened areas to verify the effectiveness of the actions taken (measure 1.9.7)

	- the company will carry out inspections of operational and abandoned areas covering at least the following elements: perimeter ditches, coronation ditches, slopes, sites with erosion, existence of waste, equipment, internal vegetation and state of surrounding vegetation (measure 1.9.8)
Water consumption and stress	As confirmed by the Applus+ Certification verification team after assessing the related evidence: Environmental management plan ^{/39/} and the Environmental Impact Assessment ^{/50/}, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has correctly followed the applicable rules to describe the impacts and associated risks on water consumption and stress according VCS Standard (version 4.7) ^{/5/}. As also confirmed by Applus+ Certification's team, the Monitoring Report correctly identifies risks in accordance with the Environmental Impact Assessment ^{/50/} and also lists the measures to prevent and mitigate impacts on water consumption and stress in accordance with Environmental management plan ^{/39/} as follows: - the impact prevention and mitigation plan (§ 1.1 of the <i>"Environmental management plan.pdf"</i> states that in the activities of forming facilities/infrastructures of the project, temporary / permanent water courses will be protected, avoiding interrupting their channel with residues or vegetation or removed material (measure 1.1.3) - legal provisions for fuel management are followed, i.e. waterproofed and roofed buckets that ensure the containment of a volume of at least 110% of the largest capacity tank (measure 1.1.4) - chemicals are handled and stored according to their MSDS Material Safety Sheets (measures 1.1.5 to 1.1.6) - equipment, machinery and vehicles must be maintained properly to avoid among others oil leaks (measure 1.1.7) - oil-water separators in power plants receive periodic maintenance and inspection (measure 1.1.10) - plant material resulting from maintenance will not interrupt channels and bodies of surface water (measure 1.1.11) - during project development, the company will minimize the impact on water, by using existing roads and rails where possible, and by planning infrastructure optimally to avoid erosion (not on slopes) (measures 1.1.15 to 1.1.17)

	- the use and disposal of dielectric insulation liquids is forbidden (measure 1.1.20) - <i>Contingency plan (§1.2)</i> to respond to environmental emergencies such as fire, transport accidents with dangerous materials, and hydrocarbon spills/leaks (measures 1.2.1 to 1.2.7) - contingency kit to respond to emergencies due to hydrocarbon spills/leaks, and these spills/leads will be removed (measures 1.2.8 to 1.2.9) - <i>training plan (§ 1.3)</i> requiring quarterly updates on environmental topics (measure 1.3.5) and the organization of training on emergency response (measure 1.3.6) - <i>Occupational health and safety plan (§1.4)</i> taking care that the fuel storage area will comply with fire prevention and protection regulations, and that an emergency response kit for hydrocarbon spills is available (measure 1.4.10) - vehicles and machinery will have an emergency response kit for hydrocarbon spills and a portable fire extinguisher (measure 1.4.11) - regular inspections of the fuel oil, and grease storage area to verify on tank integrity, corrosion leaks etc. are held (measure 1.4.12) - several measures for proper waste management by amongst others, segregation between hazardous and non-hazardous waste (measure 1.5.1) - prevention and minimizing waste generation (measure 1.5.2) - proper record keeping, storage, delivery and disposal (measures 1.5.3 to 1.5.7) - care is taken that organic waste (measure 1.5.8), debris for construction (measure 1.5.9), waste from bathrooms for the use of bathrooms (measure 1.5.10), industrial effluents (measure 1.5.11) are handled and treated properly - actions are carried out to minimize the generation of waste (measure 1.5.12)
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4.2.8.1 Rare, Threatened, and Endangered species

Item	Evidence gathering activities, evidence checked, and assessment conclusion
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Species or habitat	As confirmed by the Applus+ Certification verification team after assessing the Environmental Impact Assessment /50/, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has correctly followed the applicable rules to describe species or habitat according VCS Standard (version 4.7) /5/. As confirmed by Applus+ Certification's team, the Monitoring Report correctly identify species in accordance with the Environmental Impact Assessment /50/ as follows: - Fifteen bird species were observed of which five regarded rare (Falco sparverius, lesbia nuna, Southern Yellow grosbea, blue-gray tanager, and Tyto alba) - Two amphibian species were identified (gastrotheca pseutstes and Pristimantis sp) and one reptile (stenocercus festae) - Four found mammals are all very common (Didelphis marsupialis, Histiotus montanus, Mus musculus and Rattus norvegicus) Moreover, as also confirmed by Applus+ Certification's team, the Monitoring Report correctly identify risks in accordance with the Environmental Impact Assessment /50/ and lists measures to prevent and mitigate impacts on habitats for rare, threatened, and endangered species in accordance with Environmental management plan /39/. The identified risks are related to access to clean water, thus the mitigation measures are correctly described as the same above-mentioned risks to "water consumption and stress".
Areas needed for habitat connectivity	By taking into account the type, design and location of the VCS project activity, the Applus+ Certification's verification team is of the opinion (based on its expertise and experience with similar/comparable project-based initiatives also implemented worldwide) that it is deemed reasonable and acceptable to assume that there are no impacted areas needed for habitat connectivity affected by the project design, its occurred implementation and so far occurred continuous operation, as described in the Monitoring Report which is completed as Not Applicable in this Section. As confirmed by the Applus+ Certification's verification team, the VCS project activity and the Pichacay landfill are not located in area in or adjacent to, habitats for rare, threatened, or endangered species. This information is confirmed by both the previously issued and approved Environmental Impact Assessment (EIA) Report /50/ for the construction and operation of the Pichacay landfill and the environmental license (EIA

approval letter) issued by Coordinador Nacional de Regulación del Sector Eléctrico (National Coordinator of Electrical Sector Regulation) /31/.

Evidence gathering activities, evidence checked, and assessment conclusion	
Habitats for rare, threatened, and endangered species	As confirmed by the Applus+ Certification verification team after assessing the related evidence: Environmental management plan /39/ and the Environmental Impact Assessment /50/, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has correctly followed the applicable rules to describe habitats for rare, threatened and endangered species according VCS Standard (version 4.7) /5/. Moreover, as also confirmed by Applus+ Certification's team, the Monitoring Report correctly identify risks in accordance with the assessed evidence Environmental Impact Assessment /50/ and lists measures to prevent and mitigate impacts on habitats for rare, threatened, and endangered species in accordance with the assessed evidence Environmental management plan /39/. The identified risks are related to access to clean water, thus the mitigation measures are correctly described as the same above-mentioned risks to "water consumption and stress".
Areas for habitat connectivity	As confirmed by the Applus+ Certification verification team after assessing the Environmental management plan /39/, the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM has correctly followed the applicable rules to describe areas for habitat connectivity according VCS Standard (version 4.7) /5/. Moreover, as also confirmed by Applus+ Certification's team, the Monitoring Report correctly identify no risks in accordance with the assessed evidence Environmental Impact Assessment /50/ and with the Environmental management plan /39/.

4.2.8.2 Introduction of Species

Species introduced	Evidence gathering activities, evidence checked, and assessment conclusion
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Not applicable.	Not applicable. By taking into account the type, design and location of the VCS project activity, the Applus+ Certification's verification team is of the opinion (based on its expertise and experience with similar/comparable project-based initiatives also implemented worldwide) that it is deemed reasonable and acceptable to assume that the project design, its implementation and its so far occurred continuous operation do not result in planting or introduction of species (including invasive species) or allow an invasive species to thrive. This information is confirmed by both the previously issued and approved Environmental Impact Assessment (EIA) Report ^{/50/} for the construction and operation of the Pichacay landfill and the environmental license (EIA approval letter) issued by Coordinador Nacional de Regulación del Sector Eléctrico (National Coordinator of Electrical Sector Regulation) ^{/31/} .
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Existing invasive species	Evidence gathering activities, evidence checked, and assessment conclusion
Not applicable.	Not applicable. By taking into account the type, design and location of the VCS project activity, the Applus+ Certification's verification team is of the opinion (based on its expertise and experience with similar/comparable project-based initiatives also implemented worldwide) that it is deemed reasonable and acceptable to assume that the project design, its implementation and its so far occurred continuous operation do not result in planting or introduction of species (including invasive species) or allow an invasive species to thrive. This information is confirmed by both the previously issued and approved Environmental Impact Assessment (EIA) Report ^{/50/} for the construction and operation of the Pichacay landfill and the environmental license (EIA approval letter) issued by Coordinador Nacional de Regulación del Sector Eléctrico (National Coordinator of Electrical Sector Regulation) ^{/31/} .

Evidence gathering activities, evidence checked, and assessment conclusion	
Invasive species	Not applicable. By taking into account the type, design and location of the VCS project activity, the Applus+ Certification's verification team is of the opinion (based on its expertise and experience with similar/comparable project-based initiatives also implemented worldwide) that it is deemed reasonable and acceptable to assume that the project design, its implementation and its so far occurred continuous operation do not result in planting or introduction of species (including invasive species) or allow an invasive species to thrive. This information is confirmed by both the previously issued and approved Environmental Impact Assessment (EIA) Report ^{/50/} for the construction and operation of the Pichacay landfill and the environmental license (EIA approval letter) issued by Coordinador Nacional de Regulación del Sector Eléctrico (National Coordinator of Electrical Sector Regulation) ^{/31/} .

4.2.8.3 Ecosystem conversion

Item	Evidence gathering activities and evidence checked
Ecosystem conversion	Not applicable. By taking into account the type, design and location of the VCS project activity, the Applus+ Certification's verification team is of the opinion (based on its expertise and experience with similar/comparable project-based initiatives also implemented worldwide) that it is deemed reasonable and acceptable to assume that the project design, its implementation and its so far occurred continuous operation do not promote any ecosystem conversion or allow ecosystem conversion to occur. This information is confirmed by both the previously issued and approved Environmental Impact Assessment (EIA) Report ^{/50/} for the construction and operation of the Pichacay landfill and the environmental license (EIA approval letter) issued by Coordinador Nacional de Regulación del Sector Eléctrico (National Coordinator of Electrical Sector Regulation) ^{/31/} .

4.3 Accuracy of Reduction and Removal Calculations

As per the applied monitoring procedure and in accordance with the requirements of the applied CDM baseline and monitoring methodology AMS-III.G (version 10.0) ^{/6/} and related

provisions of the registered VCS PD ^{/2/} for the VCS project activity, GHG emission reductions are calculated based on measurement records and selected values of the ex-post monitored parameters (of which monitoring details are presented in the tables below) and also correctly considering values for ex-ante determined parameters.

Assessment of ex-ante determined parameters:

Values for the following ex-ante determined parameters are correctly reported in the Monitoring Report ^{/1/} and are correctly considered in the context of ex-post determination of GHG emission reductions achieved by the VCS project activity during the considered monitoring period:

Ex-ante determined parameter	Applied value
Global Warming Potential of methane (GWP _{CH4})	28 tCO ₂ e/tCH ₄ ⁶
NCV of methane (NCV _{CH4})	35.9 MJ/Nm ³
Density of methane at the temperature and pressure of the landfill (D _{CH4})	0.0007168 tCH ₄ /Nm ³ CH ₄
CO ₂ emission factor of the grid electricity in year y (EF _{grid,y})	0.3349 tCO ₂ /MWh

Ex-ante determined parameters not used in the context of ex-post calculation of emission reductions achieved by the VCS project activity during the considered monitoring period:

It is noteworthy that values of the fixed parameters indicated in the table above were selected ex-ante in the registered VCS PD ^{/2/}. Assessment for the previously occurred selection of values for the above-summarized ex-ante determined parameters are included in the Validation Report ^{/3/} for the VCS project activity.

As also confirmed by the Applus+ Certification's verification team, the Monitoring Report ^{/1/} also includes references to the following additional ex-ante determined parameters of which determined values were previously considered only in the particular context of determination of

⁶ According to the registered VCS PD ^{/2/} the applied value of GWP_{CH4} for ex-ante estimations of emission reductions is 25 tCO₂e/tCH₄, however VCS Standard (version 4.7) defines the following:

"Projects that complete validation on or before 31 July 2021 may use GWP values from AR4 for ex-ante emission reduction estimates, though such projects shall use GWP values from AR5 for ex-post calculations",

Therefore, the applied value for ex-post calculations (28 tCO₂e/tCH₄) is deemed as correct and in accordance with VCS rules, procedures and also with information made available at <https://archive.ipcc.ch/report/ar5/syr/>.

ex-ante estimates of emission reductions to be achieved by the VCS project activity within its crediting period:

- Efficiency of the LFG capture system that will be installed in the project activity. It is used for ex ante estimation only. A default value of 50 percent is used (η_{PJ})
- Default value for the model correction factor to account for model uncertainties (ϕ_{default})
- 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 (f_y)
- Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste) (OX)
- Fraction of methane in the SWDS gas (volume fraction) (F)
- Fraction of degradable organic carbon (DOC) that decomposes under the specific conditions occurring in the SWDS for year y ($\text{DOC}_{f,\text{default}}$)
- Methane correction factor ($\text{MCF}_{\text{default}}$)
- Amount of solid waste type j disposed or prevented from disposal in the SWDS in the year x ($W_{j,x}$)
- Fraction of degradable organic carbon in the waste type j (weight fraction) (DOC_j)
- Decay rate for the waste type j (k_j)
- Methane emissions that would be captured and destroyed to comply with national or local safety requirement or legal regulations in the year y ($F_{CH_4,BL,y}$)
- Average technical transmission and distribution losses for providing electricity to source j in year y ($\text{TDL}_{j,y}$)
- Quantity of net electricity generation supplied by the project plant/unit to the grid in 2017-2018 ($\text{EG}_{PJ,\text{facility},2017-2018}$)
- Quantity of net electricity generation supplied by the project plant/unit to the grid in year y ($\text{EG}_{PJ,\text{facility},2019 - 2027,\text{estimated}}$)

The above-listed parameters are confirmed by the Applus+ Certification's verification team as being only used in the context of ex-ante estimation of emission reductions to be achieved by the VCS project activity as reported and further explained in its registered VCS PD ^{/2/}.

Assessment of parameters monitored ex-post:

The Applus+ Certification's verification team has assessed whether the monitoring parameter of which monitoring ex-post is required as per the monitoring plan of the registered VCS PD ^{/2/} was correctly monitored during the considered monitoring period.

As confirmed by the Applus+ Certification's verification team, monitoring activities for the VCS project activity were performed for the considered monitoring period under full conformance with related requirements as established in the monitoring plan of the registered VCS PD ^{/2/} for the VCS project activity. Assessment details for monitoring the parameters monitored ex-post for the considered monitoring period are summarized below in the tables below:

Data / Parameter:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (EG _{PJ, facility})
Measuring, recording and reporting frequencies:	During the considered monitoring period, accumulated values of continuously measurements of the monitoring parameter EG_{PJ, facility} were aggregated and recorded/reported hourly by the SIMEC application of the entity “Operador Nacional de Electricidad” (National Electricity Operator) (CENACE) with related records being made available and utilized by the project proponents as part of the application of the monitoring plan of the VCS project activity. “Operador Nacional de Electricidad” (National Electricity Operator) (CENACE) is the technical and economical managing and operating entity for the National Electricity Grid of Ecuador. As confirmed by the Applus+ Certification’s verification team, based on measurements performed by installed monitoring instruments (electricity meters), SIMEC application generates a report with hourly values for generated electricity which delivered to the grid daily with records being record in a data platform from which historical records can be retrieved online. Monthly reports with accumulated measurement values for electricity generated by the VCS project activity are generated by using SIMEC application data. All net electricity generated by the VCS project activity is exported. Monthly sales receipts of generated electricity ^{/20/} were made available and were assessed by the Applus+ Certification’s verification team. As confirmed by the Applus+ Certification’s verification team, the following checking procedure (which is outlined in the VCS PD ^{/2/}) has been systematically applied during the considered monitoring period: <i>“The daily report is double-checked by the Technical Manager of the power plant as well as by CENACE technical specialists. Once the file is approved, it is stored on an online platform – SIMEM. The platform allows viewing and downloading of the stored files,</i>

	named CON_MED_EXE_20YY-MM-DD.xls. At EBE, the Project Manager groups the data of the respective monitoring period into one excel sheet. All daily reports remain available and can be double checked by the project advisor and verification body.” As per the registered VCS PD /2/ continuous measurements of EG_{PJ,facility} are to be recorded and reported under an at least every month frequency. The applied CDM methodological tool “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0) /27/ and the CDM baseline and monitoring methodology AMS-III.G (version 10.0) /6/ do not clearly indicate recording and reporting frequencies for continuous measurements for the parameter EG_{PJ,facility}. Thus, the adopted measuring, recording and reporting frequencies are assumed as in accordance with the monitoring plan of the registered VCS PD /2/ as well as with applicable guidance of the CDM baseline and monitoring methodology AMS-I.D: “Grid connected renewable electricity generation” (version 18.0) /7/ and the CDM methodological tool “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0) /27/.								
Type of monitoring equipment/instrument:	Net electricity generated by the VCS project activity during the considered monitoring period was measured by electricity meters (main meter and backup unit) which are installed, maintained, and calibrated by “Operador Nacional de Electricidad” (National Electricity Operator) (CENACE). The specifications of the installed electricity meters are as follows: <table border="1"> <thead> <tr> <th colspan="2">Specifications of installed electricity meter</th></tr> </thead> <tbody> <tr> <td>Manufacturer</td><td>Schneider Electric</td></tr> <tr> <td>Model</td><td>ION 7650</td></tr> <tr> <td>Serial Numbers</td><td>MJ-1401A358-04 (main meter)</td></tr> </tbody> </table>	Specifications of installed electricity meter		Manufacturer	Schneider Electric	Model	ION 7650	Serial Numbers	MJ-1401A358-04 (main meter)
Specifications of installed electricity meter									
Manufacturer	Schneider Electric								
Model	ION 7650								
Serial Numbers	MJ-1401A358-04 (main meter)								

	MJ-1310A536-04 (backup meter).
Accuracy	±0.2%

Source: /40/

Values presented below for the monitoring parameter $EG_{PJ, facility}$ represent the values measured by the above-mentioned electricity meters.

Month/Year	$EG_{PJ, facility}$
January-2024	458.94
February-2024	323.71
March-2024	566.13
April-2024	581.15
May-2024	516.99
June-2024	575.16
July-2024	425.87
August-2024	564.42
September-2024	545.14
October-2024	564.79
November-2024	526.72
December-2024	571.14
TOTAL	6,220.17

The registered VCS PD /2/, the applied CDM methodological tool “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0) /27/ and the CDM baseline and monitoring methodology AMS-III.G (version 10.0) /6/ do not specify any accuracy requirement for the electricity meter installed. The accuracy range for the installed instruments is confirmed as being ±0.2%

	through assessment of its specification sheet ^{/40/}. Based on its sectoral expertise and experience with other similar project-based initiative under VCS and other GHG programs (such as the CDM) (initiatives promoting collection and destruction and/or utilization of LFG), it is the opinion of Applus+ Certification that the use of the installed instrument represents good practice for monitoring generation of electricity and is under sufficient conformance with the monitoring plan as per the registered VCS PD ^{/2/} for the project activity.
Calibration frequency	As per the recommendations from the equipment's manufacturer, the installed electricity meters are to be calibrated at least every 5 years. According to the registered VCS PD ^{/2/} every two years. As confirmed by the Applus+ Certification's verification team through assessment of the specification sheet for the installed electricity meters, the selected calibration frequency is as per the recommendations of the instrument manufacturer. Valid calibration events were performed in both the main and backup electricity meters as follows: - Calibration events performed in 10-August-2023, valid until September 09-August-2025 (2 years) ^{/11/} The applied CDM baseline and monitoring methodology AMS-III.G (version 10.0) ^{/6/} does not explicitly specify any calibration frequency requirements for the installed electricity meters. The registered VCS PD ^{/2/} states the following regarding calibration of monitoring instrument for the monitoring parameter EG_{PJ,facility}: <i>"To achieve the permit that allows EBE to deliver energy to the grid, the two ION meters were calibrated. The company that performed the calibration was the National Center for Energy Control – CENACE, institution that controls and regulate the Ecuadorian Electrical Power System. The meters need to be calibrated every 2 years."</i>

As per the also applied CDM methodological tool “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0) /²⁷/, the following requirement is established regarding maintenance and calibration for electricity meters:

“(...) meters should be installed, maintained and calibrated according to equipment manufacturer instructions and be in line with national standards, or, if these are not available, international standards (e.g. IEC, ISO)”.

“In cases where electricity meters are regulated (e.g. the electricity is supplied to the electric grid), the electricity meter will be subject to regular maintenance and testing in accordance with the stipulation of the meter supplier and/or as per the requirements set by the grid operators or national requirements. The calibration of meters, including the frequency of calibration, should be done in accordance with national standards or requirements set by the meter supplier or requirements set by the grid operators. The accuracy class of the meters should be in accordance with the stipulation of the meter supplier and/or as per the requirements set by the grid operators or national requirements.”

It is important to note that the installed electricity meters are approved/certified by the entity “Operador Nacional de Electricidad” (National Electricity Operator) (CENACE). CENACE is the technical and economical managing and operating entity for the National Electricity Grid of Ecuador. The electricity meters are thus in conformance with “Operador Nacional de Electricidad” (National Electricity Operator) (CENACE)’s requirements for maintenance, testing and calibration of electricity meters. Furthermore, the applied calibration frequency of every 2 years for the electricity meters is confirmed to be in accordance with related requirements/recommendations as established by the meters

	manufacturer. While, as confirmed by the Applus+ Certification's verification team, the entity <i>Operador Nacional de Electricidad</i> (CENACE). CENACE is the technical and economical managing and operating entity for the National Electricity Grid of Ecuador, the installed electricity meter is to be calibrated every 5 years as per recommendation of its manufacturer, a calibration frequency of every 2 years is applied for the installed electricity meters. The performed calibration events in both the main and backup electricity meters confirm appropriate functioning of these electricity meters (at the time the calibration events were performed).
How were the values in the Monitoring Report (and/or supporting documents, i.e emission reduction calculation spreadsheet) verified and/or compared?	By comparing reported values against values indicated in monthly electricity commercialization receipts ^{/16/} valid for the project's electricity generation infrastructure during the considered monitoring period, the Applus+ Certification's verification team was able to confirm that the reported values are consistent, credible and also Applus+ Certification's team was able to confirm the correctness of monthly reported values for $EG_{PJ, facility}$ which are considered in the determination of baseline emissions for the VCS project activity. The Applus+ Certification's verification team has confirmed that accumulated monthly values for the monitoring parameter $EG_{PJ, facility}$ as reported in the emission reduction calculation spreadsheet and Monitoring Report ^{/1/} are in accordance with both primary monitoring records for electricity generation from "Operador Nacional de Electricidad" (National Electricity Operator) (CENACE) (which are reported every hour) and with monthly electricity commercialization receipts ^{/16/} valid for the project's electricity generation infrastructure during the considered monitoring period,

Does the applied monitoring data management process (from monitoring equipment/instrument to emission reduction calculation) ensure correct recording, transfer and reporting of data to be used for the emission reductions calculations? Are necessary/applicable QA/QC processes in place?	Details for monitoring management and quality assurance related aspects for the VCS project activity are also included in the end of this Section.
Data / Parameter:	Energy Conversion Efficiency of the project equipment, i.e. Guascor Power Genset type SFGM560. (EE_y)
Measuring, recording and reporting frequencies:	The determination of parameter EE_y is not based on measurements. The equipment manufacturer has provided the following values for the engines: - Engine-generator set 1: 36.0% - Engine-generator set 2: 36.1% The highest value of both engine-generator sets (36.1%) is selected and confirmed by the Applus+ Certification's verification team as representing value as per specification fact sheets for the installed engine-generator sets issued by the equipment manufacturer GUASCOR POWER S.A.U., ^{/13/} which were made available and assessed.
Type of monitoring equipment/instrument:	Not applicable. The determination of parameter EE_y is not based on measurements and thus there is no related monitoring equipment/instrument. The determination of parameter EE_y is not based on measurements and thus there is no related monitoring

	equipment/instrument. Based on its sectoral expertise and experience with other similar project-based initiative under VCS and other GHG programs (such as the CDM) (initiatives promoting collection and destruction and/or utilization of LFG), it is the opinion of Applus+ Certification that the determination based on information as per specification fact sheet issued by the manufacturer of the engine-generator sets represents good practice for determining energy conversion efficiency of the project's engine-generator sets.
Calibration frequency	Not applicable.
How were the values in the Monitoring Report (and/or supporting documents, i.e emission reduction calculation spreadsheet) verified and/or compared?	Not applicable.
Does the applied monitoring data management process (from monitoring equipment/instrument to emission reduction calculation) ensure correct recording, transfer and reporting of data to be used for the emission reductions calculations? Are necessary/applicable QA/QC processes in place?	Details for monitoring management and quality assurance related aspects for the VCS project activity are also included in the end of this Section.

Data / Parameter:	Quantity of electricity used for the operation of the installed facilities in the year y ($EC_{project,y}$)
Measuring, recording and reporting frequencies:	During the considered monitoring period, records of accumulated values of continuously measurements of the monitoring parameter $EC_{project,y}$ (based on measurements performed by electricity meter which is installed and maintained by the local electricity distribution company Empresa Elèctrica Regional Centro Sur C.A. (CENTROSUR)) as reported in monthly invoices for purchasing of grid-sourced electricity issued by CENTROSUR ^{/20/} were aggregated and recorded/reported on a monthly basis for the determination of accumulated value of $EC_{project,y}$ valid for the considered monitoring period. As confirmed by the Applus+ Certification's verification team, the electricity demand of the VCS project activity was met by electricity generated by the project's electricity generation infrastructure whenever such infrastructure has been under operation within the considered monitoring period. During the time periods within the considered monitoring period when the project's electricity generation component was not under operation (temporary interruptions of the component), the electricity demand of the VCS project activity was confirmed as being met by imports of grid-sourced electricity. The monthly electricity bills are split into two files as follows: - Energy consumed from the grid in low voltage (220-110V: auxiliary services) ^{/20/} - Energy consumed by the genset in mid voltage (22,000 V: substation and 480V equipment) ^{/20/}

Month/Year	EC _{project,y} (MWh)
January 2024	13.20
February 2024	12.18
March 2024	13.87
April 2024	13.76
May 2024	13.31
June 2024	13.64
July 2024	11.85
August 2024	14.36
September 2024	12.41
October 2024	13.98
November 2024	13.93
December 2024	14.91
TOTAL	161.39

As per the registered VCS PD ^{/2/} continuous measurements of EC_{project,y} (as reported in as reported in monthly invoices for purchasing of grid-sourced electricity issued by CENTROSUR) are to be recorded and reported under an at least every month frequency. The applied CDM methodological tool “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0) ^{/27/} and the CDM baseline and monitoring methodology AMS-III.G (version 10.0) ^{/6/} do not clearly indicate recording and reporting frequencies for continuous measurements for the parameter EC_{project,y}.

Thus, the adopted measuring, recording and reporting frequencies are assumed as in accordance with the monitoring plan of the registered VCS PD ^{/2/} as well as with the applied CDM

	methodological tool “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0) ^{/27/} and the CDM baseline and monitoring methodology AMS-III.G (version 10.0) ^{/6/} .										
Type of monitoring equipment/instrument:	Consumption of grid-sourced electricity by the VCS project activity during the considered monitoring period was measured by an electricity meter which is installed and maintained by the local electricity distribution company Empresa Elèctrica Regional Centro Sur C.A. (CENTROSUR). The specifications of the installed electricity meter are as follows: <table border="1"> <thead> <tr> <th colspan="2">Specifications of installed electricity meter</th></tr> </thead> <tbody> <tr> <td>Manufacturer</td><td>ELSTER</td></tr> <tr> <td>Model</td><td>type A3R, model ZE3300000LO, class CL200</td></tr> <tr> <td>Serial number</td><td>17548507</td></tr> <tr> <td>Accuracy</td><td>±0.2%</td></tr> </tbody> </table> Source: ^{/40/} The registered VCS PD ^{/2/} the applied CDM methodological tool “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0) ^{/27/} and the CDM baseline and monitoring methodology AMS-III.G (version 10.0) ^{/6/} do not specify any accuracy requirement for the electricity meter installed. The accuracy range for the installed instruments is ±0.2%. Based on its sectoral expertise and experience with other similar project-based initiative under VCS and other GHG programs (such as the CDM) (initiatives promoting collection and destruction and/or utilization of LFG), it is the opinion of Applus+ Certification that the use of the installed instrument represents good practice for monitoring consumption of grid-sourced electricity by the VCS project activity and is under sufficient conformance with the	Specifications of installed electricity meter		Manufacturer	ELSTER	Model	type A3R, model ZE3300000LO, class CL200	Serial number	17548507	Accuracy	±0.2%
Specifications of installed electricity meter											
Manufacturer	ELSTER										
Model	type A3R, model ZE3300000LO, class CL200										
Serial number	17548507										
Accuracy	±0.2%										

	monitoring plan as per the registered VCS PD /2/ for the project activity.
Calibration frequency	The following statements are confirmed by the Applus+ Certification's verification team as being included in the technical manual /13/ for the installed electricity used to perform electricity consumption measures as part of monitoring of the parameter EC_{project,y}: <i>"No user calibration required (factory calibrated)"</i> <i>"A3 ALPHA meters are factory calibrated and tested to provide years of trouble-free service. No field calibrations or adjustments are required to ensure accurate operation of the meter."</i> <i>"The A3 ALPHA meter is calibrated and tested at the factory, and it is ready for installation."</i> Furthermore, as also confirmed by the Applus+ Certification's verification team, the responsibility for testing and maintenance of the installed electricity meter is of the local electricity distribution company Empresa Elèctrica Regional Centro Sur C.A. (CENTROSUR). There is no calibration interval valid for the installed monitoring instrument. The registered VCS PD /2/ and the applied CDM baseline and monitoring methodology AMS-III.G (version 10.0) /6/ do not explicitly specify any calibration frequency requirements for the installed electricity meter. Also, as per the applied CDM methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0) /27/, the following requirement is established regarding maintenance and calibration for electricity meters: <i>"(...) In cases where electricity meters are regulated (e.g. the electricity is supplied by the electric grid – scenario A), the electricity meter will be subject to regular maintenance</i>

	<i>and testing in accordance with the stipulation of the meter supplier and/or as per the requirements set by the grid operators or national requirements. The calibration of meters, including the frequency of calibration, should be done in accordance with national standards or requirements set by the meter supplier or requirements set by the grid operators. The accuracy class of the meters should be in accordance with the stipulation of the meter supplier and/or as per the requirements set by the grid operators or national requirements. In cases where electricity meters are not regulated (e.g. the electricity is supplied by captive power plants – Scenario B), the electricity meter will be subject to regular maintenance and testing in accordance with the stipulation of the meter supplier or national requirements. The calibration of meters, including the frequency of calibration, should be done in accordance with national standards or requirements set by the meter supplier. The accuracy class of the meters should be in accordance with the stipulation of the meter supplier or national requirements. If these standards are not available, and meter supplier does not specify, calibrate the meters every 3 years and use the meters with at least 0.5 accuracy class (e.g. a meter with 0.2 accuracy class is more accurate and thus it is accepted)."</i> It is important to note that the responsibility for installation and operation of the electricity meter in the project site is of the local electricity distribution company Empresa Elèctrica Regional Centro Sur C.A. (CENTROSUR). There is no calibration event in the monitoring instrument valid for the considered monitoring period.
How were the values in the Monitoring Report (and/or supporting documents, i.e emission reduction	Not applicable.

calculation spreadsheet) verified and/or compared?	
Does the applied monitoring data management process (from monitoring equipment/instrument to emission reduction calculation) ensure correct recording, transfer and reporting of data to be used for the emission reductions calculations? Are necessary/applicable QA/QC processes in place?	Details for monitoring management and quality assurance related aspects for the VCS project activity are also included in the end of this Section.

Data / Parameter:	Average technical transmission and distribution losses for providing electricity to source j in year y ($TDL_{j,y}$)
Measuring, recording and reporting frequencies:	The ex-post determination of the monitoring parameter $TDL_{j,y}$ is not based on direct measurements performed as part of the operation and monitoring of the VCS project activity. As correctly outlined in the Monitoring Report ^{/4/}, the value for the monitoring parameter $TDL_{j,y}$ valid for the considered monitoring period is correctly selected as follows: The project participant initially clarifies that, under conformance with the CDM methodological tool “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0) ^{/27/}, option 1 (“use annual average value based on the most recent data available within the host country”) was applied. The monitoring frequency for $TDL_{j,y}$ is annual. In the absence of related data from the

relevant year, the most recent figures for the latest 5-years should be used.

The project proponent has initially applied available records for the distribution losses of regional electricity distribution company Empresa Eléctrica Regional Centro Sur C.A. (Centrosur). However, by acknowledging that national figure should be applied, data from the Annual and Multiannual Statistics of the Ecuadorian Electricity Sector 2024 ^{/14/}.

Table 4, page 22 of this technical report presents the technical distribution losses of Ecuador as a whole as being 6.33% in year 2024.

Table 4, page 22 of the technical report presents the transmission losses of the SNT (Systema National de Transmission” as being 3.96% in year 2024 (where year 2024 is the most recent year for which this information is available).

The technical distribution losses and the transmission losses are reported separately and need to be multiplied to obtain the combined technical transmission and distribution losses.

Thus, $TDL_{j,y}$ is calculated as follows:

$$TDL_{j,y} = 1 - (DL_{j,y} - 1) * (TL_{j,y} - 1)$$

Where:

$TDL_{j,y}$ = Average technical transmission and distribution losses for providing electricity to source j in year y

$DL_{j,y}$ = Average technical distribution losses of the distribution electricity system of Ecuador (%) to the project in year y (6.33%)

$TL_{j,y}$ = Average transport losses of the national electricity transport system (SNT) of Ecuador (%) to the project in year y (3.96%)

$$TDL_{j,y} = 10.04\%$$

Selected value for $TDL_{j,y}$ is confirmed by the Applus+ Certification’s verification team as correctly representing

	technical transmission and distribution losses for the National Electricity Grid of Ecuador as per official statistics from Empresa Eléctrica Regional Centro Sur C.A, (CENTROSUR) / ^{14/} . Selected value was officially issued is year 2024, which is confirmed to be the latest year for which data is available. Thus, the use of selected value for the whole considered monitoring period is deemed reasonable and acceptable.
Type of monitoring equipment/instrument:	Not applicable. There are no measurements or measurement instruments/equipment involved for the determination of the set of annual values for parameter $TDL_{j,y}$.
Calibration frequency	Not applicable.
How were the values in the Monitoring Report (and/or supporting documents, i.e emission reduction calculation spreadsheet) verified and/or compared?	Not applicable.
Does the applied monitoring data management process (from monitoring equipment/instrument to emission reduction calculation) ensure correct recording, transfer and reporting of data to be used for the emission reductions calculations? Are necessary/applicable QA/QC processes in place?	Details for monitoring management and quality assurance related aspects for the VCS project activity are also included in the end of this Section.

Assessment of handling of records for both parameters monitored ex-post and ex-ante determined parameters in the context of determination of emission reductions achieved by the VCS project activity during the considered monitoring period:

As part of the applied monitoring procedure, measurements for the electricity generation and electricity consumption related monitoring parameters were processed and recorded in a customized database with a data recording/reporting frequency of at least every month along the considered monitoring period:

It is the opinion of Applus+ Certification that the use of the applied monitoring system/routine for recording monitoring details for electricity generation and electricity consumption at the Pichacay landfill represents good practice in terms of data acquisition and data archiving. Applus+ Certification's verification team was also able to verify that a reliable and robust monitoring mechanism was established, implemented and has been followed by the project developer.

As per the implemented monitoring procedure, at regular time intervals, the monitoring manager for electricity generation ^{/16/} and electricity consumption ^{/20/} at the Pichacay landfill exports/converts data into an MS-Excel-format (.xls files).

Also, as part of the implemented monitoring procedure, monthly MS-Excel format "raw-data" files (primary monitoring records for electricity generation ^{/16/} and with monthly electricity commercialization receipts (period from January-2024 to December-2024) and also monitoring records of electricity consumption ^{/20/}) were used as primary monitoring input data for the emission reduction calculations (as established in the applicable work procedure of the VCS project activity).

For the considered monitoring period, as per the adopted working procedures, primary monitoring records for electricity generation and with monthly electricity commercialization receipts ^{/16/} (period from January-2024 to December-2024) and also monitoring records of electricity consumption ^{/20/} were aggregated for the considered monitoring period from 01-January-2024 to 31-December-2024. The MS-Excel "raw-data" files were used as primary monitoring data input for the compilation of the emission reduction calculations.

The generated MS-Excel-format "raw-data" files were made available and assessed by the Applus+ Certification's verification team.

As per the adopted monitoring procedure and in accordance with the requirements of AMS-III.G (version 10.0) ^{/6/} and related provisions of the registered VCS PD ^{/2/}, GHG emission reductions are calculated based on measurement records and selected default values of the ex-post

monitored parameters (of which monitoring details are presented in the tables above) and also using the values for the ex-ante determined parameters presented in Section “*Assessment of ex-ante determined parameters*”.

In summary, the Applus+ Certification’s verification team was able to confirm that calculations of baseline emissions and project emissions were correctly performed as per the formulae and methods stated in the registered VCS PD ^{/2/} for the VCS project activity, monitoring methodology and applicable tools.

All calculations are thus confirmed by the Applus+ Certification’s verification team to be under conformance with applicable requirements from:

- AMS-III.G.: Landfill methane recovery (version 10.0) ^{/6/}
- Methodological tool “Emissions from solid waste disposal sites” (version 08.0) ^{/26/}
- “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0) ^{/27/}
- “Project emissions from flaring” (version 02.0.0) ^{/28/}
- “Tool to calculate the emission factor for an electricity system (version 05.0) ^{/24/}
- Monitoring plan as per the registered VCS PD ^{/2/} for the VCS project activity

Data Authenticity Checking

As part of the performed verification assessment, the Applus+ Certification verification team was able to confirm that the MS-Excel-format emission reductions calculation spreadsheet ^{/15/} completed by the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM is basically MS-Excel spreadsheet that, in theory, could have recorded data being easily edited/modified (intentionally or unintentionally). Thus, this spreadsheet, if inappropriately edited, could potentially tamper reported monitoring records, thus resulting in unreal and incorrect calculation and reporting of emission reductions achieved by the VCS project activity during the considered monitoring period. In order to ensure that all emission reductions calculations are entirely and correctly based on authentic and real monitoring records valid for the considered monitoring period, a data authentic check was performed as part of the verification assessment.

Such checking aimed to ensure that only authentic and unmodified monitoring data records were used by the host-country project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM for performing the emission reduction calculation for the considered monitoring period (thus ensuring that measurement records made available in the MS-Excel format “raw

data” input files /16/ /20/ and measurement records reported in the emission reduction spreadsheet /15/ were not intentionally or unintentionally edited/modified during the generation or handling of these files).

The performed data authenticity checking involved the following steps:

STEP 1: Assessment and handling of the measurement data:

While each monthly MS-Excel format raw data contains identical electricity generation /16/ and electricity consumption /20/ related records for the whole month period encompassed by the considered monitoring period, the Applus+ Certification verification team has assessed the set of monthly files in MS-Excel format during the performed remote inspection. These comparative files were termed by the Applus+ Certification verification team as “raw data for checking” files /17/.

STEP 2: Re-calculation of emission reductions:

By using the set of MS-Excel format “raw-data for checking” comparative files /17/ as input data, the procedure for emission reductions calculation for the monitoring period was reproduced by the Applus+ Certification verification team for all months encompassed by the considered monitoring period. The content of the “raw data for checking” comparative files /17/ was used as input data for the comparative emission reduction calculation spreadsheet /10/ by applying blank version /12/ of the emission reduction calculation spreadsheet that were both made available by the project proponent. Moreover, correct values for the applicable ex-ante determined parameters were also inserted in the blank version /12/ of the emission reduction calculation spreadsheet /15/ as input data. As a result of this step, a comparative emission reduction spreadsheet /22/ was thus created.

STEP 3 – Comparison of emission reduction calculation spreadsheet developed by the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM against the created comparative emission reduction spreadsheet and analysis of the results:

As a result of STEP 3, by comparing files previously generated by the project proponent against the files generated under STEP 2, the Applus+ Certification verification team was able to confirm that the generated checking spreadsheet /22/ is identical to the emission reduction calculation spreadsheet /15/ previously created by the project proponent. While no quantitative deviations or differences were identified when

comparing the accumulated values for the calculation parameters presented in these files, and by assuming that all recorded data represent credible and authentic monitoring data, the performed data authenticity checking thus successfully and sufficiently confirmed that only authentic and not-modified monitored measurement data were previously used by the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM for the calculation of emission reductions as reported in the Monitoring Report ^{/1/}.

Assessment of GHG Calculations

Assessment of determination of baseline emissions

The Applus+ Certification's verification team assessed whether the methods and formulae used to determine baseline emissions for the considered monitoring period are correct and appropriate. The performed assessment encompassed checking whether applied methods and formulae as described in the monitoring plan of the registered VCS PD ^{/2/} and applicable CDM baseline and monitoring methodology + methodological tools were correctly applied, including confirmation whether the Monitoring Report ^{/1/} includes all parameters and monitored data at the intervals required by the applied CDM baseline and monitoring methodology + methodological tools as per the registered VCS PD ^{/2/}.

The correctness of application of emission factors and default values (ex-ante determined/fixed parameters) as per the registered VCS PD ^{/2/} was also verified.

Through assessment of the Monitoring Report ^{/1/}, the Applus+ Certification's verification team was able to verify that baseline emissions (BE_y) for the considered monitoring period are correctly calculated as follows:

$$BE_y = BE_{CH_4,PJ,y} + BE_{electricity,y}$$

Where:

BE_{Electricity,y} Baseline emissions associated with electricity generation in year y (termed in the Monitoring Report ^{/1/} as "Baseline emission from electricity displacement that otherwise would be provided by grid in year y" BE_{Electricity,y} is confirmed to be correctly determined for the considered monitoring period as follows:

$$BE_{Electricity,y} = EG_{PJ,y} * EF_{grid,y}$$

Where:

EG_{PJ,y} Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year

y. Monthly accumulated records of net electricity generated by the VCS project activity (using collected LFG as gaseous fuel) during the considered monitoring period are confirmed by the Applus+ Certification's verification team as being correctly reported in the Monitoring Report ^{/14/} and considered in the determination of baseline emissions as follows:

Month	Amount of electricity generated using LFG as gaseous fuel (EG _{PJ,y}) (MWh)
January-2024	458.94
February-2024	323.71
March-2024	566.13
April-2024	581.15
May-2024	516.99
June-2024	575.16
July-2024	425.87
August-2024	564.42
September-2024	545.14
October-2024	564.79
November-2024	526.72
December-2024	571.14
TOTAL	6,220.17

Further monitoring details for EG_{PJ,y} are summarized above. As confirmed by Applus+ Certification's verification team, values for EG_{PJ,y} are consistent with power generation monitoring records as related values were crosschecked with monthly electricity commercialization receipts ^{/16/}.

EF_{grid,y} Combined margin CO₂ emission factor for grid connected power generation in year y was calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" As defined in the VCS PD ^{/2/}, EF_{grid,y} is ex-ante determined as 0.3349 tCO₂/MWh.

As confirmed by the Applus+ Certification's verification team, the calculated accumulated value for $BE_{Electricity,y}$ for the considered monitoring period is correctly determined and reported as 2,083 tCO₂.

$BE_{CH4,PJ,y}$

Baseline emission from LFG avoidance that otherwise would be emitted to the atmosphere in absence of the Project in year y . $BE_{CH4,y}$ is confirmed to be correctly determined for the considered monitoring period as follows:

$$BE_{CH4,PJ,y} = ((1 - OX) * F_{CH4,PJ,y} * GWP_{CH4})$$

Where:

OX Oxidation factor (reflecting the amount of methane from SWDS that is oxidised in the soil or other material covering the waste). As outlined in the registered VCS PD ^{/2/}, OX is ex-ante determined as 0.1.

GWP_{CH4} Global warming potential of CH₄. As outlined in the registered VCS PD ^{/2/}, GWP_{CH4} is ex-ante determined as 28⁷.

F_{CH4,PJ,y} Methane captured and destroyed/gainfully used by the project activity in the year y . While no baseline emissions associated with combustion of collected in the installed flare is accounted (due to lack of installed related monitoring instrument/equipment), $F_{CH4,PJ,y}$ is thus confirmed to be appropriately determined as follows:

$$F_{CH4,PJ,y} = ((EG_y * 3,600) / (NCV_{CH4} * EE_y)) / D_{CH4}$$

Where:

EG_{PJ,y} Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (in MWh). Assessment details of EG_{PJ,y} for the considered monitoring period are summarized above.

⁷ According to the registered VCS PD ^{/2/} the applied value of GWP_{CH4} for ex-ante estimations of emission reductions is 25 tCO₂e/tCH₄, however VCS Standard (version 4.7) defines the following:

"Projects that complete validation on or before 31 July 2021 may use GWP values from AR4 for ex-ante emission reduction estimates, though such projects shall use GWP values from AR5 for ex-post calculations",

Therefore, the applied value for ex-post calculations (28 tCO₂e/tCH₄) is deemed as correct and in accordance with VCS rules and procedures.

NCV _{CH4}	Net calorific value for methane. As outlined in the registered VCS PD /2/, NCV _{CH4} is <i>ex-ante</i> determined as 35.9 MJ/Nm ³ .
EE _y	Energy Conversion Efficiency of the project equipment. For the considered monitoring period, EE _y is determined as 36.1% which represents the higher conversion efficiency of the installed engine-generator sets of the project's electricity generation infrastructure. As a conservative approach, the conversion efficiency of engine-generator set 2 (36.1%) is chosen over the conversion efficiency of engine-generator set 1 (36.0%), as the installed electricity meter is located after the power transformer and is not able to identify whether the electricity is generated by the first or second engine-generator sets. Further assessment details for EE _y are summarized above.
D _{CH4}	Density of methane. As outlined in the registered VCS PD /2/, D _{CH4} is <i>ex-ante determined</i> as 0.0007168 tCH ₄ /Nm ³ CH ₄ .

The calculated accumulated annual values for F_{CH4,PJ,y} are confirmed by the Applus+ Certification's verification team as being correctly determined as 1,239 tCH₄ for the considered monitoring period from 01-January-2024 to 31-December-2024.

As confirmed by the Applus+ Certification's verification team, the calculated accumulated value for BE_{CH4,PJ,y} for the considered monitoring period from 01-January-2024 to 31-December-2024 is correctly determined as 31,210 tCO_{2e}.

The calculated value for total baseline emissions (BE_{CH4,PJ,y} + BE_{electricity,y}) for the considered monitoring period from 01-January-2024 to 31-December-2024 is correctly determined as 33,293 tCO_{2e}.

Assessment of project emissions

The Applus+ Certification's verification team assessed whether the methods and formulae used to determine project emissions for the considered monitoring period are correct and appropriate. The performed assessment encompassed checking whether applied methods and formulae as described in the monitoring plan of the registered VCS PD ^{/2/} and applicable CDM baseline and monitoring methodology + methodological tools were correctly applied, including confirmation whether the Monitoring Report ^{/1/} includes all parameters and monitored data at the intervals required by the applied CDM baseline and monitoring methodology + methodological tools as per the registered VCS PD ^{/2/}.

The correctness of application of emission factors and default values (ex-ante determined/fixed parameters) as per the registered VCS PD ^{/2/} was also verified.

The Applus+ Certification's verification team was able to verify that, as correctly indicated in the Monitoring Report ^{/1/}, project emissions (PE_y) for the considered monitoring period are calculated as follows:

$$PE_y = PE_{CH4,y} + PE_{Electricity,y}$$

Where:

PE_{CH4,y} Project emissions landfill methane recovery. As established in the VCS PD ^{/2/}, PE_{CH4,y} is determined as follows:

$$PE_{CH4,y} = PE_{power,y} + PE_{flare,y}$$

Where:

PE_{flare,y} Emissions from flaring or combustion of the landfill gas stream in the year y. While no baseline emissions associated with combustion of collected in the installed flare is accounted (due to lack of installed related monitoring instrument/equipment), it is deemed reasonable and acceptable the decision of the project proponent to account PE_{flare,y} as null (zero) tCO₂e ⁸.

⁸ As confirmed by the Applus+ Certification's verification team, the following related disclaimer is appropriately included in Section 5.2 of the Monitoring Report ^{/1/}:

"At the project site a flare has been installed that is operational in case the engine is not operational. The emission reduction achieved by the flare is not counted in this project, since no measurement equipment is installed that meets the requirements of TOOL06 and TOOL08. Therefore, during monitoring, the baseline and project emissions of the use of the flare also will not be taken into account. ($ER_{flare} = BE_{flare} - PE_{flare} = 0$). Consequently, the project emissions of the flare have not been taken into account. This is a conservative approach since in reality the flare has destroyed methane part of the year."

$PE_{power,y}$ Emissions from the use of fossil fuel or electricity for the operation of the installed facilities in the year y. $PE_{power,y}$ is confirmed to be correctly determined for the considered monitoring period by correctly following applicable guidance of the CDM methodological tool “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0) /27/ as follows:

$$PE_{power,y} = EC_{project,y} * EF_{grid,y} * (1 + TDJ_{j,y})$$

Where:

$EC_{project,y}$ Amount of grid-sourced electricity consumed by the VCS project activity during the considered monitoring period. Measurement records for during the considered monitoring period as confirmed as being as follows:

Month	Amount of grid-sourced electricity consumed by the VCS project activity ($EC_{project,y}$) (MWh)
January-2024	13.20
February-2024	12.18
March-2024	13.87
April-2024	13.76
May-2024	13.31
June-2024	13.64
July-2024	11.85
August-2024	14.36
September-2024	12.41
October-2024	13.98
November-2024	13.93
December-2024	14.91
TOTAL	161.39

Accumulated annual value of consumption of grid-sourced electricity by the VCS project activity during the considered monitored are confirmed by the Applus+ Certification's verification team as being correctly determined as 161.39 MWh during the considered monitoring period. Further monitoring details for $EC_{project,y}$ are summarized above.

$TDL_{j,y}$ Average technical transmission and distribution losses for providing electricity to source j in year y . For the considered monitoring period, $TDL_{j,y}$ is determined as 10.04%. Further assessment details for $TDL_{j,y}$ are summarized above.

$EF_{grid,y}$ Combined margin CO₂ emission factor for grid connected power generation in year y was calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" As defined in the VC PD, $EF_{grid,y}$ is ex-ante determined as 0.3349 tCO₂/MWh.

The calculated value for $PE_{CH4,y} = PE_{power,y}$ for the considered monitoring period from 01-January-2024 to 31-December-2024 is correctly determined as 60 tCO₂.

In summary, the Applus+ Certification's verification team was able to confirm that calculations of baseline emissions and project emissions were correctly performed as per the formulae and methods stated in the registered VCS PD /2/ and under conformance with applicable requirements of the applied CDM baseline and monitoring methodology AMS-III.G (version 10.0) /6/.

Assessment of achieved emission reductions:

The Applus+ Certification's verification team was able to confirm that reported achieved emission reductions for monitoring period from 01-January-2024 to 31-December-2024 are correctly calculated and reported as the difference between determined accumulated values for baseline emissions and project emissions for the period.

Reported achieved emission reductions are in accordance with all applicable measurement, reporting and calculation requirements as per the monitoring plan of the registered VCS PD, CDM monitoring and baseline methodology AMS-III.G.: Landfill methane recovery (version 10.0) /6/ and applicable methodological tools.

As verified by the Applus+ Certification's verification team, emission reductions achieved during the considered monitoring period from 01-January-2024 to 31-December-2024 are correctly calculated and reported as 33,233 tCO₂e.

Assessment of related monitoring management and quality assurance procedures for the VCS project activity:

The Applus+ Certification's verification team was able to confirm that robust quality control and quality assurance (QA/QC) procedures are implemented by the project proponent and project operator for preventing or identifying and correcting eventual errors or omissions in reported values for the monitoring parameters.

As verified by the Applus+ Certification's verification team, competent and sufficiently trained staff are recruited to operate the VCS project activity and handling related monitoring data. Such employees are found with knowledge not only about the operation of the VCS project activity, but also with sufficient knowledge and competence to ensure the application of all related QA/QC procedures for data recording and storage.

As also assessed by the Applus+ Certification's verification team, the VCS project activity has been operated by sufficiently trained staff by correctly following guidance and instructions of internal documented working procedures.

As confirmed by the Applus+ Certification's verification team, the applied procedures for data collection, data reporting, performance of calibration events and other aspects related to the applied procedures for determining the emission reductions are systematically implemented and have been appropriately followed by the project proponent. Applus+ Certification's verification team was also able to verify that the operational structure of the VCS project activity is also in line with the information made available in the registered VCS PD ^{/2/} and in the Monitoring Report ^{/1/}.

In summary, Applus+ Certification was also able to verify that detailed management and operational work procedures are in place and confirmed that an operational structure for the VCS project activity is established with responsibilities clearly identified. Moreover, trained staff are employed to ensure data quality.

4.4 Quality of Evidence to Determine Reductions and Removals

Monitoring related activities for the VCS project activity were confirmed by the Applus+ Certification's verification team as being carried out under sufficient conformance with the monitoring plan as per the registered VCS PD ^{/2/} for the VCS project activity (version 3.2, dated 07-July-2019).

As a result of performed verification assessment for the considered monitoring period, Applus+ Certification's verification team was able to confirm 'that relevant details for all parameters required for the ex-post determination of emission reductions are sufficiently included in the Monitoring Report ^{/1/} and emission reduction calculation spreadsheet ^{/15/} with all figures, assumptions and calculations being consistent and under conformance with applicable requirements and/or guidance of the applied CDM baseline and monitoring methodology AMS-III.G (version 10.0) ^{/6/} and the monitoring plan contained in the registered VCS PD.

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 Monitoring Report. The verification process for the same has been clearly described above in Section "Assessment of parameters monitored ex-post". of the report.

4.5 Non-Permanence Risk Analysis

Not applicable as this is a renewable project type.

5 VERIFICATION OPINION

5.1 Verification Summary

LGAI Technological Center, S.A. (referred to as “Applus+ Certification” or the VVB) was contracted by EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM (referred to as the Client) to perform the 5th periodic verification of GHG Emission Reductions for the VCS project activity “Pichacay Landfill Gas Renewable Energy Project” (VCS project ID #1883) (referred to as the VCS project activity). The monitoring period included in the Monitoring Report ^{/1/} for which this verification applies is: 01-January-2024 to 31-December-2024.

The management team of the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM 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 registered VCS PD ^{/2/}.

Operation project staff of the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM and also the environmental consultancy BTG Biomass Technology Group B.V. are responsible for the previously occurred implementation of the VCS project activity and monitoring related activities since its starting of operations, including measurement, recording and reporting of monitoring data and determination of GHG emission reductions achieved by the VCS project activity within the considered monitoring period on the basis applicable monitoring procedures and requirements which are established in the project’s monitoring plan as per the registered VCS PD.

The verification assessment performed by Applus+ Certification is based on the approach defined as per applicable guidance and requirements of VCS rules and/or relevant UNFCCC requirements (whenever applicable). The performed verification assessment applied a risk-based approach, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. As part of the performed verification assessment, Applus+ Certification was able to confirm the following:

- The VCS project activity is implemented and has operated during the considered monitoring period under conformance with its previously defined design and with monitoring related activities/tasks being performed under sufficient compliance with monitoring requirements defined in the monitoring plan as per registered VCS PD for the VCS project activity ^{/2/}.
- The monitoring plan for the VCS project activity as previously defined in the registered VCS PD was designed and has been operated under full conformance with the applied CDM Baseline and monitoring methodology AMS-III.G.: Landfill methane recovery (version 10.0) ^{/6/}.
- The Monitoring Report ^{/1/} and other supporting documents provided are confirmed as being sufficiently complete, verifiable and with texts, assumptions, descriptions and calculation under full conformance with the applicable VCS requirements.
- Monitoring instruments required for measurements which are instrumental for the determination of ex-post GHG emission reductions achieved by the VCS project activity during the considered monitoring period were confirmed to be under correct and reliable operation with related maintenance and calibration being appropriately and timely performed.
- GHG emission reductions achieved by the VCS project activity during the considered monitoring period are confirmed as being calculated without material misstatements.

The GHG verification assessment performed by Applus+ Certification is based on the approach defined as per applicable guidance and requirements of ISO 14064-3:2019 (whenever applicable). The performed verification assessment applied a risk-based approach, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these.

5.2 Verification Conclusion

In summary, Applus+ Certification was able to confirm that information included in the Monitoring Report ^{/1/} is deemed complete and correct and that the emission reductions achieved by the VCS project activity during the monitoring period from 01-January-2024 to 31-December-2024 are correctly determined and fairly stated and were calculated without material misstatements. Applus+ Certification hereby confirms and certifies that GHG emission reductions achieved by the VCS project activity “Pichacay Landfill Gas Renewable Energy Project” during the monitoring period from 01-January-2024 to 31-December-2024 as reported in the latest version of the Monitoring Report (version 1.4, dated 19-August-2025) ^{/1/} represents the figures summarized below.

Verification period: From 01-January-2024 to 31-December-2024

Verified GHG emission reductions and carbon dioxide removals in the above verification period:

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Reduction VCU (tCO ₂ e)	Removal VCU (tCO ₂ e)	Total VCUs (tCO ₂ e)
2024 (From 01-January-2024 to 31-December-2024)	33,293	60	0	33,233	0	33,233
Total	33,293	60	0	33,233	0	33,233

5.3 Ex-ante vs Ex-post ERR Comparison

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
2024 (01-January-2024 to 31-December-2024)	37,992	33,233	-13%	Please see below
Total	37,992	33,233	-13%	Please see below

The latest version of the Monitoring Report states that the main explanation for the identified difference between the estimated and achieved amount of emission reductions by the VCS project activity is the fact that within the year 2024, three times an emergency shutdown of the engine-generators along with other unexpected events occurred, in which zero or low capacity of electricity could be produced described in Section 1.4 of the Verification Report.

APPENDIX 1: REFERENCE LIST

1	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: Monitoring reports for the VCS project activity “Pichacay Landfill Gas Renewable Energy Project” / monitoring period from 01-January-2024 to 31-December-2024, (version 1.0, dated 18-April-2025; version 1.4, dated 19-August-2025).
2	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: Registered VCS PD the VCS project activity “Pichacay Landfill Gas Renewable Energy Project” (in the particular case of the VCS project activity: Joint VCS PD and Monitoring Report (monitoring period from 27-July-2017 to 31-December-2018) for the VCS project activity (version 3.2, dated 07-July-2019)
3	EPIC Sustainability Services Pvt Ltd.: Validation report “Pichacay Landfill Gas Renewable Energy Project (in the particular case of the VCS project activity: Joint Validation Report and Verification Report (monitoring period from 27-July-2017 to 31-December-2018) (version 1, dated 27-August-2019);
4	VCS/VERRA: Validation and verification manual (version 3.2, dated 19-October-2016). https://verra.org/wp-content/uploads/2018/03/VCS_Validation_Verification_Manual_v3.2.pdf
5	VCS/VERRA: VCS standard (version 4.7, dated 16-August-2024) Available online: https://verra.org/programs/verified-carbon-standard/vcs-program-details/#rules-and-requirements
6	UNFCCC / CDM: Baseline and monitoring methodology AMS-III.G.: Landfill methane recovery (version 10.0). Available online:

	https://cdm.unfccc.int/methodologies/DB/OKHNES8D09H134V3TZDQ47C3LQL3H2
7	UNFCCC / CDM: Baseline and monitoring methodology AMS-I.D: «Grid connected renewable electricity generation» (version 18.0). Available online: https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK
8	International Organization for Standardization (ISO) Standard ISO 14064-3:2019
9	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: Set of sequential live videos (movies) + photographs (pictures) of the VCS project activity “Pichacay Landfill Gas Renewable Energy Project” produced/generated on 08-April-2025
10	Comparative emission reduction calculation spreadsheet for the VCS project activity “Pichacay Landfill Gas Renewable Energy Project” – monitoring period from 01-January-2024 to 31-December-2024. Created as part of the Data authenticity checking procedure performed during the remote inspection.
11	“Operador Nacional de Electricidad” (National Electricity Operator) (CENACE): Calibration events performed on electricity meter Schneider Electric ION 7650 of serial numbers MJ-1401A358-04 and MJ-1310A536-04 in 10-August-2023.
12	Blank version of the emission reduction calculation spreadsheet for the VCS project activity “Pichacay Landfill Gas Renewable Energy Project” – monitoring period from 01-January-2024 to 31-December-2024. Created as part of the Data authenticity checking procedure performed during the remote inspection.
13	GUASCOR POWER S.A.U.: Specification fact sheet for engine-generator sets installed as part of the VCS project activity “Pichacay Landfill Gas Renewable Energy Project”

14	Annual and Multiannual Statistics of the Ecuadorian Electricity Sector 2024 (in Spanish language: “Estadística del sector eléctrico Ecuatoriano, 2024, Agencia de Regulación y Control de Energía y Recursos naturales No Renovables): https://www.controlrecursosyenergia.gob.ec/estadisticas-del-sector-electrico-ecuatoriano-buscar/
15	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: Emission reductions calculation spreadsheet File name: “VCS ERR calculation Project 1883 01012024-31122024.xlsx”
16	CENACE: Primary monitoring records for electricity generation and with monthly electricity commercialization receipts (period from January-2024 to December-2024) for the electricity generation infrastructure implemented as part of the VCS project activity “Pichacay Landfill Gas Renewable Energy Project”
17	Input raw-data for checking for the monitoring period from 01-January-2024 to 31-December-2024.
18	UNFCCC/CDM: “Guideline – Application of materiality in verifications” (version 02.0). Available online: https://cdm.unfccc.int/filestorage/e/x/t/extfile-20150225171039012-iss_guid08.pdf/iss_guid08.pdf?t=Nnd8cjhpNm1nfDCyUV7i5kNG_5KRiOiEzL_k
19	Internal service and maintenance logbook (with details about historical of interventions, service and instrument/equipment calibration and replacement) for the VCS project activity “Pichacay Landfill Gas Renewable Energy Project” during the considered monitoring period.
20	Empresa Eléctrica Regional Centro Sur C.A. (CENTROSUR): Monthly invoices for purchasing of grid-sourced electricity issued by the electricity distribution company CENTROSUR
21	UNFCCC/CDM:

	CDM Validation and Verification Standard for project activities (version 03.0) Available online: https://cdm.unfccc.int/Reference/Standards/index.html
22	Emission reduction calculation comparative spreadsheet File name: “VCS ERR calculation Project 1883 01012024-31122024-comparative”
23	Applus+ Certification: Verification plan for the 5th Monitoring period of VCS project activity “Pichacay Landfill Gas Renewable Energy Project”, dated 24-March-2025.
24	UNFCCC/CDM: Tool to calculate the emission factor for an electricity system (version 05.0) Available online: https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v1.1.pdf/history_view
25	Positive list of technologies (version 01.0) Available online: https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-32-v1.pdf/history_view
26	UNFCCC/CDM: Emissions from solid waste disposal sites (version 08.0) Available online: https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-04-v6.0.1.pdf/history_view
27	UNFCCC/CDM: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (version 03.0)

	Available online: https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v1.pdf/history_view
28	UNFCCC/CDM: Project emissions from flaring (version 02.0.0) Available online: https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-06-v1.pdf/history_view
29	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: Social Responsibility Agreement for Co-management of the new Landfill, dated 27-May-2001
30	Electricity Regulation and Control Agency - Agencia de Regulación y Control de Eletricidad: Report of the Project Regulation on Territorial Development Projects Available online: https://www.controlrecursosyenergia.gob.ec/wp-content/uploads/downloads/2022/02/informe_de_sustento_vf.pdf
31	Coordinador Nacional de Regulación del Sector Eléctrico (National Coordinator of Electrical Sector Regulation): EIA approval letter, dated 09-February-2014
32	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: Social Responsibility Agreement for Co-management of the new Landfill, dated 15-December-2011 Available online: https://emac.gob.ec/wp-content/uploads/2024/05/POA-2020.pdf
33	General State Attorney of Ecuador: Ownership and property rights evidence File names:

	"El salado Sta Ana.pdf" "Pichacay Sr. Ambrosi 98.56 HCTS0001.pdf" "Relleno Sanitario Pichacay 25.02 HCT.0001.pdf" "EBE Commodate.pdf"
34	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: Sustainability Reports for years: 2017, 2018, 2019, 2020 and 2021 Available online: https://emac.gob.ec/memoria-de-sostenibilidad/
35	Guidelines for working conditions – Código del trabajo, dated 2005
36	Legislation and codification commission of the National Congress of Ecuador - Comisión de legislación y codificación del Congreso Nacional de Ecuador:
37	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: David Gonzalez management experience evidence. File name: 31 David Gonzalez Director project EBE 13-May-2019.pdf
38	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: COMPLIANCE REPORT OF THE COMMUNITY RELATIONS PLAN. INFORME DE CUMPLIMIENTO DEL PLAN DE RELACIONES COMUNITARIAS, dated 2023. File name: INFORME DE RELACIONES COMUNITARIAS AGREEMENT OF THE NATIONAL SECRETARIAT OF THE PUBLIC ADMINISTRATION 1423: Rule of questions complaints formulated to entities executive function Official Registry 646 of 10-December-2015.
39	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM:

	Environmental management plan 2019. Dated January-2019. File name: Environmental management plan 2019.pdf
40	Schneider Electric: ION7550/7650 series Technical Data Sheet. Available online: https://download.schneider-electric.com/files?p_enDocType=Technical+leaflet&p_File_Name=PLSED306011EN_%28web%29.pdf&p_Doc_Ref=PLSED306011EN_Web
41	INEC - Instituto Nacional de Estadísticas y Censos (National Institute of Statistics and Census): Stakeholder make-up census Available online: https://www.censoecuator.gob.ec/data-censo-ecuador/
42	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: Stakeholder consultation report 2013 File name: 6. Stakeholder consultation report 2013.pdf
43	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: Facilitation report, consultation process and social participation - Informe de facilitación, proceso de consulta y participación social File name: Informe de facilitación, proceso de consulta y participación social.pdf
44	VCS/VERRA: VCS Program Definitions (version 4.5, dated 19-September-2019).
45	Notario Décimo Cuenca Ecuador:

	Public Deed of command granted by: Municipal public company based in Cuenca EMAC EP in favor of a mixed company EMAC-BGP (Escritura Pública de comadato otorgado por: Empresa publica municipal de aseo de Cuenca EMAC EP a favor de Compañía mixta EMAC-BGP Energy CEM Cuantía: inderterminada) File name: “2.EBE Commodate.pdf”
46	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: Set of sequential live videos (movies) + photographs (pictures) of the VCS project activity “Pichacay Landfill Gas Renewable Energy Project” produced/generated on 08-April-2025
47	Instituto Colombiano de Normas Técnicas y Certificación (ICONTEC): Verification Report for the monitoring period from 26-August-2021 to 28-February-2022 File name: 36. CAF verification report 1st vintage.pdf Instituto Colombiano de Normas Técnicas y Certificación (ICONTEC): Verification Report for the monitoring period from 01-March-2022 to 31-August-2022 File name: 38. CAF verification report 2nd vintage.pdf Instituto Colombiano de Normas Técnicas y Certificación (ICONTEC): Verification Report for the monitoring period from 01-Septiembre-2022 to 31-Diciembre-2022 File name: 40. CAF verification report 3rd vintage.pdf
48	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: List of employees related to the operation of the VCS project activity.

49	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: Monitoring Report for the monitoring period from 26-August-2021 to 28-February-2022 File name: 35. CAF monitoring report 1st vintage.pdf EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: Monitoring Report for the monitoring period from 01-March-2022 to 31-August-2022 File name: 37. CAF monitoring report 2nd vintage.pdf EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: Monitoring Report for the monitoring period from 01-Septiembre-2022 to 31-Diciembre-2022 File name: 39. CAF monitoring report 3rd vintage.pdf
50	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: Environmental Impact Assessment, dated January-2014 File name: ESTUDIO IMPACTO AMBIENTAL PICHACAY
51	Performance agreement between the Andean Development Corporation, the Government Autonomous Decentralized Community of Cuenca and EMAC - BGP ENERGY CEM MIXED ECONOMY COMPANY, dated 26 August 2021. File name: Acuerdo_de_Desempeno_Cuenca_CAF_-_V4__22JUL2021_EN
52	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: Medical Control Program of Occupational Health.

53	Written procedures elaborated by the project proponent EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM for addressing stakeholder's grievances and inputs. Available at the project's control room.
54	EMAC-BGP ENERGY COMPAÑÍA DE ECONOMÍA MIXTA CEM: Risk Management Program.
55	BTG Biomass Technology Group BV: https://www.btgworld.com/en/services/diensten-consultancy/

APPENDIX 2: LIST OF RAISED CORRECTIVE ACTION REQUESTS (CAR)

The descriptions of Correction Action Requests (CARs) issued by the Applus+ Certification's verification team as part of the performed verification assessment are summarized in the tables below, which also includes the summary of the actions and responses from the project proponent for successfully addressing and closing the raised CARs.

CAR ID	01	Date: 09-April-2025
Description of CAR		
Sections of the Monitoring Report are not completed under conformance with applicable guidelines for completing the VCS Monitoring Report template (version 4.4).		
Project proponent response		Date: 18-April-2025
As a response to the raised CAR, the Monitoring Report has been corrected under conformance with applicable guidelines for completing the VCS Monitoring Report template (version 4.4).		
VVB assessment		Date: 18-May-2025
As confirmed by the Applus+ Certification's verification team, related amendments/corrections made in the revised version of the Monitoring Report sufficiently address the raised CAR. This CAR is thus closed.		

CAR ID	02	Date: 09-April-2025
Description of CAR		
Section 1.1 of the initial version of the Monitoring Report does not include sufficient information details regarding relatively reduced electricity generation during specific periods within the considered monitoring period. Moreover, selected accumulated monthly values for electricity generation as reported in the emission reduction spreadsheet are under conformance with values as outlined in the monthly electricity generation reports used as cross-check source for values reported in such spreadsheet.		

Project proponent response	Date: 18-April-2025
As a response to the raised CAR, the Monitoring Report has been corrected with information details regarding relatively reduced electricity generation during specific periods within the considered monitoring period.	
VB assessment	Date: 18-May-2025
As confirmed by the Applus+ Certification's verification team, related amendments/corrections made in the revised version of the Monitoring Report sufficiently address the raised CAR. This CAR is thus closed.	

CAR ID	03	Date: 09-April-2025
Description of CAR		
Several information presented along the whole initial version of the Monitoring Report does not apply corrections/clarifications in accordance with the Monitoring Report from the previous monitoring period in the context of the raised findings in the attached project review report (PRR) for the 4 th monitoring period under the VCS.		
Project proponent response		Date: 18-April-2025
As a response to the raised CAR, corrections/clarifications in accordance with the Monitoring Report from the previous 4 th monitoring period, have been applied in the Monitoring Report.		
WB assessment		Date: 18-May-2025
As confirmed by the Applus+ Certification's verification team, related amendments/corrections made in the revised version of the Monitoring Report sufficiently address the raised CAR. This CAR is thus closed.		

CAR ID	04	Date: 09-April-2025
Description of CAR		
Section 2 (Safeguards and stakeholder engagement) of the Monitoring Report is not completed with sufficient conformance with related requirements/guidelines for its completion as per the applicable guidelines for completing the Monitoring Report and/or as per VCS Standard (version 4.7). No information related to the considered monitoring period is included. Moreover, information related to the Grievance Redress Procedure is also not sufficiently presented in the Monitoring Report.		
Project proponent response		Date: 18-April-2025
As a response to the raised CAR, information regarding the Section 2 (Safeguards and stakeholder engagement) have been corrected in the Monitoring Report.		
VB assessment		Date: 18-May-2025
As confirmed by the Applus+ Certification's verification team, related amendments/corrections made in the revised version of the Monitoring Report sufficiently address the raised CAR. This CAR is thus closed.		

CAR ID	05	Date: 09-April-2025
Description of CAR		
Accumulated monthly values for the parameter monitored ex-post "The quantity of electricity used for the operation of the installed facilities in the year y" ($EC_{project,y}$) are not reported in Section 4.2 of the Monitoring Report.		
Project proponent response		Date: 18-April-2025
As a response to the raised CAR, information regarding the parameter monitored ex-post "The quantity of electricity used for the operation of the installed facilities in the year y" ($EC_{project,y}$), has been corrected in the Monitoring Report.		
VB assessment		Date: 18-May-2025
As confirmed by the Applus+ Certification's verification team, related amendments/corrections made in the revised version of the Monitoring Report sufficiently address the raised CAR. This CAR is thus closed.		

CAR ID	06	Date: 09-April-2025
Description of CAR		
The emission reduction spreadsheet contains information in Spanish language (therefore not under conformance with related requirements as per the applicable guidelines for completing the Monitoring Report and/or as per VCS Standard (version 4.7)). Moreover, the emission reduction spreadsheet refers to an ex-ante estimated value for parameter monitored ex-post “<i>Energy Conversion Efficiency of the project equipment</i>” (EE_y) (40%) which is not the value applied during the considered monitoring period.		
Project proponent response		Date: 18-April-2025
As a response to the raised CAR, information regarding the ex-ante estimated value for parameter monitored ex-post “<i>Energy Conversion Efficiency of the project equipment</i>” (EE_y) and also information presented in Spanish language, have been corrected in the Monitoring Report.		
VB assessment		Date: 18-May-2025
As confirmed by the Applus+ Certification’s verification team, related amendments/corrections made in the revised version of the Monitoring Report and also in the ER spreadsheet, sufficiently address the raised CAR. This CAR is thus closed.		

CAR ID	07	Date: 06-June-2025
Description of CAR		
Section 5.2 of the Monitoring Report presents incorrect information regarding the Average technical transmission and distribution losses for providing electricity to source <i>j</i> in year <i>y</i> (TDL_{j,y}), moreover, values of project emissions are not reported in accordance with the emission reductions spreadsheet.		
Project proponent response		Date: 09-June-2025
As a response to the raised CAR, information regarding the Average technical transmission and distribution losses for providing electricity to source <i>j</i> in year <i>y</i> (TDL_{j,y}) and also the values of project emissions, have been corrected in the Monitoring Report and in the ER spreadsheet.		
VB assessment		Date: 09-June-2025

As confirmed by the Applus+ Certification's verification team, related amendments/corrections made in the revised version of the Monitoring Report and also in the ER spreadsheet, sufficiently address the raised CAR. This CAR is thus closed.

CL ID	01	Date: 09-April-2025
Description of CL		
The Monitoring Report does not include sufficient description of relevant operation aspects for each one of the 2 installed engine-generator sets during the considered monitoring period.		
Project proponent response		Date: 18-April-2025
As a response to the raised CAR, information regarding the relevant operation aspects for each one of the 2 installed engine-generator sets has been corrected in the Monitoring Report.		
WB assessment		Date: 18-May-2025
As confirmed by the Applus+ Certification's verification team, related amendments/corrections made in the revised version of the Monitoring Report sufficiently address the raised CL. This CL is thus closed.		