

PERRY JOHNSON REGISTRARS



Carbon Emissions Services, Inc.

GOLD STANDARD VERIFICATION REPORT

GEC ORGANICS

“AVOIDANCE OF METHANE EMISSIONS AT ORGANIC
COMPOST SOIL AMENDMENT FACILITY FROM GEC
ORGANICS”

IN

UNITED STATES OF AMERICA

GOLD STANDARD REF No: 103000000006015
MONITORING PERIOD: 04 Jan 2015 to 31 Dec 2015

REPORT No. GE-2-U-13-L-0397_VE
DATE: JANUARY 25, 2017



Carbon Emissions Services, Inc.

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Approved By:	Organizational unit:
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Client:	Client Ref:
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GS Reg No.: 103000000006015
Monitoring Period: 04/01/2015 to 31/12/2015

Verification Status

- ☐ Corrective Actions Requested
☐ Clarifications Requested
☒ Full Approval and submission for registration

☐ Rejected

In summary, it is PJRCES's opinion that the "Avoidance of Methane Emissions at Organic Compost Soil Amendment Facility from GEC Organics" project in "Castleberry, Alabama" (hereafter called "the project"), as described in the PDD of 09/09/2016, latest Gold Standard Passport and Local Stakeholder Consultation Report, meets all relevant Gold Standard requirements and all relevant host country criteria and correctly applies the baseline and monitoring methodology Revised Approved consolidated baseline methodology ACM0010 - "Revised Consolidated baseline methodology for GHG emission reductions from manure management systems and municipal solid waste", version 7.0. PJRCES thus requests the registration of the project as a Gold Standard CDM project activity.

Report No.:	Date of this revision:	Rev. No.	Key words:
GE-2-U-13-L-0397_VE	25/01/2017	3.0	☐ No distribution without permission from the Client or responsible organizational unit ☐ Limited distribution ☐ Unrestricted distribution
Report title:			
“Avoidance of Methane Emissions at Organic Compost Soil Amendment Facility from GEC Organics” Verification Report			
Work carried out by:			
Scott Jones			
Work Approved by:			
			



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Explain any abbreviations that have been used in the report here

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
GS	Gold Standard
GS-TAC	Gold Standard Technical Advisory Committee
EB	Executive Board
EIA	Environmental Impact Assessment
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
LoA	Letter of Approval
LSCR	Local Stakeholder Consultation Report
MP	Monitoring Plan
NGO	Non-governmental Organization
ODA	Official Development Assistance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change



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1. INTRODUCTION

GEC Organics (hereafter referred as Project Participant, PP) has commissioned Perry Johnson Registrars Carbon Emissions Services, Inc (hereafter referred to as PJRCES) to perform Gold Standard verification of the registered GS project 6015, “Avoidance of Methane Emissions at Organic Compost Soil Amendment Facility from GEC Organics” project in the United States (hereafter called “project”), with regard to relevant requirements for GS project activities.

Verifiers have reviewed implementation of monitoring plan. Monitoring data for the monitoring period covering 04-01-2015 to 31-12-2015 was verified in detail applying the set of requirements, audit practices and principles as required under the latest version of the Validation and Verification Standard (VVS) of the UNFCCC and GS Version 9.0 documents.

This report summarizes the findings and certification statement for this GS VER verification of the above mentioned GS registered project activity.

1.1 OBJECTIVE

Objective of the verification is the independent review and ex-post determination by a Designated Operational Entity (DOE) of the monitored GHG emission reductions that have occurred as well as GS related indicators. It includes,

- a. Ensure that the project activity has been implemented and operated as per the registered PDD and GS passport that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- b. Ensure that the monitoring report and other supporting documents provided are complete and verifiable and in accordance with applicable CDM & GS requirements;
- c. Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology.
- d. Evaluation of the data is recorded and stored as per the monitoring methodology.

1.2 SCOPE

The verification of this registered project is based on the registered PDD, registered GS passport, monitoring report, supporting spread sheets, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.



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Verification is carried out on the basis of the following requirements, applicable for this project activity:

- other relevant rules, including the host country legislation,
- CDM Validation and Verification Standard (VVS),
- GS Version 2.2 documents (GS Toolkit version 2.2, GS Toolkit Annexes A to S version 2.2)
- monitoring plan as given in the registered PDD,
- monitoring plan as given in the registered GS Passport,
- Approved Methodology for Large Scale CDM AMS/ACM/AM “Revised Approved consolidated baseline methodology ACM0010 – “Revised Consolidated baseline methodology for GHG emission reductions from manure management systems and municipal solid waste” (Version 7.0).
- Alternative waste treatment processes (ACM 0022) -Version 1.0.
- GHG emission reductions through multi-site manure collection and treatment in a central plant (ACM 0073) Version 1.0

1.3 DESCRIPTION OF THE PROJECT ACTIVITY

1.3.1 PROJECT CHARACTERISTICS

Particular	Information
Project Title	Avoidance of Methane Emissions at Organic Compost Soil Amendment Facility from GEC Organics
Project Description	The proposed project activity known as “Avoidance of Methane Emissions at Organic Compost Soil Amendment Facility from GEC Organics”, involves aerobic decomposition of chicken manure and green waste (wood shavings) through composting in Castleberry, Alabama in the South-Eastern Region of the United States. The project activity will be undertaken by GEC Organics Corp. (“GECO”), a company that is committed to the development, production and marketing of advanced technologies that address specific environmental challenges, in agriculture.
Project Size	☒ Large Scale ☐ Small Scale
GS Reference No:	6015
Date of GS Registration	28-04-2016
Project Sectoral Scope (according to UNFCCC)	13
Applied Methodology(ies)	AMS/ACM/AM
Monitoring period	04-01-2015 to 31-12-2015



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1.3.2 PROJECT PARTICIPANTS & OTHER INVOLVED PARTIES

Project Parties and project participants

Characteristic	Party	Project Participants
Host Party	United States	GEC Organics
Other Party	n/a	n/a

1.3.3 PROJECT LOCATION

The Project is located in 70 acreage of land at 630 Conecuh County Road, Castleberry Alabama 36432, United States of America (USA). The geo-coordinates of 70 acreage campus (31°19' 23.75'' N / 87°01'22.04'' W). The detail geo-coordinates of the project are mentioned below.

Project Location details

#	Location	Latitude	Longitude
0	Project Area	31° 19' 23.75''N	87° 01' 22.04''W
1	Windrow 1	31° 19' 17.22''N	87° 02' 05.12''W
2	Windrow 2	31° 19' 19.43''N	87° 02' 02.42''W
3	Windrow 3	31° 19' 21.23''N	87° 02' 00.53''W
4	Windrow 4	31° 19' 23.52''N	87° 02' 13.07''W
5	Windrow 5	31°19' 25.31''N	87° 02' 10.44''W

Chicken Manure Site:

The Chicken manure farm is operated by JEB Farms, located at 12773 Mt Zion Rd Ramer, Alabama 36069-5670. The geo-coordinates of the JEB Farms location is (32.048927, -86.152619).

Green Waste Site:

The Green Waste is purchased from Conecuh Timber, located at 1040 Main St, Beatrice, Alabama 36425. The geo-coordinates of the Conecuh Timber location is (31°43'53.0"N 87°12'38.2"W).

1.3.4 TECHNICAL DESCRIPTION OF PROJECT ACTIVITIES

GEC Organics has set up a Greenfield Organic Compost ("OSA 1000") ("OSA – CT1000") Soil Amendment production unit with the capacity of 5,000 TPM of chicken waste and green waste (wood shavings) at Conecuh County Road, Conecuh County, in Castleberry Alabama, United States of America (USA). The technology to be adopted will be aerobic composting by Windrow method. The waste is collected and transported by third party transporters to the composting facility. The waste comprises in the ratio of 90% chicken manure and 10% green waste (wood shavings) by weight of raw



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materials. However, the green waste is not accounted for as part of the emission reductions. The project is a Greenfield project.

The project activity involves aerobic treatment of the received chicken manure and green waste. The compost recovered is around 80% by weight of the waste processed. The compost produced is sold to local farmers as a soil enricher for agricultural activities.

The key parameters for the project are given in table below:

No.	Parameters	Unit
1	Waste reception	Tons
2	Windrow formation(s)	Cubic Feet
3	Temperature of compost in windrow	°F
4	Screen Size	mm
5	Chicken manure to green waste ratio	%
6	Driving distance to and from chicken farm and project location	Miles
7	Fuel Consumption (Diesel)	Gal

1.4 PROJECT IMPLEMENTATION STATUS

During the verification, an on-site visit was carried out on 31 May 2016. Based on this on-site visit and the reviewed project documentation, the verification team confirms that the realized technology, the project equipment, as well as the monitoring and metering equipment, has been implemented and operated as described in the registered PDD. The implementation status and actual operation are described in details as the following:

The project activity involves aerobic treatment of the received chicken manure and green waste.

The entire process of composting of fresh waste on-site was observed to consist of the following important steps:

1. Waste Reception:

The raw material is delivered on an open cement pad for a short time, approximately 2 to 3 days and treated immediately with liquid microbe blend to begin the de-odorization and degradation of the material. The green waste was also received and weighed separately.

2. Mixing of Waste:

The chicken manure was sprayed on the cement pad to prevent excessive nutrient leaching into the local soil and preserve the proper consistency of the material. In



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parallel the green waste was staged in separate piles prior to being combined in windrows with the chicken manure. The green waste was processed to a size which would degrade quickly when the process began.

3. Windrow Formation and Aerobic Decomposition:

The green waste was spread as a first layer on a windrow. The windrow were verified to be approximately 12 feet wide and up to 1000 feet in length. After the green waste (wood shavings) was in place the Chicken manure was distributed over the same area. During this process, the windrows were sprayed with the soil inoculants, a proprietary blend of beneficial microbes and organic microbe growth enhancers to accelerate the process. After the spray was completed, a combine like machine (Scarab) known as a windrow turner blended the raw material mixture and began the heating process for the 30 to 45 day decomposition period. The windrow turner machine mixed and blended each windrow approximately 3 times per week and the microbe formula was added with each turning. The temperature was maintained at a minimum of 140-160°C during this phase. The temperatures was taken in each windrow twice daily during this process, which lasted 30 to 45 days. At the end of this period, the waste materials were blended and moved to the curing pile to cool at the ambient temperature and then sprayed again with the soil inoculants. When the pile reaches ambient temperature, it was sufficiently cooled and put through a sifting machine.

4. Segregation:

The produced compost was fed through a sifting machine for coarse segregation containing a single screen of approx. 6.35 mm particle size. The pieces which were not made small enough to go through the commercial spreader was put back onto the new windrows. The material that went through the sifter machine was staged for packaging.

5. Packing:

The compost prepared was finally packaged for sales. Depending on the customer's needs, the PP had the ability pack the following: (1) 20 or 40 lb. bags, (2) ½ ton (3) bulk sales by truck load based on the size of the truck that the customer provides.

In the project activity, minimum surface water run-off is generated. This run off water goes to retention ponds, including storm water, which are fed from drains. These are constructed around the perimeter of the property's operational areas. After that, it naturally drains as per topography towards the adjacent creek.



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Technical Specifications of major equipment used in the project activity:

Windrow Turner	Scarab Composter Make
Engine	TIER II Caterpillar
Drum & Wheel drives	Hydraulic drive systems
Tunnel	18' X 7'
Drum	32'' overall diameter, 1/2'' drum wall thickness
Cab	Air Conditioned, heated, tilt console with controls electric over hydraulic

The technology used in the project activity is available in the Host country and there is no technology transfer. The technology is environmentally safe and sound.

At the time of the current verification period, the PP was operating two out of the five windrows. However, all five windrows were present during the site visit. Only two windrows were in operation during the verification period because the PP was waiting for the project to be validated and first VERs to be verified for revenue to be generated for raw material purchase and operational costs. The Start date of operation was verified to be 04 January 2015.

There are no major changes at the compost facility since the validation of the project.

There was no request for notification of change or request for approval of change from the project activity as described in the Monitoring Report.

1.5 DETAILS REGARDING THE VERIFICATION TEAM AND TIMELINES OF VERIFICATION

Verification Team

Name	Qualification	Competency			Task Performed			
		Sectoral Scope	Technical Area	Host Country Exp.	DR	SV	RP	Tech. Review
n/a	VT		☒		☒	☒	☒	
Scott Jones	LV	☒	☒		☒	☒		
n/a	TE			☒		☒		
Bilal Anwar	TR	☒	☒					☒
Bilal Anwar	Approver							☒

- 1) VT - Verifier trainee, LV – Lead Verifier, TE – Technical Expert, TR – Technical Reviewer
- 2) DV: Desk review of Monitoring Report and documents, SV: Site Visit, RP: Report Preparation.
- 3) Technical Expert involved has the required Host country knowledge



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Duration of Verification

Particular	Details
Desk review and verification planning	5/1/16 to 5/30/16
Site visit:	5/31/16
Completion of Reporting:	5/31/16 to 01/25/17

2. METHODOLOGY

2.1 VERIFICATION PROCESS

Verification process is based on the guidelines described in the latest of CDM VVS and GS requirements. Verification team performs first a desk review, followed by an on-site visit to review the project realisation and its implementation. Findings will be collected and described in Appendix1. In case of lack of clarity or inconsistencies, related findings (CARS, CLs & FARs) will be raised. The next step is to close out the findings through direct communication with the PP and finally prepare the final verification report. This verification report and other supporting documents then undergo a technical review by the “PJRCES” prior submission to the GS-TAC.

2.2 DOCUMENT REVIEW (DESK REVIEW)

PJRCES has conducted a desk review of all documents initially provided by the client and publicly available documents relevant for the verification. The main reviewed documents are listed below:

- Registered PDD, dated 09 September 2016, Ver 8.0
- Registered GS Passport, dated 09 September 2016, Ver 8.0
- Registered Local Stakeholder Consultation Report, dated 09 September 2016, Ver 7.0
- Approved GS Validation Report, dated 12 September 2016, Ver 6.0
- GECSO GS Monitoring Report, dated 23 January 2017, Ver 3.0
- Applied monitoring methodology(ies)
- Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board and GS;
- Any other information and references relevant to the project activity’s resulting emission reductions (e.g., IPCC reports, data on electricity generation in the national grid or laboratory analysis and national regulations).



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2.3 ON SITE ASSESSMENT

On 31 May 2016, Scott Jones from PJRCES's verification team carried out an on-site visit.

The main tasks covered during the on-site visit include, but are not limited to:

- On-site assessment included an investigation of whether all relevant equipment is installed and works as anticipated;
- Operating staff were interviewed and observed in order to check the risks of inappropriate operation and data collection procedures;
- Information processes for generating, aggregating and reporting the selected monitored parameters were reviewed;
- Duly calibration of all monitoring equipment was checked;
- Monitoring processes, routines and documentations were audited to check their proper application;
- Monitoring data were checked completely;
- Data aggregation trails were checked; and
- Assessment of sustainability matrix monitoring parameters.

List of Persons interviewed

Name, Designation	Affiliation	Interview Topic
Site visit: Peter Ubaldi, GECO	PP Representative	Overall project / Operations / Documentation / Monitoring System
Site visit: James Jackson, Operations Manager	GECO	Operations / Monitoring System / Calibration / Records
Site visit: Thea Kelly, Sales	GECO	Sales
Site visit: J.B Jackson City of Castleberry	Stakeholder	Stakeholder / Mayor
Site visit: Jeremy Brown, Owner JEB Farms	JEB Farms	Owner of Chicken Farm; Baseline Scenario
Site Visit: Chad Johnson, Scarab Operator	GECO	Quality of Employment, including Health and safety awareness.

2.4 REPORTING OF FINDINGS

Findings established during the verification may be:



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Corrective Action Request (CAR) which should be issued, where:

- a. Non-conformities with the monitoring plan or methodology are found in monitoring and;
- b. reporting, or if the evidence provided to prove conformity is insufficient;
- c. Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impair the estimate of emission reductions;
- d. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

Clarification (CL) which should be issued, where:

- a. Information is insufficient or not clear enough to determine whether the applicable CDM and/or GS requirements have been met.

A forward action requests (FAR) should be issued, where:

- a. The actual project monitoring and reporting practices requires attention and /or adjustment for the next consecutive verification period, or
- b. An adjustment of the MP is recommended.

In the context of FARs, risks have been identified, which may endanger the delivery of high quality CERs in the future, i.e., by deviations from standard procedures as defined by the MP. As a consequence, such aspects should receive a special focus during the next consecutive verification. A FAR may originate from lack of data sustaining claimed emission reductions.

3. VERIFICATION FINDINGS

3.1 REMAINING ISSUES, FARs FROM PREVIOUS VALIDATION OR VERIFICATION

By assessing the Validation Report for the project activity and previous verification reports, if applicable, the verification team identified 0 remaining issues, open issues or material discrepancy from the validation phase of the project activity.

Thus, there were no pending issues from the validation phase of the project.

There are 0 previous verifications for this project as this is the 1st periodic verification after registration.

3.2 COMPLIANCE OF THE MONITORING PLAN WITH THE MONITORING METHODOLOGY

The approved baseline and monitoring methodology Revised Approved consolidated baseline methodology ACM0010 - "Revised Consolidated baseline methodology for GHG emission reductions from manure management systems and municipal solid waste" Ver 7.0 has been correctly applied for the proposed project activity. The



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monitoring plan as described in the registered PDD, version 8.0 dated 09 September 2016, which was also correctly incorporated in the Monitoring Report 23 January 2017 is completely in line with the approved monitoring methodology. Neither a revision nor deviation to the monitoring plan has been requested to Gold Standard.

Compliance Question	Verification Activities	Verification Findings
Is the monitoring plan in compliance with the applied methodology?	The verification team reviewed the monitoring plan in the registered PDD and compared it against the requirements of the applied methodology and the tools referred in the methodology.	As required by the monitoring methodology Revised Approved consolidated baseline methodology ACM0010 - "Revised Consolidated baseline methodology for GHG emission reductions from manure management systems and municipal solid waste" Ver 7.0, parameters needed to be monitored for the project are indicated below in the section: Data and parameters to be monitored.
Are there any additional parameters included in the monitoring plan to ensure the accuracy and conservativeness of the emission reduction calculations?	The verification team reviewed the monitoring plan in the registered PDD and compared it against the requirements of the applied methodology and the tools referred in the methodology.	No additional parameters were included.
Are the monitoring equipment as defined in the monitoring plan for each of the parameters in line with the monitoring methodology?	The verification team reviewed the monitoring plan in the registered PDD and compared it against the requirements of the applied methodology and the tools referred in the methodology.	As required by the monitoring methodology Revised Approved consolidated baseline methodology ACM0010 - "Revised Consolidated baseline methodology for GHG emission reductions from manure management systems and municipal solid waste" Ver 7.0, monitoring equipment included an on-site weigh scale and thermometers.



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Is the monitoring and recording frequency of each of the parameters in line with the monitoring methodology?	The verification team reviewed the monitoring plan in the registered PDD and compared it against the requirements of the applied methodology and the tools referred in the methodology.	As required by the monitoring methodology Revised Approved consolidated baseline methodology ACM0010 - "Revised Consolidated baseline methodology for GHG emission reductions from manure management systems and municipal solid waste" Ver 7.0, the monitoring and recording frequency were verified to be in line with the monitoring methodology.
Are the parameters and data relating to the key sustainable development indicators included in the MR?	The verification team reviewed the monitoring plan in the registered PDD along with the monitoring report and compared it against the requirements of the applied methodology and the tools referred in the methodology.	As required by GS, the sustainable development indicators have been included in the Monitoring Report.
Is the accuracy and accuracy check requirement of each of the monitoring equipment in line with monitoring methodology?	The verification team reviewed the monitoring report and monitoring plan in the registered PDD and compared it against the requirements of the applied methodology and the tools referred in the methodology.	As required by the monitoring methodology Revised Approved consolidated baseline methodology ACM0010 - "Revised Consolidated baseline methodology for GHG emission reductions from manure management systems and municipal solid waste" Ver 7.0, accuracy and accuracy checks for monitoring equipment have been identified and addressed through calibration requirements.

PJRCES confirms that appropriate provisions are included for the organization and management structure, monitoring and reporting procedures, measuring instruments, staff training, QA/QC procedures, data management and improvement.

Monitoring processes for the data and parameters, which are required to be monitored by the methodology, are included in the monitoring plan.

The application of the monitoring methodology was found to be appropriate and PJRCES confirms that the monitoring plan is consistent with the requirements of applied methodology



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Revised Approved consolidated baseline methodology ACM0010 - “Revised Consolidated baseline methodology for GHG emission reductions from manure management systems and municipal solid waste” Ver 7.0.

PJRCES verification team assessed the monitoring of each parameter stated in the monitoring plan. All parameters monitored and reported were verified to be in line with the monitoring plan. Monitoring report lists each parameter required by the monitoring plan and the information flow (i.e. data generation, aggregation, recording, calculation and reporting) for these parameters is provided in the monitoring report.

3.3 COMPLIANCE OF MONITORING WITH MONITORING PLAN

The monitoring has been carried out in accordance with the monitoring plan in the registered PDD. All parameters are monitored and reported in line with the registered monitoring plan. Monitoring report lists each of the parameter required by the monitoring plan and the information flow (i.e. data generation, aggregation, recording, calculation and reporting) for all these parameters.

The application of the monitoring plan for the verification period is summarized in this section. The information flow and the values in the monitoring report were verified as follows:

Compliance Question	Verification Activities	Verification Findings
Are all monitoring parameters as required by the monitoring plan covered in the monitoring report for the verification period under consideration?	The verification team reviewed the monitoring plan in the registered PDD and compared it against the required parameters of the applied methodology and the tools referred in the methodology.	PJRCES confirms that parameters required to be monitored include: <i>W_x</i> -Quantity of chicken manure received; <i>Q_y</i> - Quantity of waste composted in composting in year y (wet basis).; <i>T</i> – <i>Temperature of waste being composted in windrows.</i> <i>FC_{i,j,y}</i> – <i>Quantity of fuel consumed.</i> <i>D</i> - Driving distance to and from chicken farm and project location % - Chicken manure to green waste ratio. These parameters are correctly monitored as per the requirements of the applicable methodology and the registered monitoring plan.



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Does the monitoring report cover the monitoring of additional (if any) parameters included in the monitoring plan to ensure the accuracy and conservativeness of the emission reduction calculations?	The verification team reviewed the monitoring plan in the registered PDD and compared it against the required parameters of the applied methodology and the tools referred in the methodology.	PJRCES confirms that no additional parameters are monitored from what was included in the registered monitoring plan.
Is all the monitoring equipment for each parameter implemented and operated in line with the monitoring plan?	The verification team reviewed the monitoring plan in the registered PDD along with the Monitoring Report and compared it against the required parameters of the applied methodology and the tools referred in the methodology.	Monitoring equipment for each parameter have been identified as the following: On-site truck scale is used to monitor the weight of all incoming waste to be composted and all bulk sales for finished compost. Verified the scale is maintained and calibrated in accordance with manufacturer requirements. Scale is calibrated weekly. Commercial composting thermometers are used to monitor the temperature of waste during the composting process. Thermometers were verified on-site and in use as required by the Monitoring Report. Calibration records were verified for each thermometer.
Is the monitoring and recording frequency of each of the parameters in line with the monitoring plan?	The verification team reviewed the monitoring plan in the registered PDD and compared it against the required parameters of the applied methodology and the tools referred in the methodology.	The monitoring data was continuously measured. Windrow information and associated temperatures were recorded daily. Quantity of waste received was tracked per windrow and documented on the F-02 GS Verification Chicken monthly form. Data records are filed electronically each month and kept at least for 2 years after the end of the crediting period or the last issuance of CERs, whichever occurs later. PJRCES confirms that frequency of monitoring data is in line with the



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		monitoring plan.
Is the accuracy and accuracy check requirement of each of the monitoring equipment in line with monitoring plan?	The verification team reviewed the monitoring plan in the registered PDD and compared it against the required parameters of the applied methodology and the tools referred in the methodology.	The calibration of the Truck Scale has been verified to be in full compliance with the monitoring report. Based on the manufacturer's recommendation, the scale is to be calibrated periodically with a known weight. The PP has decided to calibrate the scale weekly. Calibrations were verified to be documented on the F-07 Scale Calibration Form. The valid calibrations confirmed the proper functioning of the scale during the selected monitoring period from 04 January 2015 to 31 December 2015. The calibration of the commercial composting thermometers has been verified to be in full compliance with the monitoring report. Based on the manufacturer's recommendation, the thermometers are to be calibrated periodically with a known weight. The PP has decided to calibrate the thermometers for each daily use. Calibrations were verified to be documented on the F-08 Thermometer Calibration Form. The valid calibrations confirmed the proper functioning of the thermometers during the selected monitoring period from 04 January 2015 to 31 December 2015.
Has PP applied any correction factor due to non-availability or delayed accuracy checks? Is the application of the correction factor in line with the CDM EB's latest guidelines for assessing compliance with calibration frequency	Based on the review of documentation provided, and the site visit, PJRCES evaluated the need for a correction factor.	PJRCES confirmed that no correction factor was applied or required to be applied.



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requirements		
Is the applied correction factor reasonable and conservative?	n/a	n/a
Is complete set of data available for all the parameters?	Based on the review of documentation provided, and the site visit, PJRCES evaluated the data for this monitoring period.	PJRCES confirms that a complete set of data for this monitoring period is available to be monitored and are in accordance with the registered monitoring plan. The electricity monitoring data has been verified to be continuously measured and recorded on a monthly basis. Based on the physical site inspection, the data monitoring and recording were deemed to be in order.
Has the GS specific Key Sustainable Development Indicators specified in the GS passport been monitored as per the requirements established in the MP?	The verification team reviewed the monitoring Report and Monitoring Plan in the registered PDD and compared it against the Key Sustainable Development Indicators specified in the GS Passport.	PJRCES verified the F-09 Monthly Compliance Checklist for each month in 2015. This checklist includes all Key SD Indicators as indicated in the GS passport. PJRCES confirmed that the checklist was completed for all months during 2015. No negative issues were indicated.

PJRCES verification team assessed the monitoring of each parameter stated in the monitoring plan. All parameters monitored and reported were verified to be in line with the monitoring plan. Monitoring report lists each parameter required by the monitoring plan and the information flow (i.e. data generation, aggregation, recording, calculation and reporting) for these parameters is provided in the monitoring report.

Opinion

PJRCES is able to confirm that the actual monitoring is in compliance with the monitoring report and monitoring plan as contained in the GECO GS PDD, Ver 8.0, and all parameters stated in the monitoring report and monitoring plan are monitored and reported appropriately.



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3.4 COMPLETENESS OF MONITORING DATA

The monitoring has been carried out in accordance with the approved monitoring plan in the GECO GS PDD, Ver 8.0 and the Monitoring Report for this verification period. As per the monitoring plan of the registered PDD and the monitoring report, quantity of chicken manure composted shall be monitored for the determination of the baseline emissions.

Data / Parameter	Wx or Wi																																			
Unit	Tonne																																			
Description	Total amount of waste disposed or prevented from disposal in a SWDS in year x or month i																																			
Source of data	Measurement is done by project participants and record will be maintained in log books																																			
Value(s) Applied	1296.79 Chicken Manure 129.68 Green Waste																																			
Measurement methods and procedures	Measurement is done on wet basis for every incoming waste carrying vehicle by an electronic weigh-bridge and recorded electronically and manually																																			
Monitoring frequency	Continuously, aggregated at least annually for year x or monthly for month i																																			
QA/QC procedures	Calibration frequency: In accordance with the Truck Scale Description and Maintenance Procedure. Calibration of Truck Scale is required on a weekly basis. Accuracy Class: As per manufacturer’s specification <table><tr><th>Date</th><th>Scale No.</th><th>Actual Weight (lbs)</th><th>Verified Weight</th><th>Variance</th></tr><tr><td>8-Jan-15</td><td>Cardinal #225</td><td>100</td><td>99.8</td><td>0.2%</td></tr><tr><td>9-Jan-15</td><td>Cardinal #225</td><td>100</td><td>99.9</td><td>0.1%</td></tr><tr><td>21-Jan-15</td><td>Cardinal #225</td><td>100</td><td>100.1</td><td>-0.1%</td></tr><tr><td>30-Jan-15</td><td>Cardinal #225</td><td>100</td><td>100</td><td>0.0%</td></tr><tr><td>27-Feb-15</td><td>Cardinal #225</td><td>100</td><td>99.8</td><td>0.2%</td></tr><tr><td>28-Feb-</td><td>Cardinal</td><td>100</td><td>99.5</td><td>0.5%</td></tr></table>	Date	Scale No.	Actual Weight (lbs)	Verified Weight	Variance	8-Jan-15	Cardinal #225	100	99.8	0.2%	9-Jan-15	Cardinal #225	100	99.9	0.1%	21-Jan-15	Cardinal #225	100	100.1	-0.1%	30-Jan-15	Cardinal #225	100	100	0.0%	27-Feb-15	Cardinal #225	100	99.8	0.2%	28-Feb-	Cardinal	100	99.5	0.5%
Date	Scale No.	Actual Weight (lbs)	Verified Weight	Variance																																
8-Jan-15	Cardinal #225	100	99.8	0.2%																																
9-Jan-15	Cardinal #225	100	99.9	0.1%																																
21-Jan-15	Cardinal #225	100	100.1	-0.1%																																
30-Jan-15	Cardinal #225	100	100	0.0%																																
27-Feb-15	Cardinal #225	100	99.8	0.2%																																
28-Feb-	Cardinal	100	99.5	0.5%																																



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	15	#225			
	6-Mar-15	Cardinal #225	100	99.9	0.1%
Purpose of data	For calculating the baseline emission				
Additional Comment	PJRCES confirmed that - The equipment for monitoring has an appropriate accuracy and has been controlled and calibrated in accordance with the monitoring plan and monitoring report. - The monitoring results have been recorded consistently as per the approved frequency in the monitoring plan and monitoring report. - QA/QC procedures have been applied in accordance with the monitoring plan and monitoring report.				

Data / Parameter	Qy
Data unit	Tonne/yr
Description	Quantity of waste composted in composting in year y (wet basis).
Source of data	Plant records
Value(s) applied:	1,426.47 * 0.8 (conversion rate) = 1,167.11
Measurement methods and procedures	Measurement is done by an electronic weigh-bridge and recorded electronically and manually
Monitoring Frequency	Continuously, aggregated at least annually for year x or monthly for month i
QA/QC procedures	Calibration frequency: In accordance with the Truck Scale Description and Maintenance Procedure. Calibration of Truck Scale is required on a weekly basis. Accuracy Class: As per manufacturer's specification
Purpose of data	For calculating the project emission
Additional Comment	PJRCES confirmed that The equipment for monitoring has an appropriate accuracy and has been controlled and calibrated in accordance with the monitoring plan and monitoring report.



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	- The monitoring results have been recorded consistently as per the approved frequency in the monitoring plan and monitoring report. - QA/QC procedures have been applied in accordance with the monitoring plan and monitoring report.
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Data / Parameter	T
Unit	°C
Description	Average ambient temperature at project site
Source of data	Project proponents
Value(s) applied:	18 to 23
Measurement methods and procedures	Monitor temperature for site location on a monthly basis using NOAA.org
Monitoring frequency	Monthly
QA/QC Procedures	---
Purpose of Data	Calculation of baseline and project emissions
Additional Comment	PJRCES confirmed that The monitoring results have been recorded consistently as per the approved frequency in the monitoring plan and monitoring report.

Data / Parameter	FAer
Unit	Fraction
Description	Fraction of volatile solids directed to aerobic treatment
Source of data	Only project activity is passive windrow
Value(s) applied:	100%
Measurement methods and procedures	On-site verification
Monitoring frequency	Annually
QA/QC Procedures	N/A
Purpose of Data	Calculation of project emissions



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Additional Comment	PJRCES confirmed that The monitoring results have been recorded consistently as per the approved frequency in the monitoring plan and monitoring report.
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Data / Parameter	MS%_j
Unit	Fraction
Description	Fraction of manure handled in system j in the project activity
Source of data	Project proponents
Value(s) applied:	100%
Measurement methods and procedures	N/A
Monitoring frequency	Annually
QA/QC Procedures	N/A
Purpose of Data	N/A
Additional Comment	PJRCES confirmed that The monitoring results have been recorded consistently as per the approved frequency in the monitoring plan and monitoring report.

Data / Parameter	NEXLT_y
Unit	kg N/animal/year
Description	Annual average nitrogen excretion per head of a defined livestock population estimated as described in appendix 2
Source of data	Refer to appendix 2; Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories
Value(s) applied:	0.6
Measurement methods and procedures	N/A
Monitoring frequency	Annually
QA/QC Procedures	N/A



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Purpose of Data	Calculation of baseline emissions
Additional Comment	PJRCES confirmed that The monitoring results have been recorded consistently as per the approved frequency in the monitoring plan and monitoring report.

Data / Parameter	FC_{i,j,y}
Unit	Mass or volume units of fuel
Description	Fuel consumption on-site during year y of the crediting period
Source of data	Onsite measurements
Value(s) applied:	620 Gal of diesel 0 Gal of gasoline
Measurement methods and procedures	No on-site fuel tanks are utilized. Fuel is only stored in the equipment. Facility takes a conservative approach and assumes all fuel purchased during the verification period is consumed.
Monitoring frequency	Continuously
QA/QC Procedures	n/a
Purpose of Data	Calculation of project emissions
Additional Comment	PJRCES confirmed that The monitoring results have been recorded consistently as per the approved frequency in the monitoring plan and monitoring report.

Data / Parameter	RATE_{Compliance,y}
Unit	Fraction
Description	Rate of Compliance with a regulatory requirement to implement the alternative waste treatment t implemented in the project activity.
Source of data	Ex post based on the information (annual report) to be provided by the local environment management authority + email communication if any from ADEM
Value(s) applied:	0%



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Measurement methods and procedures	Fraction is calculated as the number of instances of compliance divided by the number of instances of compliance plus non-compliance. The compliance rate is based on the annual reports of Alabama Environment Management Authority.
Monitoring Frequency	Annual
QA/QC procedures	NA
Purpose of Data	For calculation of Baseline Emissions
Comments	PJRCES confirmed that The monitoring results have been recorded consistently as per the approved frequency in the monitoring plan and monitoring report.

Data / Parameter	NCV_{i,y}
Unit	TJ/Gg
Description	Net calorific value of diesel consumed for compost processing unit.
Source of data	Table 1.2 of IPCC 2006 of Guidelines of national Greenhouse gas Inventories.
Value(s) applied:	43
Measurement methods and procedures	Default value as per IPCC 2006. Link is given below: http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf
Monitoring Frequency	Any future revision of the IPCC Guidelines shall be taken into account
QA/QC Procedures	Measurement will be taken in line with national/international standards
Purpose of Data	For calculation of Project Emissions
Additional Comment	PJRCES confirmed that The monitoring results have been recorded consistently as per the approved frequency in the monitoring plan and monitoring report.



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Data / Parameter	EF_{CO₂,i,y}
Unit	kgCO ₂ /TJ
Description	CO ₂ emission factor for diesel consumed at the MSW processing unit
Source of data	Table 1.4 of IPCC 2006 of guidelines of Greenhouse gas inventories
Value(s) applied:	74800
Measurement methods and procedures	Default value as per IPCC 2006. http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf
Monitoring Frequency	Any future revision of the IPCC Guidelines shall be taken into account
QA/QC Procedures	Measurement will be taken in line with national/international standards
Purpose of Data	For calculation of Project Emissions
Additional Comment	PJRCES confirmed that The monitoring results have been recorded consistently as per the approved frequency in the monitoring plan and monitoring report.

Opinion

PJRCES confirms that the monitoring has been undertaken as per the approved monitoring plan in the GECS GS PDD and Monitoring Report. The monitoring frequency is correct and all necessary equipment are in place. The accuracy of each equipment is as per the applied standards which results into correct and most conservative calculation of emission reductions.

The parameters required by GS requirements

With respect to GS requirements, the project has to comply with the parameters in Sustainable Development Assessment Matrix (see chapter 3.4.1, VVS-GS). The following sustainability indicators are to be monitored as per the registered GS passport:

- Quality of employment
- Quantitative employment and income generation

By checking these parameters required by the monitoring plan and also assessment of background information, according to the Gold Standard requirements, the following two parameters are monitored.



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Data / Parameter:	Continuous Inputs & Grievance Mechanism
Data unit:	Not applicable
Description:	As per GECO's Quality Monitoring Plan: Communication Channel and Corrective Action Process have been established for the Continuous Inputs & Grievance Mechanism. Training of staff employed regarding the maintenance and operations of composting, and emergency and safety procedures and employee benefits
Source of data used:	Records provided from weekly collection and review of any inputs / grievances received by walk-in, email, phone or comment box. Management to review inputs / grievances and determine if a correction / corrective action is necessary.
Means of verification/Comments:	Review of records provided from weekly collection and review of any inputs / grievances received by walk-in, email, phone or comment box. Also, review of corrections and/or corrective actions taken by management to address inputs and/or grievances.
Verification Outcome:	Reviewed mechanism indicated in the Quality Monitoring Plan. Observed Comment box located on the exterior of the office building was installed. No inputs or grievances have been communicated at the time of the site visit.

Data / Parameter:	Quality of employment
Data unit:	Not applicable
Description:	As per GECO's Quality Monitoring Plan: Training of staff employed regarding the maintenance and operations of composting, and emergency and safety procedures and employee benefits
Source of data used:	Monitoring training records, safety training manuals and records of social security/health care provided to employees.
Means of verification/Comments:	Relevant trainings including the technical training safe Operation, Emergency procedure, and Health and safety statement have been specified. Relevant training records have been obtained and checked by the verification team. The interview of relevant staff and stakeholders during the site visit also confirmed the fact. Those trainings are deemed as satisfactory as they were carried out as per stated in the management and operational procedure manual; The parameter has been monitored in line with the Gold Standard version 2.2 and the registered GS passport.
Verification Outcome:	Verified training records for all employees on-site. Training for this monitoring period was conducted on 1/15/15. Training included environmental, health and safety training, including use of PPE. Verified that all employees were wearing appropriate PPE while onsite. During interviews with employees, it was clear that they were aware of the associated health and safety risks and had proper training.



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Data / Parameter:	Quantitative employment and income generation
Data unit:	Not applicable
Description:	Number of jobs created in the operations of the composting project and their salary levels.
Source of data used:	HR records and Pay reports.
Means of verification/Comments:	• Salary payroll indicated that all taxes have been paid in accordance with local laws. • Detailed information on the staff employed by the operator is described in the management and operational procedure manual, such as Organization, Job Description, Personnel Qualification and Training Qualification • PJRCES verified the staff list of all permanent employees for the composting project, the staff list and salary payroll have been reviewed by the assessment team. The interview of relevant staff on site also confirmed the fact. • All employees are covered by labor insurance and health insurance statement. The working environment and working conditions were in a positive circumstance. The parameter has been monitored in line with the Gold Standard version 2.2 and the registered GS passport.
Verification Outcome:	Verified employees on-site were actually employed by GECO. Verified employment records, including social security cards on file and payroll records. Employees included: James Jackson, Chad Johnson, Laurie Mixon and Lester Rabon.

It was evident that the project contributes to enhance quality and quantitative of employment and contributes to better income.

It can also be confirmed that there were no occurrences with negative impact on sustainable development of the project.

Opinion: In accordance with requirements §272 – §275 of VVS version 2.2, along with the onsite visit, it is PJRCES' opinion that the monitoring has been carried out in accordance with the registered GECO GS PDD, Ver 8.0, GECO GS Monitoring Report, Ver 3.0 and the complete set of data was monitored by the client in this monitoring period.



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3.5 ASSESSMENT OF DATA AND CALCULATION OF GHG EMISSION REDUCTIONS

3.5.5 DATA FLOW

All incoming waste is received as either Chicken manure or green waste. Both the chicken manure and green waste are weighed on the on-site truck scale. Weights are documented on the F-02 GS Verification Chicken form and the F-03 GS Verification Wood form. The chicken manure and green waste (wood) are then mixed in a windrow at a ratio of 90% chicken manure and 10% green waste. The windrows are then sprayed with a proprietary soil inoculant. The windrow turner turns the windrow, approximately three times per week, adding the soil inoculant each time.

The windrow temperature was verified to have been maintained between 140 – 160 degrees F. Temperatures were taken at each windrow twice per week, with a thermometer spacing of 150 feet along the windrow. Temperature readings and windrow information were documented on the F-05 Windrow Log Information form.

Once the composting period was complete, the produced compost was fed through a sifting machine. PJRCES verified the screen size of the sifter to be 6.35 mm. Depending on customer demand, the compost was prepared accordingly. The amount of compost sold was documented on the F-04 Compost Sold Form.

PJRCES confirms that a complete set of data for the specified monitoring period is available.

As per the monitoring plan and internal procedures, the monitoring data collected are archived electronically and would be kept at least for 2 years after the end of the crediting period or the last issuance of CERs, whichever occurs later.

Opinion: The assessment team confirms that:

- A complete set of data required for the determination of emission reduction in this monitoring period were available.
- The most conservative assumption theoretically possible has been adopted for the data monitored in compliance with the registered monitoring plan in the GECO GS PDD, Ver 8.0.
- The reported data have been cross checked with the data of sales receipts.

3.5.6 CALCULATION OF EMISSION REDUCTIONS:

3.5.7 CALCULATION OF BASELINE EMISSIONS OR BASELINE NET GHG REMOVALS BY SINKS

The amount of methane that is generated each year (BECH_4 , SWDS_y tCO_2e) is calculated for each year with the recommended multi-phase model, the First Order Decay (FOD) model.



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As per equation:

$$BE_{\text{Manure},y} = BE_{\text{CH}_4,y} + BE_{\text{N}_2\text{O},y} + BE_{\text{elec/heat},y} \quad (2)$$

Where:

$BE_{\text{manure},y}$ = Baseline emissions in year y (tCO_2/yr)

$BE_{\text{CH}_4,y}$ = Baseline CH_4 emissions in year y (tCO_2/yr)

$BE_{\text{N}_2\text{O},y}$ = Baseline N_2O emissions in year y (tCO_2/yr)

$BE_{\text{elec/heat},y}$ = Baseline CO_2 emissions from electricity and/or heat used in the baseline (tCO_2/yr)

3.5.7.1 BASELINE CH4 EMISSION CALCULATIONS FOR MANURE TREATMENT

$$BE_{\text{CH}_4} = \text{GWP}_{\text{CH}_4} * D_{\text{CH}_4} * \sum (\text{MCF}_j * B_{0,\text{LT}} * \text{VS}_{\text{excreted}} * \text{MS}\%_{\text{Bl},j})$$

Parameter	Unit	Value
GWP - CH4	$\text{tCO}_2\text{e}/\text{tCH}_4$	25
Density - CH4	t/m^3	0.00067
Bo	$\text{M}^3\text{CH}_4/\text{kg-dm}$	0.36
VS% of TS	%	73.0%

Management Systems	MS%	MCF
Dry Lot	100%	1.5%
Solid Storage		4.0%
Spreading		0.5%

$BE_{\text{CH}_4} = \text{GWP}_{\text{CH}_4} * D_{\text{CH}_4} * \sum (\text{MCF}_j * B_{0,\text{LT}} * \text{VS}_{\text{excreted}} * \text{MS}\%_{\text{Bl},j})$				
	Dry Lot	Solid Storage	Spreading	
t CO2e	80.49	211.61	25.46	317.55
Baseline Manure Treatment			TAP	Verification Period
Emissions from (A): Chicken Manure CH4			tCO2e	317

3.5.7.2 BASELINE N2O EMISSION CALCULATIONS FOR MANURE TREATMENT

$$BE_{\text{CH}_4} = \text{GWP}_{\text{N}_2\text{O}} * \text{CF}_{\text{N}_2\text{O}-\text{N},\text{N}} * 1/1000 (E_{\text{N}_2\text{O},\text{D},y} + E_{\text{N}_2\text{O},\text{ID},y})$$

Part a =		$\text{GWP}_{\text{N}_2\text{O}} * \text{CF}_{\text{N}_2\text{O}-\text{N},\text{N}} * 1/1000$		
	Dry Lot	Solid Storage	Spreading	
Part a	0.47	0.47	0.47	
$E_{\text{N}_2\text{O},\text{D},y} =$		$\sum \text{EF}_{\text{N}_2\text{O},\text{D},j} * W_{\text{LT},y} * \% \text{NEX} * \text{MS}\%_{\text{Bl},j}$		
Part b	3112.30	3050.05	0	
t CO2e	3112.0	3050.05	0	6,162.35



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$EN_{2O,ID,y} =$		$\sum (EF_4 + EF_5) * F_{gasMS,j,LT} * W_{LT,y} * \%NEX * MS\%_{Bl,j}$		
Part c	1361.63	1361.63	1361.63	
t CO₂e	1361.63	1361.63	1361.63	4,084.89

Parameter	Unit	Value
GWP_{N₂O}	tCO₂e/tN₂O	298
CF_{N₂O-N,N}	--	1.57143
EF_{N₂O,D,j} Dry Lot	kg N ₂ O-N/year	0.02
EF_{N₂O,D,j} Solid Storage	kg N ₂ O-N/year	0.02
EF_{N₂O,D,j} Spreading	kg N ₂ O-N/year	0.0
W_{LT,y}	tons	1296.79
%NEX	%	12.0%
MS%_{Bl,j}	%	100%
F_{gasMS,j,LT}	(fraction)	0.50

Baseline	Dry Lot	Solid Storage	Spreading	Total
BE_{N₂O,y} =	2095.08	2065.93	637.63	4,798

3.5.7.3 BASELINE CH₄ EMISSION CALCULATIONS FOR MANURE TRANSPORTATION

GECO has taken a conservative approach and assumes no emissions due to manure transportation as part of the baseline calculations.

3.5.7.4 TOTAL BASELINE EMISSIONS

Description		Total
Avoided chicken manure, processed for composting	TPA	1297
Emissions from (A): Broilers CH ₄	tCO ₂ e	317
Emissions from (B): Broilers N ₂ O	tCO ₂ e	4798
Emissions from Manure Transportation	tCO ₂ e	0
Total baseline methane emissions (MBy)	tCO ₂ e	5115
Verification Period Baseline emissions (BEy)	tCO₂e	5,115



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3.5.7.5 CALCULATION OF PROJECT EMISSIONS OR ACTUAL NET GHG REMOVALS BY SINKS

For the project activity, project emissions are as follows:

$$PE_y = PE_{AD,y} + PE_{Aer,y} + PE_{Comp,y} + PE_{N_2O,y} + PE_{EC/FC,y} + PE_{Tran,y} + PE_{Storage,y} \quad (12)$$

Where:

PE_y = Project emissions in year y

$PE_{AD,y}$ = Project emissions associated with the anaerobic digester/ co-digestion in year y (tCO₂e/yr)

$PE_{Aer,y}$ = Project CH₄ emissions from aerobic AWMS treatment (tCO₂e/yr)

$PE_{Comp,y}$ = Project CH₄ emissions from composting/ co-composting (tCO₂e/yr)

$PE_{N_2O,y}$ = Project N₂O emissions in year y (t CO₂/yr)

$PE_{EC/FC,y}$ = Project emissions from electricity consumption and fossil fuel combustion (tCO₂e/yr)

= Project emissions from manure transportation in the year y (tCO₂/yr)

$PE_{Tran,y}$

$PE_{Storage,y}$ = Project emissions from manure storage (tCO₂e,yr)

3.5.7.6 PROJECT EMISSIONS ASSOCIATED WITH THE ANAEROBIC DIGESTER IN YEAR Y (PEAD,Y)

The project activity does not involve an anaerobic digester.

3.5.7.7 PROJECT CH₄ EMISSIONS FROM AEROBIC AWMS TREATMENT (PEAER, Y)

The project activity does not involve aerobic AWMS treatment.

3.5.7.8 CH₄ PROJECT EMISSIONS ASSOCIATED WITH THE COMPOSTING IN THE YEAR Y (PECOMP,Y)

$$PE_{CH_4} = GWP_{CH_4} * D_{CH_4} * MCF * \sum (Q_{LT,y} * \%VS * B_{0,LT})$$

Parameter	Unit	Value
GWP - CH ₄	tCO ₂ e/tCH ₄	25
Density - CH ₄	t/m ³	0.00067
Bo	m ³ CH ₄ /kg -dm	0.36
VS% of TS	%	73.0%
Q _{LT,y}	tons	1296.79
Management Systems	MS%	MCF
Compost	100%	0.005
CH ₄ PE from Composting		
t CO ₂ e		6.71
PE _{CH₄,y} =		7.0



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3.5.7.9 PROJECT N₂O EMISSIONS FROM COMPOSTING IN YEAR Y (PEN_{2O,y})

$$PE_{N2O,y} = GWP_{N2O} * CF_{N2O-N,N} * (EN_{2O,D,y} + EN_{2O,ID,y})$$

Part a = GWP_{N2O} * CF_{N2O-N,N}	
Part a	0.47
EN_{2O,D,y} = EF_{N2O,D,j} * ∑ (Q_{LT,y} * N)	
EF _{N2O,D,j}	0.01
Part b	155614.80
t CO₂e	1556.15
EN_{2O,ID,y} = EF_{N2O,ID,j} * ∑ F_{gasMS,j,LT} * ∑ (Q_{LT,y} * N)	
EF _{N2O,ID,j}	0.01
F _{gasMS,j,LT}	0.50
Part b	155614.80
t CO₂e	778.07
BE_{N2O,y} =	1093.08
BE_{N2O,y} w/ Inoculant (25%)	274

3.5.7.10 PROJECT EMISSIONS FROM USE OF HEAT AND/OR ELECTRICITY (PE_{ELEC/HEAT})

The project activity doesn't consume electricity for composting activity hence **PE_{elec}** is zero.

3.5.7.11 PROJECT EMISSIONS FROM FOSSIL FUEL (DIESEL) CONSUMPTION

The project activity consists of fossil fuel consumption for preparation of compost. The diesel and gasoline are consumed in the project. Hence, the fossil fuel consumption for the entire project site is measured together using fossil fuel purchase invoices.

Project emissions from fossil fuel (Diesel) consumption associated with composting (PE _{FC,y})			
Parameter	Description	Unit	Ver Period
FC _{diesel, onsite, y (Gal)}	Fuel consumption on site per year (diesel)	Gal	620
FC _{diesel, onsite, y (L)}	Fuel consumption on site per year (diesel)	Litres	2346.95
ρ _{diesel}	Density of Diesel	Kg/L	0.85
FC _{diesel, onsite, y (t)}	Fuel consumption on site per year (diesel)	Kg	1994.9
NCV _{diesel, onsite}	Net calorific value of fuel (diesel)	TJ / Gg	43.33
EF _{CO₂, diesel}	CO ₂ emission factor for fuel (diesel)	Kg/TJ	74100
PE_{CO₂, diesel, onsite, y}	Emissions from on-site fuel consumption per year	tCO₂	7.0



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3.5.7.12 PROJECT EMISSIONS FROM MANURE TRANSPORTATION (PETRAN)

The project emissions from manure transportation from collection points to the central treatment plant shall be calculated according to the Methodological tool “Project and leakage emissions from transportation of freight”.

Activity #	EF _{CO2,f} (g CO ₂ / t km)	Freight Type	FR _{f,m} (t)	Origin	Destination	D _{f,m} (km)	Vehicle Class
1	129	Chicken Manure	1296.79	JEB Farms	Project facility	133	Heavy
2	129	Green Waste	314.02	Conecuh Timber	Project facility	44	Heavy

$$PE_{TR,m} = \sum D_{f,m} * FR_{f,m} * EF_{CO2,f} * 10^{-6}$$

PE Transportation			
PETR,m	Chicken Manure	Green Waste	Total
Part a	22.25	0.74	
t CO ₂ e	22.25	0.74	23

3.5.7.13 PROJECT EMISSIONS FROM MANURE STORAGE (PE_{STORAGE,y})

The project activity does not involve manure storage.

3.5.7.14 TOTAL PROJECT EMISSIONS

Project Emissions	TPA	Verification Period
Emissions from (A): Fuel	tCO ₂ e	7
Emissions from (B): PE Broilers	tCO ₂ e	7
Emissions from (B): Broilers N ₂ O	tCO ₂ e	274
Emissions from (D): Transportation	tCO ₂ e	23
Total Project methane emissions	tCO ₂ e	311
Project emissions (PE_y)	tCO₂e	311



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3.5.7.15 CALCULATION OF LEAKAGE

As there is no production of RDF in the project activity hence ex-ante estimation of leakage emission is considered as zero for 10 years.

Hence, $LE_{ENDUSE,RDF_SB,y} = 0$

3.5.7.16 CALCULATION OF EMISSION SAVINGS FROM ELIMINATION OF SYNTHETIC FERTILIZERS

Since the project creates USDA certified organic compost, no synthetic fertilizers will be used in conjunction with the compost. Therefore, the use of the organic compost also reduces the carbon emissions for synthetic fertilizers that would have been used on the agricultural land.

Baseline emission calculations for elimination of synthetic fertilizer:

$BE_{syn} = 0.53 \text{ tCO}_2\text{e} / \text{acre}$

The project activity compost is applied at a rate of $5.91 \text{ tCO}_2\text{e} / \text{acre}$.

$= 5.91 \text{ tCO}_2\text{e per acre} / (0.53 \text{ tCO}_2\text{e per acre} + 5.91 \text{ tCO}_2\text{e per acre})$

$= 8\% \text{ per tCO}_2\text{e}$

Additional amount saved for not using synthetic fertilizer is 8% per tCO₂e for the project activity compost.

Item	Baseline emissions or baseline net GHG removals by sinks (t CO ₂ e)	Project emissions or actual net GHG removals by sinks (t CO ₂ e)	Leakage (t CO ₂ e)	Emission savings from elimination of synthetic fertilizers (t CO ₂ e)	GHG emission reductions or net GHG removals by sinks (t CO ₂ e) achieved in the monitoring period
					Total amount
Total	5,115	-311	0.0	548	5,352



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3.5.7.17 COMPARISON OF ACTUAL EMISSION REDUCTIONS OR NET GHG REMOVALS BY SINKS WITH ESTIMATES IN REGISTERED PDD

Item	Values estimated in ex ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO ₂ e)	8,212	5,352

3.5.7.18 REMARKS ON DIFFERENCE FROM ESTIMATED VALUE IN REGISTERED PDD

The difference between the actual achieved emission reductions and the values indicated in the PDD are due to the following issues:

The future estimated weight volumes to be processed on-site are determined to be at a ratio of 90% chicken manure and 10% green waste. The original calculations in the PDD took the sum of the waste received (chicken manure and green waste) and calculated the emission reductions for the year 2015 this way, instead of using the actual values used for green waste. 100% of the chicken manure was used for composting. However, only a portion of the green waste was used, the amount equivalent to 90% of the overall waste to be composted. Furthermore, more conservative values for EF_{N₂O} were used, which reduced the overall emission reductions.



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3.5.8 DEVIATION IN GHG EMISSION REDUCTION (COMPARISON BETWEEN ESTIMATED AND ACTUAL EMISSION REDUCTIONS)

According to the “Project Standard”, the MR contains the comparison of the actual emission reduction claimed in the monitoring period with the annual estimate in the registered PDD.

The estimation of emission reductions for the monitoring period from 04 January 2015 to 31 December 2015 used the same calculation for years 1 through 10. However, since year 1 in the PDD was based on actual values, the total value of chicken manure and green waste received as used and calculated using the ratio of 90% chicken manure and 10% green waste. Furthermore, the PP used the entire amount of green waste received in the calculation for the total amount of waste composted, instead of calculating the amount actually used. Since the green waste is not factored into baseline or project emissions, this was overlooked by the PP. The estimated emission reductions calculated in the registered PDD was 8,212 tCO₂e.

The actual emission reduction has been verified as 5,352 tCO₂e for the same period. The actual emission reduction are lower (35%) than average estimated ER (8,212 tCO₂e) of this period. And this variation of 35 % will definitely not impact the additionality of the project. Only an increase of emission reductions could impact the additionality of the project.

Taking into consideration these factors, it could be concluded that the actual ER verified (while lower than that estimated ex-ante in the registered PDD) is well within the variation expected due to practical operation of the compost facility. PJRCES also deemed that there is no other information provided in the MR that is different from that stated in the PDD and has caused an increase in estimated of the ER in the current monitoring period or is highly likely to increase the ER estimates in the future monitoring period.

3.6 QUALITY OF EVIDENCE TO DETERMINE EMISSION REDUCTIONS

PJRCES verified the quality of the evidence provided. All raw materials received were immediately weighed upon receipt. Weights were documented on weigh tickets and verified against customer’s weights on their own scales. All shipment weights were found to be accurate and recorded appropriately. PJRCES verified all shipment weights for the verification period.

Composting processes were verified by PJRCES. PJRCES reviewed all calibration records for the commercial composting thermometers while on-site. Through the verification process, PP demonstrated calibration process to the verification team. Thermometers were verified as accurate and without damage. PJRCES verified all Windrow Log forms to ensure proper composting was conducted.

PJRCES also verified finished compost and its particle size through the sifting process. PJRCES confirmed that the sifting screen was 6.35 mm. Compost sold was verified through invoices reviewed on-site. All invoices were reviewed by PJRCES.



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3.7 MANAGEMENT SYSTEM AND QUALITY ASSURANCE

The management system for the project is in place. The management of the project activity has implemented a quality management system to monitor the performance and ability of the project to deliver the emission reductions. Monitoring Manual is established with detailed responsibility allocated. In the manual, the organization structure with the responsibilities, personnel competencies, monitoring procedure and monitoring management have been properly identified and put in place. By interviewing with some staff, site visit and records check, it can be confirmed that the monitoring management system is implemented following the Monitoring Manual and training records to assure the proper implementation were checked.

Opinion: PJRCES confirms that the responsibilities and authorities in the management and operational system for monitoring and reporting are in accordance with the responsibilities and authorities stated in monitoring plan in the GECO GS PDD, Ver 8.0. **Error! Reference source not found..**

4. VERIFICATION & CERTIFICATION STATEMENT

Perry Johnson Registrars Carbon Emissions Services has performed the GS-CER-verification of the project Avoidance of Methane Emissions at Organic Compost Soil Amendment Facility from GEC Organics for the period starting from 04-01-2015 to 31-12-2015, with regards to relevant requirements of GS project activity.

Project participant is responsible for collection of data and reporting the GHG emission reductions on the basis set out within the project's monitoring plan in the registered PDD dated 09 September 2016, passport dated 09 September 2016 and the applied methodology Revised Approved consolidated baseline methodology ACM0010 - "Revised Consolidated baseline methodology for GHG emission reductions from manure management systems and municipal solid waste", version 7.0.

PJRCES's responsibility is to express an independent verification/certification statement for the emission reductions reported for the project for the monitoring period 04-01-2015 to 31-12-2015.

PJRCES's verification approach basically included the desk review of the project design (as stated in the registered CDM PDD ver 08 & GS-Passport, ver 08); Monitoring Report, Ver 3.0; approved baseline and monitoring methodology; on-site verification of the reported emission reductions and resolution of outstanding issues and issuance of final verification report. PJRCES also requested for the evidences, relevant information and explanations that were considered necessary to give a reasonable assurance of the reported emission reductions during the period from 04-01-2015 to 31-12-2015.

In PJRCES's opinion, the GHG emission reductions for Avoidance of Methane Emissions at Organic Compost Soil Amendment Facility from GEC Organics in the United States for the period from 04-01-2015 to 31-12-2015 are fairly stated in the Monitoring Report, ver 3.0 dated 23-01-2017.



Carbon Emissions Services, Inc.

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GHG emissions were calculated correctly on the basis of approved baseline and monitoring methodology and the monitoring plan as included in the registered GECO GS PDD, Ver 08, dated 09 September 2016.

Based on the information provided, verified and evaluated, PJRCES is able to certify the following statement:

Reporting period:	04-01-2015 to 31-12-2015
Baseline emissions:	5,115 tCO ₂ e
Project emissions:	-311 tCO ₂ e
Leakage emission:	0 tCO ₂ e
Synthetic emission savings:	548 tCO ₂ e
Emission reductions:	5,352 tCO ₂ e
Total	5,352 tCO₂e

Signature

Lead Verifier

Scott Jones, 25/01/2017

Signature

Final Approval

Bilal Anwar, 25/01/2017



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5. REFERENCES

1	Registered PDD, dated 09 September 2016, Ver 8.0
2	Registered GS Passport, dated 12 September 2016, Ver 8.
3	Registered Local Stakeholder Consultation Report, dated 09 September 2016, Ver 7.0
4	Approved GS Validation Report, dated 09 September 2016, Ver 6.0
5	Applied monitoring methodology(ies)
6	Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board and GS;
7	GECCO_VER Calcs_2015_v3
8	GECCO Project Diagram – GS, Ver 1.0
9	GS Version 2.2 documents (GS Toolkit version 2.2, GS Toolkit Annexes A to S version 2.2)
10	GECCO GS Monitoring Report, Ver 03, dated 23 January 2017
11	Approved Methodology for Large Scale CDM AMS/ACM/AM “Revised Approved consolidated baseline methodology ACM0010 – “Revised Consolidated baseline methodology for GHG emission reductions from manure management systems and municipal solid waste” (Version 7.0).
12	Quality Monitoring Plan_v 03, dated 02 April 2016
13	GECCO Fuel Consumption for 2015, dated 29 December 2015
14	GECCO Temperature Calibration Procedure, dated December 30, 2014
15	Monthly Compliance Inspection Logs, January through December 2015.
16	F-02 GS Verification Log – Chicken_2015
17	F-03 GS Verification Log – Wood_2015
18	F-04 Compost Sold_2015
19	F-05 Windrow Log_Weeks for April and May
20	F-06 Fuel Consumption Log_2015
21	F-07 Scale Calibration Log_2015
22	F-08 Thermometer Calibration Log_2015
23	F-09 Monthly Compliance Inspection Logs, Jan through Dec 2015
24	F-10 Ambient Air Temperature Log_2015
25	F-11 Group Training – EHS_1-15-15
26	Payroll Journal_2015
27	Turner Scale_2015 Invoice
28	IPCC 2006, chapter 10, volume 4
29	IPCC 2006, chapter 11, volume 4
30	ICF Incorporated, CH ₄ and N ₂ O Emissions from Livestock Manure, 2001
31	ASAE D384.2 MAR2005
32	Blonk Consultants, LCI data for the calculation tool Feedprint for greenhouse gas emissions of feed production and utilization, November 2012



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APPENDIX 1: RESOLUTION OF ISSUES

<i>Draft report clarification requests, corrective action requests and forward action request</i>	<i>Reference</i>	<i>Summary of project owner response</i>	<i>Verification team conclusion</i>
CAR 01: The verification team observed green waste being tarped and stored on cement pad. The original calculations included all green waste received. However, this does not accurately depict what is occurring on-site since not all green waste received was used.	GECO_VER Calcs_2015, Ver 1	As part of the original development of the project, green waste was included in the emission reductions. However, for conservativeness, green waste was removed from the emission reduction portion of the project. Green waste is still used for compost best practices. Although green waste is not included in the emission reductions, the amount of green waste used in the composting process impacts the total volume and weight of the overall weight composted. Therefore, GECO has updated the GECO GS Monitoring Report, Ver 03 formulas to include only the amount of green waste used. However, emissions for the total amount of green waste transported over a given verification period will still be included for that verification period. The format of both the GECO_VER Calcs spreadsheet and the format of the Monitoring Report	PJRCES verified the GECO_VER Calcs_2015, Ver 2. The actual 2015 green waste weights were applied correctly along with the transportation emissions for delivery of green waste. Updated the Monitoring Report to include actual green waste used in the composting process for the verification period.



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		template have been revised to ensure this issue does not recur.	
CR 01: The Monitoring Report, GECO GS Monitoring Report, Ver 01 does not include information pertaining to the location where the green waste is purchased.	GECO GS Monitoring Report, Ver 01	As the green waste was removed from the baseline emission reductions, this was overlooked. GECO understand that the overall amount of waste composted and the transportation of the green waste is considered in the project though. GECO has added the green waste supplier information, including location and distance, to the monitoring report.	PJRCES verified GECO GS Monitoring Report, Ver 02 to confirm the changes were made appropriately.
CR 02: It is unclear how the total weight volumes in the GECO_VER Calcs_2015, Ver 1 were determined. The actual numbers entered into the spreadsheet are correct. However, the total weight of the waste is summed and then the ratio of 90% chicken manure and 10% green waste was applied.	GECO_VER Calcs_2015, Ver 1	The Waste weights entered for chicken manure and green waste were entered correctly. However, in the process of estimating years 2-10, an overall weight was applied. From there, the 90/10 ratio was applied. As year 1 (2015) was based on actual data, this estimation method should not have applied for year 1. The calculations have been corrected to reflect the actual weights for chicken manure and green waste.	PJRCES verified the GECO_VER Calcs_2015, Ver 2. The actual 2015 weights were applied correctly.