

VERIFICATION REPORT

Kamiranga Ceramic Fuel Switching Project



Document Prepared by Earthood Services Private Limited

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Report Title	Verification Report – Kamiranga Ceramic Fuel Switching Project
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Summary:

Brief summary of the project activity

The project activity involves fuel switching from native firewood from Amazon biome to sawdust, açai pits, Brazilian nut husks, wood residue and wood from forest management. Thus, GHG emission reduction is achieved.

The project applies the CDM approved methodology AMS-I.E – Switch from Non-Renewable Biomass for Thermal Applications by the User – version 01.0.

Scope of verification

Sustainable Carbon – Projetos Ambientais Ltda. has contracted ESPL to conduct the 7th verification of the project “Kamiranga Ceramic Fuel Switching Project” for the period from 01/04/2016 to 31/12/2017 (both days included) for VCS and 01/05/2016 to 31/12/2017 (both days included) for SOCIALCARBON.

The scope of the verification is to establish/verify that:

- the latest available MR template was used and correctly filled up;
- the project activity has been implemented and operated as per the registered PD and that all physical features (technology, project equipment and monitoring and metering equipment) of the project are in place;
- the monitoring report and other supporting documents provided are complete in accordance with the latest applicable version of the completeness checklist for requests for issuance of VCUs, verifiable, and in accordance with applicable VCS Version 3 requirements;
- the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan, the approved methodology including applicable tool(s) and/or, where applicable, the approved standardized baseline;
- the data are recorded and stored as per the monitoring methodology including applicable tool(s) and, where applicable, the standardized baseline.

In addition, ESPL has also been contracted to conduct the verification of SOCIALCARBON Standard of the project activity at Point 6, with regard to its relevant requirements, for the period between 01/05/2016 to 31/12/2017 (both days included).

Conclusion

ESPL has performed the verification of the VCS project “Kamiranga Ceramic Fuel Switching Project”, with VCS Project ID 197, for the monitoring period from 01/04/2016 to 31/12/2017 (both days included) for VCS and 01/05/2016 to 31/12/2017 (both days included) for SOCIALCARBON.

During the present VCS verification, findings were raised and successfully closed. For the SOCIALCARBON verification, also findings were raised and successfully closed.

The verification team has confirmed the implementation of the project as per description in the VCS-PD, the monitoring plan of the PD and the application of the monitoring methodology (AMS-I.E – version 01.0). In addition, it was confirmed that the monitoring system is in place and the emission reductions are calculated without material misstatements.

The verified emission reductions amount to **70,646 tCO₂e** in the above mentioned monitoring period.

In addition, the verifier confirms that the project meets all relevant requirements established by the SOCIALCARBON Standard and its report identifies the social economic and environmental impacts of the project activity and presents the results obtained by meeting the “Brazilian Red Ceramic factories Indicators” – version 1.1.

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1 INTRODUCTION

1.1 Objective

Sustainable Carbon – Projetos Ambientais Ltda. has contracted ESPL to conduct the verification of the 7th verification of the project “Kamiranga Ceramic Fuel Switching Project” for the period from 01/04/2016 to 31/12/2017 (both days included) according to the requirements of the Verified Carbon Standard Version 3 and from the period between 01/05/2016 to 31/12/2017 (both days included) to conduct the verification from point SIX of SOCIALCARBON.

1.2 Scope and Criteria

The scope of the verification is to establish/verify that:

- the project activity has been implemented and operated as per the registered PD and that all physical features (technology, project equipment and monitoring) of the project are in place;
- the monitoring report and other supporting documents provided are complete in accordance with the latest applicable version of the completeness checklist for requests for issuance of VCUs, verifiable, and in accordance with applicable VCS Version 3 requirements;
- the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan, the approved methodology including applicable tool(s) and/or, where applicable, the approved standardized baseline;
- the data are recorded and stored as per the monitoring methodology including applicable tool(s) and, where applicable, the standardized baseline.

The verification of this monitoring period is based on the registered VCS-PD, MR and GHG emission reduction calculation spreadsheet and supporting documents.

In addition, the scope of the SOCIALCARBON verification is to establish/verify that:

- to have an independent third party assessment in order to evaluate the accuracy and consistency of the SOCIALCARBON Standard – version 5.0 and “Brazilian Red Ceramic factories Indicators” – version 1.1, for this specific point in time – Point Six; and
- to verify the consistency of these Indicators and their evolution since last evaluation, with the established criteria to maintain the designation as SOCIALCARBON, following the SOCIALCARBON Standard.

1.3 Level of Assurance

The verification of this monitoring period aims to achieve a reasonable level of assurance.

1.4 Summary Description of the Project

The project activity involves fuel switching from native firewood from Amazon biome to sawdust, *açaí* pits, Brazilian nut husks, wood residue and wood from forest management in Kamiranga at the city of São Miguel do Guamá, State of Pará, Brazil. Thus, GHG emission reduction is achieved.

Cerâmica Kamiranga Indústria e Comércio LTDA is the project owner.

The project is listed at VCS and can be accessed by the following link:

http://vcsprojectdatabase.org/#!/project_details/197

2 VERIFICATION PROCESS

2.1 Method and Criteria

The verification process is conducted as per internal CDM Quality Manual and in accordance with criteria laid down by VCS. It includes the following steps:

- contract with PP for the scope and appointment of verification team and technical review team;
- completeness check of Monitoring Report;
- desk review of Monitoring Report and corresponding ER sheet by verification team and planning of onsite audit (including sampling approach to be applied);
- physical on-site inspection by verification team;
- follow up activities e.g., interviews;
- reporting and closure of findings (CARs/CLs/FARs) and preparation of draft verification report;
- independent technical review of the draft verification report and final/revised documentation (e.g., Monitoring Report, corresponding ER sheet and evidences);
- reporting and closure of TR comments/findings (CARs/CLs/FARs) and final approval for the decision made;
- issuance of final verification report to contracted PP (or authorized representatives).

2.2 Document Review

A desk review was conducted by the verification team that included:

- a review of the data and information presented to verify its completeness;
- a review of the registered monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
- an evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions;
- supporting documents.

A complete list of documents/evidences reviewed is included as Appendix I.

A complete list of documents/evidences reviewed for SOCIALCARBON purposes is included as Appendix II.

2.3 Interviews

#	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Fernandes	Nonato	Kamiranga	25/04/2018	Project activity management, operation and monitoring	Marcelo Sebben
2.	Moura	Gleudson	Kamiranga	25/04/2018	Social Carbon	Marcelo Sebben
3.	Suzuki	Fernanda	Sustainable Carbon	25/04/2018	Project activity monitoring Excel calculations	Marcelo Sebben

2.4 Site Inspections

Duration of on-site inspection: 25/04/2018				
#	Activity performed on-site	Site location	Date	Team member
1.	Opening Meeting	São Miguel do Guamá	25/04/2018	Marcelo Sebben
2.	Implementation and operation of project activity as per registered PD/previous verifications.	São Miguel do Guamá	25/04/2018	Marcelo Sebben
3.	Management and monitoring procedures followed at project site.	São Miguel do Guamá	25/04/2018	Marcelo Sebben
4.	Physical inspection of the project activity: site visit and interview of monitoring personnel.	São Miguel do Guamá	25/04/2018	Marcelo Sebben
5.	Verification checklist: compliance of monitoring procedures followed at project site with registered PD and monitoring methodology.	São Miguel do Guamá	25/04/2018	Marcelo Sebben
6.	Management and operational system: documentation, allocation of responsibilities, qualification and training, data recording & archiving, internal audit and management review and emergency procedures.	São Miguel do Guamá	25/04/2018	Marcelo Sebben
7.	Review of estimated ER calculations in accordance with applied methodology and relevant tools.	São Miguel do Guamá	25/04/2018	Marcelo Sebben
8.	Review of monitored data and relevant document in accordance with registered monitoring plan and applied monitoring methodology.	São Miguel do Guamá	25/04/2018	Marcelo Sebben

11.	Presentation of findings	São Miguel do Guamá	25/04/2018	Marcelo Sebben
12.	Closing meeting	São Miguel do Guamá	25/04/2018	Marcelo Sebben

2.5 Resolution of Findings

The findings may be of following types: CAR – Corrective Action Request, CL – Clarification Request and FAR – Forward Action Request.

During the present verification, findings were raised and successfully closed. No FAR has been raised.

For the SOCIALCARBON verification, also findings were raised and successfully closed. No FAR has been raised.

The list of findings and their resolution are presented at Appendices IV and V of this report.

2.5.1 Forward Action Requests

No FAR were raised.

2.6 Eligibility for Validation Activities

ESPL holds the accreditation for validation of the sectoral scope.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project activity has no participation under any other GHG program.

3.2 Methodology Deviations

The project activity complies with the applied methodology AMS-I.E – Switch from Non-Renewable Biomass for Thermal Applications by the User – version 01.0.

No deviations were observed.

3.3 Project Description Deviations

According to information gathered during the site visit, the verification team has to confirm that some deviations occurred in the physical features and biomass monitoring when comparing to the registered VCD-PD version 2.3 from 27/10/2009 as follows:

- The parameter ($Q_{renbiomass}$) is currently measured by the biomass volume in m³ presented in the purchase receipts instead of the weight as this information is not available. By using the biomass density, the total mass is calculated.
- The Kamiranga Ceramic currently operates with 4 "Paulista" kilns (with two chambers each) and 1 Hoffmann kiln. The VCS-PD states only 2 Paulistas and one Hoffman. These two new kilns started their operation in January 2012 during the third monitoring period.

Both deviations were already considered in the previous verification and the additionality was also validated (check verification report from last period⁽¹¹⁾). It was confirmed that the project is still additional even with the deviations proposed above.

3.4 Grouped Project

The project activity is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity involves fuel switching from native firewood from Amazon biome to açai pits, Brazilian nut husks, wood residue and wood from forest management. During this monitoring period, Kamiranga used sawdust and açai pits. The ceramic operates with 4 "Paulista" kilns (with two chamber each) and 1 Hoffmann kiln.

As per the on-site assessment, observations, interviews and collected evidences, it was possible to assess that, in general, the project activity has been implemented as described in the VCS-PD, with all changes already approved in the previous crediting period.

There is no material discrepancies between the actual monitoring system, and the monitoring plan set out in the project description and the applied methodology.

In addition, the GHG emission reductions generated by the project have not become included in any emissions trading program or any other mechanism that includes GHG allowance trading. Moreover, the project has not received nor sought any other form of environmental credit, and neither has become eligible to do so since validation or previous verification. Finally, the project has not participated nor been rejected under any other GHG programs since validation or previous verification.

Some of the characteristics of the project activity are described below:

- Project Proponents: Cerâmica Kamiranga Indústria e Comércio LTDA and Sustainable Carbon – Projetos Ambientais Ltda.;
- Project Category: project ($\leq 300,000$ t CO₂e/y);
- Methodology: AMS-I.E – Switch from non-renewable biomass for thermal applications by the user – version 01.0;
- Start Date: 01/09/2007 – date on which the project proponent began employing renewable biomass as fuel;
- Crediting Period: 1st Crediting Period – from 01/01/2008 to 31/12/2017 – 10 years and zero months – renewable;
- Project Location: Kamiranga Ceramic – Estrada Santa Rita da Barreira, s/nº - km 04 - Zona Rural, São Miguel do Guamá - Pará, Brazil, Postal Code: 68660-000– geographical coordinates (SAD69): 1°36'53.0"S and 47°26'31.6"W / Meridian Convergence: 0° 4' 7.9";
- Technical Data: 4 "Paulista" kilns (with two chamber each) and 1 Hoffmann kiln.

The main sustainable development contributions are:

- a. use of clean and efficient technologies through the use of renewable biomass as fuel;
- b. pioneer initiative that encourages the development of new technologies throughout the country;
- c. use of renewable biomasses resulting in GHG emission reductions.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

- the approved CDM methodology AMS-I.E – Switch from non-renewable biomass for thermal applications by the user – version 01.0 is applied to the project activity. GHG emission reduction is calculated as baseline emissions;
- project emissions are not envisaged by the methodology for the project activity;
- no leakage is considered for this kind of project, in accordance with the applied methodology and “General guidance on leakage in biomass project activities”, as all possible sources of leakage are demonstrated at the MR as:
 - o there is no transference of equipment;
 - o the amount of biomasses to provide thermal energy for the project activity represents a non-representative quantity of these kind of biomasses, which avoids the possibility of leakage;
 - o the project is expected to decrease the use of non-renewable biomass by similar users, especially due to the incentive of carbon credits;
- all methods and formulas used in the calculations of emission reductions have been followed in accordance to the applied methodology and monitoring plan of the validated at VCS-PD;
- all monitored data is traceable.

Fixed parameters (as per Section 3.3 of VCS-PD):

- $EF_{projected\ fossil\ fuel}$ – CO₂ Emission factor of residual fuel oil: 77.4 tCO₂/TJ;
- $NCV_{biomass}$ – Net calorific value (of non-renewable biomass): 0.0182 TJ/ton
- ρ_{wood} – Specific gravity (of non-renewable wood): 0.67 ton/m³;
- BF_y – Baseline consumption of non-renewable biomass per tons of ceramic units produced in year y: 0.81 ton of wood / ton of ceramic units fired

Monitored parameters:

- $Q_{renbiomass}$ – Amount of renewable biomass used (refer to Section 3.2 of the MR);
- PR_y – Production of ceramic units (refer to Section 3.2 of the MR);
- *Origin of Renewable Biomass* – all biomasses used at the project activity are renewable and from a legalized source;
- *Renewable biomass surplus* – Amount of renewable biomass available (refer to Sections 3.2 and 4.3 of the MR);

- *Leakage of non-renewable biomass* – Leakage resulted from the non-renewable biomass: 0 tCO₂e;
- $f_{NRB,y}$: Fraction of biomass (wood) used in the absence of the project activity is established as non-renewable biomass using survey methods – 82.84% (as per Section 3.2 of MR and ER calculations)

The emission reduction spreadsheet is transparent, traceable and correct, with no manual transposition errors.

Baseline emissions (BE_y)

The baseline emissions are calculated as follows:

$$BE_y = B_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossil_fuel}$$

Where:

- BE_y : Baseline emissions during the year y ;
- B_y : Quantity of woody biomass that is substituted or displaced;
- $f_{NRB,y}$: Fraction of non-renewable biomass (wood) used in the absence of the project activity in year y ;
- $NCV_{biomass}$: Net calorific value of non-renewable biomass;
- $EF_{projected_fossil_fuel}$: Emission factor for the projected fossil fuel consumption in the baseline.

So, $BE_y = 70,646$ tCO₂e.

Project emissions (PE_y)

No project emissions are applied as per methodology. Thus, $PE_y = 0$ tCO₂e

Leakage emissions (LE_y)

No leakage is considered for this kind of project. Thus, $LE_y = 0$ tCO₂e.

Emission Reductions

Therefore, according to the applied methodology, ER_y are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

- ER_y : Emission reductions in year y ;
- BE_y : Baseline reductions in year y ;
- PE_y : Project reductions in year y ;
- LE_y : Leakage reductions in year y .

Thus, $ER_y = BE_y$. So, $ER_y = 70,646$ tCO₂e.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

- records were submitted by the project proponent as evidences to determine emission reduction;
- the records, data and information provided were found valid for the current verification period. The documents were verified during site visit and when possible, were checked directly from its source;
- interviews were performed during site visit with involved personnel and PP's representatives;
- the GHG emission reduction calculations were check step by step with PP's representatives;
- the quality of evidences were found of adequate level by the verification team to ensure an accurate quantification of the emission reductions.

4.4 SOCIALCARBON Results

4.4.1 Social Resource

Indicator	1. Diversity				
Situation	<i>The Ceramic factory has 82 employees; around 10% of the workers are from excluded social groups.</i>				
There are currently no employees at the factory from minority groups and there are no plans to hire minorities.	There are currently no employees from minority groups, but the factory has made plans to hire minorities.	Less than 15% of employees belong to a minority group.	Between 15 ≤ 30% of employees are from minority groups.	More than 30% of employees are from minority groups.	In addition to more than 30% of employees being minorities, the factory presents initiatives or combat forms of discrimination.
Score	3 (three)				
Justification	The ceramic has currently only 10% of employment from excluded social groups and has no intention to improve at this moment due to lack of qualified labor within these groups.				
Evidence	Interviews performed with ceramic representatives and human resources documents.				

Indicator	2. Community development				
Situation	<i>Kamiranga Ceramic factory makes frequent donations of financial resource and construction material to institutions and community members.</i>				
The factory has no initiatives/ activities planned that benefit the local community.	The factory responds to occasional (not continuous) requests for assistance.	The factory supports community members or civil society organizations: - Regularly: one per month; OR - Significant: at least 10 different parties were benefited.	In addition to scenario 3, the factory lends out equipment, space and/or provides manpower for activities that benefit the local community.	The factory is formally involved in the development and implementation of social and/or environmental projects in partnership with public entities and/or civil society organizations.	In addition to scenario 5, the factory has formalized planning in order to maximize their contribution to local community development, through survey with the community, establishing new partnerships, etc.
Score	3 (three)				

Justification	It was verified by the performed interviews that the ceramic performs frequent donations to institution and community members. Among these institutions are Abrinq foundation, São Miguel do Arcanjo Parish, Evangelic Church, Medecins Sans Frontieres.
Evidence	Pictures, interviews performed during site visit and donation receipts

Indicator	3. Employee satisfaction surveys				
Situation	<i>The Ceramic factory has a suggestion box to consult the workers' opinions. To discuss suggestions, the factory holds a meeting with the employees' participation during CIPA's reunions. That way, the ceramic owner can improve the factory working system and increase the employees' satisfaction.</i>				
Lack of a consultation system for employee feedback.	There are attempts to implement an employee consultation system but it is not being properly utilized. Example: There is a suggestion box, but employees do not use it.	The system for employee consultation is being utilized, but is limited to a suggestion box.	In addition to scenario 3, the factory has implemented or is currently implementing one or more suggestions made by employees.	The factory promotes periodic satisfaction surveys among employees. Example: monthly meetings, book for documenting information, etc.	In addition to scenario 5, the factory has stipulated targets and timelines for solutions to employee complaints.
Score	3 (three)				
Justification	It was verified by the performed interviews and by the visit at the ceramic that it has suggestion boxes that receive information directly from the employees. Moreover, the suggestions and complaints are taken to the manager's evaluation.				
Evidence	Interviews and site visit.				

4.4.2 Human Resource

Indicator	4. Additional employee benefits				
Situation	Comments: <i>The Ceramic factory offers to all the employees:</i> - Life insurance for all employees; - Discounts for employees that need bricks; - Some of the workers receive food staples in comemoratives dates. (End of Year; Labor day and others); - Uniform for all employees. - End of Year party: All employees; - Commission for bricks produced.				
The factory offers no additional benefits to employees.	Some employees receive an additional benefit.	All employees receive sporadic additional benefits, independent of frequency.	All employees receive an additional benefit monthly.	All employees receive more than one additional benefit monthly.	All employees receive more than one additional benefit monthly and there are also award programs based on merit.

Score	3 (three)
Justification	It was verified by the performed interviews with employees that the ceramic has implemented some benefits to all employees.
Evidence	Interviews and site visit.

Indicator	5. Health and safety practices				
Situation	<i>The Kamiranga Ceramic factory accomplishes all the mandatory programs and some complementary programs as follows:</i> - PPRA: Program for Prevention and Environmental Risks; - PCMSO: Program for Controlling Medical and Occupational Health; - CIPA: Internal Commission for Accident Prevention; - PPR: Respiratory Protection Program; - PCA: Hearing Conservation Program. <i>The company has a safety engineer called Barbara Bastos Fernandes, which goes once a week in the Ceramic to ensure best practices in the company, and offers all the personal protective equipment necessary for the workers to carry out their activities safely. Also, she monitors the use of PPEs by the workers and files all control forms of delivery and return.</i> <i>The ceramic factory provides lectures, trainings and courses to the Ceramic factory employees regarding security in the workplace.</i>				
There is no control of PPE distribution. None of the health and safety programs required by law are being implemented.	PPE distribution is being controlled OR there is at least one health and safety program required by law being implemented	The factory meets all legal requirements.	The factory meets all legal requirements and: (a) penalizes employees who do not properly use the PPE and/or (b) has signs encouraging the use of PPE in the factory and/or (c) The factory promotes lectures and events addressing issues related to health and safety in the workplace.	In addition to scenario 4, the factory contracts or has a technical professional or safety engineer on staff to ensure best practices in the company.	In addition to scenario 5, the factory develops complementary programs such as PPR, PPRPS and PCA; and/or The factory encourages physical activity or conducts activities for disease prevention.
Score	6 (six)				
Justification	It was verified by the performed interviews and by the presented pictures that the ceramic promotes CIPA meetings where several subjects can be discussed and where lectures and trainings are presented. In addition, the PCMSO and PPRA of the company were presented to the verification team.				
Evidence	Pictures, interviews, PCMSO, PPRA, PPR and PCA.				
Indicator	6. Training and capacity building programs				

Situation	<i>The ceramic factory offered lectures of health and security themes to all employees, as mentioned above. In addition some training courses to individual employees.</i>				
The company has not invested in lectures nor professional training courses for staff.	The factory organized occasional lectures.	Training courses were offered to individual employees, but not to all employees.	In addition to item 3, the individual employees who were contemplated by the training courses replicate the knowledge via lectures to other employees; and/or Regular lectures were offered to employees (at least two per semester).	In addition to scenario 4, the factory has an internal campaign to encourage employees to complete their high school education; and/or The factory promotes a literacy program for youth and adults.	In addition to scenario 5, the Ceramic factory has established a strategic plan regarding training and capacity building programs.
Score	3 (three)				
Justification	It was verified by the performed interviews that the company provides several different courses to the employees. Certificates and attendance lists were presented. There is the intention to invest in training and capacity building program to all employees.				
Evidence	Certificates of training courses and attendance lists.				

4.4.3 Financial Resource

Indicator	<i>7. Biomass supply</i>				
Situation	<i>The Kamiranga Ceramic factory uses sawdust, açai pits and wood residues as fuel: 100% comes from agro-industrial waste.</i>				
The factory has no control of the source and amount of biomass used; and/or the factory is using non-renewable fuel in the production process.	The factory only has partial control of the source and amount of biomass used.	The factory has total control of the source and amount of renewable biomass used, however 100% of the biomass comes from renewable wood.	The factory has total control of the source and amount of renewable biomass used and less than 50% of the fuel is coming from agro-industrial waste.	The factory has total control of the source and amount of renewable biomass used and more than 50% of the fuel is coming from agro-industrial waste.	The factory has total control of the source and amount of renewable biomass used and 100% of the fuel is coming from agro-industrial waste.
Score	4 (four)				
Justification	It was verified by the performed interviews that the ceramic has total control of the suppliers and accounts for 100% of the used biomass that comes from agro-industrial waste (sawdust, açai pits and wood residue).				
Evidence	Records of purchase of biomass and report of daily production of ceramic device.				

Indicator	<i>8. Planning and control</i>				
Situation	<i>The factory has partial control of the income received from carbon credit sales, as they are aware of the destination of the income. The Ceramic factory has control of the expenses from the carbon project, and the income was used</i>				

	<i>mostly in investments of the ceramic infrastructure and donations to community members and institutions.</i>				
The factory has no organized controls of the income received from carbon credit sales nor the destination for proceeds.	The factory has partial control of the income received from carbon credit sales and the destination for proceeds.	The factory has organized controls of the income received from carbon credit sales, but control of the destination for proceeds is partial.	The factory has organized controls of the income received from carbon credit sales, as well as of the destination for proceeds. However, the factory presents no future planning.	The factory has organized controls of the income received from carbon credit sales, as well as of the destination for proceeds. However, the factory presents incomplete future planning.	The factory has organized controls of the income received from carbon credit sales, as well as of the destination for proceeds. The factory presents satisfactory future planning (timeline, budget, responsible involved and benefits).
Score	2 (two)				
Justification	During the period, the ceramic has only partial control as it was not continued until the end of this monitoring period.				
Evidence	Accountability of the investments carried out due to carbon credits income until 07/2016				

Indicator	9. Carbon credit investments				
Situation	<i>The Ceramic factory has control of the expenses of the carbon project. In the period analyzed Kamiranga invested in factory improvements.</i>				
The income generated by carbon credit sales was not invested in the factory nor in the community, or there are no organized controls of the allocation of proceeds.	Less than 20% of the income generated by carbon credit sales was invested the factory or in the community development.	Between 20 and 40% of the income generated by carbon credit sales was invested the factory or in the community development.	Between 40 and 60% of the income generated by carbon credit sales was invested the factory or in the community development.	Between 60 and 80% of the income generated by carbon credit sales was invested the factory or in the community development.	Between 80 and 100% of the income generated by carbon credit sales was invested the factory or in the community development.
Score	6 (six)				
Justification	The ceramic has records of the income received from carbon credit sales. Moreover, interviews were conducted which stated that all carbon income goes for factory improvement.				
Evidence	Receipts of payment of the VCUs.				

4.4.4 Natural Resource

Indicator	10. Environmental management
Situation	<i>The company has no environmental management system; however there are more than two initiatives to reduce the main environmental impacts caused by the Ceramic factory such as:</i> <i>The residues not burned are returned into the clay mixture and reused in the production process.</i>

	- The ashes generated by Kamiranga productive process are used as fertilizer; - The ceramic has selective collection.				
There are no environmental management initiatives.	There are up to two specific initiatives to prevent/reduce the main environmental impacts caused by the ceramic factory.	There are more than two initiatives to prevent / reduce the main environmental impacts caused by ceramic factory.	In addition the scenario 3, the factory is structuring an environmental management system in the company.	The factory has implemented a formal environmental management system.	The factory's environmental management system has been certified by a third party.
Score	3 (three)				
Justification	It was evidenced by the performed interviews with ceramic representatives and at the site visit that the ceramic has implemented a system to capture rain water and selective collection. Moreover, the company use the ashes for closing the kilns instead wasting it and reuses the not burned residues into the production process.				
Evidence	Interviews and site visit.				

Indicator	11. Brazilian environmental legislation				
Situation	The Ceramic factory posses all the mandatory licenses: - Operating License (LO): nº 032/2016 emitted by the Municipal Secretary of the Environment (SEMMA) on December 13rd, 2020. - Clay Extraction License: nº039/2016 emitted by the State Secretary of the Environment (SEMAS/PA) on December 14th, 2020. - Water Grant: nº 235/2013 emitted by the State Secretary of the Environment (SEMA/PA) in August, 2013, valid until August, 27th of 2017. - Federal Technical Registry (CTF): Regular. The CTF is a document emitted by the Brazilian Institute of Environment and the Natural Renewable Resources.				
The factory does not possess any of the following: -operating license -license for clay extraction -water grant - federal technical registry	The factory only posses two of the following: -operating license -license for clay extraction -water grant - federal technical registry	The factory only posses three of the following: -operating license -license for clay extraction -water grant - federal technical registry	The factory posses all of the following: -operating license -license for clay extraction -water grant - federal technical registry However, they do not meet all the conditions established by them.	All licenses are up to date and all conditions established by them are being met.	In addition to the previous scenario, the factory collaborates with public administration and/or civil society organizations for cooperation with environmental projects.
Score	5 (five)				

Justification	All licenses are up to date and all conformity conditions to require their renovations are in place.
Evidence	Licenses.

Indicator	<i>12. Voluntary environmental initiatives</i>				
Situation	<i>The factory has constructed a system to capture the rain water and also has selective collection.</i>				
The factory is not involved in voluntary environmental initiatives.	The factory has implemented only one internal environmental initiative. Example: Planting ten tree saplings on factory grounds.	The factory has implemented more than one internal initiative or is showing continuity for an existing Initiative. Example: Periodic planting of saplings on factory grounds.	The factory has implemented more than one initiative or ongoing initiative whose benefits extend to workers families.	In addition to the previous scenario, the benefits of the initiatives also extend to community members.	In addition to the previous scenario, the factory promotes voluntary environmental initiatives with civil society organizations and/or public administration.
Score	2 (two)				
Justification	It was evidenced by the performed interviews with company representatives and site visit that the company has built system to capture rainwater.				
Evidence	Pictures, site visit and interviews.				

4.4.5 Biodiversity/Technology Resource

Indicator	<i>13. Technological advances to improve efficiency of the production process</i>				
Situation	<i>The factory meets the following characteristics described:</i> - The factory possesses two dryer that recycles the heat from kilns. - The Ceramic controls the temperature of the kilns in the firing process using an electronic thermometer in each kiln. The monitoring system of the burning is manual however all data in filed in the Kamiranga office. - The factory control and records production at different stages of the production process through the Dropbox, an online tool to share monitoring data. - The Ceramic operates with four "Paulista" kilns which is a medium efficiency kiln and one Hoffman kiln that is considered a high efficiency kiln. - The ceramic owner made some improvements in the factory infrastructure, such as the construction of an quality lab.				
The factory does not meet any of the characteristics described.	The factory meets one of the characteristics described.	The factory meets 2-3 of the characteristics described.	The factory meets 4 of the characteristics described.	The factory meets all of the characteristics described.	In addition to scenario 5, the factory has organized planning to improve general conditions of the production process.
Score	4 (four)				

Justification	It was evidenced by the performed interviews with ceramic representatives and during the site visit that the ceramic has several equipment that enables an improvement in the efficiency of the production process.
Evidence	Interviews and site visit.

Indicator	14. Technological advances to improve the general conditions of the working environment				
Situation	- <i>Cleanliness:</i> The ceramic factory has selective collection and all metal from productive process is forwarded to a recycling company. Also, there is a cleaning team that cleans the whole factory every day to result in less dust. - <i>Noise control:</i> Kamiranga has a Hearing Conservation Program to evaluate and control the noise in the factory. - <i>Heat:</i> The Ceramic factory has fans in the productive process that reduces the employees' exposure to a warm environment. - <i>Lighting:</i> The Ceramic factory has translucent tiles to maintain a well-lit working environment. - <i>Appropriate signage:</i> The factory uses signing according to the applicable norms.				
The factory does not meet any of the characteristics described.	The factory meets one of the characteristics described.	The factory meets 2-3 of the characteristics described.	The factory meets 4 of the characteristics described.	The factory meets all of the characteristics described.	In addition to scenario 5, the factory has organized planning to improve general conditions of the working environment.
Score	5 (five)				
Justification	It was evidenced by the performed interviews with ceramic employees and during the site visit that the ceramic has several features that improve the general conditions of the working environment.				
Evidence	Interviews and site visit.				

Indicator	15. Product quality				
Situation	Kamiranga constructed a quality control lab, and has a trained employee to conduct the tests				
No efforts were made to analyze or improve product quality.	Samples of some products were evaluated by quality tests.	Samples of all products were evaluated by quality tests.	Some of the products have quality certification.	All products have quality certification.	In addition to scenario 5, the factory has an in-house quality lab.
Score	3 (three)				
Justification	Some samples are analysed in the quality lab built in the company.				
Evidence	Interviews, site visit and analysis reports.				

4.4.6 Carbon Resource

Indicator	16. Stakeholder consultation
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Situation	<i>During the present monitoring period the ceramic Kamiranga did not conducted an stakeholder consultation.</i>				
During the time period analyzed, the factory did not conduct a stakeholder consultation.	During the time period analyzed, the factory conducted an informal (no record) stakeholder consultation.	During the time period analyzed, the factory conducted a formal (with records) stakeholder consultation; however negative comments were made regarding the project.	During the time period analyzed, the factory conducted a formal (with records) stakeholder consultation, and no negative comments were made regarding the project.	As well as the previous scenario, there are continuous means of communication with stakeholders.	As well as the previous scenario, the next consultation is being planned together with stakeholders.
Score	1 (one)				
Justification	The company has already planned a new stakeholder consultation in 2019 and has continuous means of consultation by email, direct conversation, etc.				
Evidence	Pictures and interviews.				

Indicator	17. Green marketing				
Situation	<i>The ceramic does not have marketing strategies based on their environmental practices.</i>				
The factory does not have marketing strategies based on their environmental practices.	The factory markets their environmental practices only using one means of communication. Example: magazine advertisement.	The factory markets their environmental practices using more than one means of communication. Example: magazine advertisement and billboard.	The factory has an established green marketing strategy, but still has not seen positive results.	The factory has an established green marketing strategy and sees positive results.	As well as the previous scenario, the factory has plans to invest in Green marketing.
Score	1 (one)				
Justification	The company does not have marketing strategies.				
Evidence	Interviews.				

Indicator	18. Project performance				
Situation	<i>The Ceramic owner is satisfied with the project because since it was implemented the ceramic factory is more organized and the workers are happier with the benefits they receive. Also, now he is aware about the importance of the environment and the sustainability.</i>				
The factory is very dissatisfied and threatens to abandon the carbon project.	The factory is dissatisfied, but does not plan to abandon the carbon project.	The factory is indifferent about the carbon project.	The factory believes the carbon project is something positive, but has complaints.	The factory is very satisfied with the carbon project.	In addition to the previous scenario, the factory considers the carbon project a competitive advantage for their business and encourages other factories to adopt similar practices.

Score	5 (five)
Justification	The project representative is satisfied with the carbon project due to the organization generated in the factory, however he does not see advantages in the business.
Evidence	Interviews.

4.5 Analysis of SOCIALCARBON Results

4.5.1 Current Performance

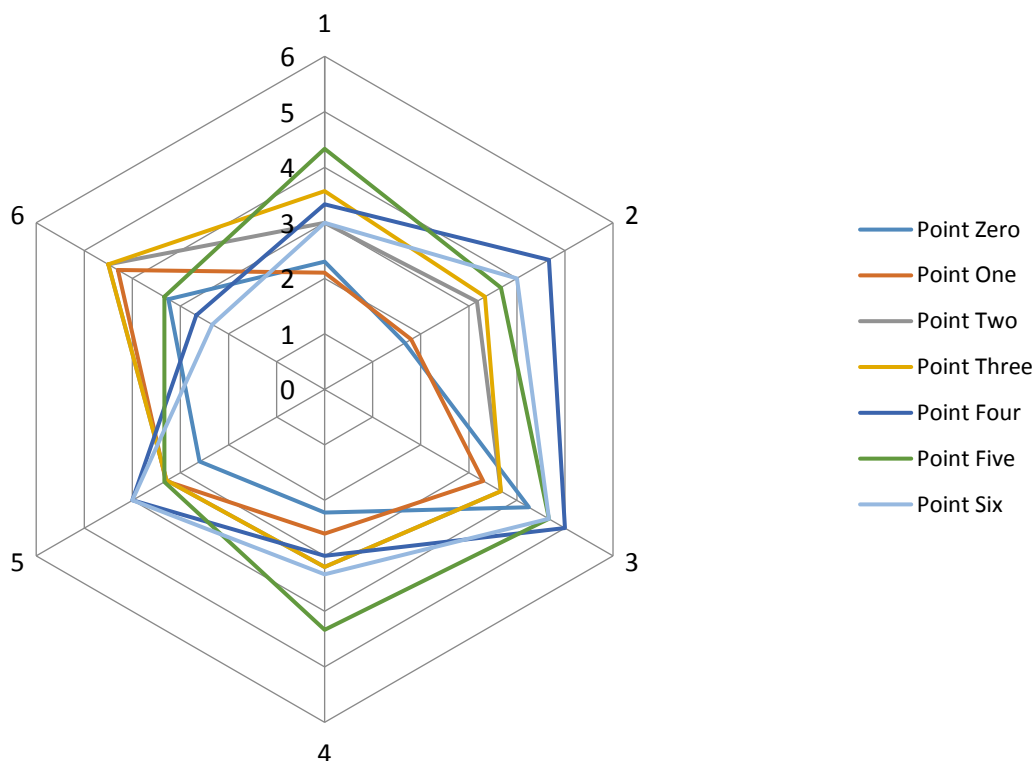
Resource	Critical	Satisfactory	Sustainable	Average Score	Performance
Social	0.0%	100.0%	0.0%	3.0	Satisfactory
Human	0.0%	66.7%	33.3%	4.0	Satisfactory
Financial	33.3%	0.0%	66.7%	4.7	Satisfactory
Natural	33.3%	33.3%	33.3%	3.3	Satisfactory
Biodiversity / Technology	0.0%	66.7%	33.3%	4.0	Satisfactory
Carbon	66.7%	0.0%	33.3%	2.3	Critical

4.5.2 Historical Performance

Social	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six
	2.3	2.1	3.0	3.6	3.3	4.3	3.0
<u>Historic Analysis:</u> Kamiranga had an expressive decrease due to the crisis that affect the donations and the opportunity to comply with the employees demands, which was a common practice in ceramic factory							
Human	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six
	1.7	1.8	3.2	3.3	4.7	3.7	4.0
<u>Historic Analysis:</u> Kamiranga increased its score due to the courses offered to some employees.							
Financial	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six
	4.3	3.3	3.7	3.7	5.0	4.7	4.7
<u>Historic Analysis:</u> the Financial Resource maintained the score as point five as there were no expressive modifications at the factory that could represent a modification at the grade.							
Natural	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six
	2.2	2.6	3.2	3.2	3.0	4.3	3.3
<u>Historic Analysis:</u> The ceramic factory had a decrease due to the crisis. Even so Kamiranga implemented the rainwater reuse system.							

Biodiversity / Technology	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six
	2.6	3.3	3.3	3.3	4.0	3.3	4.0
<u>Historic Analysis:</u> The factory increased the performance due to the quality tests that were conducted with all products.							
Carbon	Point Zero	Point One	Point Two	Point Three	Point Four	Point Five	Point Six
	3.3	4.3	4.5	4.5	2.7	3.3	2.3
<u>Historic Analysis:</u> The ceramic had an expressive decrease due to the crisis that affect the plans of the owner to conduct the stakeholder consultation.							

4.5.3 Performance Hexagon



4.6 Non-Permanence Risk Analysis

Not applicable.

5 SAFEGUARDS

5.1 Social, Economic and Environmental Impacts

The burning of the biomasses emits particulate material and CO₂ identified as negative impact. This also occurs when using fossil fuel. Nevertheless, as they are renewable biomasses, they have carbon neutral lifecycle.

All ashes resulting from the burning are incorporated into the clay used as thermal insulator in the kilns entrance.

Thus, the negative impacts caused by the project activity are being mitigated.

5.2 Local Stakeholder Consultation

The project participant has a good relationship with local community and has open channels in order to receive comments from local stakeholders. Thus, the project activity has a local stakeholder consultation access in place and working.

No comments/complaints have been observed during the monitoring period.

6 VERIFICATION CONCLUSION

ESPL, contracted by Sustainable Carbon – Projetos Ambientais Ltda., has performed the independent verification of the emission reductions of the VCS project “Kamiranga Ceramic Fuel Switching Project”, with VCS Project ID 197, for the monitoring period 01/04/2016 to 31/12/2017 (both days included) for VCS and from 01/05/2016 to 31/12/2017 to SOCIALCARBON.

Sustainable Carbon – Projetos Ambientais Ltda. is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

ESPL commenced the verification based on the baseline and monitoring methodology AMS-I.E – version 01.0, the monitoring plan contained in the VCS-PD and draft Monitoring Report.

ESPL’s verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. ESPL planned and performed the verification by obtaining evidence and other information and explanations that ESPL considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

The verification team confirms that:

- the project activity was found completely implemented as per the description given in the registered VCS-PD; and
- the actual operation conforms to the description in the VCS-PD.

Thus, the GHG emissions reductions reported for the project activity for the period from 01/04/2016 to 31/12/2017 (including both days) are fairly stated in the final version of the Monitoring Report. The GHG emission reductions were calculated correctly based on the approved baseline and monitoring methodology AMS-I.E – version 01.0 and the monitoring plan contained in the VCS-PD.

Therefore, ESPL is able to certify that the emission reductions from the VCS project “Kamiranga Ceramic Fuel Switching Project”.

In addition, as a result of the SOCIALCARBON verification, the verifier confirms that:

- the indicators and reports are in accordance with SOCIALCARBON Standard and “Brazilian Red Ceramic factories Indicators” – version 1.1;
- the project is being periodically monitored and Point Zero is being used as the baseline;

- there are perspectives of improvement and the efforts to seek for this improvement are being done. Decrease in performance have been observed in Social, Natural and Carbon resources especially due to crisis. However none of these has presented decrease two consecutive times, which is in accordance with Social Carbon requirements;
- the report has been validated by an accredited entity, an on-site visit has been carried out and this verification report has been issued.

In addition, the verifier confirms that the indicators for “Brazilian Red Ceramic factories Indicators” – version 1.1 are accurate and the calculations are correct. The SOCIALCARBON template and SOCIALCARBON Guidelines were correctly used.

ESPL herewith confirms that the project is in line with all applicable criteria for the verification.

The characterization of the Point Six for the project as “SATISFACTORY”, as described in the referenced documents, is accurate.

Verification period: From 01-April-2016 to 31-December-2017.

SOCIALCARBON verification period: From 01-May-2016 to 31-December-2017.

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

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2016	29,920	0	0	29,920
2017	40,726	0	0	40,726
Total	70,646	0	0	70,646



Kaviraj Singh
Managing Director

11/09/2018

APPENDIX I: references

No.	Title	References
1.	<u>Methodology</u> AMS-I.E – Switch from non-renewable biomass for thermal applications by the user	version 01.0
3.	<u>Biomass</u> Records of biomass purchase	2016 / 2017
4.	<u>Production</u> Records of production by type of ceramic devices	2016 / 2017
5.	<u>Licenses</u> - Environmental License # 032/2016 – Production of ceramic pieces – Municipality of São Miguel do Guamá. Environmental Secretariat - SEMMA - Environmental License # 033/2016 – extraction of clay – Municipality of São Miguel do Guamá. Environmental Secretariat - SEMMA - Dispense of water grant Request Protocol issued by Environment and Sustainability Secretariat from State of Para – SEMAS/PA. - Conformity License # 04289 – factory operation – City Hall of Sao Miguel do Guamá for the year 2018	Validity: 13/12/2020 Validity: 14/12/2020 Issue: 23/02/2018 Validity: 31/12/2018
6.	MR – draft	version 01 – 21/03/2018
7.	MR – final	version 02 – 10/09/2018
8.	ER Spreadsheet – draft	version 1
9.	ER Spreadsheet – final	version 2
10.	VCS-PD (Registered)	version 2.3 – 27/10/2009
11.	Verification report issued by RINA from the period between 01/10/2013 to 31/03/2016 ID# 2016-BQ-37-MD	03/10/2016 version 1.2Aa
12.	IPCC publications	www.ipcc-nggip.iges.or.jp
13.	UNFCCC	http://cdm.unfccc.int
14.	VCS	http://www.v-c-s.org/

APPENDIX II: REFERENCES – SOCIALCARBON

No.	Title	References
1.	SOCIALCARBON Report (draft)	version 01 – 24/10/2016
2.	SOCIALCARBON Report (revised/final)	version 02 – 27/07/2018 version 03 – 10/09/2018
3.	<u>Social Resource:</u> - Human resources documents - Pictures - CIPA minutes	2016 / 2017 2016 / 2017
4.	<u>Human Resource:</u> - Pictures - Attendance lists of courses performed by the employees - Certificates of training courses - PCMSO (Program of Medical Control of Occupational Health) SESI - PPRA (Program of Prevention of Environmental Risks) – SESI - PPE records	2016 / 2017 2016 / 2017 2016 / 2017 2016 / 2017
5.	<u>Financial Resource:</u> - Records of purchase of sawdust, wood residue and acai pits. - Report of daily production of ceramic device - Receipts of payment of the VCUs	2016 / 2017 2016 / 2017 2016
6.	<u>Natural Resource:</u> -Pictures -Licenses: - Environmental License # 032/2016 – Production of ceramic pieces – Municipality of São Miguel do Guamá. Environmental Secretariat - SEMMA - Environmental License # 033/2016 – extraction of clay – Municipality of São Miguel do Guamá. Environmental Secretariat - SEMMA - Dispense of water grant Request Protocol issued by Environment and Sustainability Secretariat from State of Para – SEMAS/PA. - Conformity License # 04289 – factory operation – City Hall of Sao Miguel do Guamá for the year 2018	Validity: 13/12/2020 Validity: 14/12/2020 Issue: 23/02/2018 Validity: 31/12/2018
7.	<u>Carbon Resource:</u> - Sales invoices - Pictures	2016 / 2017
8.	Brazilian Red Ceramic factories Indicators	version 1.1
9.	Guidance for Completing SOCIALCARBON Reports	version 4.0
10.	SOCIALCARBON Standard	version 5.0
11.	SOCIALCARBON	http://www.socialcarbon.org/

APPENDIX III: ABBREVIATIONS

Abbreviations	Full texts
BE	Baseline Emission
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CGM	Ceramic Gomes de Mattos
CIPA	Internal Commission of Labor Accidents Prevention
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CL	Clarification Request
DOE	Designated Operational Entity
DOF	Document of Forest Origin
ER	Emission Reduction
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
GHG	Greenhouse gas(es)
MP	Monitoring Plan
MR	Monitoring Report
PA	Project Activity
PCMSO	Program for Medical Control of Labour Health
PE	Project Emission
PP	Project Participant
PPE	Personal Protection Equipment
PPRA	Program for Prevention of Environmental Risks
QA/QC	Quality Assurance / Quality Control
SC	SOCIALCARBON
SCR	SOCIALCARBON Report
SESI	Social Service of the Industry
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCS-PD	VCS – Project Description
VCU	Verified Carbon Unit
XLS	Emission Reduction Calculation Spread Sheet

APPENDIX IV: FINDINGS

Table 1. CL from this verification

CL ID	0x	Section no.	x	Date:	x
Description of CL					
Not applicable					
Project participant response				Date:	03/04/2018
DOE assessment				Date:	04/05/2018

Table 2. CAR from this verification

CAR ID	0x	Section no.	x	Date:	x
Description of CAR					
Not applicable					
Project participant response				Date:	x
DOE assessment				Date:	x

Table 3. FAR from this verification

Not applicable.

APPENDIX V: FINDINGS – SOCIALCARBON

Table 1. CL from this verification

CL ID	01	Section no.	4.1	Date: 08/03/2018
Description of CL				
At Section 5, it was revealed during the site visit that the decrease in the number of employees is not result of the market crisis as described at the historic analysis of Social Resource.				
Project participant response				Date: 22/03/2018
The reason for the decrease of employees was changed.				
DOE assessment				Date: 27/03/2018
Section 5 was revised and the explanation for the decrease in the number of employees is due to the increase of ceramic efficiency, which is in accordance with information revealed during the performed interviews.				
CL is closed				

Table 2. CAR from this verification

CAR ID	01	Section no.	3.1	Date: 24/07/2018
Description of CAR				
Social resource – community development Evidences regarding employment opportunities to excluded social groups which attest the data informed in the Social Carbon report were not provided to the verification team.				
Project participant response				Date: 27/07/2018
The Evidences on employment opportunities for social groups which attest to the date reported in the Social Carbon report were made available.				
Documentation provided by project participant				
Controle_RAIS_Kamiranga spreadsheet RAIS 2016 pdf RAIS 2017 pdf				
DOE assessment				Date: 14/08/2018
Evidences were duly provided to the verification team.				
CAR is closed				

Table 3. FAR from this verification

Not applicable.

APPENDIX VI: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Competence Statement			
Name	Marcelo Sebben		
Country	Brazil		
Education	M.Sc. (Sustainable Energy System) B. Eng. (Chemical Engineering)		
Experience	12.5 Years		
Field	Chemical process industry, CDM, Energy, Climate Change		
Approved Roles			
Team Leader	Yes		
Validator	Yes		
Verifier	Yes		
Methodology Expert	Yes (ACM0001, ACM0002, ACM0006, AM0065, AMS ID)		
Local expert	Brazil, Chile, Honduras		
Financial Expert	Yes		
Technical Reviewer	Yes		
TA Expert	Yes (TA 1.1, 1.2, 5.1, 13.1)		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Ashok Kumar Gautam	Date	01/03/2018

Competence Statement			
Name	Sergio Bonanno Cruz		
Country	Brazil		
Education	Post Graduate Diploma in Environment		
Experience	25 Years		
Field	Environmental Law, CDM, Energy, Climate Change		
Approved Roles			
Team Leader	Yes		
Validator	Yes		
Verifier	Yes		
Methodology Expert	Yes (ACM0001, ACM0002, AM0026, ACM0006, AMS ID)		
Local expert	Brazil, Chile		
Financial Expert	Yes		
Technical Reviewer	Yes		
TA Expert	Yes (TA 1.2, 13.1)		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Ashok Kumar Gautam	Date	01/03/2018