




**Verification and certification report form for
CDM programme of activities**

(Version 03.0)

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the programme of activities (PoA)	9948: Impact Carbon Global Safe Water Programme of Activities (PoA)	
Version number(s) of the PoA-DD(s) to which this report applies	7.0	
Version number of the verification and certification report	2.0	
Completion date of the verification and certification report	28/07/2019	
Monitoring period number and duration of this monitoring period	Monitoring Period Number: Second Monitoring Period: 23/05/2017-22/05/2019	
Number and version number of the monitoring report to which this report applies	Version: 3.0 Monitoring Report Number: 01	
Coordinating/managing entity (CME)	Impact Carbon	
Host Parties	Host Parties of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)
	Rwanda	No
	Uganda	No
	Nigeria	Yes
	Kenya	No
Applied methodologies and standardized baselines	Methodology: AMS-III.AV. ver.4 Low greenhouse gas emitting safe drinking water production systems Standardized Baseline: None	
Mandatory sectoral scopes	3: Energy Demand	
Conditional sectoral scopes, if applicable	None	
Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report	153,860 tCO _{2e}	

Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report	1,011 tCO _{2e}
Name and UNFCCC reference number of the DOE	Earthood Services Private Limited E-0066
Name, position and signature of the approver of the verification and certification report	 Dr. Kaviraj Singh Managing Director

SECTION A. Executive summary

The PoA aims at distribution of the low carbon water purification technologies to households, communities and institutions in Rwanda, Nigeria, Kenya and Uganda. Thus, PoA through the dissemination of these technologies aims to address the issue of lack of access to safe drinking water.

In absence of the PoA, boiling water using non-renewable woody biomass would have been the source of availing safe drinking water. The Water Purification Systems (WPS) provides safe drinking water without the use of non-renewable biomass/ fossil fuel, thus leading to reduction in Green-house gas (GHG) emissions. This verification covers implemented CPAs 9948-0043 to CPA 9948-0077 (35 CPAs).

The verification team confirms that the total emission reductions achieved under this monitoring period 23/05/2017 to 22/05/2019 (inclusive of both days) are 1,011 tCO₂e.

Scope of verification:

The verification is an independent and objective review, of ex-post determination of the monitored reductions in GHG emissions, by the DOE. The verification includes the implementation and operation of the PoA as set out in the revised accepted PoA-DD & CPA-DDs viz., 9948-0043 to 9948-0077 in the monitoring period.

The verification tests the data and assertions set out in the monitoring report prepared for this monitoring period by the CMEs and is based on the following:

- (i) The approved methodology AMS-III.AV. ver.4 Low greenhouse gas emitting safe drinking water production systems/6/ applied in the PoA-DD & CPA-DDs/1,2/
- (ii) The registered and revised accepted PoA-DD & CPA-DDs and monitoring plan/1,2/
- (iii) UNFCCC criteria referred to in the Kyoto Protocol criteria and the CDM modalities and procedures as agreed in the Bonn Agreement and the Marrakech Accords
- (iv) The CDM Validation and Verification Standard (VVS) for PoA version 2.0/9/
- (v) The CDM Project Standard (PS) /7/ and Project Cycle Procedure (PCP) for PoA version 2.0 /8/
- (vi) Relevant decisions, guidance and clarifications of the CMP and CDM Executive Board and any other information and references relevant to the project activity's reported emission reductions

The verification has considered both quantitative and qualitative aspects on stated/reported emission reductions. The monitoring report (all versions) and corresponding supporting documentation was assessed in accordance with the rules defined by UNFCCC, as appropriate to the PoA. The verification is not meant to provide any consulting or recommendations to the CME/others. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the monitoring activities.

Verification Process:

The verification process is conducted as per internal CDM Quality Manual, which includes the following steps;

- a) Contract with CME and appointment of verification team and technical review team (refer Section B.1 and B.2 of this report)
- b) Completeness check of Monitoring Report
- c) Publication of Monitoring Report at UNFCCC website
- d) Desk review (refer Section D.1 of this report) of Monitoring Report/13/ and corresponding ER sheet /4/ by verification team and planning of onsite audit (including sampling approach (refer Section D.4 of this report) to be applied)
- e) On site audit (refer Section D.2 of this report) (physical implementation and interview with relevant stakeholders) by verification team consistent of Team Leader and all Technical Experts, as a minimum
- f) Follow up activities e.g., interviews (refer Section D.3 of this report)
- g) Reporting and closure of findings (CARs/CLs/FARs) and preparation of draft verification report (refer Section D.5 of this report)

- h) Independent technical review (refer Section F of this report) of the draft verification report and final/revised documentation (e.g., Monitoring Report, corresponding ER sheet and evidences)
- i) Reporting and closure of TR comments/findings (refer Section D.5 of this report) (CARs/CLs/FARs) and final approval for the decision made (refer Section G and H of this report).
- j) Issuance of final verification report to contracted CME (or authorized representatives) and submission of request for issuance, as appropriate.

Verification Conclusion:

Based on the outcome of the verification process of the registered/revised accepted PoA “Impact Carbon Global Safe Water Programme of Activities (PoA)” and its 35 CPAs (9948-0043 to 9948-0077) for the monitoring period **23/05/2017 – 22/05/2019** (including both dates) we confirm that the implementation of referenced registered/revised accepted PoA and CPAs is complying with applicable CDM rules and regulations as stated in the Monitoring Report (final) **Ver 3.0, dated 27/07/2019** /13/. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodologies AMS-III.AV. ver.4 Low greenhouse gas emitting safe drinking water production systems/6/ and the monitoring plan contained in the revised accepted PoA-DD/1/.

Earthood Services Private Limited is able to certify that the emission reductions from the registered CDM PoA UN#9948 “Impact Carbon Global Safe Water Programme of Activities (PoA)” in Nigeria during the period **23/05/2017 – 22/05/2019** (including both days) amount to **1,011 tCO₂e**. Therefore, this is being submitted for request for issuance, as per UNFCCC procedures

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team members

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader	IR	Mahala	Deepika	Central Office	Y	Y	Y	Y
2.	Verifier	IR	Mahala	Deepika	Central Office	Y	Y	Y	Y
3.	Technical Expert	IR	Mahala	Deepika	Central Office	Y	Y	Y	Y
4.	Methodology Expert	IR	Mahala	Deepika	Central Office	Y	Y	Y	Y
5.	Local Expert	IR	Eleri	Adeola	Central Office	Y	N	N	Y
6.	Trainee Verifier	IR	Vatsa	Vaishali	Central Office	Y	N	N	Y

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical Reviewer	IR	Gautam	Ashok	Central Office
2.	TA to TR	IR	Gautam	Ashok	Central Office
3.	Approver	IR	Singh	Kaviraj	Central Office

SECTION C. Application of materiality in conducting the verification

C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Observational error by monitoring survey staff of CME/CPA implementer while recording the responses of users in relation to survey parameters	High	35 CPAs are being verified for the first time and there may be lack of experience. The survey is conducted for representative samples of population, which may impact the population significantly. Surveyors may be unsupervised at the site.	Verification team randomly selected the samples from CME surveyed institutions. The recorded survey forms by CME were checked with DOE field observations. The verification team interviewed the monitoring staff and checked their training records.
2.	Calculation Errors	Med	The process is manual and therefore there is potential risk of errors / omissions/misstatements.	All calculations were checked by verification team with respect to applicable requirements under various documents viz., methodology, registered PoA DD/1/, CPA DDs/2/ etc.

C.2. Consideration of materiality in conducting the verification

In accordance with CDM VVS for PoAs, Version 02.0/9/ the prescribed thresholds for materiality for CDM PoAs are as under;

Type of PoA	PoAs comprising large-scale CPAs			PoAs comprising only small-scale CPAs	PoAs comprising only micro-scale CPAs
Emission Reductions (tCO ₂ e)/year	500,000 or more	300,001 to 499,999	300,000 or less		
Materiality Threshold	0.5%	1.0%	2.0%	5.0%	10.0%

The applicable materiality threshold is 5% as PoA comprises only small-scale CPAs.

Particulars / Monitoring Report	MR Version (Public)	MR Version (Revised/Final)
Emission Reductions Achieved (tCO ₂ e) in this monitoring period	1,750	1,011*
Applicable Threshold (%) as per CDM VVS for PoAs Version 02.0	5.0%	5.0%

The verification team has identified the impact of errors observed and those have been corrected by CME during verification for all monitoring parameter at individual and aggregate level

Monitored Parameter (Symbol / Description)	Reporting Frequency	Number of Discrete Data* (Total) Total (100%)	Sample selected for verification Sample (100%)	Type of error identified	Impact on ERs	
					ERs impacted (Sample)	ERs impacted (Population based on extrapolation)
CPA 9948-0043 – CPA 9948-0077						
<u>For water purifier</u>						
QPW _y	Annual or at least biennial	35(calculated parameter for each CPA)	35(100%)	There were errors in calculation which have been corrected (35).	All the errors have been corrected*	No extrapolation is required as 100% values checked and corrected.
n _{WB}	Continuously or at least biennial	1	1	None	NA	NA
T _{yi}	Continuous	210 UltraFLO 79 UltraTAB (289)	210 UltraFLO 79 UltraTAB Sales database/5/ was checked for the information. 8 systems were checked during site visit for cross check.	None	NA	NA
N _{yi}	Continuous	289 values for each system and 35 values (average value for each CPAs)	Entire sales database was checked for the information.	None	NA	NA
Water quality (WQ)	Annual or at least biennial	45	8 (based on acceptance sampling)	None	NA	NA

Operational Units _i	At least once per verification or biennially	45	8 (based on acceptance sampling)	None	NA	NA
f _{NRB}	Continuously or at least biennial	1	1	None	NA	NA
EF _{projected}	1	1	1	None	NA	NA
Existence of public distribution network of safe drinking water	Annual	45	8 (based on acceptance sampling)	None	NA	NA

* The ERs mentioned in MR (public) and the ER sheet were found to be different. A calculation error was identified by the CME in the ER calculator (for QPW_y) after the MR was published for webhosting. CL#02 was raised and resolved.

Based on the above table it can be confirmed that the actual individual and aggregated material error is determined for the registered PoA as per CDM VVS for PoA/09/. The applicable threshold for materiality in accordance with CDM PoA VVS Version 2 para 308(d)/9/ is 5%.

SECTION D. Means of verification

D.1. Desk/document review

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

- a) A review of data and information provided for its completeness.
- b) A review of registered monitoring plan, monitoring methodologies including applicable tools, standards and the applicable applied standardized baselines.

All the documents reviewed during the verification process are listed in the Appendix 3 of VCR.

D.2. On-site inspection

Duration of on-site inspection: 14/07/2019-17/07/2019				
No.	Activity performed on-site	Site location	Date	Team member
1.	Opening Meeting	Lagos, Nigeria	14/07/2019	Deepika Mahala
2.	Review of information flows for generating, aggregating and reporting the monitoring parameters	Lagos, Nigeria	15/07/2019-16/07/2019	Deepika Mahala
3.	Cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources	Lagos, Nigeria	15/07/2019-16/07/2019	Deepika Mahala
4.	A check of the monitoring equipment including calibration performance and observations of monitoring practices against the applicable requirements	Lagos, Nigeria	15/07/2019-16/07/2019	Deepika Mahala
5.	Identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters	Lagos, Nigeria	15/07/2019-16/07/2019	Deepika Mahala
6.	Closing Meeting	Lagos, Nigeria	17/07/2019	Deepika Mahala

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Brown	Julie	Impact Carbon	14/07/2019-17/07/2019	Sampling Surveys	Deepika Mahala
2.	Akinyemi	Zacch	Impact Water Nigeria	14/07/2019-17/07/2019	Implementation, Sales records	Deepika Mahala
3.	Obunaya	Samuel	Impact Water Nigeria	14/07/2019-17/07/2019	Database management	Deepika Mahala
4.	Huelsenbeck	Mark	Impact Water Nigeria	14/07/2019-17/07/2019	Monitoring surveys	Deepika Mahala
5.	Shoaga	Billy	Impact Water Nigeria	14/07/2019-17/07/2019	Database management	Deepika Mahala
6	Oke	Omolara	Impact Water Nigeria (Sales associate)	17/07/2019	Water Quality Test	Deepika Mahala
7	Nwachukwu	Nnamdi	Impact Water Nigeria (Sales	17/07/2019	Water Quality Test	Deepika Mahala

			Merchandiser)			
8	-	Nihar	Climate Secure Services	14/07/2019-17/07/2019	ER calculation and Sampling	Deepika Mahala
9	Lohia	Rohit	Climate Secure Services	14/07/2019-17/07/2019	Monitoring Report, Sampling methodology, ER calculations	Deepika Mahala
10	Ha	Raji	Isolog School (ADM-Manager)	15/07/2019	DOE Survey	Deepika Mahala
11	Ojo	Beatrice	Corner Stone Group of Schools (Head Teacher)	16/07/2019	DOE Survey	Deepika Mahala
12	Basirat	Akanbi	Imoru Community (Head Teacher)	16/07/2019	DOE Survey	Deepika Mahala
13	Ogunmodede	Pastor	C-Zion Progress School (Head Teacher)	15/07/2019	DOE Survey	Deepika Mahala
14	Adebisi	Ojeymi	Rebecca Modupeola memorial School (Head Teacher)	15/07/2019	DOE Survey	Deepika Mahala
15	A.K	Bello	Nasfat Nursery and Primary School (Head teacher)	15/07/2019	DOE Survey	Deepika Mahala
16	Oyekammi	Amul R.	DC Elementary School Olukotun (Head Teacher)	16/07/2019	DOE Survey	Deepika Mahala
17	A.	Ajani	DC govt. Elementary/Middle School (Head Teacher)	16/07/2019	DOE Survey	Deepika Mahala

D.4. Sampling approach

CME Sampling approach

For the purpose of sampling, CME has followed the CDM guidelines for Sampling and surveys for CDM project activities and programmes of activities version 7.0/19/ which is in-line with the revised accepted PoA DD/1/. The CME has applied Stratified Random Sampling at PoA level for different monitoring parameters as per validated revised accepted/registered PoA DD /1/and registered CPA DDs/2/. 95/10 confidence precision was applied by CME in the sampling which is appropriate as per the single sampling covering 35 CPAs. Thus, CPA wide single sampling plan was used by the CME.

DOE Sampling approach

In order to meet the requirements of paragraph 28 of Standard for Sampling and surveys for CDM project activities and programmes of activities, Version 7/19/ the verification team applied acceptance sampling in the verification (in accordance with para 28). As per para 33 of the Standard for Sampling and surveys for CDM project activities and programmes of activities, Version 7/19/-

“A DOE may select a different sample size than the one indicated in paragraph 31 above, either by choosing a different value for the consumer risk and producer risk (e.g. 20 per cent for the consumer risk) when applying acceptance sampling or by using another approach, if any of the following conditions apply:

(a) The estimated volume of annual GHG emission reductions of the project activity or the PoA being verified is equal to or less than 100,000 t CO₂ eq.;

(b) The security conditions in the project region prevents inspection of many samples (e.g. conflict zones); or

(c) The project activity or the PoA is located in a least developed country or a host Party with 10 or fewer registered CDM project activities at the end of the monitoring period being verified.”

Since, some of the samples monitored by the CME lies in conflict zones of the country/34/, the condition (b) of the above referred paragraph was referred and the verification has applied a producer and consumer risk different than para 29 of the sampling standard.

The verification team selected the sample size as 8 institutions for the purpose of physical on-site inspection institution visit to check the acceptability of CME's sampling results or otherwise.

Sample Size:

CPA Ref No.	AQL	UQL	Producer Risk	Consumer Risk	Sample Size; Min	Acceptance No.
9948-0043 to 9948-0077	0.5%	20%	10%	20%	8	0

The verification team selected the random samples of CME's sampled records to check the acceptability (or otherwise) of the data for each such record with CME's sample records, and determine if the CME's sample records meet the requirements.

The distribution breakup from sales database is as follows:

Type of WPS	No. of units
Ultra FLO	210
Ultra Tab	79

Since, the distribution ratio between the two categories is 2.6 :1, the sample size was also divided in a similar ratio. The samples were chosen randomly (using website www.randomizer.org) out of total of 289 CME's monitored samples (as part of monitoring survey). As per plan 8 systems¹ were required. DOE visited 5 systems of Ultra FLO type and 3 systems of Ultra Tab type. No inconsistency/discrepancy between the CME's result (results of monitoring survey conducted by CME) and DOE's observations on site were found. Therefore, monitoring survey conducted by CME was accepted by the DOE.

D.5. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
General			
Compliance of the monitoring report with the monitoring report form	-	CAR#04	-
Remaining forward action requests from validation and/or	-	-	FAR#01

¹ The definition of each system considered for ER is different for Ultra FLO and Ultra Tab. Each unit of Ultra FLO having unique ID as listed in the database, is considered as individual system for CER calculations. For Ultra TAB, the value of the parameter has been determined by considering each institution as one system. Therefore, for institutions with Ultra TAB, the number of TAB systems is same as the number of institutions.

previous verifications			
CPAs considered for verification and covered in this report	-	-	-
Programme of activities			
Compliance of the programme implementation with the registered PoA-DD	CL#02	-	-
Implementation and operation of the management system	-	-	-
Post-registration changes			
• Corrections	-	-	-
• Inclusion of a monitoring plan	-	-	-
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents ²	-	-	-
• Changes to the programme design	-	-	-
• Addition of CPA inclusion template	-	-	-
• Change of coordinating/managing entity	-	-	-
• Changes specific to afforestation and reforestation activities	-	-	-
Component project activities	-		
Compliance of the CPA implementation with the included CPA design document	CL#05	-	FAR#01
Post-registration changes	-		
• Temporary deviations from registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents	-	-	-
• Corrections	-	-	-
• Changes to the start date-of the crediting period	-	-	-
• Inclusion of a monitoring plan	-	-	-
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	-	-	-
• Changes to the project design	-	-	-
• Changes specific to afforestation and reforestation activities	-	-	-
Compliance of the registered monitoring plan with applied methodologies and standardized baselines	-	-	-
Compliance of monitoring activities with the registered monitoring plan	-	-	-
• Data and parameters fixed ex ante or at renewal of crediting period	-	-	-
• Data and parameters monitored	CL#02 CL#05	-	-
• Implementation of sampling plan		-	
Compliance with the calibration frequency requirements for measuring instruments	-	-	-
Assessment of data and calculation of emission reductions	-	CAR#03	-

² Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

or net removals			
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks	-	CAR#04	-
• Calculation of project GHG emissions or actual net GHG removals by sinks	-	-	-
• Calculation of leakage GHG emissions	-	-	-
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	-	-	-
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA	-	-	-
• Remarks on difference from estimated value in included CPA	-	-	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
Total	02	02	01

SECTION E. Verification findings

E.1. General

E.1.1. Compliance of the monitoring report with the monitoring report form

Means of verification	The monitoring report form used is CDM-PoA-MR-FORM version 03.0/10/ which is an appropriate form and the latest version available at the time of verification/submission for request for issuance. All the sections of the aforesaid form were duly filled as per the guidelines and provided all the relevant details.
Findings	None
Conclusion	The final monitoring report /13/ is found to be in-line with the latest CDM-PoA-MR-form/10/ available and the instructions therein.

E.1.2. Remaining forward action requests from validation and/or previous verifications

There was one FAR (listed as FAR#01 under Appendix 4) raised at the time of inclusion because the implementation of the CPAs, that are being verified as part of this verification, could not be confirmed at the time of inclusion by validating DOE.

Therefore, the verification team raised this FAR#01. Based on the response submitted by CME and the delivery notes/21/ shared by the CME, the start date of each CPA was confirmed. Furthermore,

The compliance of the CPAs with the PoA DD/1/ eligibility criteria was also checked through following:

1. The technology implemented during the 35 CPAs includes Ultra FLO and Ultra TAB systems only as checked from the sales database/5/ and the site visit observations.
2. The address given in the sales database/5/ and physical visit to the institutions confirmed that the systems have been installed within the geo-graphical boundary of Nigeria.
3. The unique IDs of each purification system and details of institutions where the systems are installed were checked from the purchase order/14/ and IDs written on the purification systems to ensure that double counting would be avoided for each WPS. It was observed during the site visit that for Ultra FLO systems, the cartridges have UIDs written on them and for Ultra TAB systems, each pack of purification tablets (10 strips of 10 tablets each) have UIDs written on it in line with registered CPA-DDs/2/.
4. Onsite inspection and manufacturer's specification/28/ confirmed that the system does not consume fossil fuel.

Thus, the verification team confirms that the CPAs have been implemented in line with the registered PoA DD/1/. FAR#01 was resolved. Please refer to Appendix #4 for more details.

E.1.3. CPAs considered for verification and covered in this report

Title and UNFCCC reference number of the CPA included in the PoA as of the end of this monitoring period	Is the CPA considered for this verification? (yes/no)	The date when the CPA was included	Version of the PoA-DD	Confirmation that a request for issuance including the CPA has been published for the previous monitoring period (Y/N)
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 1, Version: 3.0, 9948-0001	No	01/05/2014	3.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 2, Version: 3.0, 9948-0002	No	01/05/2014	3.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 3, Version: 1.3, 9948-0003	No	08/05/2017	6.1	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 4, Version: 01.2, 9948-0004	No	02/07/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 5, Version: 5.0, 9948-0005	No	04/10/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 6, Version: 5.0, 9948-0006	No	04/10/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 7, Version: 5.0, 9948-0007	No	04/10/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 8, Version: 5.0, 9948-0008	No	04/10/2017	7.0	NA

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 9, Version: 5.0, 9948-0009	No	04/10/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 10, Version: 5.0, 9948-0010	No	04/10/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 11, Version: 5.0, 9948-0011	No	04/10/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 12, Version: 5.0, 9948-0012	No	04/10/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 13, Version: 5.0, 9948-0013	No	04/10/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 14, Version: 1.0, 9948-0014	No	21/11/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 15, Version: 1.0, 9948-0015	No	21/11/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 16, Version: 5.0, 9948-0016	No	21/11/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 17, Version: 5.0, 9948-0017	No	21/11/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 18, Version: 5.0, 9948-0018	No	21/11/2017	7.0	NA

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 19, Version: 5.0, 9948-0019	No	21/11/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 20, Version: 5.0, 9948-0020	No	21/11/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 21, Version: 5.0, 9948-0021	No	21/11/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 22, Version: 5.0, 9948-0022	No	21/11/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 23, Version: 4.0, 9948-0023	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 24, Version: 4.0, 9948-0024	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 25, Version: 4.0, 9948-0025	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 26, Version: 4.0, 9948-0026	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 27, Version: 4.0, 9948-0027	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 28, Version: 4.0, 9948-0028	No	18/11/2018	7.0	NA

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 29, Version: 4.0, 9948-0029	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 30, Version: 4.0, 9948-0030	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 31, Version: 4.0, 9948-0031	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 32, Version: 4.0, 9948-0032	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 33, Version: 4.0, 9948-0033	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 34, Version: 4.0, 9948-0034	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 35, Version: 4.0, 9948-0035	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 36, Version: 4.0, 9948-0036	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 37, Version: 4.0, 9948-0037	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 38 supported by Republic of Korea, Version: 2.0, 9948-0038	No	26/04/2019	7.0	NA

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 39 supported by Republic of Korea, Version: 2.0, 9948-0039	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 40 supported by Republic of Korea, Version: 2.0, 9948-0040	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 41 supported by Republic of Korea, Version: 2.0, 9948-0041	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 42 supported by Republic of Korea, Version: 2.0, 9948-0042	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 43 supported by Republic of Korea, Version: 1.0, 9948-0043	Yes	26/04/2019	7.0	NA ³
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 44 supported by Republic of Korea, Version: 1.0, 9948-0044	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 45 supported by Republic of Korea, Version: 1.0, 9948-0045	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 46 supported by Republic of Korea, Version: 1.0, 9948-0046	Yes	26/04/2019	7.0	NA

³ 9948-0043 to 9948-0077 are being verified for the first time therefore there is no verification history for these CPAs.

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 47 supported by Republic of Korea, Version: 1.0, 9948-0047	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 48 supported by Republic of Korea, Version: 1.0, 9948-0048	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 49 supported by Republic of Korea, Version: 1.0, 9948-0049	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 50 supported by Republic of Korea, Version: 1.0, 9948-0050	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 51 supported by Republic of Korea, Version: 1.0, 9948-0051	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 52 supported by Republic of Korea, Version: 1.0, 9948-0052	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 53 supported by Republic of Korea, Version: 1.0, 9948-0053	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 54 supported by Republic of Korea, Version: 1.0, 9948-0054	Yes	26/04/2019	7.0	NA

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 55 supported by Republic of Korea, Version: 1.0, 9948-0055	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 56 supported by Republic of Korea, Version: 1.0, 9948-0056	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 57 supported by Republic of Korea, Version: 1.0, 9948-0057	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 58 supported by Republic of Korea, Version: 1.0, 9948-0058	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 59 supported by Republic of Korea, Version: 1.0, 9948-0059	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 60 supported by Republic of Korea, Version: 1.0, 9948-0060	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 61 supported by Republic of Korea, Version: 1.0, 9948-0061	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 62 supported by Republic of Korea, Version: 1.0, 9948-0062	Yes	26/04/2019	7.0	NA

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 63 supported by Republic of Korea, Version: 1.0, 9948-0063	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 64 supported by Republic of Korea, Version: 1.0, 9948-0064	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 65 supported by Republic of Korea, Version: 1.0, 9948-0065	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 66 supported by Republic of Korea, Version: 1.0, 9948-0066	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 67 supported by Republic of Korea, Version: 1.0, 9948-0067	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 68 supported by Republic of Korea, Version: 1.0, 9948-0068	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 69 supported by Republic of Korea, Version: 1.0, 9948-0069	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 70 supported by Republic of Korea, Version: 1.0, 9948-0070	Yes	26/04/2019	7.0	NA

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 71 supported by Republic of Korea, Version: 1.0, 9948-0071	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 72 supported by Republic of Korea, Version: 1.0, 9948-0072	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 73 supported by Republic of Korea, Version: 1.0, 9948-0073	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 74 supported by Republic of Korea, Version: 1.0, 9948-0074	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 75 supported by Republic of Korea, Version: 1.0, 9948-0075	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 76 supported by Republic of Korea, Version: 1.0, 9948-0076	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 77 supported by Republic of Korea, Version: 1.0, 9948-0077	Yes	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 78 supported by Republic of Korea, Version: 1.0, 9948-0078	No	26/04/2019	7.0	NA

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 79 supported by Republic of Korea, Version: 1.0, 9948-0079	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 80 supported by Republic of Korea, Version: 1.0, 9948-0080	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 81 supported by Republic of Korea, Version: 1.0, 9948-0081	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 82 supported by Republic of Korea, Version: 1.0, 9948-0082	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 83 supported by Republic of Korea, Version: 1.0, 9948-0083	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 84 supported by Republic of Korea, Version: 1.0, 9948-0084	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 85 supported by Republic of Korea, Version: 1.0, 9948-0085	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 86 supported by Republic of Korea, Version: 1.0, 9948-0086	No	26/04/2019	7.0	NA

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 87 supported by Republic of Korea, Version: 1.0, 9948-0087	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 88 supported by Republic of Korea, Version: 1.0, 9948-0088	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 89 supported by Republic of Korea, Version: 1.0, 9948-0089	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 90 supported by Republic of Korea, Version: 1.0, 9948-0090	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 91 supported by Republic of Korea, Version: 1.0, 9948-0091	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 92 supported by Republic of Korea, Version: 1.0, 9948-0092	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 93 supported by Republic of Korea, Version: 1.0, 9948-0093	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 94 supported by Republic of Korea, Version: 1.0, 9948-0094	No	26/04/2019	7.0	NA

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 95 supported by Republic of Korea, Version: 1.0, 9948-0095	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 96 supported by Republic of Korea, Version: 1.0, 9948-0096	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 97 supported by Republic of Korea, Version: 1.0, 9948-0097	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 98 supported by Republic of Korea, Version: 1.0, 9948-0098	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 99 supported by Republic of Korea, Version: 1.0, 9948-0099	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 100 supported By Republic of Korea, Version: 1.0, 9948-0100	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 101 supported By Republic of Korea, Version: 1.0, 9948-0101	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 102 supported By Republic of Korea, Version: 1.0, 9948-0102	No	26/04/2019	7.0	NA

E.2. Programme of activities

E.2.1. Compliance of the programme implementation with the registered programme design document

Means of verification	<p>The PoA aims at disseminating water purification systems (WPS) technologies to target countries like Rwanda, Nigeria, Uganda and Kenya for addressing the problem of safe drinking water. During this monitoring period, 35 CPA's of Type 2: Technologies for institutional water consumption, with no project emissions were included. This monitoring period includes the implementation and monitoring of 35 CPAs from 9948-0043 to 9948-0077 in Nigeria. The coordinating and managing entity (CME) is Impact Carbon, and CERPD is the CPA Implementer/15/. Their roles and responsibilities are defined in the signed agreement.</p> <p>In absence of the project activity, the water would have been boiled using non-renewable biomass/fossil fuels leading to release of GHG emissions in the baseline. The implementation of the technology helps in replacing the non-renewable biomass / fossil fuel for boiling with the WPS reducing amount of equivalent GHG emissions.</p> <p>CPAs of this PoA involve dissemination of two types of water purification systems:</p> <ol style="list-style-type: none">1. Ultra FLO2. Ultra Tab		
		Ultra FLO	Ultra Tab
	Size / Dimensions	Cartridge Length: ~12 cm Cartridge height: ~10 cm Cartridge circumference: ~22 cm	Strip size: ~13 cm X ~5.5 cm (100 tablets per packet)
	Application	Piped water	Un-piped water
	Flow rate	20L/min	1 tablet treats 100 L
	Capacity/lifespan	340,000 L / 5-year expiry	10,000 L / 5-year expiry
	Fixed or Portable	Fixed	Portable
	Removal of E. Coli	99 (2-log)	99 (2-log)
	Watts/Voltage	Not applicable	Not applicable
	<p>Both the systems meet the eligibility requirements of the PoA DD, page 65/1/. The details of the systems were verified from the manufacturer's specification/28/ provided by the CME.</p> <p>During the on-site visit the installation of WPS claimed by the CME were checked and found to be in-line with the technical description provided in the registered PoA-DD/1/ and Monitoring report/13/.</p> <p>Also, the verification team checked the implementation status of the project activity as defined in the registered PoA DD/1/, and MR/13/.</p> <p>Interview of the personnel involved in the QA/QC procedures revealed that the procedures mentioned in the PoA DD/1/ are being followed and the Training records/20/ regarding the trained personnel were checked.</p> <p>During the site visit the project location and coordinates were verified using the "Go geo-coordinates app" and found to be in-line with the registered PoA-DD/1/ and MR/13/.</p> <p>Further, based on the review of sales database (presented in ER sheet)/4/, physical</p>		

	<p>observations and interview conducted during the site visit, the verification team found that:</p> <ul style="list-style-type: none"> • The CPA(s) were implemented within the boundary of the PoA as described in the revised accepted PoA-DD/1/. • The CME is same as that mentioned in the revised accepted PoA-DD/1/ • The implementation and operation of the project activity has been conducted in accordance with the description contained in the revised accepted PoA-DD/1/ and included CPA-DDs/2/. • All physical features of the CPA proposed in the included CPA-DDs/2/ were in place • The project participants/CPA implementer has operated the CPAs as per the included CPA DDs/2/. <p>An onsite verification was conducted by the verification team; 8 institutions (5 for Ultra FLO and 3 for Ultra TAB) were visited. The uniqueness of the system was identified from UID written on the units (either on cartridges or on TAB box packs)/27/. Along with the unique ID the following details are also noted in the database:</p> <ol style="list-style-type: none"> a) Type of system (UltraFLO / UltraTAB) b) Unique serial number of the units installed / distributed c) Date of installation / distribution d) Address and details of school and contact detail (if available) of representative e) Type of School (Boarding / Non-boarding) f) School population count (number of students / staff in boarding / non-boarding category) <p>The information of the was also verified from the CME database/5/ which was cross checked for 8 samples with the purchase orders/14/.</p> <p>The emission reductions being claimed during this monitoring period are lesser than the estimated emission reductions in the revised or included CPA-DDs/2/, as given in the table under section E.3.6.5. for comparable estimated ERs in the CPA DDs/2/ for the corresponding period.</p> <p>The CPAs are within the threshold limits of the applied methodology/6/.</p> <p>The monitoring report was compared and verified against the description provided in the revised accepted PoA-DD/1/ and found to be correct.</p>
Findings	CL#02 was raised and resolved.
Conclusion	<p>In view of the information's verified during the site visit, the verification team is able to confirm that all physical features (technology, project equipment, and monitoring and metering equipment) of the registered CDM program of activities were in place and that the CME has operated the project activity as per the registered PoA-DD/1/ during the concerned monitoring period.</p> <p>The emission reductions achieved during the current monitoring period are 1,011 tCO₂e. Justification for this has been assessed in further sections of report.</p>

E.2.2. Implementation and operation of the management system

Means of verification	The verification team during the site visit assessed the management systems in place to implement the monitoring of the PoA. This included the roles and responsibilities, data collection, transfer and aggregation procedures, data storage
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	<p>and archiving for the monitoring system through physical inspection. The roles and responsibilities, data collection, transfer and aggregation procedures, data storage and archiving for the monitoring system have been provided in the MR /13/ and were verified through interviews with the local staff.</p> <p>CPA implementers fill purchase order/14/ to note the details of the institution and provide delivery note/21/ at the time of installation (receipt of tablets in case of Ultra TAB). All the information is transferred to Salesforce software by the CME which was checked during the site visit to confirm that the management system is in place. The sales database was crosschecked with purchase order, delivery notes and Salesforce data to confirm that information for any system installed (unique ID) is consistent between the records. The unique ID code of WPS is combination of system type code, year code, country code and a serial number. The unique IDs of the WPS were checked for all the sampled systems seen during site visit to ensure that no number is repeating in the database and the same system is not credited in any other CPA either, thus avoiding the double counting.</p> <p>The CME also has a customer care centre which contacts the schools to ensure if the cartridge replacement (Ultra FLO) or new packets of tablets (Ultra TAB) are required or not.</p> <p>For data survey, a monitoring team has been organized by the CME consisting of trained monitoring staff, who conducted the Aquagenix tests (water quality tests) and Usage surveys. The monitoring manager at the CME is responsible for QA/QC of the data, analysis and reporting in the monitoring report. QA/QC procedures were found being followed during the site visit. Scanned copies of purchase order /14/ and completed monitoring survey forms with test results/18/ were made available to the verification team for assessment of the information of institutions and survey and test results, in the sales data and monitoring data mentioned in ER calculator /5/ . Monitoring team staff were interviewed by the verification team regarding the monitoring procedures, using the water quality testing kits and filling the monitoring questionnaires. The staff explained the complete procedure followed for Aquagenix tests and the monitoring survey form filling. The evaluation of the water quality test is done in the main office. The verification team also checked training records of the monitoring & data recording personnel/20/.</p> <p>Thus, it can be confirmed that the Implementation and operation of the management system has been done in line with the registered PoA DD/1/ and CPA DDs/2/.</p>
Findings	None.
Conclusion	The verification team from the desk review and on-site assessment confirms that the monitoring management system of the PoA is in place with the responsibilities properly identified and established.

E.2.3. Post-registration changes

E.2.3.1. Corrections

No correction observed.

E.2.3.2. Inclusion of a monitoring plan

N/A

E.2.3.3. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

N/A

E.2.3.4. Changes to the programme design

The request of approval of changes from the PoA as described in the registered PoA-DD was submitted by CME under the following request no. and approval date:

PRC request number	Approval Status	Date of Approval	Reference Link
PRC-9948-002	Approved	03/07/2017	https://cdm.unfccc.int/PRCContainer/DB/prcp445611461/view
PRC-9948-001	Approved	08/05/2017	https://cdm.unfccc.int/PRCContainer/DB/prcp266525508/view

E.2.3.5. Addition of CPA inclusion template

NA

E.2.3.6. Change of coordination/managing entity

NA

E.2.3.7. Changes specific to afforestation and reforestation activities

NA

E.3. Component project activities**E.3.1. Compliance of the CPA implementation with the included CPA design document**

Means of verification	The registered PoA aims to provide safe drinking water to the institutions in Nigeria, Rwanda, Uganda and Kenya. The PoA is primarily designed to replace the existing non-renewable means of purifying water by installing Water purification systems instead to provide safe drinking water. CERPD is the implementer of the CPAs and has fully implemented the CPAs with the help of Sales and Distribution Partner (SDP). The same has been verified from the agreement between the CME and CPAI/15/. This monitoring period includes the implementation and monitoring of 35 CPAs- CPA 9948-0043 to CPA 9948-0077 in Nigeria.							
	CPA no.	First WPS Installation date	Inclusion date	Crediting period	No. of units		Estimated ERs	ERs achieved
					FLO	TAB		
	9948-0043	23-04-2019	26-04-2019	26-04-2019	5	3	4,396	25
	9948-0044	23-04-2019	26-04-2019	26-04-2019	5	3	4,396	19
	9948-0045	23-04-2019	26-04-2019	26-04-2019	6	3	4,396	26
	9948-0046	24-04-2019	26-04-2019	26-04-2019	5	3	4,396	37
	9948-0047	24-04-2019	26-04-2019	26-04-2019	5	3	4,396	36
	9948-0048	24-04-2019	26-04-2019	26-04-2019	5	3	4,396	25
	9948-0049	24-04-2019	26-04-2019	26-04-2019	6	3	4,396	39
	9948-0050	24-04-2019	26-04-2019	26-04-2019	6	3	4,396	32
	9948-0051	24-04-2019	26-04-2019	26-04-2019	6	3	4,396	34

	9948-0052	24-04-2019	26-04-2019	26-04-2019	5	2	4,396	22
	9948-0053	24-04-2019	26-04-2019	26-04-2019	5	2	4,396	18
	9948-0054	24-04-2019	26-04-2019	26-04-2019	5	2	4,396	23
	9948-0055	24-04-2019	26-04-2019	26-04-2019	5	2	4,396	21
	9948-0056	24-04-2019	26-04-2019	26-04-2019	5	2	4,396	19
	9948-0057	24-04-2019	26-04-2019	26-04-2019	5	2	4,396	36
	9948-0058	24-04-2019	26-04-2019	26-04-2019	5	2	4,396	23
	9948-0059	24-04-2019	26-04-2019	26-04-2019	6	2	4,396	26
	9948-0060	24-04-2019	26-04-2019	26-04-2019	6	2	4,396	30
	9948-0061	24-04-2019	26-04-2019	26-04-2019	7	2	4,396	24
	9948-0062	24-04-2019	26-04-2019	26-04-2019	5	2	4,396	23
	9948-0063	24-04-2019	26-04-2019	26-04-2019	5	2	4,396	19
	9948-0064	24-04-2019	26-04-2019	26-04-2019	5	2	4,396	20
	9948-0065	24-04-2019	26-04-2019	26-04-2019	5	2	4,396	17
	9948-0066	24-04-2019	26-04-2019	26-04-2019	5	2	4,396	21
	9948-0067	24-04-2019	26-04-2019	26-04-2019	5	2	4,396	29
	9948-0068	24-04-2019	26-04-2019	26-04-2019	5	2	4,396	18
	9948-0069	24-04-2019	26-04-2019	26-04-2019	5	2	4,396	28
	9948-0070	24-04-2019	26-04-2019	26-04-2019	5	2	4,396	23
	9948-0071	24-04-2019	26-04-2019	26-04-2019	7	2	4,396	29
	9948-0072	25-04-2019	26-04-2019	26-04-2019	25	2	4,396	101
	9948-0073	25-04-2019	26-04-2019	26-04-2019	6	2	4,396	34
	9948-0074	25-04-2019	26-04-2019	26-04-2019	6	2	4,396	31
	9948-0075	25-04-2019	26-04-2019	26-04-2019	6	2	4,396	31
	9948-0076	25-04-2019	26-04-2019	26-04-2019	6	2	4,396	38
	9948-0077	25-04-2019	26-04-2019	26-04-2019	6	2	4,396	34
		AS checked from the delivery notes/21/	Checked from the UN website /12/	Checked from the UN website /12/	Check- ed from sales data base/5/	Check- ed from sales data base/5/	Checked from the ER sheet/4/	Checked from the ER sheet/4/
	As per the registered PoA-DD page 59 “products deployed under the project activity are assumed be in operation as of the start of the next month following the date of sale”. Thus, any installation in the month of May 2019 will be eligible for crediting only in the month of June 2019. Given, the current monitoring period is ending in 22 May 2019, therefore only the units installed in April 2019 (up to 30-April-2019) are eligible for crediting under the concerned monitoring period. Thus, the CME has considered 30-April-2019 as the cut-off date of installation for this monitoring period.							

	<p>It has been checked by the verification team from the ER sheet/4/ that the ERs achieved for the CPAs lies between 17 tCO₂e - 101 tCO₂e, which is below the threshold of small-scale activity. It has been confirmed that :</p> <ol style="list-style-type: none"> 1. Each of these CPAs achieves an annual emission reduction equal to or less than 60,000 tCO₂ e per year thus complying with the applied methodology SSC threshold/6/, . 2. Each of the technologies installed under these CPAs achieves an annual emission reduction equal to or less than 3,000 tCO₂ e per year (5% of the SSC limit) thus fulfilling the additionality criteria stated in the CPA DD/2/ and PoA DD/1/. 3. Each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the applied methodology (i.e. not exceeding 600tCO₂e for SSC type III methodologies) thus fulfilling the additionality criteria stated in the CPA DD/2/ and PoA DD/1/. <p>The implementation of the CPA as mentioned above is within the geographical boundary of PoA-DD/1/, which constitutes the physical boundary as well. Impact Carbon is the CME of the CPA and CEPRD is the CPAI/15/.</p> <p>The reference number and the inclusion date of CPAs have been checked and verified from the UN website/12/ and the details are found correct and consistent. The start date of CPAs was confirmed from the delivery notes/21/. The WPS are installed across Nigeria.</p>
Findings	CL#05 and FAR#01 was raised and resolved.
Conclusion	<ol style="list-style-type: none"> a) The verification team is of the opinion that physical features of the CPA have been implemented in accordance with the registered CPA-DD. b) No specific monitoring equipment had to be installed according to the monitoring plan. c) It is also confirmed, through the physical site visit and review of the supporting documentation that physical features of the component CPA have been implemented in accordance with the CPA-DD. d) The CPA was also found to be completely operational in line with the CPA-DD. e) The information provided in the relevant sections of the monitoring report are appropriately describe the implementation and operational status of the PoA

E.3.2. Post-registration changes

E.3.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

No deviations identified in the current verification and there exist no previously approved deviations for the CPAs under verification.

E.3.2.2. Corrections

Corrections were identified in CPA 9948-005 to CPA 9948-0013 and CPA 9948-0016 to CPA 9948-0022. The corrections were approved on 02/05/2019.

<https://cdm.unfccc.int/PRCContainer/DB/prcp52130222/view>

However, these CPAs are not considered under current verification as the monitoring report does not cover the aforesaid CPAs.

E.3.2.3. Changes to the start-date of the crediting period

No changes to the start date of crediting period.

E.3.2.4. Inclusion of a monitoring plan

NA

E.3.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

NA

E.3.2.6. Changes to the project design

Changes to the project design were identified in CPA 9948-005 to CPA 9948-0013 and CPA 9948-0016 to CPA 9948-0022. The changes were approved on 02/05/2019.

<https://cdm.unfccc.int/PRCContainer/DB/prcp52130222/view>

However, these CPAs are not considered under current verification as the monitoring report does not cover the aforesaid CPAs.

E.3.2.7. Changes specific to afforestation and reforestation activities

NA

E.3.3. Compliance of the registered monitoring plan with applied methodologies and standardized baselines

Means of verification	The monitoring plan as contained in CPA-DDs/2/ were reviewed against the monitoring requirements of the applied methodology AMS-III.AV version 04 /6/ as well as PoA-DD/1/ with reference to the technology involved. Based on this review, it was found that the monitoring plan contained in the CPA DDs/2/ includes all the required parameters to be monitored in the context of the CPA design and description and allows proper determination of emission reductions in accordance with PoA DD/1/ and applied methodology AMS-III.AV version 04/6/.
Findings	None.
Conclusion	The monitoring plan is in line with the approved methodology AMS III A.V Ver.4/6/, that is included in the CPA-DDs/2/.

E.3.4. Compliance of monitoring activities with the registered monitoring plan

E.3.4.1. Data and parameters fixed ex ante or at renewal of crediting period

Case 1 or Case 2: Project activities implemented in rural or urban areas of countries with proportion of rural or urban population using an improved drinking-water source equal to or less than 60 % (Case1) or above 60% (Case2), Case1 or Case 2

Means of verification	The CPAs located in Nigeria fall under Case 1. It was checked from CPA DDs/2/ and study report MICS 2016-2017/23/ which states that only 22.7% of the Nigerian population has access to clean drinking water, hence Case 1 is applied.
Findings	None.
Conclusion	The value applied is found to be consistent with the registered CPA-DDs/2/ which is correct and justified.

Specific Heat of water, WH, Kj/L °C

Means of verification	The value of the parameter is fixed at the time of validation and the value has been sourced from Methodology A.M.S.-III.AV Ver.4/6/. The value considered is 4.186 and is found to be consistent with the CPA-DD/2/.
Findings	None.
Conclusion	The value in the MR/13/ and CER sheet /4/ are consistent with the registered PoA-DD/1/ & CPA-DDs/2/. The applied value is correct and justified.

Final Temperature, T_f , (°C)

Means of verification	The value of the parameter is fixed at the time of validation and the value is sourced from the methodology AMS-III.AV version 4.0/6/. The values as available in MR is 100 which is found consistent with the values in CPA-DD/2/.
Findings	None.
Conclusion	The value in the MR/13/ and CER sheet /4/ are consistent with the registered PoA-DD/1/ & CPA-DDs/2/. The applied value is correct and justified.

Initial Temperature, T_i

Means of verification	The value of the parameter is fixed at the time of validation and the value is sourced from the methodology AMS-III.AV version 4.0/6/. The value considered is 20 and is found to be consistent with the CPA-DD/2/.
Findings	None.
Conclusion	The value in the MR/13/ and CER sheet /4/ are consistent with the registered PoA-DD/1/ & CPA-DDs/2/. The applied value is correct and justified.

Latent heat of Water Evaporation, WHE, KJ/L

Means of verification	The value of the parameter is fixed at the time of validation and the value is sourced from the methodology A.M.S.III AV- version 4/6/. The value considered is 2,260 and is found to be consistent with the CPA-DDs/2/.
Findings	None.
Conclusion	The value in the MR and CER sheet /13,4/ are consistent with the registered PoA-DD/1/ & CPA-DDs/2/. The applied value is correct and justified.

Leakage, L

Means of verification	The value of the parameter is fixed at the time of validation and the value is sourced from the methodology AMS-I.E version 5.0 /25/. The value considered is 0.95 and is found to be consistent with the CPA-DDs/2/.
Findings	None.
Conclusion	The value in the MR /13/and CER sheet /4/ are consistent with the registered PoA-DD/1/ & CPA-DD/2/. The applied value is correct and justified.

Average volume of drinking water per person per day, R_{yi} , Litres/Person/day

Means of verification	The value of the parameter is fixed at the time of validation and the value is sourced from the report WHO Minimum water quantity needed for domestic use in emergencies/24/. The value considered is 2 (for day schools) and 3.5 (for boarding schools, prisons) and is found to be consistent with the CPA-DD/2/.
Findings	None.
Conclusion	The value in the MR and CER sheet /13,4/ are consistent with the registered PoA-DD/1/ & CPA-DD/2/. The applied value is correct and justified.

E.3.4.2. Data and parameters monitored**Quantity of purified water in year y, QPW_y (liters/year):**

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording	Annual or at least biennial

	frequency	
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>The parameter is a calculated parameter determined through following equation:</p> $QPW_y = \sum (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times \text{Water Quality}_i \times \text{Operational Units}_i)$ <p>The formula is correct and in line to the applied methodology/6/, PoA DD/1/ and CPA DDs/2/.</p> <p>The installation for CPAs under the verification has been done between 23/04/2019-30/04/2019.</p> <p>As per the page 59 of revised approved PoA DD/1/, <i>"The date of installation for each unit is used to determine the portion of the monitoring period during which the unit was active. Products deployed under the project activity are assumed be in operation as of the start of the next month following the date of sale, i.e. if the date of sale is April 1st, the start of operation is May 1"</i></p> <p>Thus, for all the systems installed in April, ERs will be claimed in May 2019.</p> <p>The end date of the monitoring period is 22/05/2019.</p> <p>Thus, only 22 days have been considered for ER calculation. The approach was found to be conservative and in line with PoA DD/1/.</p> <p>The adjusted formula is:</p> $QPW_y = \sum (T_{y,i} \times N_{y,i} \times R_{y,i} \times 22 \times \text{Water Quality}_i \times \text{Operational Units}_i)$ <p>The ER sheet/4/ was checked to confirm that the formula has been applied correctly.</p>
	If applicable, has the reported data been cross-checked with other available data?	Yes. The equation used for the calculation is correct and is sourced from the paragraph 11 of the applied methodology/6/

	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	CAR#03, CL#05 was raised and resolved	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

Efficiency of water boiling system being replaced, η_{wb} , fraction

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Continuous or at least biennial
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>The parameter is determined by sourcing a default value from the applied methodology/6/ and multiplying it with the proportion of population of the institutions different type of stove.</p> <p>The GACC report for Nigeria, 2016/16/ was reviewed to confirm that the all public institutions cook with wood on traditional three stone fire.</p> <p>Therefore, a value of efficiency for unimproved stove was applied.</p>
	If applicable, has the reported data been cross-checked with other available data?	Yes. Sampled number of entries (8) were visited. The head/deputy head of the institutions were interviewed to know the treatment method used in the absence of the WPS installation. All interviewed people replied that unsafe drinking water was used from borewells and boiling water would have been the cheapest option to get safe drinking water. No other means were deemed affordable by the institutions.

	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	None.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

Total distributed water purification systems, $T_{y,i}$, Number

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Continuous
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>The total number of systems reported in the monitoring report are as following:</p> <p>210 UltraFLO</p> <p>79 UltraTAB</p> <p>The CME keeps purchase order, delivery note and details of each system on salesforce as checked on site.</p> <p>Each unit of Ultra FLO system has unique ID, which is listed in the database and has been claimed for ERs.</p> <p>For Ultra TAB system, the value of the parameter has been determined by considering each institution as a system. Therefore, for institutions with Ultra TAB, the number of tab systems is same as number of institutions.</p> <p>The entries in database were checked to confirm the total number presented in the MR. 8 samples were visited</p>

		physically also, to confirm that the details of the entries in the database/5/ are correct.
	If applicable, has the reported data been cross-checked with other available data?	Yes. Sampled number of entries (8) were checked with the installation invoices/14/ and the delivery notes/21/.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	None.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

The average population serviced by water purification systems, $N_{y,i}$, Persons/equipment

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Continuously
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	At the time of installation, the purchase order form is filled by the CME. This form/14/ notes down the total number of students and staff in boarding/non-boarding schools. These number are mentioned for each school in the sales database. For the 8 samples checked by the DOE on site, the same numbers were checked and found to be correct. The CME has also applied formula in the ER sheet/4/ to ensure that the $N_{y,i}$ multiplied by $R_{y,i}$ does not exceed the maximum output of the unit [per unit]. An average value of all the adjusted $N_{y,i}$ has been used for ER calculation respective of each CPA. In general,

		<p>the average of $N_{y,i}$ for all the CPAs was found to be 307 person/technology.</p> <p>The parameter value is noted at the time of installation by the CME and as the number of systems increases over the time, the value will change continuously. The institutions were checked to confirm that CME is recording this information in database and the implementation is in line with PoA DD/1/.</p> <p>As per the CPA DDs (9948-0043-9948-0077) page 20/2/, The value of $N_{y,i}$ is effectively the number of people in the institution. The number of people in the institution will be updated (at least biennially) to reflect change in the institution size over time. The value will be updated in the sales database biennially.</p> <p>For the current monitoring, the value of the parameter was verified from the sales database /5/ and purchase orders/14/. This parameter is neither prescribed nor monitored by CME on sample basis as per registered monitoring plan. The parameter is monitored on absolute basis for each of the installation.</p>
	If applicable, has the reported data been cross-checked with other available data?	Yes. The values in the ER sheet were checked with onsite observations by the DOE which was further cross-checked with the purchase orders/14/.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	CL#05 was raised and resolved.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

Water quality measurement, Water Quality_i, Proportion

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording	Annual or at least Biennial

	frequency	
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
	Monitoring equipment	Aquagenix testing kits
	Calibration details	Not Applicable.
	How were the values in the monitoring report verified?	<p>The CME conducted Aquagenix testing kits to monitor the thermo tolerant coliform value for sampled institutions.</p> <p>The Head teachers/ Deputy Head teachers of the schools visited by the DOE confirmed that they were visited by monitoring team for the tests.</p> <p>The monitoring forms/18/ for all the institutions were checked to ascertain that all the tests gave positive results confirming safe drinking water Hence, the applied value of 1.00 was found acceptable.</p>
	If applicable, has the reported data been cross-checked with other available data?	Photos of the test/30/ conducted during the monitoring were shared by the CME which confirmed the results in monitoring forms.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The staff conducting the tests were interviewed during the site visit and training evidences/20/ provided by the CME confirmed that the tests are conducted and evaluated by trained staff.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	None.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

Percent of the monitoring period in which the units are in use, Operational Units, Percentage

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	At least once per verification or biennially
	Is measuring and reporting frequency	Yes

	in accordance with the monitoring plan and monitoring methodology? (Yes / No)	
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>The sampled institutions were visited by the CME's monitoring team to monitor the operational status of the WPS units installed in the institutions as checked from the monitoring survey forms/18/.</p> <p>The Head teachers/ dy. Head teachers of the schools visited by the DOE confirmed that they were visited by monitoring team for the surveys.</p> <p>All the DOE visited institutions were found to be operational.</p> <p>Thus, the applied value of 100% was found acceptable.</p>
	If applicable, has the reported data been cross-checked with other available data?	Results presented in the ER sheet were checked with monitoring survey forms/18/ and DOE site visit.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The staff conducting the tests were interviewed during the site visit and training evidences/20/ provided by the CME confirmed that the surveys are conducted and evaluated by trained staff.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	None.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

Fraction of woody bio-mass saved by the project activity in Year, fNRB, Fraction

Means of verification		
	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Continuous or at least biennial
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes /	Yes

	No)	
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>The parameter is determined by sourcing a default value from UNFCCC SSC WG 37th Meeting Report for Nigeria /26/ and multiplying it with the proportion of population of the institutions using different type of stove.</p> <p>The GACC report for Nigeria, 2016/16/ was reviewed to confirm that the all public institutions cook with wood on traditional three stone fire.</p> <p>Therefore, a value 100% of efficiency for unimproved stove was multiplied with default value of 0.93 UNFCCC SSC WG 37th Meeting Report for Nigeria /26/ to the final value = 0.93, which was applied in the ER calculation sheet/4/. The applied value was found to be correct.</p> <p>The value has been determined is in line with the PoA DD/1/ and CPA DDs/2/.</p>
	If applicable, has the reported data been cross-checked with other available data?	NA
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	CL#02 was raised and resolved.	
Conclusion	The values in the Monitoring Report /13/ and corresponding Emission Reduction Spreadsheet /4/ are consistent with the revised accepted PoA-DD/1/ and CPA-DDs/2/. The values applied for ER calculations/4/ in the relevant CPAs are correct and justified.	

Emission factor as per AMS-I.E. procedures when NRB is displaced or the emission factor of the fossil fuel substituted, EF projected_fossil fuel, tCO₂/TJ

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Continuous or at least biennial

	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>The parameter is determined by sourcing a default value from AMS-I.E./25/ and multiplying it with the proportion of population of the institutions using different type of stove.</p> <p>The GACC report for Nigeria, 2016/16/ was reviewed to confirm that the all public institutions cook with wood on traditional three stone fire.</p> <p>Therefore, a value 100% of efficiency for unimproved stove was multiplied with default value of 81.6 sourced from AMS-I.E./25/ to give the final value = 81.6, which was applied in the ER calculation sheet/4/. The applied value was found to be correct.</p> <p>The value has been determined is in line with the PoA DD/1/ and CPA DDs/2/.</p>
	If applicable, has the reported data been cross-checked with other available data?	Yes. The value sourced form AMS-I.E./25/ was also cross-checked from the IPCC greenhouse gas inventories report/22/.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	None.	
Conclusion	The values in the Monitoring Report /13/ and corresponding Emission Reduction Spreadsheet /4/ are consistent with the revised accepted PoA-DD/1/ and CPA-DDs/2/. The values were found consistent with IPCC default values for fossil fuels /22/. The applied values are correct and justified.	

Existence of public distribution network of safe drinking water, Fraction, Existence of public distribution network of safe drinking water in year y, Fraction

Means of verification	Criteria/Requirements	Assessment/Observations
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	Measuring /Reading /Recording frequency	Annual or at least biennial
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>The sampled institutions were visited by the CME's monitoring team to check the existing public distribution network with safe drinking water as checked from the monitoring survey forms/18/.</p> <p>The Head teachers/ dy. Head teachers of the schools visited by the DOE during on site assessment confirmed that they were visited by monitoring team for the surveys.</p> <p>All the institutions DOE visited were found to not have any access to public distribution network. Their source of water was found to be Borewell/ Well. Besides, review of other monitoring survey forms and sales database indicated that safe drinking water based public distribution network was not accessible to project schools.</p> <p>Thus, the applied value of 0 was found acceptable for the current verification.</p>
	If applicable, has the reported data been cross-checked with other available data?	Results presented in the ER sheet were checked with monitoring survey forms/18/ and DOE site visit.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The staff conducting the tests were interviewed during the site visit and training evidences/20/ provided by the CME confirmed that the surveys are conducted and evaluated by trained staff.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	None.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

E.3.4.3. Implementation of sampling plan

Means of verification	<p>The monitoring has been carried out in accordance with the monitoring plan contained in the revised approved PoA DD/1/ and CPA DDs/2/.</p> <p>Sampling Design/Target Population/Sampling Frame/Reliability:</p> <p>The CME has applied single sampling plan for all of the 35 CPAs. According to the 'Sampling and Survey standards,' version 7.0/19/, the sampling plan applied by the PP for the following CPAs are found to be appropriate. As per the sampling plan stated in the PoA DD/1/, a minimum 90% confidence interval and a 10% margin of error requirement is achieved for the sampled parameters. When a single sampling plan covers a group of CPAs or when monitoring is conducted biennially (every two years), confidence/precision of 95/10 for the sample size calculation is applicable. Since the sampling has been done across the CPAs, the CME has taken 95/10 as the confidence precision levels which is found to be in line with the registered monitoring plan/1,2/.</p> <p>The target population for the parameters stated above are Water purification systems⁴ installed / distributed in institutions and recorded in the project sales database</p> <p>Sampling Frame:</p> <p>There are two different type of units under the CPAs. 210 UltraFLO units and 79 UltraTAB units have been listed in the sales database. However, the parameters for monitoring are homologous (i.e. implemented in schools). Thus, the CME has applied a common sampling for all the parameters monitored which was found acceptable.</p> <p>Sampling Method and selection:</p> <p>The CME has applied Stratified Random Sampling by dividing the population into two strata (UltraFLO and UltraTAB). The samples have been chosen randomly from both the strata as checked from screenshots of random generator online website - Stat Trek/32/ and the excel sheets with random numbers/33/.</p> <p>Sample Size for Parameter of Interest:</p> <p>The sampling is applied to the following monitoring parameters:</p> <ul style="list-style-type: none"> • Water Quality- Aquagenix Tests • Operational Units • Existence of public distribution network of safe drinking water <p>The sample size is chosen using the equation inline to CDM guidelines for Sampling and surveys for CDM project activities and programmes of activities.</p> <p>In this regard, sample size calculation spreadsheet /4/ was checked and found correct as per registered monitoring plan. The complete details are given in E.3 section of Monitoring Report/13/.</p> <p>Implementation of Sampling Survey and Field Test Records:</p> <p>Based on interviews with the CME and surveyors during the site visit, in addition to simply asking this question to the end users, the surveyors were also trained to evaluate to results of Aqua-genix tests. Therefore, the implementation of surveys</p>
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⁴ The definition of each system considered for ER is different for Ultra FLO and Ultra Tab. Each unit of Ultra FLO having unique ID as listed in the database, is considered as individual system for CER calculations. For Ultra TAB, the value of the parameter has been determined by considering each institution as one system. Therefore, for institutions with Ultra TAB, the number of TAB systems is same as the number of institutions.

	<p>and tests was considered reliable. The surveyors also took photos of the school name, test results which were checked during the on-site visit by the verification team.</p> <p>Monitoring survey (by CME) duration:</p> <p>The monitoring survey (field survey / tests) was carried out by CME representatives between following duration for the current monitoring period.</p> <table><tr><th>CPA Ref.No.</th><th>Technology</th><th>From</th><th>To</th></tr><tr><td>9181-0043 to 9948-77</td><td>Water Purification systems</td><td>21/05/2019</td><td>27/06/2019</td></tr></table> <p>Reliability and precision calculation:</p> <p>The verification team has verified the ER calculation spreadsheets /4/ with the monitored data, where the actual achieved precision is calculated against the Guidelines outlined under “Standard for sampling and surveys for CDM project activities and Programme of Activities” /19/ and confirms that the calculation of achieved reliability was done correctly.</p> <p>All parameters of interest are included in the ER spreadsheet for the revised approved CPAs. These were checked for the input values as well as formula applied and were found consistent. The reliability (demonstration of precision achieved after the survey results) is depicted in the ER calculation sheets /4/ corresponding to final Monitoring Report /13/, which were also found correct.</p> <p>Thus, the verification team confirms that required precision has been met and the results are reliable.</p>	CPA Ref.No.	Technology	From	To	9181-0043 to 9948-77	Water Purification systems	21/05/2019	27/06/2019
CPA Ref.No.	Technology	From	To						
9181-0043 to 9948-77	Water Purification systems	21/05/2019	27/06/2019						
Findings	None.								
Conclusion	The verification team has found out that the sampling plan applied is found to be in-line with the monitoring plan mentioned in the registered PoA-DD/1/ and CPA-DDs/2/ and Sampling and survey standards, ver.7/19/								

E.3.5. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	No monitoring equipment are used required as outline in the CPA-DDs/2/ and revised accepted PoA-DD/1/.
Findings	None.
Conclusion	The verification team has determined that no monitoring equipment has been used by the PP that requires calibration. Furthermore, there was no requirement of calibration in the CPA-DDs/2/. This was in accordance with the accepted monitoring plan and the applied monitoring methodology/6/.

E.3.6. Assessment of data and calculation of emission reductions or net removals

E.3.6.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	<p>The following equations were used to determine the baseline emissions as provided in the monitoring report /13/ and applied in the corresponding ER calculations sheet /4/. The expressions used were found consistent with the revised accepted PoA DD /1/, CPA DDs /2/ and the applied methodology AMSIII.AV, version 04 /6/:</p> $BE_y = QPW_y * SEC * f_{NRBy} * EF_{\text{projected_fossilfuel}} * 10^{-9}$ <p>Where,</p> <p>BE_y Baseline emissions during the year y in (tCO₂e)</p>
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	<p>QPW_y Quantity of purified water in year y (Liters/yr).</p> <p>SEC Specific energy consumption required to boil one litre of water (kJ/L)</p> <p>f_{NRB,y} Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable.</p> <p>For biomass, the default values of f_{NRB} shall be used from EB67. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of biomass and other fuels (e.g. fossil fuels) are used, a weighted average renewability factor shall be applied.</p> <p>EF_{projected_fossilfuel} Emission factor when NRB is displaced or the emission factor of the fossil fuel substituted</p> <p>Default emission factors from AMS-I.E as referenced in AMS-III.AV version 4 and IPCC shall be used. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of woody biomass and fossil fuels are used in the absence of the project activity a weighted average value shall be applied, as described in parameter box in section E.2</p> <p>Calculation for CPA 9948-0043 (as an example):</p> $= 97,856 \times 3574.80 \times 0.93 \times 81.60 \times 10^{-9}$ $= 26.55 \text{ tCO}_2\text{e}$ <p>Specific energy consumption (SEC) i.e. energy required to boil one litre of water is calculated as</p> $\text{SEC} = [\text{WH} \times (\text{T}_f - \text{T}_i) + 0.01 \times \text{WHE}] / n_{wb}$ <p>Where</p> <p>WH Specific heat of water (kJ/L °C)</p> <p>T_f Final temperature (°C)</p> <p>T_i Initial temperature of water (°C)</p> <p>WHE Latent heat of water evaporation (kJ/L)</p> <p>n_{wb} Efficiency of water boiling system being replaced (fraction)</p> <p>Calculation for CPA 9948-0043:</p> $\text{SEC} = [4.186 \times (100 - 20) + 0.01 \times 2260] / 0.10$ $\text{SEC} = 3574.80 \text{ kJ/L.}$ <p>And QPW_y is calculated through following equation:</p> $\text{QPW}_y = \sum (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times \text{Water Quality}_i \times \text{Operational Units}_i)$ <p>The installation for CPAs under the verification has been done between 26/04/2019-30/04/2019.</p> <p>As per the page 59 of revised approved PoA DD/1/, "The date of installation for each unit is used to determine the portion of the monitoring period during which the unit was active. Products deployed under the project activity are assumed be in operation as of the start of the next month following the date of sale, i.e. if the date of sale is April 1st, the start of operation is May 1"</p>
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	<p>Thus, for all the systems installed in April, ERs will be claimed in May 2019. The end date of the monitoring period is 22/05/2019.</p> <p>Thus, only 22 days have been considered for ER calculation. The approach was found to be conservative and in line with PoA DD/1/.</p> <p>The number of days for the current monitoring period is 22 days. Thus, the revised formula is :</p> $QPW_y = \sum (T_{y,i} \times N_{y,i} \times R_{y,i} \times 22 \times \text{Water Quality}_i \times \text{Operational Units}_i)$ <p>Where:</p> <p>QPW_y : Quantity of purified water for drinking for all technologies type i in year y (Liters)</p> <p>$T_{y,i}$: The average population serviced by water purification systems (person/equipment)</p> <p>$R_{y,i}$: Average volume of drinking water per person per day (Liters/person/day)</p> <p>Water Quality_i : Percent of units that meet water quality requirements</p> <p>$\text{Operational Units}_i$: Percent of the monitoring period in which the units are in use</p> <p>$N_{y,i}$: The average population serviced by water purification systems (Persons/equipment)</p> <p>Calculation for CPA 9948-0043:</p> $QPW_y = 8 \times 278 \times 2.0 \times 22 \times 1.0 \times 1.0$ $QPW_y = 97,856 \text{ L}$ <p>The verification team has checked that the calculation for other CPAs (9948-0044 to 9948-77) have also been done in the worksheet 'ERs Summary' /4/ in the same manner.</p> <p>The calculations for all the CPAs (9948-0044 to 9948-77) were checked in the ER sheet/4/ and it was found that calculations have been done inline to the PoA DD/01/ and in accordance to the applied methodology/6/.</p> <p>All the parameters are assessed in detail under section E.3.4. of this report.</p>
Findings	CAR#03 and CAR#04 were raised and resolved
Conclusion	<p>The verification team confirms that</p> <ol style="list-style-type: none"> The complete data was available and is duly reported; As indicated above, the description with regard to cross-check of reported data is included under respective parameter above; Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals were followed; Appropriate emission factors, IPCC default factors and other reference values were correctly applied. There is no pro-rata approach applied in the current monitoring period as entire monitoring period falls into period that is after the end of first commitment period of Kyoto Protocol.

E.3.6.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	The project activity involves no emissions as it involves dissemination of water purification systems and replaces the non-renewable woody biomass fossil fuel way of boiling water with the transitioned way of water purification by the chlorination technologies.
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Findings	None.
Conclusion	The project emissions have not been considered. The approach is in line with the PoA DD/1/.

E.3.6.3. Calculation of leakage GHG emissions

Means of verification	<p>The PoA-DD/1/, CPA DDs/2/ and applied monitoring methodologies does not prescribe any leakage emissions to be considered. The onsite visit and project design also did not reveal any potential source to be considered in this regard. However, the leakage adjustment factor that is required to adjust the baseline emissions has been duly accounted in baseline calculations.</p> <p>BE_y is multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required. Therefore, the leakage is calculated as follows:</p> <p>Leakage = BE_y * (1-95%)</p> <p>Calculation for 9948-0043 is as follows:</p> <p>LE = 26.55 * (1-0.95)</p> <p>LE = 1.33</p> <p>The verification team has checked that the calculation for other CPAs (9948-0044 to 9948-77) have also been done in the worksheet 'ERs Summary' /4/ in the same manner.</p> <p>The calculations for all the CPAs (9948-0044 to 9948-77) were checked in the ER sheet/4/ and it was found that calculations have been done inline to the PoA DD/01/ and in accordance to the applied methodology/6/.</p> <p>The verified value of Leakage for all the CPAs is 53.94 tCO₂e. The value is mentioned CPA wise in the table presented under the next section.</p>
Findings	None.
Conclusion	No additional leakage emissions (other than what is already considered in baseline calculations) were required in accordance with the methodology AMS-III.AV, version 04 /6/.

E.3.6.4. Summary of calculation of GHG emission reductions or net GHG removals by sinks

Means of verification	<p>As elaborated above, the entire emission reductions from the PoA were based on baseline emissions. The calculations presented in this regard in the final monitoring report /13/ and corresponding ER calculations sheet /4/ were found appropriate and complying with the provisions prescribed in the registered monitoring plan of respective CPA-DDs/2/, PoA-DD/1/ and applied methodology/6/.</p> <p>The verification team confirms that an audit trail that contains the evidence and records that validated the stated figures were checked and found acceptable.</p>
Findings	CAR#03 was raised and resolved.
Conclusion	<p>The verification team confirms that</p> <ul style="list-style-type: none"> a) The complete data was available and is duly reported; b) As indicated above, the description with regard to cross-check of reported data is included under respective parameter (refer Section E.5.4 of this report); c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals, project emissions and leakage emissions were followed;

d) The total number of ERs achieved (on account of water purifiers installation) during the current monitoring period were 1,011 tCO₂e.

Title and UNFCCC reference number of the CPA	Baseline emissions or baseline net GHG removals by sinks (tCO ₂ e)	Project emissions or actual net GHG removals by sinks (tCO ₂ e)	Leakage (tCO ₂ e)	GHG emission reductions or net GHG removals by sinks (tCO ₂ e)		
				Amount achieved before 1 January 2013	Amount achieved from 1 January 2013	Amount achieved in the entire monitoring period
9948-0043	26.55	0	1.33	0	25	25
9948-0044	20.15	0	1.01	0	19	19
9948-0045	27.81	0	1.39	0	26	26
9948-0046	39.16	0	1.96	0	37	37
9948-0047	38.48	0	1.92	0	36	36
9948-0048	27.13	0	1.36	0	25	25
9948-0049	41.97	0	2.10	0	39	39
9948-0050	33.73	0	1.69	0	32	32
9948-0051	35.86	0	1.79	0	34	34
9948-0052	23.65	0	1.18	0	22	22
9948-0053	18.97	0	0.95	0	18	18
9948-0054	25.07	0	1.25	0	23	23
9948-0055	22.48	0	1.12	0	21	21
9948-0056	20.14	0	1.01	0	19	19
9948-0057	38.77	0	1.94	0	36	36
9948-0058	24.24	0	1.21	0	23	23
9948-0059	28.27	0	1.41	0	26	26
9948-0060	32.28	0	1.61	0	30	30
9948-0061	25.42	0	1.27	0	24	24
9948-0062	24.40	0	1.22	0	23	23
9948-0063	20.30	0	1.02	0	19	19
9948-0064	21.93	0	1.10	0	20	20
9948-0065	18.11	0	0.91	0	17	17
9948-0066	22.73	0	1.14	0	21	21
9948-0067	30.95	0	1.55	0	29	29
9948-0068	19.22	0	0.96	0	18	18
9948-0069	29.58	0	1.48	0	28	28
9948-0070	24.57	0	1.23	0	23	23

9948-0071	31.18	0	1.56	0	29	29
9948-0072	106.68	0	5.33	0	101	101
9948-0073	35.91	0	1.80	0	34	34
9948-0074	33.20	0	1.66	0	31	31
9948-0075	33.52	0	1.68	0	31	31
9948-0076	40.10	0	2.00	0	38	38
9948-0077	36.29	0	1.81	0	34	34
Total	1,078.76	0	53.94	0	1,011⁵	1,011

E.3.6.5. Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA

Means of verification	<p>Earthood Services Private Limited is able to certify that the emission reductions from the CDM project activity 9948 "Impact Carbon Global Safe Water Programme of Activities (PoA)" in Nigeria for the monitoring period 23/05/2017-22/05/2019 (including both days) amount to 1,011tCO₂.</p> <p>Verified and certified emission reductions as per commitment period:</p> <table> <tr> <td>Commitment period</td><td>Amount</td></tr> <tr> <td>Upto 31/12/2012 (1st commitment period)</td><td>0 tCO₂e</td></tr> <tr> <td>From 01/01/2013</td><td>1,011 tCO₂</td></tr> </table>	Commitment period	Amount	Upto 31/12/2012 (1 st commitment period)	0 tCO ₂ e	From 01/01/2013	1,011 tCO ₂
Commitment period	Amount						
Upto 31/12/2012 (1 st commitment period)	0 tCO ₂ e						
From 01/01/2013	1,011 tCO ₂						
Findings	None.						
Conclusion	The actual ERs achieved in included CPAs are not higher than the estimated quantity of ERs in the CPA-DDs/2/. Accordingly, it was accepted by verification team.						

CPA UNFCCC reference number	Amount achieved during this monitoring period (t CO ₂ e)	Amount estimated ex ante for this monitoring period in the CPA-DD (t CO ₂ e)
9948-0043	25	4,396
9948-0044	19	4,396
9948-0045	26	4,396
9948-0046	37	4,396
9948-0047	36	4,396
9948-0048	25	4,396
9948-0049	39	4,396

⁵ CME has rounded down ERs for each CPA to keep it full integer. The value represents here the sum of all such CPAs.

9948-0050	32	4,396
9948-0051	34	4,396
9948-0052	22	4,396
9948-0053	18	4,396
9948-0054	23	4,396
9948-0055	21	4,396
9948-0056	19	4,396
9948-0057	36	4,396
9948-0058	23	4,396
9948-0059	26	4,396
9948-0060	30	4,396
9948-0061	24	4,396
9948-0062	23	4,396
9948-0063	19	4,396
9948-0064	20	4,396
9948-0065	17	4,396
9948-0066	21	4,396
9948-0067	29	4,396
9948-0068	18	4,396
9948-0069	28	4,396
9948-0070	23	4,396
9948-0071	29	4,396
9948-0072	101	4,396
9948-0073	34	4,396
9948-0074	31	4,396
9948-0075	31	4,396
9948-0076	38	4,396
9948-0077	34	4,396
Total	1,011	153,860

E.3.6.6. Remarks on difference from estimated value in included CPA

Means of verification	As verified and evident from the Monitoring Report /13/ and corresponding ER calculations sheet /4/, the actual emission reductions achieved for Water Purification systems for the CPAs under this verification in the current monitoring period were found less than the estimated quantity in the CPA-DDs/2/ for the comparable period. This is largely due to lower number of water purifiers that were sold. Considering, there is no increase in ERs no further verification effort was put in. The quantitative details of actual values of achieved ERs for the CPA and value estimated in the CPA- DDs/2/ is presented in the next table.
Findings	None.
Conclusion	The actual emission reductions achieved in any of specific CPAs are not higher than the estimated quantity of ERs in the CPA-DDs/2/. Accordingly, it was accepted by the verification team.

E.3.7. Assessment of reported sustainable development co-benefits

Means of verification	The coordinating/managing entity did not identify and establish the monitoring of the sustainable development benefits of the registered CDM PoA/1/ and no such document was developed and published on the UNFCCC CDM website/12/. Therefore, assessment is required.
Findings	None.
Conclusion	The CME is not required to monitor the sustainable development benefits of the registered CDM PoA.

E.3.8. Global stakeholder consultation

Means of verification	The global stakeholder consultation was not found applicable because period under verification is 2nd monitoring period.
Findings	None.
Conclusion	The requirement is applicable for situations when global stakeholder consultation was carried out after the publication of first monitoring report. Therefore, this was not found applicable.

SECTION F. Internal quality control

The draft verification report that is prepared by verification team is reviewed by an independent technical review team (one or more members) to confirm if the internal procedures established and implemented by Earthood were duly complied with and such opinion/conclusion is reached in an objective manner that complies with the applicable CDM rules/requirements. The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scope the project activity relates to. All team members of technical review team are independent of the verification team

During the technical review process additional findings may be identified or the closed-out findings may be opened, which needs to be satisfactorily resolved before the request for issuance is submitted to UNFCCC. The independent technical reviewer may either approve the report as such or reject/return the same in such case providing the comments/findings/issues that needs to be resolved by the verification team. The decision taken by the Technical Reviewer is final and is authorized on behalf of Earthood Services Private Limited.

SECTION G. Verification opinion

Earthood Services Private Limited (ESPL), contracted by Impact Carbon (the CME for the PoA), has performed the first independent verification of the emission reductions for the registered CDM PoA 9948 "Impact Carbon Global Safe Water Programme of Activities (PoA)" for the second monitoring period

23/05/2017-22/05/2019 (both days included) as reported in the Monitoring Report (final) Version 3.0 dated 27/07/2019/13/. The CME is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

This verification report is for the PoA-9948 which was included at the UNFCCC webpage at the end of the current monitoring period.

ESPL confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements. This verification report has been prepared using the latest available template/11/ specified by UNFCCC and complies with the instructions to follow of CDM VVS-PoA Version 02/9/.

The verification activities were conducted in accordance with ESPL's CDM Quality Manual System as per the steps indicated under Section A of this report. The verification process has resulted in conclusion that the included CPAs confirm to the revised accepted PoA-DD/1/ as well as comply with applicable CDM rules and regulations and in accordance with applied monitoring methodologies, AMS III.AV (Version 04)/6/.

As a result, it is confirmed that the emission reductions from the CDM PoA 9948 "Impact Carbon Global Safe Water Programme of Activities (PoA)" are correctly reported in the Monitoring Report Version 3/13/ dated 27/07/2019 and corresponding ER sheets for the monitoring period 23/05/2017-22/05/2019(including both days) amount as 1,011 tCO₂e. Therefore, this will be submitted as part of request for issuance as per CDM PCP Version 02/8/.

SECTION H. Certification statement

The 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.

In our opinion the GHG emissions reductions reported for the PoA for the monitoring period 23/05/2017 – 22/05/2019 (MP 02) are fairly stated in the Monitoring Report (final) Version 3.0 dated 27/07/2019.

ESPL, based on outcome of verification activities, certify in writing that, during the monitoring period 23/05/2017-22/05/2019 (including both days), the registered CDM PoA "Impact Carbon Global Safe Water Programme of Activities (PoA)" and the included CDM CPAs achieved the verified amount of **1,011** tCO₂e reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the CPAs.

Appendix 1. Abbreviations

	Full texts
AMS	Approved Methodology for Small-scale
BE	Baseline Emission
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CERPD	Carbon Emission Reduction Project Developers
CH ₄	Methane
CL	Clarification Request
CME	Coordinating and Managing Entity
CO ₂	Carbon di oxide
CPA	Component Project Activity
CP	Crediting Period
DNA	Designated National Authority
DR	Desk Review
DOE	Designated Operational Entity
EB	Executive Board
ER	Emission Reduction
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
GHG	Green House Gas
GSC/GSP	Global Stakeholder Consultation Process
GW	Giga Watt
GWh	Giga Watt hour
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
kW	kilo Watt
L/min	Litres per minute
LoA	Letter of Approval/Authorization
LSC	Local Stakeholder Consultation Process
MoC	Modalities of Communication
MoV	Means of Validation
MP	Monitoring Plan
MW	Mega Watt
MWh	Mega Watt hour
N ₂ O	Nitrous Oxide
PCP	Project Cycle Procedure
PE	Project Emission
PoA DD	Programme of Activities Design Document
PP	Project Participant
PRC	Post Registration Changes
PS	Project Standard
QA/QC	Quality Assurance/Quality Control
tCO ₂ e	tonnes of Carbon di Oxide equivalent
UID	Unique Identification
UNFCCC	United Nations Framework Convention on Climate Change
V	Version
VVS	Validation and Verification Standard
WPS	Water Purification Systems

Appendix 2. Competence of team members and technical reviewers

Competence Statement			
Name	Deepika Mahala		
Country	India		
Education	M. Sc. (Environmental Management), GGSIP University B.Sc. Hons. (Chemistry), Sri Venkateshwar College, DU		
Experience	3 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	ACM0002, AMS.I.D., AMS.I.A, AMS.III.AV, AMS.II.G		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2 & TA 3.1)		
Reviewed by	Shreya Garg	Date	14/09/2018
Approved by	Anshika Gupta	Date	14/09/2018

Competence Statement			
Name	Ms. Adeola Ijeoma Eleri		
Country	Nigeria		
Education	Certificate in Energy and Sustainable Development (IIIEE, Sweden) M.Sc. (Environmental Biology) B.Sc. (Microbiology)		
Experience	8 Years		
Field	Climate Change, Energy & Environment		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	YES (Nigeria)		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert	NO		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Ashok Kumar Gautam	Date	01/03/2018

Competence Statement			
Name	Vaishali Vatsa		
Education	M.Sc. (Environmental Studies and Resource Management), TERI University		
Experience	4 months		
Field	Climate Change		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	NO		
Trainee	Validator/ Verifier		
Reviewed by	Shreya Garg	Date	28/06/2019
Approved by	Anshika Gupta	Date	28/06/2019

Competence Statement			
Name	Ashok Gautam		
Country	India		
Education	M. Sc. (Environmental Sciences) M. Tech. (Energy & Environmental Management)		
Experience	16 Years +		
Field	Energy, Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS-I.D., AMS-I.A., AMS-I.C., AMS-I.E, AMS-II.D., AMS-II.G., AMS-III.E., AMS-III.H., AMS-III.Q, AMS-III.Z., AMS-III.AV., AM0029, AM0025, AM0056, ACM0001, ACM0002, ACM0004, ACM0012, ACM0006, AM0018, ACM0009, AM0034, AMS.I.B		
Local expert	YES (India)		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1)		
Reviewed by	Shreya Garg	Date	25/01/2019
Approved by	Anshika Gupta	Date	25/01/2019

Appendix 3. Documents reviewed or referenced

[illegible]

11	UNFCCC	CDM-PoA-VCR-Form	Version 3	Others
12	UNFCCC	PoA UN webpage	https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/5J36IFUKQVNMRA0OZPGLH9C7STED1W/viewCPAs?s=0	Others
13	Impact Carbon	Monitoring Report (Final)	Version 03 Dated:27/07/2019	CME
14	Impact Carbon	Purchase Orders	Dated: 23/04/2019-25/04/2019	CME
15	Impact Carbon	Agreement between CME and CPA Implementer	Dated: 15/01/2019	CME
16	GACC	GACC Analysis report (The Truth About Cooking Landscape Analysis, Nigeria)	Dated:14/10/2016	CME
17	DHS	DHS Report, Nigeria 2016	2016	CME
18	Impact Carbon	Monitoring form + Water Quality Test	Multiple Dates: 23/05/2019-29/06/2019	CME
19	UNFCCC	Standards for Sampling and survey for CDM PoA	Version 7.0	Others
20	Impact Carbon	Training Records	20/05/2019 & 17/06/2019	CME
21	Impact Carbon	Delivery Notes	Multiple Dates: 23/04/2019-30/04/2019	CME
22	IPCC	IPCC default values for fossil fuels	https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf	Other
23	MICS	MICS 2016-2017 survey report for Nigeria	https://www.unicef.org/nigeria/reports/multiple-indicator-cluster-survey-2016-17-mics	CME
24	WHO	WHO Technical Notes on Drinking -Water sanitation and Hygiene	https://www.who.int/water_sanitation_health/emergencies/WHO_TN_10_Hygiene_promotion_in_emergencies.pdf?ua=1	CME
25	UNFCCC	AMS-I.E.	Version 5.0	Other
26	UNFCCC	UNFCCC SSC WG 37 th Meeting Report for Nigeria	http://cdm.unfccc.int/Panels/ssc_wg/meetings/037/ssc_37_an14.pdf	CME
27	Impact Carbon	UID photographs of WPS	-	CME
28	Impact Carbon	Manufacturer's Specifications	-	CME
29	Impact Carbon	Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO 2011)	https://www.who.int/water_sanitation_health/publications/2011/evaluating_water_treatment.pdf	CME
30	Impact Carbon	Photos of Aquagenix test	-	CME
31	UNFCCC	Guidelines for sampling and surveys for CDM project activities and programme of activities	Version 4.0	Other
32	Stat Trek	Screenshot- Stat trek	-	CME
33	Impact Carbon	Random number -excel sheet	-	CME
34	UK gov.	Foreign travel Advice-Nigeria	https://www.gov.uk/foreign-travel-advice/nigeria/safety-and-security	CME

Appendix 4. Clarification requests, corrective action requests and forward action requests

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

FAR ID	01	Section no.	E.1.2. and E.3.1.	Date	:14/07/2019
Description of FAR					
FAR from Inclusion “During the Validation stage, implementation for the thirty-five CPAs has not started. Referring to paragraph 34 of CDM VVS for PoAs, version 02.0, during 1st periodic verification, the verifying DOE shall check/review the project implementation in accordance with the CPA-DDs including checking of all the solutions/technologies (chemical disinfection based water purification systems) to be implemented in the CPAs and its compliance with the requirements of the PoA.”					
Project participant response					Date :18/07/2019
At the time of validation, the CPAs were not implemented hence, the FAR was issued to check the implementation of the CPAs (wrt to technology installed). Implementation of all the thirty-five CPAs (9948-0043 to 9948-0077) covered in the Monitoring Report has started. The following demonstrates compliance with the inclusion eligibility criteria (relevant to technology implemented): <ol style="list-style-type: none"> 1. The technology implemented in the CPAs is same as that described in the CPA-DD (i.e. UltraTab and UltraFlo systems have been implemented. Refer sales database in the ER calculator) 2. The water purification systems (WPS) installed in each of the CPA is located within the geographical boundary of Nigeria. 3. Each water purification system bears a unique serial number (product ID) to avoid any double counting. Besides, the location of each unit (Address of school where it has been installed) has also been recorded in the sales receipt (Refer sales database in the ER calculator). 4. The water purification system installed under these CPAs do not consume any fossil fuel. <p>Thus, the CPAs have been implemented as defined in the CPA-DDs and in compliance with the requirements of the PoA.</p>					
Documentation provided by project participant					
<ol style="list-style-type: none"> 1. The delivery note of installation of first unit in each CPA as an evidence of CPA implementation 2. Technical specifications of the WPS installed 3. ER calculator including the sales database 					
DOE assessment					Date : 22/07/2019
<p>The delivery notes shared by the CME confirmed the start date of each CPA.</p> <p>The compliance of the CPAs was also checked to confirm that they meet the eligibility criteria.</p> <ol style="list-style-type: none"> 1. The technology implemented during the 35 CPAs includes Ultra FLO and Ultra Tab systems only as checked from the sales database and the site visit observations. 2. The address given in the sales database and physical visit to the institutions confirmed that the systems have been installed within the geo-graphical boundary of Nigeria. 3. The unique IDs of each purification system and details of institutions where the system are installed were checked to ensure that double counting would be avoided for each of the WPS 4. Onsite inspection confirmed that the system do not consume fossil fuel. <p>Thus, the verification team confirms that the CPAs have been implemented in line with the registered PoA DD/1/. Thus, FAR stands closed.</p>					

Table 2. CL from this verification

CL ID	02	Section no.	E.3.4.2., E.2.1	Date	:14/07/2019
Description of CL					

1. The value applied for f_{NRB} is sourced from UNFCCC SSC WG 37th Meeting Report for Nigeria. CME shall clarify if the value is valid for the current monitoring period considering that the parameter needs Continuous or at least biennial monitoring.
2. CME shall demonstrate compliance with requirement stated on page 66 of the PoA DD:
"The water purification technology/equipment must achieve compliance with either: a relevant national standard or (d) The interim performance targets as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011)."

Project participant response	Date :18/07/2019
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1. The default value for f_{NRB} for biomass (=0.93 sourced from EB97) has been fixed at the PoA level. Please refer page number 69 and 82 of the registered PoA-DD which states the following:
EB 67 Annex 22 Default Values for Fraction of Non-Renewable Biomass for Least Developed Countries and Small Island Developing States, combined with survey, national, or regional data to determine the percent of users using woody biomass and fossil fuel in the baseline scenario.

Thus, the continuous or at least biennial monitoring, as per PoA-DD, refers to determining the % mix of fuels (% of beneficiaries using non-renewable biomass, % of beneficiaries using other fossil fuels in the baseline) and updating the applicable $f_{NRB,y}$ as per the formula stated in the monitoring parameter table – Measurement Methods and procedures, on page 82 of the PoA-DD. The percentage of users using non-renewable biomass and percentage of users using fossil fuel in Nigeria has been updated as the per the Global Alliance for Clean Cookstoves, Nigeria report and a weighted average value has been applied to determine $f_{NRB,y}$.

2. As per table A.2.4, page 52, of the "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO 2011), free chlorine disinfection by default performs better than the interim level specified on page 7 of the report, therefore the water purification system installed under the CPAs achieve compliance with "Interim or higher" performance targets. This has also been substantiated at the time of CPA inclusion as validated and confirmed in the CPA inclusion report on page 30 and 38
https://cdm.unfccc.int/filestorage/G/H/S/GHSLWF4ZADY3J02VPK1QBTC6IMU8ER/CCIPL%20675_FV_R_CPA%20inclusion_43%20to%2077_Nigeria.pdf?t=WWH8cHV3NnV6fDBiITXkshERGSllwwJTJL6gX)

Documentation provided by project participant
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1. The Truth About Cooking Landscape Analysis, October 2016 by GACC, page 88
2. CPA Inclusion Validation Report CPA 43-77

DOE assessment	Date: 22/07/2019
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1. The approach to determine the value of the f_{NRB} was found to be in line with the registered PoA DD.
 2. The compliance of the systems with "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO 2011) report was confirmed from the CPA inclusion report.
- Thus, CL stands closed.

CL ID	05	Section No.	E.3.4.2.	Date: 26/07/2019
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Description of CL

1. CME shall clarify why the last date of installation considered under the current monitoring is Apr 30, 2019 and not the end of monitoring period?
2. For parameter $N_{y,i}$:
 - Please explain the monitoring of this parameter as it seems it was not prescribed on sampling basis.
 - Considering that the validating DOE did not visit, how this information was captured by CME and will it change over a period of time for a given device and if yes how the new value would be captured by CME and if not, why it is expected that it won't change.
 - Additionally, based on how CME recorded these numbers for each device, how the number appears to be assumption because several figures are like 200, 300, 400 under column H to column K, which eventually feeds to column R.

Project participant response	Date : 27/07/2019
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<ol style="list-style-type: none"> As per the registered PoA-DD page 59 “products deployed under the project activity are assumed be in operation as of the start of the next month following the date of sale”. Thus, any installation in the month of May 2019 will be eligible for crediting only in the month of June 2019. Given, the current monitoring period is ending in May 2019, therefore only the units installed in April 2019 (up to 30-April-2019) are eligible for crediting under the concerned monitoring period. Thus, the CME has considered 30-April-2019 as the cut-off date of installation for this monitoring period. Parameter $N_{y,i}$: <ul style="list-style-type: none"> The CME has monitored parameter $N_{y,i}$ (person / equipment) for each school at the time of distribution of the system in the school and recorded it on the purchase order. The parameter is marked as continuous as the new installations will keep on taking place and at the time of each installation, this will be monitored for the given school. To capture the change in the student and staff count, CME will monitor the parameter $N_{y,i}$ for each school at least biennially and update the student and staff count in its database management system (Salesforce). The updated value of $N_{y,i}$, will be used for calculation of the ERs in the subsequent monitoring periods, as applicable. The numbers are not assumptions but actual number of students and staff in the school as reported by the school representative and recorded in the PO which is signed by the school representative. Refer the response to the above CL Refer the response to the above CL
Documentation provided by project participant
NA
DOE assessment Date: 28/07/2019
<ol style="list-style-type: none"> The PoA DD page 59 requires that the systems shall be credited for ERs only from the start of next month. Thus, all the system installed in May 2019 will be credited in June. Thus, they have not been listed now in the database. Parameters $N_{y,i}$: The parameter value is noted at the time of installation by the CME and as the number of systems increases over the time, the value will change continuously. The institutions were checked to confirm that CME is recording this information in database and the implementation is in line with PoA DD. For the current monitoring, the value of the parameter was verified from the sales database and purchase orders as well as the schools' representatives for the schools visited. As per the CPA DDs (9948-0043- 9948-0077) page 20, The value of $N_{y,i}$ is effectively the number of people in the institution. The number of people in the institution will be updated (at least biennially) to reflect change in the institution size over time. The value will be updated in the sales database biennially. <p>Thus, the CL stands closed.</p>

Table 3. CAR from this verification

CAR ID	03	Section no.	E.3.6	Date	14/07/2019
Description of CAR					
PP shall explain the reason for the difference between the MR made public and ER sheet submitted to DOE for verification					
Project participant response					Date
A calculation error was observed in the ER calculator (for QPW _y) after the MR was published for web-hosting. In the revised MR the calculation error was corrected which resulted in reduction in ERs from that specified in the MR published for webhosting.					18/07/2019
Documentation provided by project participant					
NA					
DOE assessment					Date
1. The calculation error has been rectified in the ER sheet and the revised MR incorporated the updated value.					22/07/2019
Thus, CAR stands closed.					

CAR ID	04	Section no.	E.3.6.1.	Date	14/07/2019
Description of CAR					
As per the template guidelines, CME shall Provide sample calculations for all formulae used to calculate baseline GHG emissions or baseline net GHG removals, applying actual values under section F.1.					
Project participant response					Date
					18/07/2019

The sample calculations for all formula used to calculate baseline GHG emission or baseline net removals applying actual value has been added under section F.1 for the revised MR. The sample calculations presented are for CPA 43 as an illustration.

Documentation provided by project participant

PoA 9948 MP#2 MR v2.1 18072019 Nigeria

DOE assessment

Date: 22/07/2019

CME has clearly mentioned the sample calculations for each of the formulae involved in the baseline calculations along with the description of notations for each parameter in the revised MR version 2.1. All the notations were checked and found to be in-line with the applied methodology.
Thus, CAR stands closed.

Table 4. FAR from this verification

FAR ID	NA	Section no.	Date :DD/MM/YYYY
Description of FAR			
NA			
Project participant response			Date : DD/MM/YYYY
NA			
Documentation provided by project participant			
NA			
DOE assessment			Date: DD/MM/YYYY
NA			

There is no FAR from this verification.

Document information

Version	Date	Description
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"> Ensure consistency with version 02.0 of the “CDM validation and verification standard for programmes of activities” (CDM-EB93-A08-STAN); Make structural and editorial improvements.
02.0	29 December 2017	Revision to align with the requirements of the “CDM validation and verification standard for programme of activities” (version 01.0).
01.0	5 June 2015	Initial publication.

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			Name	Date	Name	Date
2.0	11/06/2019	Adoption of latest forms	Shreya Garg	11/06/2019	Anshika Gupta	13/06/2019
1.0	04/05/2018	Guidelines updated	Shreya Garg	04/05/2018	Anshika Gupta	04/05/2018
*This table is for ESPL internal document control purpose only						