




**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)	Impact Carbon Global Safe Water Programme of Activities (PoA) UNFCCC ID: 9948	
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	16/05/2021	
Monitoring period number and duration of this monitoring period	Third Monitoring Period 23/05/2019 – 31/12/2019 (both days inclusive)	
Number and version number of the monitoring report to which this report applies	Monitoring report number: 3.0 Monitoring report version: 4.0	
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	Yes
	Nigeria	No
	Kenya	No
Applied methodologies and standardized baselines	Methodology: AMS-III.AV. Low greenhouse gas emitting safe drinking water production systems (Version 4.0) Standardized Baseline: Not applicable	
Mandatory sectoral scopes	3: Energy Demand	
Conditional sectoral scopes, if applicable	-	
Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report	289,863 tCO ₂ e	
Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report	31,278 tCO ₂ e	
Name and UNFCCC reference number of the DOE	TÜV NORD CERT GmbH E-0022	
Name, position and signature of the approver of the verification and certification report		

	Final Approver Kunal Rami
--	------------------------------

SECTION A Executive summary

The Impact Carbon has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 3rd periodic verification of the CDM Programme of Activities (CDM-PoA-9948):

“Impact Carbon Global Safe Water Programme of Activities (PoA)”

with regard to the relevant requirements for CDM PoAs.

This verification covers the monitoring period from 23/05/2019 – 31/12/2019 (including both days).

The PoA involves distribution of low greenhouse gas emitting, safe drinking water purification systems (WPS) across the identified host countries. The safe portable water is delivered to the end users after treatment from an Ultraviolet or Chemical (Chlorination) disinfection technology. The CPAs under consideration (CPA 9948-P1-0002-CP1 and 9948-P1-0014-CP1 to CPA 9948-P1-0022-CP1, 10 CPAs) have been implemented in Uganda and result in reduction in consumption and/or replacement of the non-renewable biomass or fossil fuels which would have been used for boiling water to make it suitable for drinking, in the baseline. Thus, in absence of CPAs under the PoA, the usage of fuel wood and other fossil fuel would have continued for boiling water to make it suitable for drinking purposes resulting in GHG emissions.

Details of the PoA location are given in table A-1 below:

Table A-1: **Project Location** CPA 9948-P1-0002-CP1 and 9948-P1-0014-CP1 to CPA 9948-P1-0022-CP1

No.	Project Location
Host Country	Uganda
Region:	Entire country
Latitude	4°N and 2°S
Longitude	29° and 35° E

This Programme of Activities consists of a total of 105 CPAs (till the time of end of MP) of which 10 are considered as part of this monitoring period. The CPA's are described shortly below:

Basic technical details of the PoA are summarized in table A-2.

Table - A-2: Technical data of the CPA 9948-P1-0002-CP1 and 9948-P1-0014-CP1 to CPA 9948-P1-0022-CP1

CPAs	CPA 9948-P1-0016-CP1 to CPA 9948-P1-0022-CP1	CPA 9948-P1-0002-CP1, CPA 9948-P1-0014-CP1, CPA 9948-P1-0015-CP1
Name of models	UltraFLO	Multi-barrier UV
Water Source	Piped	Piped
Flow rate	20 L/min	Small UV: 2-4 L/min Large UV: 6-8 L/min
Capacity/lifespan	340,000 L / 5-year expiry	Small UV: 2,044,116 L / 7 years Large UV: 4,088,232 L / 7 years
Fixed or Portable	Fixed	Fixed
Removal of E.Coli	99 (2-log)	>99 (4-log)

As a result of this verification, the verifier confirms that:

- all operations of the CPAs assessed under this verification report (CPA 9948-P1-0002-CP1 and 9948-P1-0014-CP1 to CPA 9948-P1-0022-CP1) are implemented and installed as planned and described in the included component project activities design documents.
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., AMS-III.AV ver. 4.0
- the equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately (as applicable),
- the monitoring system is in place and functional. The CPAs have generated GHG emission reductions.

As the result of the 3rd periodic verification of the PoA, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above-mentioned reporting period as follows:

Emission reductions: **31,278 tCO₂e**

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+ Technical Expert	EI	Mishra	Prakash Kumar		x	x	x	x

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	EI	Lubanga	David	-
2.	Approver	IR	Kunal	Rami	TUV NORD CERT

SECTION C. Application of materiality in conducting the verification

C.1. Consideration of materiality in planning the verification

In order to ensure a complete, transparent and timely execution of the verification task the team leader has planned the complete sequence of events necessary to arrive at a substantiated final verification opinion.

Various tools have been established in order to ensure an effective verification planning.

Materiality Threshold

The verification is based on the materiality threshold identified in table C-1 below:

Table C-1: Applied Materiality Threshold

	Threshold	Related to
<input type="checkbox"/>	0.5 %	Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal equal to or more than 500,000 tonnes of carbon dioxide equivalent per year ¹ ;
<input type="checkbox"/>	1 %	Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal of between 300,000 and 500,000 tonnes of carbon dioxide equivalent per year;
<input type="checkbox"/>	2 %	Emission reductions or removals for registered large-scale CDM project activities achieving a total emission reduction or removal of 300,000 tonnes of carbon dioxide equivalent per year or less;
<input checked="" type="checkbox"/>	5 %	Emission reductions or removals for registered small-scale CDM PoA other than registered CDM PoA covered under next category below;
<input type="checkbox"/>	10 %	Emission reductions or removals for the type of registered small-scale CDM PoA referred to in decision 3/CMP.6, paragraph 38 (referred to as microscale project activities).

Strategic Analysis

At the beginning of the verification the verification team leader has assessed the nature, scale and complexity of the verification tasks by carrying out a strategic analysis of all activities relevant to the project activity. The team leader has collected and reviewed the information relevant to assess that the designated verification team is sufficiently competent to carry out the verification and to ensure that it is able to conduct the necessary risk analysis.

Risk analysis and detailed audit testing planning

For the identification and assessment of potential reporting risks and to determine the necessary detailed audit testing procedures for residual risk areas the following table is used.

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.	<p>Analysis and transfer of data from:</p> <ul style="list-style-type: none"> • Sales records (supported by Sales receipts, Installation forms), • Water Quality Testing Reports, • Sampling Surveys (for each technology type), international reports (with traceability) which are utilized for determination of the parameter $f_{NRB,y}$, • Biennial/ Annual sampling results, • Sales database, • Sampling surveys, • Surveys Records, • UNHS, Household Survey Report 2016/17² for <p>Transcription of monitored values from monitoring records to MR and excel ER spreadsheet.</p>	Low	Human error during transfer of data from, Sales record, monitoring Sampling Survey records, Water Quality Testing, reports/sheet etc (manual operations) for BE, PE, LE and ER calculations	<p>Thorough cross-check and assessment required on the generation and transfer of data to the ER spreadsheet. Assessment of data generation, collection and recording for all monitoring parameters and appropriateness of sampling plan etc.</p> <p>Assessment of information flow processes, data reporting, aggregation, management, and QA/QC procedures in place by CME to ensure the sales / installation database is accurate</p>

¹ A year refers to a period of 12 consecutive months.

² https://www.ubos.org/wp-content/uploads/publications/03_20182016_UNHS_FINAL_REPORT.pdf

On the basis of the risk analysis, the verification has been planned. A detailed audit / verification plan (remote assessment) has been prepared and submitted to the project participant(s) in due time before the remote assessment.

C.2. Consideration of materiality in conducting the verification

Based on the verification planning, verification process is carried out. The concept of materiality considered during the verification process. A breakdown of the chosen approaches is included in the following table.

Parameter	Approach*	Errors* detected	Findings reference	Corrected	Remaining verification risk
QPW _y (Quantity of purified water in year y (litres))	CDC	<input checked="" type="checkbox"/>	CL 01, CAR 02, CAR 03, CAR 04, CL 02	<input checked="" type="checkbox"/>	Not material
T _{yi} (Total distributed water purification systems)	CDC	<input checked="" type="checkbox"/>	CAR 02, CAR 03, CAR 04	<input checked="" type="checkbox"/>	Not material
N _{yi} (The average population serviced by water purification systems)	CDC	<input checked="" type="checkbox"/>	CL 01, CAR 03, CAR 04	<input checked="" type="checkbox"/>	Not material
Water Quality _i (Water quality measurement)	SPL	<input checked="" type="checkbox"/>	CAR 04	<input checked="" type="checkbox"/>	Not material
Operational Units _i (percent of monitoring period in which the units are in use)	SPL	<input checked="" type="checkbox"/>	CAR 02, CAR 04	<input checked="" type="checkbox"/>	Not material
f _{NRB,y} (Fraction of woody biomass saved by project activity in year, y, that can be established as non-renewable biomass)	CDC	<input checked="" type="checkbox"/>	CAR 02, CAR 04	<input checked="" type="checkbox"/>	Not material
η _{wb} (Efficiency of water boiling system being replaced)	CDC	<input type="checkbox"/>	N/A	<input type="checkbox"/>	Not material
EF _{projected_fossilfuel} (Emission factor as per AMS-I.E procedures when NRB is displaced or the emission factor of the fossil fuel)	CDC	<input type="checkbox"/>	N/A	<input type="checkbox"/>	Not material

substituted)					
Existence of public distribution network of safe drinking water (Existence of public distribution network of safe drinking water in year y)	SPL	<input checked="" type="checkbox"/>	CAR 01	<input checked="" type="checkbox"/>	Not material
$EC_{pj,y}$ (Quantity of electricity consumed by the project electricity consumption source j in year y)	CDC	<input checked="" type="checkbox"/>	CAR 02, CAR 04	<input checked="" type="checkbox"/>	Not material
Aggregate					Materiality threshold not exceeded

*) incl. omissions and misstatements

+) Verification Approaches:

CDC: Complete data check of data including all data aggregation steps
 NDC: Non-complete data check – omissions not material
 SPL: Sampling approach (all data available)
 ASP: Acceptance Sampling
 COM: Data check at higher data aggregation levels and sampling at original data levels
 :

For risk mentioned in section C.1 above, the verification team has conducted a thorough cross check and verification as follows:

Analysis and transfer of data from, sales records, usage Survey, water quality testing report to MR and excel ER spreadsheet:

Total sales record presented in ER calculation spreadsheet and MR were assessed and verified against the evidences submitted by CME during desk review and during remote audit assessment³. The CME conducted the sampling surveys accordance with registered monitoring plan.

Verification team assessed the monitored data collected by CME for different sampling-based monitoring parameters. This was to determine the parameters e.g. proportion of WPS units in use/ in operation over the monitoring period, proportion of WPS installed providing safe water quality and the Existence of public distribution network providing safe drinking water every year in accordance with registered monitoring plan (Annual monitoring) and found them to be acceptable. Other parameters used for determining QPW_y i.e. number of people served by the distributed water purification systems and the count of non-barding and boarding persons were verified by the Verification team against original sales records. The desk review assessment, remote audit assessment observations and subsequent closures of the raised findings (refer Appendix-4 and Appendix-5 of this report) confirm that the values presented in the ER calculation worksheet are accurate, appropriate and consistent with the MR.

In addition, verification team has assessed the value of different monitoring parameters in CME's records and verified /compared the same with observations and interview response by the project technology users during remote audit assessment. During the course of verification, CAR/ CLs were raised and were subsequently closed against appropriate justification provided by the PP and submission of revised MR and ER sheet. For more detail, please refer Appendix-4 of this report.

³ Refer section D.2 for details of Remote audit assessment

SECTION D. Means of verification**D.1. Desk/document review**

During the desk review all documents initially provided by the client and publicly available documents relevant for the verification were reviewed. The main documents are listed below:

- The last revision of the PoA-DD including the monitoring plan^{/PoA-DD/}
- PoA Validation Report^{/VAL/}the last revisions of the CPA-DDs
- The last revision of the CPA validation reports^{/VAL/},
- The monitoring report, including the claimed emission reductions for the PoA^{/MR/},
- Sales Receipt^{/PO/}
- Project/ Sales database in chronological order^{/PO/}
- Questioner for undertaking the Sampling Survey Records and related work sheets^{/USAGE/}
- Technical Specification of the Aquagenx Water Testing kit^{/TS/ELIG/}
- Water Quality Testing Report^{/CBT/}
- The emission reduction calculation spreadsheet^{/XLS/}.
- Sample size calculation spreadsheet for Project Survey^{/XLS/}
- Training Procedures^{/TRG/}
- Survey report for determination of the fraction of the woody biomass saved by the project activity
- Technical Specification of project devices^{/TS/}

Other supporting documents, such as publicly available information on the UNFCCC website and background information were also reviewed.

D.2. On-site inspection

A remote audit was conducted using other means of verification due to Pandemic of COVID-19 and related lockdown in the host country of Uganda. Detailed explanation on remote audit is provided under D.4.2 below.

Duration of Remote-site Assessment: 11/05/2020, 12/05/2020				
No.	Activity performed on-site	Site location	Date	Team member
1.	<ul style="list-style-type: none"> • Assessment of the installation database • Assessment of sample end-user/customer's agreements/receipt/installation record (Sales Force Enterprise Edition) • Comparison of end-user/customer's agreements / installation record/ School Installation Records with the Sales Database • PO (Tax Invoice with the name of the name of Institution, date of invoice, Type of technology) • Sales Force Enterprise Edition with information in the database (date of installation, technology implemented, SF ID number, Contact number, name of the institution, type of institution (boarding, non-boarding, both), etc.) • Assessment of data management system, QA/QC procedures • Interviews with CME, CPA implementer management • Interviews with CME/CPA representative • Discussion of emission reductions 	Remote/skype/telephonic	11/05/2020 12/05/2020	Prakash Kumar Mishra (PKM)

	and supporting documentation <ul style="list-style-type: none"> • Telephonic/ Skype based interview with representatives of CME and enumerators; • Video / Telephonic interview with randomly selected sampled users from total database and also to further cross verify if the samples taken are representative of the entire population 			
2.	Remote verification of randomly selected principal and school Management representatives	Remote/skype/telephonic	11/05/2020 12/05/2020	Prakash Kumar Mishra
3.	<ul style="list-style-type: none"> • Data collection, aggregation and processing • Discussion on MR and supporting documents and final closing meeting 	CME/CPA Implementer/consultant	11/05/2020 12/05/2020	Prakash Kumar Mishra

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Brown	Julie	Impact Carbon, Director (Operations)	11/05/2020 - 12/05/2020	Implementation schedule, justification on not postponing onsite visit dates upto, delivery deadlines, schedules etc. Trainings, Information flow, data Management, record keeping, Financial Management, staff training, sales database CPA development, QM, Organisational structure, QA/QC, raw data, sales database	PKM
2.	Kalcic	Katrina	Impact Water Uganda, Country Director	11/05/2020 12/05/2020	CPA development, QM, Organisational structure, QA/QC, raw data, sales database Sales database, raw data, QA/QC	
3.	Lohia	Rohit	CSIPL (Carbon Consultant)	11/05/2020 12/05/2020	MR development, ER calculation and monitoring aspects including Sampling & Survey analysis	
4.	Akankunda	Moreen	Impact Carbon Uganda, Operation Installation Manager	11/05/2020 12/05/2020	Data management, including data check/verification, transcription of data from survey form to excel file survey protocol, survey related trainings, experience etc.	

5	Neville	Timothy B.	Impact Carbon, COO	11/05/2020 12/05/2020	Survey designing, survey team trainings, appointment process, survey protocol, survey questions and appropriateness, survey related point check e.g., operation status verification, check and recording of the details through interview of survey respondents
6	Kankwiine	Joan	Impact Carbon, Representative	11/05/2020 12/05/2020	Recording template, training, equipment used, calibration etc.
7	Shrivastava	Nihar	CSIPL (Carbon Consultant)	11/05/2020 12/05/2020	MR development, ER calculation and monitoring aspects including Sampling & Survey analysis QA/QC, raw data, sales database
8	Kumar	Ritesh	CSIPL (Carbon Consultant)	11/05/2020 12/05/2020	MR development, ER calculation and monitoring aspects including Sampling & Survey analysis QA/QC, raw data, sales database
9	Nakiganda	Sarah	Director (Bright Primary School) Tech: Multi-barrier UV-U152064	11/05/2020 12/05/2020	<p>Usage of the water filtration devices, baseline water source for drinking purposes, date of installation, operation and maintenance survey, verification of below parameters</p> <ul style="list-style-type: none"> Parameters including application of days for the calculation of the total quantity of water purified during the year Water quality tested as per paragraph 2(b) of AMS III.AV ver. 4 (i.e. Laboratory test report and/or official notifications (e.g. from national authority on health)) the monitoring frequency for the parameter "operational units" operation of the project activity and continuous availability of safe
10	Evelyn	Wandwasi	Head Teacher BROOK FOUNTAIN SCHOOL Tech-UltraFlo (U1818068)	11/05/2020 12/05/2020	
11	Frank	Lubega	Director-Go Beyond Primary School Tech-Multi-barrier UV (U151529)	11/05/2020 12/05/2020	
12.	Getrude	Nabiku	Bursar-Jit Day and Boarding Mbalala Tech-Multi-barrier UV (U160112)	11/05/2020 12/05/2020	

13.	Nagujja/	Agatha	School Nurse-Infant Images-Tech-Multi-barrier UV (U1700061)	11/05/2020 12/05/2020	drinking water	
14	Adadi	Yusuf	Head Teacher-Joweria Islamic Junior Tech-UltraFlo (U1816665)	11/05/2020 12/05/2020		
15.	Grace	Turyamusii ma	Head Teacher Kampala Model School Tech-Multi-barrier UV (U150046)	11/05/2020 12/05/2020		
16.	Umar	Balaluse	Head Teacher-Mpigi Light College Tech-Multi-barrier UV (U1805140)	11/05/2020 12/05/2020		

D.4. Sampling approach

D.4.1 Sampling during monitoring

The monitoring followed the monitoring frequency as per stipulations of the registered monitoring plan. The concerned monitoring period is 23/05/2019 – 31/12/2019 (both days inclusive). Thus, the CME has conducted monitoring representing monitoring period i.e. 23/05/2019- 31/12/2019.

<input type="checkbox"/>	No sampling approach has been used by the PP to determine the monitored parameters
<input checked="" type="checkbox"/>	A sampling approach has been taken for the following monitored parameter(s):

Sr. No	Parameter	Sampling approach ¹⁾	Sampling Type ²⁾	Population	Sample Size
(MP3): 23/05/2019 to 31/12/2019					
1.	Water quality (UF)	SiRS	PS	78	(3 UF + 42 UV) = 45
2.	Water quality (Multi barrier UV)	SiRS	PS	1,028	
3.	Operational units (UF)	SiRS	PS	78	(4 UF + 45 UV) = 49
4.	Operational units (Multi barrier UV)	SiRS	PS	1,028	
5.	Existence of public distribution network of safe drinking water (UF)	SiRS	PS	78	(3 UF + 42 UV) = 45
6.	Existence of public distribution network of safe drinking water (Multi barrier UV)	SiRS	PS	1,028	

¹⁾Sampling Approaches:

SiRS: Simple Random Sampling
 StRS: Stratified Random Sampling
 SS: Systematic Sampling
 CS: Cluster Sampling

MSS: Multi-stage Sampling

²⁾Sampling Types:

PS: Parameter Sampling

A stratified random sampling was carried out across all CPAs covered in this monitoring report.

i. Sampling overview

Representative sampling has been undertaken as part of SSC-PoA-wide Sampling Plan (by grouping and sampling across CPAs). The Sampling is based on 95/10 confidence/precision.

ii. Objectives and Reliability Requirements

The objective was to obtain an unbiased and reliable estimate of the proportion or mean value of the following parameters over the course of the monitoring period, and with 95/10 confidence/precision for sampling across CPAs.

1. Water quality
2. Operational units
3. Existence of public distribution network of safe drinking water

iii. Target Population

The target population for the three parameters stated above are all WPS units that were installed/ distributed in institutions and recorded in the project sales database.

iv. Sampling Frame

The target population are the WPS units that were installed/ distributed in institutions and recorded in the project sales database. Since all parameters under monitoring are homologous (i.e. implemented in institution), which justifies the application of the common sampling for all the parameters is justified.

v. Sampling Method

Stratified Random Sampling was applied across the WPS population. Random numbers were generated using the random number generator function in excel. The WPS distribution data was arranged by date of distribution, and the samples corresponding to the random numbers obtained via the online random number generator were picked for sampling.

The required sample sizes were derived using below stated equation (1), (2), (3), (4) and (9) of Appendix 3 of the Guideline: Sampling and surveys for CDM project activities and programmes of activities, Version 04.0 for proportion-based parameter as follows:

$$n \geq \frac{z^2 * N * V}{(N - 1) * precision^2 + z^2 * V}$$

Where,

n = number of WPS to be sampled

N = Total number of WPS in the population

z = Constant referring to level of confidence (1.96 for 95 % confidence)

Precision = Required precision (e.g. 10% = 0.1)

$$V = \frac{SD^2}{\bar{p}^2}$$

Where:

$$SD^2 = \frac{\sum_{i=1}^k g_i * p_i * (1 - p_i)}{N}$$

$$\bar{p} = \frac{\sum_{i=1}^k g_i * p_i}{N}$$

Where,

g_i = weight of strata i in the population

p_i = expected proportion of strata i in the population

k = total number of strata in the population

Stratified Random Sampling was applied by dividing the population into two strata (UltraFLO and Multi-barrier UV). The expected parameter values (proportion) were determined based on project developer's knowledge and experience as per para 13(b) and 13(c) of the "Standard: Sampling and surveys for CDM project activities and programmes of activities"

The CPA sub-group population was arranged chronologically for each stratum. The WPS were selected by randomly assigning, in corresponding stratum, a number to each WPS and sorting in increasing order from lower to higher number. Random numbers were generated using online random number generator for each stratum and the numbers obtained were used to identify the samples from the stratum population. A slightly higher number of samples were identified than that required to cover for outliers / non-response and ensure that the desired precision / confidence is achieved.

Based on the registered monitoring plan, 95/10 reliability level is selected for CPA specific sampling for all the parameters listed above at monitoring frequency prescribed in PoA - DD and CPA-DD. The target population for the parameters stated above are total and all Installed/distributed WPS as included in the sales database covered under the monitoring period ^{/DB/}.

Sample size calculation is assessed to be in accordance with registered sampling plan in PoA-DD/CPA-DD and the guideline "Sampling and surveys for CDM project activities and programme of activities ", version 04.0.

CME/PP has submitted sample size calculation spreadsheet including reliability worksheet and random number generator where it was demonstrated that samples are drawn randomly using stratified random sampling technique. The verification team further has crosschecked the sampling approach by CME as per MR section E.3 against related PoA-DD and CPA-DD requirements. Besides, the related sample sizes have been checked with corresponding supporting documents. Input parameters for the sampling calculation have been checked whether consistent with the stated approach and against PoA-DD, CPA-DD and sampling guidance. Further, verifier has recalculated the required confidence/precision to be met and confirm that the same are in line and appropriate with applied sampling requirements.

D.4.2 Sampling approaches during verification

<input type="checkbox"/>	No sampling approach has been used by the VT to verify the monitored parameters
<input checked="" type="checkbox"/>	A sampling approach has been applied by the VT for the following monitored parameter(s):

Sr. No	Parameter	Sampling approach ¹⁾	Sampling Type ²⁾	Population	Sample Size ⁴
(MP3): 23/05/2019 to 31/12/2019					
1.	Water quality (UF)	StRS	PS	45	(2UF + 06 UV with mixed type schools i.e. Boarding/non-boarding/both) = 08
2.	Water quality (Multi barrier UV)	StRS	PS		
3.	Operational units (UF)	StRS	PS	49	(2UF + 06 UV with mixed type schools i.e. Boarding/non-boarding/both) = 08
4.	Operational units (Multi barrier UV)	StRS	PS		
5.	Existence of public distribution network of safe drinking water (UF)	StRS	PS	45	(2UF + 06 UV with mixed type schools i.e. Boarding/non-boarding/both) = 08
6.	Existence of public distribution network of safe drinking water (Multi barrier UV)	StRS	PS		

1) Sampling Approaches:

SiRS: Simple Random Sampling
 StRS: Stratified Random Sampling
 SS: Systematic Sampling
 CS: Cluster Sampling
 MSS: Multi-stage Sampling

2) Sampling Types:

PS: Parameter Sampling

Remote audit assessment:

Due to COVID-19 pandemic there was a complete lockdown in the Host Country of Uganda where movement in the field was not permitted and hence, Verification Team, in line with UNFCCC INQ-09667 (email reply from Secretary to The CDM Executive Board, dated 20/03/2020 where agreement to relax mandatory site visit by DOE for period of 03 months which is further extended up to December 2020⁵. The extension was conditionally permitted to apply alternative and credible means of verification). In addition, as per EB 108 Meeting Report, para 28, page 8 of 16, confirms and rather extends the alternative measures of validation/verification to mandatory on-site inspections until 30 June 2021. The Verification Team has presented the reasoning to demonstrate the fulfilment of conditions to initiate the Remove Audit Assessment:

Condition	Applicable (Y/N)	Justification
Para 321 of VVS-PS It is mandatory for the DOE to conduct an on-site inspection at verification for the included CPA if: a) It is the first verification for the DOE with regard to this CPA; b) More than three years have elapsed since the last on-site inspection conducted for verification for the CPA; or c) The CPA has achieved more than 300,000 t CO ₂ e.q. of GHG emission reductions or net anthropogenic GHG removals since the last verification when an on-site inspection was conducted.	Y	a) The CPAs 14 to 22 are undergoing the second periodic verification. Thus, the site visit is mandatory as per § 321 (a). b) The CME is not availing verification where more than three years have elapsed since the last on-site inspection conducted for verification. Thus, the site visit not is mandatory as per § 321 (b). c) The CPA's have not achieved more than 300,000 t CO ₂ e.q. of GHG emission reductions or net anthropogenic GHG removals since the last verification. Thus, the site visit not is mandatory as per § 321 (c). Justification of alternative, credible and sufficient

⁴ Please refer section D.3 of this report for technology and institution type (boarding/non-boarding/both)

⁵ https://cdm.unfccc.int/newsroom/latestnews/releases/2020/01041_index.html

		means for the purpose of verification of on-ground information is provided in detail below under para "Applied Other Credible means of verification"
Can the site visits be postponed	N	Client has the delivery deadlines of CER's so postponing site visit will cause negative impact on CER delivery commitment by CME. Thus, site visit cannot be postponed.
Is it possible to travel to host country Uganda and undertake site visits	N	Global Travel Ban at the time did not allowing the VT to visit to Host country Uganda.

Applied Other Credible means of verification:

The credible other means of verification is applied to cross check on-ground information as described below:

Photographs and other evidence: These include the photos of the water purification systems with clear depiction of type of system, unique serial number, name of school etc. to confirm the implementation of the project as described in the PoA-DD/CPA-DD. Other records e.g. usage survey records and water quality field test results/records, which are assessed to verify their operational status and water quality tests performed over the applied monitoring period. The audit records (remote audit are audio/video recorded wherever possible) are stored in the QMS system of DOE; these records are retrievable and assessable.

Telephonic Call: Telephonic assessment was made by interviewing randomly selected samples to verify the information in the records submitted by PP. The telephonic calls are recorded, stored and maintained so that the assessments of the Verification Team are traceable and reproducible if required.

Skype Calls: This tool has allowed to connect multiple stakeholders such as CME, project developer/ consultant, relevant personnel from monitoring survey/test team, all other relevant persons as per the organogram of the PoA/ CPA including QA/ QC key personnel. The VT could virtually verify the implementation of the project against the requirements in the registered CPAs. The interviews with all the above-mentioned parties including sampled end users were conducted using this tool.

Furthermore, the data collected during the above steps are utilized for assessments which is described in relevant parts of the Verification Report.

The sampling approach conducted is in accordance with "Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities" version 04.0 and the "Standard for Sampling and Surveys for CDM Project Activities and Programme Activities version 08.0". As the population is relatively homogeneous with respect to the object of the sampling effort, stratified random sampling method is adopted for verification of the parameters.

Since the CPAs included in the PoA implement technologies/measures with high degree of standardization and technological capacities i.e. Water Purification System in terms of emission reductions per year in the CPAs are smaller than 1% of small scale CDM thresholds, the verification team decided to draw samples mainly from the project samples selected by PP. i.e. the acceptance sampling approach has been applied.

The verification team followed the "Standard for Sampling and Surveys for CDM Project Activities and Programme Activities" version 08, para 29 to 32 and 39, esp. for taking sample out of the CME's sample. Verification team has adopted the acceptance sampling approach (AS) in accordance with § 29, 30, 31 to 32 and 39 of the Sampling Standard. The verification team checked provisions of the para 39 of the applied standard to apply the producer risk and consumer risk following the provision of para 39 as assessed below:

Statement of para 39:

A DOE may select a different sample size than the one indicated in paragraph 32 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:)	
Requirement of para	DOE Assessment
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 CO ₂ eq.;	Not Applicable. the estimated emissions are 289,863 t CO ₂ eq
The security conditions in the project region prevents inspection of many samples (e.g. conflict zones); or	The COVID-19 was declared pandemic WHO which has created a health situation which was tangible and globally apparent. Thus, the DOE has availed the sampling size accordingly.
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	The CPA under PoA are located in the LDC i.e. Host Country Uganda as per https://unfccc.int/topics/resilience/workstreams/national-adaptation-programmes-of-action/ldc-country-information

Thus, Verification team has adopted the acceptance sampling approach in accordance with § 29, 30, 31 and 32 of the Sampling Standard by considering AQL 0.5 % and UQL 20%). Producer risk of 10 % and consumer risk of 20%. Considering the above § under applied sampling standard, DOE has verified 08 samples for the monitoring period (23/05/2019 to 31/12/2019). The monitoring frequency stipulated under PoA is annual. Applying the acceptance sampling approach with acceptance number (c) as 0 (randomly picked from CME's samples covering usage related surveys and water quality test results). Therefore, a total of 08 samples from all technology (UltraFlo and UV) and population type (boarding/non-boarding and both) have been verified remotely by verification team. These samples were randomly selected (from PP's samples) by verification team. The list of these samples verified using remote assessment techniques are presented under section D.3 of this report above.

Table 7: Applied sampling standard

AQL	0.5%
UQL	20%
Producer risk	10 %
Consumer risk	20%
Sample size	08 (02 UltraFlo and 06 Multi-barrier UV)
Acceptance Number	0

No CME sampling-based monitoring records/data results were found discrepant during the DOE verification remote assessment. All the 08 samples under applied Monitoring Period were found to be operational, Water Quality tested during remote assessment and interview/verification and in line with PP/CME's survey and WFT results.

Further Verification team could also interview the representatives of schools (sampled) and confirm the presence of public distribution network providing safe drinking water. Details on each sample verified through remote assessment are presented under Section D.3 above. Based on the assessment of 08 remotely assessed samples observing photos and other records of each sample prepared and submitted by CME before onsite remote assessment, together with telephonic interview of end users/representatives, it could be confirmed that the result presented for all the monitored parameters are reproducible and thus, sampling/monitoring results are deemed acceptable. Further, the verification team reviewed all the primary monitoring records before and during remote audit assessment to assess the consistency of information with ER calculation spreadsheet and found the monitoring data to be correctly transcribed into the ER sheet and MR. Therefore, verification team concludes that sampling results and values presented by CME in the MR and ER calculation spread sheet and results of survey and WQT records are consistent with the onsite observation and interview with the end users.

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	0	1	0
Remaining forward action requests from validation and/or previous verifications	0	0	0
CPAs considered for verification and covered in this report	0	0	0
Programme of activities	-	-	-
Compliance of the programme implementation with the registered PoA-DD	0	0	0
Implementation and operation of the management system	0	0	0
Post-registration changes	-	-	-
• Corrections	0	0	0
• Inclusion of a monitoring plan	0	0	0
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents ⁶	0	0	0
• Changes to the programme design	0	0	0
• Addition of CPA inclusion template	0	0	0
• Change of coordinating/managing entity			
• Changes specific to afforestation and reforestation activities	0	0	0
Component project activities	-	-	-
Compliance of the CPA implementation with the included CPA design document	0	0	0
Post-registration changes	-	-	-
• Temporary deviations from registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents	0	0	0
• Corrections	0	0	0
• Changes to the start date-of the crediting period	0	0	0
• Inclusion of a monitoring plan	0	0	0
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	0	0	0
• Changes to the project design	0	0	0
• Changes specific to afforestation and reforestation activities	0	0	0
Compliance of the registered monitoring plan with applied methodologies and standardized baselines	0	0	0
Compliance of monitoring activities with the registered monitoring plan	-	-	-
• Data and parameters fixed ex ante or at renewal of crediting period	0	0	0
• Data and parameters monitored	1	1	FAR 01, FAR 02
• Implementation of sampling plan	0	0	0
Compliance with the calibration frequency requirements for measuring instruments	1	0	0
Assessment of data and calculation of emission reductions	0	0	0

⁶ 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	0	1	0
• Calculation of project GHG emissions or actual net GHG removals by sinks	0	0	0
• Calculation of leakage GHG emissions	0	0	0
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	0	0	0
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA	0	0	0
• Remarks on difference from estimated value in included CPA	0	0	0
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	0	0	0
Others (please specify) pending documents	0	1	0
Total	02	04	02

SECTION E. Verification findings

E.1. General

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

Means of verification	<p>An initial monitoring report was submitted to the verification team by the CME. The DOE has made this report publicly available prior to the start of the verification activities. No comments were received.</p> <p>By means of the UNFCCC website it has been checked whether the latest applicable MR template CDM-PoA-MR-FORM has been used.</p> <p>Further it has been checked whether the latest instructions for filling out the MR template have been followed. Every section has been checked against the respective guidance.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /MRT/ • /unfccc/ 		
Findings	<input checked="" type="checkbox"/>	The latest reporting template CDM-PoA-MR-FORM as listed on the UNFCCC website has been used for the Monitoring Report to be uploaded.	
	<input checked="" type="checkbox"/>	The latest instructions for filling out the MR have been followed. No adverse finding has been identified in the course of this verification.	
	<input checked="" type="checkbox"/>	The respective requirements have widely been complied with; however, the following issues needed to be addressed in this context:	
		CAR 01	
Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.	
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.	
		During the verification, a remote assessment using video/ skype/ telephonic modes were utilized to verify onsite information, considering travel restrictions due to the global COVID-19 Pandemic. On the basis of observations made during remote assessment and the project documentation reviewed, it can be confirmed that the project has been implemented as described in the registered CPA-DDs and the latest instructions for filling out the MR template have been followed adequately in the MR.	

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

During the validation the validating DOE might have raised issues that could not be closed or resolved during the validation stage. For this purpose, FARs might have been raised. Likewise, FARs might have been raised in the course of previous verifications.

In the course of this verification the latest version of the last issued MR^{MR/} and the PoA Verification report^{VER/}, have been checked in order to identify any remaining forward action requests. For the current monitoring period the following applies:

(i) Open issues from validation:

<input checked="" type="checkbox"/>	There were no open issues which have been addressed in the latest version of the validation report.
<input type="checkbox"/>	All open issues from the validation have been appropriately addressed in the context of previous verifications.
<input type="checkbox"/>	All issues related to the validation have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
<input type="checkbox"/>	The following issues related to the validation have not yet been appropriately addressed (for details please refer to appendix 4):
	- N/A

(ii) Open issues from previous verifications:

<input type="checkbox"/>	N/A – as this is the first monitoring period for this CDM project activity.
<input type="checkbox"/>	There were no open issues which have been addressed in the previous verification report
<input checked="" type="checkbox"/>	All issues related to the previous verification have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
<input type="checkbox"/>	The following issues related to the previous verification have not yet been appropriately addressed (for details please refer to appendix 4):
	- N/A

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, Ref No.:9948-P1-0001-CP1	No	01/05/2014	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 2, Version: 3.0, 9948-P1-0002-CP1	Yes	01/05/2014	Version: 7.0	Y
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 3, Version: 1.3, 9948-P1-0003-CP1	No	08/05/2017	Version: 7.0	N

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 4, Version: 01.2, 9948-P1-0004-CP1	No	02/07/2017	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 5, Version: 5.0, 9948-P1-0005-CP1	No	04/10/2017	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 6, Version: 5.0, 9948-P1-0006-CP1	No	04/10/2017	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 7, Version: 5.0, 9948-P1-0007-CP1	No	04/10/2017	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 8, Version: 5.0, 9948-P1-0008-CP1	No	04/10/2017	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 9, Version: 5.0, 9948-P1-0009-CP1	No	04/10/2017	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 10, Version: 5.0, 9948-P1-0010-CP1	No	04/10/2017	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 11, Version: 5.0, 9948-P1-0011-CP1	No	04/10/2017	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 12, Version: 5.0, 9948-P1-0012-CP1	No	04/10/2017	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 13, Version: 5.0, 9948-P1-0013-CP1	No	04/10/2017	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 14, Version: 1.0, 9948-P1-0014-CP1	Yes	21/11/2017	Version: 7.0	Y
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 15, Version: 1.0, 9948-P1-0015-CP1	Yes	21/11/2017	Version: 7.0	Y

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 16, Version: 5.0, 9948-P1-0016-CP1	Yes	21/11/2017	Version: 7.0	Y
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 17, Version: 5.0, 9948-P1-0017-CP1	Yes	21/11/2017	Version: 7.0	Y
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 18, Version: 5.0, 9948-P1-0018-CP1	Yes	21/11/2017	Version: 7.0	Y
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 19, Version: 5.0, 9948-P1-0019-CP1	Yes	21/11/2017	Version: 7.0	Y
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 20, Version: 5.0, 9948-P1-0020-CP1	Yes	21/11/2017	Version: 7.0	Y
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 21, Version: 5.0, 9948-P1-0021-CP1	Yes	21/11/2017	Version: 7.0	Y
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 22, Version: 5.0, 9948-P1-0022-CP1	Yes	21/11/2017	Version: 7.0	Y
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 23, Version: 4.0, 9948-P1-0023-CP1	No	18/11/2018	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 24, Version: 4.0, 9948-P1-0024-CP1	No	18/11/2018	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 25, Version: 4.0, 9948-P1-0025-CP1	No	18/11/2018	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 26, Version: 4.0, 9948-P1-0026-CP1	No	18/11/2018	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 27, Version: 4.0, 9948-P1-0027-CP1	No	18/11/2018	Version: 7.0	N

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 28, Version: 4.0, 9948-P1-0028-CP1	No	18/11/2018	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 29, Version: 4.0, 9948-P1-0029-CP1	No	18/11/2018	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 30, Version: 4.0, 9948-P1-0030-CP1	No	18/11/2018	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 31, Version: 4.0, 9948-P1-0031-CP1	No	18/11/2018	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 32, Version: 4.0, 9948-P1-0032-CP1	No	18/11/2018	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 33, Version: 4.0, 9948-P1-0033-CP1	No	18/11/2018	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 34, Version: 4.0, 9948-P1-0034-CP1	No	18/11/2018	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 35, Version: 4.0, 9948-P1-0035-CP1	No	18/11/2018	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 36, Version: 4.0, 9948-P1-0036-CP1	No	18/11/2018	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 37, Version: 4.0, 9948-P1-0037-CP1	No	18/11/2018	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 38 supported by Republic of Korea, Version: 2.0, 9948-P1-0038-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 39 supported by Republic of Korea, Version: 2.0, 9948-P1-0039-CP1	No	26/04/2019	Version: 7.0	N

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 40 supported by Republic of Korea, Version: 2.0, 9948-P1-0040-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 41 supported by Republic of Korea, Version: 2.0, 9948-P1-0041-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 42 supported by Republic of Korea, Version: 2.0, 9948-P1-0042-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 43 supported by Republic of Korea, Version: 1.0, 9948-P1-0043-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 44 supported by Republic of Korea, Version: 1.0, 9948-P1-0044-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 45 supported by Republic of Korea, Version: 1.0, 9948-P1-0045-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 46 supported by Republic of Korea, Version: 1.0, 9948-P1-0046-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 47 supported by Republic of Korea, Version: 1.0, 9948-P1-0047-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 48 supported by Republic of Korea, Version: 1.0, 9948-P1-0048-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 49 supported by Republic of Korea, Version: 1.0, 9948-P1-0049-CP1	No	26/04/2019	Version: 7.0	N

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 50 supported by Republic of Korea, Version: 1.0, 9948-P1-0050-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 51 supported by Republic of Korea, Version: 1.0, 9948-P1-0051-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 52 supported by Republic of Korea, Version: 1.0, 9948-P1-0052-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 53 supported by Republic of Korea, Version: 1.0, 9948-P1-0053-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 54 supported by Republic of Korea, Version: 1.0, 9948-P1-0054-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 55 supported by Republic of Korea, Version: 1.0, 9948-P1-0055-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 56 supported by Republic of Korea, Version: 1.0, 9948-P1-0056-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 57 supported by Republic of Korea, Version: 1.0, 9948-P1-0057-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 58 supported by Republic of Korea, Version: 1.0, 9948-P1-0058-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 59 supported by Republic of Korea, Version: 1.0, 9948-P1-0059-CP1	No	26/04/2019	Version: 7.0	N

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 60 supported by Republic of Korea, Version: 1.0, 9948-P1-0060-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 61 supported by Republic of Korea, Version: 1.0, 9948-P1-0061-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 62 supported by Republic of Korea, Version: 1.0, 9948-P1-0062-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 63 supported by Republic of Korea, Version: 1.0, 9948-P1-0063-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 64 supported by Republic of Korea, Version: 1.0, 9948-P1-0064-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 65 supported by Republic of Korea, Version: 1.0, 9948-P1-0065-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 66 supported by Republic of Korea, Version: 1.0, 9948-P1-0066-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 67 supported by Republic of Korea, Version: 1.0, 9948-P1-0067-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 68 supported by Republic of Korea, Version: 1.0, 9948-P1-0068-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 69 supported by Republic of Korea, Version: 1.0, 9948-P1-0069-CP1	No	26/04/2019	Version: 7.0	N

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 70 supported by Republic of Korea, Version: 1.0, 9948-P1-0070-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 71 supported by Republic of Korea, Version: 1.0, 9948-P1-0071-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 72 supported by Republic of Korea, Version: 1.0, 9948-P1-0072-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 73 supported by Republic of Korea, Version: 1.0, 9948-P1-0073-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 74 supported by Republic of Korea, Version: 1.0, 9948-P1-0074-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 75 supported by Republic of Korea, Version: 1.0, 9948-P1-0075-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 76 supported by Republic of Korea, Version: 1.0, 9948-P1-0076-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 77 supported by Republic of Korea, Version: 1.0, 9948-P1-0077-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 78 supported by Republic of Korea, Version: 1.0, 9948-P1-0078-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 79 supported by Republic of Korea, Version: 1.0, 9948-P1-0079-CP1	No	26/04/2019	Version: 7.0	N

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 80 supported by Republic of Korea, Version: 1.0, 9948-P1-0080-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 81 supported by Republic of Korea, Version: 1.0, 9948-P1-0081-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 82 supported by Republic of Korea, Version: 1.0, 9948-P1-0082-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 83 supported by Republic of Korea, Version: 1.0, 9948-P1-0083-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 84 supported by Republic of Korea, Version: 1.0, 9948-P1-0084-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 85 supported by Republic of Korea, Version: 1.0, 9948-P1-0085-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 86 supported by Republic of Korea, Version: 1.0, 9948-P1-0086-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 87 supported by Republic of Korea, Version: 1.0, 9948-P1-0087-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 88 supported by Republic of Korea, Version: 1.0, 9948-P1-0088-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 89 supported by Republic of Korea, Version: 1.0, 9948-P1-0089-CP1	No	26/04/2019	Version: 7.0	N

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 90 supported by Republic of Korea, Version: 1.0, 9948-P1-0090-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 91 supported by Republic of Korea, Version: 1.0, 9948-P1-0091-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 92 supported by Republic of Korea, Version: 1.0, 9948-P1-0092-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 93 supported by Republic of Korea, Version: 1.0, 9948-P1-0093-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 94 supported by Republic of Korea, Version: 1.0, 9948-P1-0094-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 95 supported by Republic of Korea, Version: 1.0, 9948-P1-0095-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 96 supported by Republic of Korea, Version: 1.0, 9948-P1-0096-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 97 supported by Republic of Korea, Version: 1.0, 9948-P1-0097-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 98 supported by Republic of Korea, Version: 1.0, 9948-P1-0098-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 99 supported by Republic of Korea, Version: 1.0, 9948-P1-0099-CP1	No	26/04/2019	Version: 7.0	N

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 100 supported By Republic of Korea, Version: 1.0, 9948-P1-0100-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 101 supported By Republic of Korea, Version: 1.0, 9948-P1-0101-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 102 supported By Republic of Korea, Version: 1.0, 9948-P1-0102-CP1	No	26/04/2019	Version: 7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 103 supported By Republic of Korea, Version: 1.0, 9948-P1-0103-CP1	No	11/06/2019	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 104 supported By Republic of Korea, Version: 1.0, 9948-P1-0104-CP1	No	11/06/2019	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 105 supported By Republic of Korea, Version: 1.0, 9948-P1-0105-CP1	No	11/06/2019	7.0	N

E.2. Programme of activities

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

Means of verification	<p>By means of an in-depth review of the latest PoA-DD – as downloaded from the UNFCCC project site - and checks carried out during the remote audit assessment, it has been assessed if the project has been implemented and operated in line with the latest approved version of the PoA-DD and whether all physical features of the project are in place. The following has been checked against the PoA-DD and corresponding CPA-DDs and found appropriate:</p> <ul style="list-style-type: none"> • implemented technology i.e. low GHG emitting water purification technologies • implemented monitoring plan in line with approved monitoring plan. • Exchange or modification of the relevant technical equipment of the project activity, if any. • consistent notations of key equipment (product IDs etc.) in PoA-DD, MR and calculation spreadsheet. <p>Interviews with, CME, CPA implementer and operational personnel have been carried out. QMS records, maintenance records, instruments specifications were also checked in this context.</p> <p>Special focus has further been laid to determine whether a potential phase wise implementation has occurred within the crediting period or any delays with respect to the starting dates have occurred.</p> <p>Further it has been checked whether any observed deviations from the registered</p>
------------------------------	--

project design have been correctly addressed as PRC.

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 Water Purification System reducing amount of equivalent GHG emissions.

The Verification Team assessed the CPAs covered in this MR involve dissemination of two types of water purification^{/ER/, /PO/, /TS/}

Systems:

1. Ultra FLO
2. Multi-barrier UV

The Verification Team checked and confirms that all the deployed systems meet the eligibility requirements of the PoA-DD, Version 7^{/PoA-DD/}, and respective CPA-DDs^{/CPA-DD/}. The technical specifications (refer section A of this FVR) along with the interview with the end users (refer section C of this FVR) ascertained that the deployed systems met the CPA eligibility criteria. During the course of the Verification the VT has assessed the documentation pertaining to the technical specifications^{/TS/, /DB/, /REC/}, lifetime and performance characteristics^{/TS/, /DB/, /REC/} to ascertain the performance of the WPS as per stipulations of the PoA-DD and the CPA-DDs. The Verification Team also assessed the evidence of physical implementation with the help of photographs^{/TS/} to ascertain the WPS characteristics. The following documents^{/TS/, /DB/, /REC/} were reviewed and verified:

- Multi-Barrier UV - Technical Specification from Supplier (Rotek) for Large and Small UV systems confirming treatment capacity and other parameters (inlet port size, pressure rating, wattage etc.)
- Multi-Barrier UV - Lifespan confirmation from Supplier (Rotek)
- Multi-Barrier UV - Certificate from Supplier (Rotek) on WHO compliance
- UltraFlo - Technical specification confirming capacity / expiry by Medentech (Technology Supplier)
- UltraFlo Installation Manual
- UltraFlo - Device Dimensions Declaration by CME
- UltraFlo cartridges are manufactured in a standardized size as per the dimensions specified in the CPA-DDs and MR (verified physically during previous site visits as well as from UltraFLO dimension declaration by CME) and pertains to the specifications issued by Medentech (Technology supplier)
- The expiry of the UltraFlo was also found mentioned on the cartridge as 5 years (verified physically during previous site visits and photographs of UltraFlo units).
- Installation Logs for Multi-Barrier UV and UltraFlo systems

Please also refer closure of CL 02.

The project location was compared from the submitted sales database^{/PO/}, survey^{/USAGE/} forms and compared with the boundaries of the host country^{/BOUND/} and deems the same within the host country boundaries.

The Verification checked the data management and date coverage as per requirements. It is noted that below information was verified^{/USAGE/, /XLS/}:

- a) Type of system (UltraFLO / Multi-barrier UV)
- b) Unique serial number of the units
- 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)

The training requirements were also verified and deemed as in line with the registered PoA-DD and CPA-DD^{/TRG/}.

	<p>The section F.7 of the MR^{/MR/} and the ER^{/XLS/} worksheet were checked and the Verification Team confirms that the emissions were with the threshold of the small-scale limits.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PoA-DD/ • /CPA-DD/ • /MR/ • /VVS/ • /XLS/ • /unfccc/ 	
Findings	<input checked="" type="checkbox"/>	The project has been implemented as described in the latest version of the PoA-DD as well as in section B.1 of the monitoring report. No deviations thereof have been identified in the course of this verification.
	<input type="checkbox"/>	The following deviations from the registered / approved project design and or the project description in the MR have been identified in the course of this verification (for further details please refer to section E.4): -N/A
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs have been raised:
		CL 02
		<i>In case of phased implementation:</i>
	<input checked="" type="checkbox"/>	N/A
	<input type="checkbox"/>	The phased implementation has correctly and in sufficient detail been described in the latest version of the PoA-DD.
	<input type="checkbox"/>	The description in section B.1 of the MR differs in content or the level of detail from the latest version of the PoA-DD. However, the description in the MR is correct and reflects the situation during the site inspection.
	<input type="checkbox"/>	The project description in the PoA-DD/MR is not deemed sufficient. The detailed implementation timeline is as follows: N/A or add as appropriate
Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

E.2.2. Implementation and operation of the management system

Means of verification	<p>The verification team carried out remote audit assessment for all the CPAs covered in the monitoring report for this monitoring period i.e. CPA 9948-P1-0002-CP1 and CPA 9948-P1-0014-CP1 to 9948-P1-0022-CP1 and interviewed key personnel to assess the implementation of the management system.</p> <p>The water purification systems included in the CPAs include 02 technologies i.e. Multi-barrier UV and UltraFLO. The sampled school representatives were interviewed to check the physical implementation of the project. Interviewees also included the CME and project developer. Other means of Verification as explained section D.4.2 of FVR were employed.</p> <p>It was established that the programme management system has been implemented and operated as described.</p> <ul style="list-style-type: none"> • /PoA-DD/ • /PO/ • /QA/ • /IM/ • /VAL/ • /CPA-DD/
Findings	N/A
Conclusion	The CDM PoA is managed by Impact Carbon as the CME. The management structure is comprised of operational staff, monitoring officer and CDM advisor. The

entities responsible for monitoring are:

- Project Development Director
- Programme Manager
- CPA Implementer
- Programme Associate
- Field measurement personnel
- External QA/QC

Below important functions are undertaken

- Arrangements for training and capacity development for local sales and distribution partner personnel by CME and CPA implementer,
- System/procedure to avoid double counting (by aggregating the unique database like Product Serial numbers, date of installation, address, contact details, type of institution, population (students, staff [boarding/non-boarding])
- Provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA (Informational material, training social media and contractual agreements as applicable)
- Measures for continuous improvement of the PoA management
- Ex-post monitoring and maintaining record system for each CPA under the PoA (currently 105 at time of Verification)
- Conduct on the ground monitoring of end users. Sample size determination, monitoring of samples, development of suitable template to capture the data, develop the working sheets to analyze the results of monitoring (Operational status, output water quality, presence of safe public water distribution network)
- Verify the monitoring work done to ensure accuracy before submission; review protocols, interview enumerators, spot check data
- Assist with the completion of monitoring reports with input
- Coordination and communication with the verifier and the UNFCCC

Below data checks were undertaken by the Verification Team:

- The Sales Force Edition Report was verified to check the details of the institution, the time of installation (which captured the name of the institution, type, population, SF ID and other details) ^{/DB/, /REC/}
- Consistency check was performed between the sales database and sample purchase orders, installation logs and Salesforce data to confirm that information for any system installed (SF ID, type of technology, unique serial number, name of institution etc) were internally consistent ^{/DB/, /REC/}
- Check on the avoidance of double counting was initiated by checking the unique IDs of the installed water purification devices and it is confirmed that the all the numbers are unique.
- The Verification Team checked and confirms that School's SF ID are rightly defined for each water purification device (for example U1808838) which is covering system type code, year code, country code and a serial number.
- The training requirements were verified and deemed as acceptable and in line with the requirements of PoA-DD and CPA-DD ^{/TRG/}.
- The Organogram was checked and it is noted that Programme Manager at the CME is responsible for QA/QC of the data, analysis and subsequent reporting in the monitoring report. The Verification Team confirms that QA/QC procedures were found being followed.
- The Verification Team interviewed the CME team responsible for monitoring for sampling techniques, data formats, trainings, competence, application of the water quality testing kits and undertaking the surveys ^{/USAGE/, /TRG/, /ELIG/, /CBT/}. The Verification Team confirms that appropriate provisions in line with the requirement for the PoA-DD and CPA-DD are being followed.

Based on and Remote Assessments and desk review and web-based and telephonic interviews; DOE representative found that the system is in place, appropriate and effective ^{/PO/}. The management system is implemented as per the

registered PoA-DD & CPA-DDs.

E.2.3. Post-registration changes**E.2.3.1. Corrections**

It has been checked whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input checked="" type="checkbox"/>	During this verification of the current MP no need for corrections has been identified.
<input type="checkbox"/>	The following corrections have been applied:
	Corrections in the PoA-DD and CPA-DD were made and approved by the CDM EB.
<input type="checkbox"/>	A related post registration change has been submitted prior to the issuance request.
<input type="checkbox"/>	No related post registration change is submitted along with this issuance request. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.

E.2.3.2. Inclusion of a monitoring plan

<input checked="" type="checkbox"/>	N/A - as this monitoring plan was part of the registered PoA-DD /CPA-DD
<input type="checkbox"/>	In line with PS § 281 or § 282 the PP has forwarded a monitoring plan to the DOE for validation. No prior approval of the monitoring plan was required as the PP in line with PS § 282 wished to submit the monitoring plan together with the request for issuance for the first monitoring period. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.
<input type="checkbox"/>	In line with § 282 the PP submitted a monitoring plan prior to the submission of the request for issuance for validation to the DOE. A DOE has assessed the monitoring plan in line with related VVS requirements and submitted a related PRC report for prior approval. The approval has been received on DD/MM/YYYY via approval number

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

It has been checked whether any permanent changes from the registered monitoring plan (PCrMP) or applied methodologies (PCfMM) including standardized baselines (PCfSB) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input checked="" type="checkbox"/>	No PCrMP, PCfMM or PCfSB have been submitted to the UNFCCC prior to the current monitoring period		
<input type="checkbox"/>	The following PCrMP, PCfMM or PCfSB have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Approval	
		Ref. No.	
<input checked="" type="checkbox"/>	During the verification of the current MP no need for a PCrMP, PCfMM or PCfSB has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
<input type="checkbox"/>	An approval of the following PCrMP, PCfMM or PCfSB is to be requested from the EB for the current		

	MP as appendix 1 of the project standard does not apply.	
1	Issue:	
2	Issue:	
<input type="checkbox"/>	The following PCfMP, PCfMM or PCfSB for which appendix 1 of the PS is applicable have been applied:	
1	Issue:	
2	Issue:	

E.2.3.4. Changes to the programme design

It has been checked whether any changes to the project design (CoPD) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input type="checkbox"/>	No CoPD has been submitted to the UNFCCC prior to the current monitoring period	
<input checked="" type="checkbox"/>	The following CoPD have been approved or are under approval by the UNFCCC	
1	Title	Expansion of PoA Boundary to include Host Country Nigeria
	Status	<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved
	Appr.date	03/07/2017
	Ref. No.	PRC-9948-002
2	Title	Changes have an impact on: Include additional host Parties
	Status	<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved
	Appr.date	08/05/2017
	Ref.No.	PRC-9948-001
3	Title	
	Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
	Appr.date	
	Ref.No.	
<input checked="" type="checkbox"/>	During the verification of the current MP no need for a CoPD has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA	
<input type="checkbox"/>	An approval of the following CoPD is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.	
1	Issue:	
2	Issue:	
<input type="checkbox"/>	The following CoPD for which appendix 1 of the PS is applicable have been applied:	
1	Issue:	
2	Issue:	

E.2.3.5. Addition of CPA inclusion template

N/A

E.2.3.6. Change of coordination/managing entity

N/A

E.2.3.7. Changes specific to afforestation and reforestation activities

<input checked="" type="checkbox"/>	N/A - as this monitoring plan was part of the registered CPA-DD
-------------------------------------	---

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

Means of verification	By means of an in-depth review of the latest CPA-DDs – as downloaded from the UNFCCC project site - and checks carried out during the remote audit assessment, it has been assessed if the project has been implemented and operated in line with the latest approved version of the CPA-DDs and whether all physical features of the project are in place. The following has been checked against the PoA-DD and corresponding CPA-DDs and found appropriate:					
	<ul style="list-style-type: none">• implemented technology i.e. low GHG emitting water purification technologies• implemented monitoring plan in line with approved monitoring plan.• Exchange or modification of the relevant technical equipment of the project activity, if any.• consistent notations of key equipment (product IDs etc.) in PoA-DD, MR and calculation spreadsheet.					
	Interviews with, CME, CPA implementer and operational personnel have been carried out. QMS records, maintenance records, instruments specifications were also checked in this context.					
	Special focus has further been laid to determine whether a potential phase wise implementation has occurred within the crediting period or any delays with respect to the starting dates have occurred.					
	The CPA's covered in the MR involve dissemination of low greenhouse gas emitting safe drinking water production systems across Uganda. The CPAs under the PoA result in reduction and/or replacement of non-renewable biomass or fossil fuels used for boiling water to make it suitable for drinking purposes.					
	Multi-Barrier UV and UltraFLO Chlorination water purification systems (WPS) are fixed type water purification systems requiring pressurized piping connection to operate. The VT has reviewed the relevant information / specifications of these WPS (given below) to confirm that they require a piping connection to operate.					
	Table 1: System Specification					
WPS Type	Model	Port size inlet	Pressure (psi)	Rated capacity (L)	Lifespan (year)	Reference
Multi Barrier UV	Small UV (1 GPM)	¼ inch	125	2,044,116	7	Technical Specification from Supplier (Rotek) for Large and Small UV ^{/TS/}
Multi Barrier UV	Large UV (2 GPM)	¼ inch	125	4,088,232	7	
UltraFlo	UltraFlo	20mm	As per	340.0000	5	Technical

			line pressure			specification / expiry of UltraFlo by Medentech (technology supplier) ^{/TS/} UltraFLO Installation Manual ^{/TS/}
	<p>The Port size inlet rating and pressure rating mentioned in the manufacturer specifications / installation manual confirm that these systems require piping connection at their inlet ports for water purification. Thus, it is confirmed that a water connection is pre-requisite for these two types of systems by virtue of their design.</p> <p>Additionally, The VT also secured photographs ^{/DB/,REC/} of the WPS installations during the physical site visits conducted previously, reviewed CME installation logs ^{/DB/,REC/} and monitoring survey records ^{/usage/} and observations made during remote site visit interviews ^{/DB,REC/} to confirm that these WPS are installed on pressurized piping connection and are designed to operate exclusively for piped applications only.</p> <p>Please also refer detailed assessment under CL 02.</p> <p>All monitoring parameters are assessed to be monitored as per the registered monitoring plan included in the respective CPA-DDs and registered PoA-DD version 7.0.</p> <p>Further it has been checked whether any observed deviations from the registered project design have been correctly addressed as PRCs.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /CPA-DD/ • /MR/ • /VVS/ • /XLS/ • /ELIG/ • /IPCC/ • /unfccc/ • /TS/ • /DB/, /REC/ 					
Findings	CL 02 (point 1)					
Conclusion	<p>The verification team confirms that the CPAs under this MP are implemented and operated in line with the provisions of the PoA-DD and the latest approved versions of CPA-DDs. And all physical features of the component project activities are in place. The implementation of the WPS was verified based on the submitted technical specifications, remote assessments. Photographs, installation manuals, observation of previous verifications and the review of the requirements under CPA-DD. However, during course of verification findings were raised and closed successfully. Please refer Appendix-4 of this report.</p>					

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

It has been checked whether Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been applied during this monitoring period. The result is summarized in the table below.

<input checked="" type="checkbox"/>	No Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been submitted to the UNFCCC prior to the current monitoring period.		
<input type="checkbox"/>	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.:)
		Appr.date	
		Ref. No.	
	2	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.:)
		Appr.date	
		Ref.No.	
<input checked="" type="checkbox"/>	During the verification of the current MP no need for a TDfrMP or TDfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
<input type="checkbox"/>	An approval of the following TDfrMP or TDfMM is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		
	1	Issue:	
	2	Issue:	
<input type="checkbox"/>	The following TDfrMP or TDfMM for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

E.3.2.2. Corrections

It has been checked whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input checked="" type="checkbox"/>	During the verification of the current MP no need for corrections has been identified.		
<input type="checkbox"/>	The following corrections have been applied:		
	1	Issue:	
	2	Issue:	
	<input type="checkbox"/> A related post registration change has been submitted prior to the issuance request. <input type="checkbox"/> A related post registration change is submitted along with this issuance request. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		

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

N/A

E.3.2.4. Inclusion of a monitoring plan

<input checked="" type="checkbox"/>	N/A - as this monitoring plan was part of the included CPA-DD
<input type="checkbox"/>	In line with PS § 281 or § 282 the PP has forwarded a monitoring plan to the DOE for validation. No prior approval of the monitoring plan was required as the PP in line with PS § 282 wished to submit the monitoring plan together with the request for issuance for the first monitoring period. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.
<input type="checkbox"/>	In line with § 282 the PP submitted a monitoring plan prior to the submission of the request for issuance for validation to the DOE. A DOE has assessed the monitoring plan in line with related VVS requirements and submitted a related PRC report for prior approval. The approval has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z.

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

It has been checked whether any permanent changes from the registered monitoring plan (PCfrMP) or applied methodologies (PCfMM) including standardized baselines (PCfSB) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input checked="" type="checkbox"/>	No PCfrMP, PCfMM or PCfSB have been submitted to the UNFCCC prior to the current monitoring period		
<input type="checkbox"/>	The following PCfrMP, PCfMM or PCfSB have been approved or are under approval by the UNFCCC		
<input type="checkbox"/>	1	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr.date	
		Ref. No.	
	2	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr.date	
		Ref. No.	
<input checked="" type="checkbox"/>	During the verification of the current MP no need for a PCfrMP, PCfMM or PCfSB has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
<input type="checkbox"/>	An approval of the following PCfrMP, PCfMM or PCfSB is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.		
<input type="checkbox"/>	1	Issue:	
	2	Issue:	
<input type="checkbox"/>	The following PCfrMP, PCfMM or PCfSB for which appendix 1 of the PS is applicable have been applied:		
<input type="checkbox"/>	1	Issue:	
	2	Issue:	

E.3.2.6. Changes to the project design

It has been checked whether any changes to the project design (CoPD) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input type="checkbox"/>	No CoPD has been submitted to the UNFCCC prior to the current monitoring period		
<input checked="" type="checkbox"/>	The following CoPD have been approved or are under approval by the UNFCCC		
	1	Title	Addition or change of technologies/measures with or without addition or change of applied methodologies (Change in the water purification technology from Ultraviolet disinfection devices to Chemical disinfection). CPA05-CPA13 and CPA16-CPA22 are included under this PRC.
		Status	<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved
		Appr.date	Effective approval date 02/05/2019 and approved on 03/05/2019
		Ref. No.	PRC-9948-003
	2	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr.date	
		Ref.No.	
<input checked="" type="checkbox"/>	During the verification of the current MP no need for a CoPD has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
<input type="checkbox"/>	An approval of the following CoPD is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.		
	1	Issue:	
	2	Issue:	
<input type="checkbox"/>	The following CoPD for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

E.3.2.7. Changes specific to afforestation and reforestation activities

<input checked="" type="checkbox"/>	N/A - as this registered PoA is not an afforestation and reforestation activity
-------------------------------------	---

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

Means of verification	By means of comparison of the MR with (i) the applied CDM methodology (ii) all applicable CDM Meth tools and (iii) if applicable, a standardized baseline the verification team has checked whether the MP is in compliance with the MP related requirements of the applied methodology/tools/SB. The following sources of information have been used in this context: <ul style="list-style-type: none"> • /MR/ • /AMS-III.AV./ • /IPCC/ • /unfccc/ 		
Findings	<input checked="" type="checkbox"/>	The MP is completely in accordance with the approved methodology applied by the CDM PoA project (last registered/approved version of the PoA-DD)	
	<input checked="" type="checkbox"/>	The breakdown of MP accordance of the referenced guidelines is as follows:	
	1	Title (of the guideline)	Guidelines for Sampling and Survey for CDM Project activities and Programme of activity,

			version 04	
		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)	
	2	Title (of the tool)	Tool 05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation	
		Version	Version 01	
		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A	
		The breakdown of MP accordance of the applicable SB is as follows:		
	<input type="checkbox"/>	1	Title (of the SB)	n.a.
		Version	-	
		MP compliance	-	
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:		-
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.		
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		
	-			

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

Means of verification	By means of comparison of the MR and the ER calculation with the latest version of the registered CPA-DD, the verification team has checked whether all parameters fixed ex-ante or at renewal of the crediting period have been applied correctly.			
	Parameters which are fixed ex-ante are listed as below have been found to be adequately provided in the section E.1 of the MR. Corresponding values in the ER sheet are also verified to be correct.			
	No	Parameter	Description	Applied Value
	1.	Case1 or Case 2	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).	Case 1
	2.	WH	Specific Heat of Water	4.186 kJ/L°C
	3.	T _f	Final Temperature	100 °C
	4.	T _i	Initial Temperature	20 °C
	5.	WHE	Latent Heat of Water Evaporation	2,260 kJ/L
	6.	L	Leakage	0.95
	7.	R _{y,i}	Average volume of drinking water per person per day	3.5 (for boarding schools, prisons) and 2 (for day schools). (l/ person / day)
8.	EF _{EL,j,y}	Emission factor for electricity	1.3 tCO ₂ /MWh	

		generation for source j in year y (tCO ₂ /MWh)	
	9.	$TDL_{j,y}$	Average technical transmission and distribution losses for providing electricity to source j in year y
<p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/ • /PoA-DD/ • /CPA-DD/ • /PS/ • /VVS/ • /unfccc/ • /TOOL/ 			
Findings	<input type="checkbox"/>	The MR and the ER calculation have considered the parameters fixed ex-ante or at the renewal of the crediting period correctly, no deviations have been observed.	
	<input type="checkbox"/>	The following deviations from the parameters fixed ex-ante or at renewal of crediting period have been identified in the course of this verification:	
		- N/A	
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:	
		-	
		CL 01	
Conclusion	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.	
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out.	
	The fixed ex-ante parameters corresponding with the provisions of CPA-DD are appropriately applied for the ER calculation.		

E.3.4.2. Data and parameters monitored

Means of verification	<p>During the verification all relevant monitoring parameters (as listed in the PoA-DD) have been verified with regard to the</p> <ul style="list-style-type: none"> (i) appropriateness of the applied measurement / determination method, (ii) the correctness of the values applied for ER calculation, (iii) the accuracy, and applied QA/QC measures. <p>The results as well as the verification procedure are described parameter-wise in the project specific verification checklist (Appendix 5).</p>		
Findings	CL 01, CAR 02, CAR 03, CAR 04 and CL 02		
Conclusion	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.	
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.	
	<p>During the verification all relevant monitoring parameters (as listed in chapter B.5.1 of the registered CPA-DDs) have been verified with regard to the appropriateness of the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. The results as well as the verification procedure are described parameter-wise in the project specific verification checklist (Appendix 5).</p> <p>After appropriate corrections were carried out by the CME it can be confirmed that all monitoring parameters have been measured / determined in accordance with the registered monitoring plan, without material misstatements and in line with all applicable standards and relevant requirements.</p>		

E.3.4.3. Implementation of sampling plan

Means of verification	<p>The verification team checked whether the PP applied a sampling approach to determine the monitored values. Further it has been checked whether the PP correctly applied the implemented sampling plan including</p> <ul style="list-style-type: none"> (i) description of the implemented sampling design (ii) collected data (iii) analysis of collected data (iv) demonstration on whether the required confidence/precision has been met. <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /RC/ • /XLS/ • /PoA-DD/ • /CPA-DD/ 																																					
Findings	<div style="border: 1px solid black; padding: 5px;"> <input type="checkbox"/> </div> <p>The PPs have applied sampling approaches for the following parameters monitored.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="5">Parameter</th> </tr> <tr> <th style="width: 30%;">Name:</th> <th colspan="4">Water Quality_i</th> </tr> </thead> <tbody> <tr> <td style="width: 30%;">Description on how the sampling efforts and survey comply with the validated sampling plan:</td> <td colspan="4"> <p>A sample size was calculated based on estimated proportion values based on project developer's knowledge and experience in line with para 13(b) and 13(c) of the Sampling and surveys for CDM project activities and programmes of activities.</p> <p>A sample size was calculated from the installed Water Purification System as:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Particular</th> <th>Total population (N)⁷</th> <th>Reliability</th> <th>Sample Size (n) required</th> <th>Samples covered during monitoring</th> </tr> </thead> <tbody> <tr> <td colspan="5">MP3</td> </tr> <tr> <td>Water quality (UF)</td> <td>78</td> <td rowspan="2">95/10</td> <td rowspan="2">(3 UF + 28 UV) = 31</td> <td rowspan="2">(3 UF + 42 UV) = 45</td> </tr> <tr> <td>Water quality (Multi barrier UV)</td> <td>1,028</td> </tr> </tbody> </table> </td> </tr> <tr> <td colspan="5"> <p>The sample size has been calculated according to the following equations:</p> $n \geq \frac{z^2 * N * V}{(N - 1) * precision^2 + z^2 * V}$ <p><u>Where.</u></p> <p><u>Where.</u></p> <p>n = number of WPS to be sampled</p> <p>N = Total number of WPS in the population</p> <p>z = Constant referring to level of confidence (1.96 for 95 % confidence)</p> <p>Precision = Required precision (e.g. 10% = 0.1)</p> </td> </tr> </tbody> </table>	Parameter					Name:	Water Quality _i				Description on how the sampling efforts and survey comply with the validated sampling plan:	<p>A sample size was calculated based on estimated proportion values based on project developer's knowledge and experience in line with para 13(b) and 13(c) of the Sampling and surveys for CDM project activities and programmes of activities.</p> <p>A sample size was calculated from the installed Water Purification System as:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Particular</th> <th>Total population (N)⁷</th> <th>Reliability</th> <th>Sample Size (n) required</th> <th>Samples covered during monitoring</th> </tr> </thead> <tbody> <tr> <td colspan="5">MP3</td> </tr> <tr> <td>Water quality (UF)</td> <td>78</td> <td rowspan="2">95/10</td> <td rowspan="2">(3 UF + 28 UV) = 31</td> <td rowspan="2">(3 UF + 42 UV) = 45</td> </tr> <tr> <td>Water quality (Multi barrier UV)</td> <td>1,028</td> </tr> </tbody> </table>				Particular	Total population (N) ⁷	Reliability	Sample Size (n) required	Samples covered during monitoring	MP3					Water quality (UF)	78	95/10	(3 UF + 28 UV) = 31	(3 UF + 42 UV) = 45	Water quality (Multi barrier UV)	1,028	<p>The sample size has been calculated according to the following equations:</p> $n \geq \frac{z^2 * N * V}{(N - 1) * precision^2 + z^2 * V}$ <p><u>Where.</u></p> <p><u>Where.</u></p> <p>n = number of WPS to be sampled</p> <p>N = Total number of WPS in the population</p> <p>z = Constant referring to level of confidence (1.96 for 95 % confidence)</p> <p>Precision = Required precision (e.g. 10% = 0.1)</p>				
Parameter																																						
Name:	Water Quality _i																																					
Description on how the sampling efforts and survey comply with the validated sampling plan:	<p>A sample size was calculated based on estimated proportion values based on project developer's knowledge and experience in line with para 13(b) and 13(c) of the Sampling and surveys for CDM project activities and programmes of activities.</p> <p>A sample size was calculated from the installed Water Purification System as:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Particular</th> <th>Total population (N)⁷</th> <th>Reliability</th> <th>Sample Size (n) required</th> <th>Samples covered during monitoring</th> </tr> </thead> <tbody> <tr> <td colspan="5">MP3</td> </tr> <tr> <td>Water quality (UF)</td> <td>78</td> <td rowspan="2">95/10</td> <td rowspan="2">(3 UF + 28 UV) = 31</td> <td rowspan="2">(3 UF + 42 UV) = 45</td> </tr> <tr> <td>Water quality (Multi barrier UV)</td> <td>1,028</td> </tr> </tbody> </table>				Particular	Total population (N) ⁷	Reliability	Sample Size (n) required	Samples covered during monitoring	MP3					Water quality (UF)	78	95/10	(3 UF + 28 UV) = 31	(3 UF + 42 UV) = 45	Water quality (Multi barrier UV)	1,028																	
Particular	Total population (N) ⁷	Reliability	Sample Size (n) required	Samples covered during monitoring																																		
MP3																																						
Water quality (UF)	78	95/10	(3 UF + 28 UV) = 31	(3 UF + 42 UV) = 45																																		
Water quality (Multi barrier UV)	1,028																																					
<p>The sample size has been calculated according to the following equations:</p> $n \geq \frac{z^2 * N * V}{(N - 1) * precision^2 + z^2 * V}$ <p><u>Where.</u></p> <p><u>Where.</u></p> <p>n = number of WPS to be sampled</p> <p>N = Total number of WPS in the population</p> <p>z = Constant referring to level of confidence (1.96 for 95 % confidence)</p> <p>Precision = Required precision (e.g. 10% = 0.1)</p>																																						

⁷These are rounded figures of total strata population for calculating sample size only.

$$V = \frac{SD^2}{\bar{p}^2}$$

Where:

$$SD^2 = \frac{\sum_{i=1}^k g_i * p_i * (1 - p_i)}{N}$$

$$\bar{p} = \frac{\sum_{i=1}^k g_i * p_i}{N}$$

Where,

g_i = weight of strata i in the population

p_i = expected proportion of strata i in the population

k = total number of strata in the population

Procedures for sampling have been duly articulated in the field monitoring excel report and spreadsheet, and a sample of survey questionnaires has been furnished to verification team.

The samples (randomly selected, stratified sampling) were visited by surveyor/s on behalf of CME/CPA Implementer. During visit, the existence and functionality of the project WPS was confirmed through visual assessment of the appliance with the unique ID clearly visible and Water Quality Test was conducted using Aquagenx Test kit. The monitoring (Surveys and Water Quality Tests) were conducted from 03/02/2020 to 14/02/2020.

During remote audit assessment conducted by the DOE representative, a total of 08 samples were surveyed covering entire monitoring period across all the models of the water purification system and Institution type (Boarding/ non-boarding/ Both schools) as illustrated above under section D.4 of this verification report (FVR).

During course of verification, relevant findings were raised and same can be referred in detail in Appendix 4 of this report

Name	Operational units;																				
Description on how the sampling efforts and survey comply with the validated sampling plan:	<p>A sample size was calculated based on estimated proportion values based on project developer's knowledge and experience in line with para 13(b) and 13(c) of the Sampling and surveys for CDM project activities and programmes of activities.</p> <p>A sample size was calculated from the installed Water Purification System as:</p> <table border="1"> <thead> <tr> <th>Particular</th><th>Total population (N)⁸</th><th>Reliability</th><th>Sample Size (n) required</th><th>Samples covered during monitoring</th></tr> </thead> <tbody> <tr> <td colspan="5">*MP3</td></tr> <tr> <td>Operational units (UF)</td><td>78</td><td rowspan="2">95/10</td><td rowspan="2">(3 UF + 28 UV) = 31</td><td rowspan="2">(4 UF + 45 UV) = 49</td></tr> <tr> <td>Operational units (Multi</td><td>1,028</td></tr> </tbody> </table>				Particular	Total population (N) ⁸	Reliability	Sample Size (n) required	Samples covered during monitoring	*MP3					Operational units (UF)	78	95/10	(3 UF + 28 UV) = 31	(4 UF + 45 UV) = 49	Operational units (Multi	1,028
Particular	Total population (N) ⁸	Reliability	Sample Size (n) required	Samples covered during monitoring																	
*MP3																					
Operational units (UF)	78	95/10	(3 UF + 28 UV) = 31	(4 UF + 45 UV) = 49																	
Operational units (Multi	1,028																				

⁸These are rounded figures of total strata population for calculating sample size only.

		barrier UV)					
		<p>The sample size has been calculated according to the following equations:</p>					
		$n \geq \frac{z^2 * N * V}{(N - 1) * precision^2 + z^2 * V}$					
<u>Where.</u>		<p><u>Where.</u></p> <p>n = number of WPS to be sampled</p> <p>N = Total number of WPS in the population</p> <p>z = Constant referring to level of confidence (1.96 for 95 % confidence)</p> <p>Precision = Required precision (e.g. 10% = 0.1)</p>					
		$V = \frac{SD^2}{p}$					
<u>Where:</u>		$SD^2 = \frac{\sum_{i=1}^k g_i * p_i * (1 - p_i)}{N}$ $p = \frac{\sum_{i=1}^k g_i * p_i}{N}$					
<u>Where.</u>		<p>g_i = weight of strata i in the population</p> <p>p_i = expected proportion of strata i in the population</p> <p>k = total number of strata in the population</p>					
		<p>The samples (randomly selected) were visited by surveyor/s on behalf of CME/CPA Implementer. During the remote assessments, the existence and functionality of the project WPS was confirmed through visual assessment of the appliance with the unique ID clearly visible and Usage Surveys were conducted. The monitoring (Surveys and Water Quality Tests) were conducted from 03/02/2020 to 14/02/2020.</p> <p>During remote audit assessment conducted by Verification Team, a total of 08 samples were surveyed covering entire monitoring period across all the models of the water purification system and Institution type (Boarding/ non-boarding/ Both schools) as illustrated above under section D.4 of this FVR.</p>					
Name	Existence of public distribution network of safe drinking water						
Description on how the sampling efforts and survey comply with the	<p>The Assessment Team assessed the monitoring survey forms submitted by the CME. The Verification Team (during the remote audits) reconfirmed the below particulars with the end users to confirm the credibility of the monitoring data:</p> <ul style="list-style-type: none"> • Confirmation that all appliances are in continued operation based on traceable maintenance schedules 						

	<p>validated sampling plan:</p>	<p>confirming continuous supply of cartridge/tablets, through the 'Question pertaining to continuity/Maintenance' and also checks on the operational status through 'Question pertaining to usage'. The response to these questions confirms that there were routine supply/ maintenance of filters / cartridges, as well as usage. Based on the review of the all the submitted monitoring survey forms, read with the observation during remote assessment and interviews with the representatives of sampled end users, it can be concluded that all appliances are in continued operation and delivering optimum level of services.</p> <ul style="list-style-type: none"> • Assessment of the continued availability of the drinking water- The above questions pertaining to continuity/maintenance ensures that the institution is receiving continuous supplies and hence have remained under continued use during the monitoring period. The questions pertaining to usage confirm that these supplies are being uninterrupted. The response to these questions confirms that the WT unit was used for the water treatment; the end users did not avail boiling/ unsafe drinking water during the applied monitoring period. Based on the review of the all the submitted monitoring survey forms read with the observation during remote assessment with the representatives of sampled end users, it can be concluded that there was continued availability of the safe drinking water. <p>Additional checks by the VT: All the interviewed institution heads of randomly sampled systems were interviewed by the VT to confirm that</p> <ul style="list-style-type: none"> • the product installed in the school was currently in operational condition and • they have been receiving continuous supply of cartridge/tablets thus, getting continuous supply of safe drinking water. Any institution reporting the product as being functional, cannot be out of supplies. <p>The Verification Team has assessed all the above data points while interviewing, the sampled school representatives. As stated above this data is already part of the submitted ER worksheet</p> <p>Additionally, during the remote assessment the VT checked if there are provisions in place to ensure continuous supply of safe drinking water</p> <ul style="list-style-type: none"> • Call Centers: The CME representatives confirmed that follow up calls with the institutions regarding usage, users are performed to gauge the expected date of next supply of (cartridge/tablets). This fact was also confirmed by the verification team with the school representatives. • Other Evidences (Purchase Order, delivery notes etc): The objective evidences delivery notes, delivery notes, installation records, maintenance records and the traceability of customer care number/email for supply / repair on the system's tank or school wall in form of sticker were checked to confirm that the CME country office contact detail is available to the institution staff and they can contact the CME in case they find any issue with the performance, breakdown, problem with the product or need additional tablets / cartridge. The VT during the remote assessment (telephone call and video calls) with the institution heads confirmed about the availability and
--	---------------------------------	--

use of contact number to register their complaints regarding the product or their request for supplies.

- The VT is already in receipt of the sales database which captures the supplies with their product IDs for each institution, which is presented in the ER sheet (refer ER calculator, tab "Sales Database"). The VT has also assessed the scanned copies of delivery notes made available for cross verification of the subsequent supplies made to an institution. The verification team had checked it for the sampled institutions. The evidence reviewed confirmed the quantities of supplies mentioned in the ER sheet.

Thus, the above monitoring provisions ensure as uninterrupted supply of safe drinking water in the institution.

A sample size was calculated based on estimated proportion values based on project developer's knowledge and experience in line with para 13(b) and 13(c) of the Sampling and surveys for CDM project activities and programmes of activities.

A sample size was calculated from the installed Water Purification System as:

Particular	Total population (N) ⁹	Reliability	Sample Size (n) required	Samples covered during monitoring
MP3				
Existence of public distribution network of safe drinking water (UF)	78	95/10	(3 UF + 28 UV) = 31	(3 UF + 42 UV) = 45
Existence of public distribution network of safe drinking water (Multi barrier UV)	1,028			

The sample size has been calculated according to the following equations:

$$n \geq \frac{z^2 * N * V}{(N - 1) * precision^2 + z^2 * V}$$

Where,

Where,

n = number of WPS to be sampled

N = Total number of WPS in the population

z = Constant referring to level of confidence (1.96 for 95 % confidence)

Precision = Required precision (e.g. 10% = 0.1)

⁹These are rounded figures of total strata population for calculating sample size only.

	$V = \frac{SD^2}{\bar{p}^2}$ <p><u>Where:</u></p> $SD^2 = \frac{\sum_{i=1}^k g_i * p_i * (1 - p_i)}{N}$ $\bar{p} = \frac{\sum_{i=1}^k g_i * p_i}{N}$ <p><u>Where,</u></p> <p>g_i = weight of strata i in the population p_i = expected proportion of strata i in the population k = total number of strata in the population</p> <p>The samples selected by CME were visited by surveyor/s on behalf of CME/CPA Implementer. During visit, the existence and functionality of the project WPS was confirmed through visual assessment of the appliance with the unique ID clearly visible. The CME's monitoring team checked the existence of any public distribution network with safe drinking water in sampled schools.</p> <p>The monitoring (Surveys and Water Quality Tests) were conducted from 03/02/2020 to 14/02/2020.</p> <p>During remote audit assessment conducted by verification team and, a total of 08 samples were surveyed covering entire monitoring period across all the models of the water purification system and Institution type (Boarding/ non-boarding/ Both schools) as illustrated above under section D.4 of this FVR.</p>
	<input checked="" type="checkbox"/> In this context the following CARs, CLs, FARs have been raised: CL 01, CAR 01, CAR 02 and CAR 04
Conclusion	<input type="checkbox"/> No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements. <input checked="" type="checkbox"/> The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4. <p>Based on the assessment of sampling records, monitoring survey records^{/usage/} and WQT^{/CBT/} records, the data analysis sheets for the related parameters, it is concluded that all the parameters have been monitored correctly in accordance with registered monitoring plan and the applied methodology.</p> <p>The verification team concludes that all sampled parameters values have been calculated correctly in line with the registered corresponding CPA-DDs and the sampling standard. For all the parameters, the achieved relative precision of 10 % and 95% confidence level is demonstrated to be met.</p> <p>Based on above, along with the Remote Assessment observations and interview and assessment of the project Water Purification System installations (via supporting documents for sampled Institutions with photographs showing product type, unique serial numbers verifiable against the sales database), the verification team concludes that the approach applied and result achieved/accrued are deemed appropriate and acceptable.</p>

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

Means of verification	<p>During the verification, the relevant monitoring equipment has been checked whether the calibration requirements have been met; especially if the calibration frequency is in line with the requirements of the validated CPA-DD and/or the applicable calibration standards.</p> <p>The results as well as the verification procedure are described equipment-wise in the project specific verification checklist (Appendix 6).</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/ • /PoA-DD/ • /CPA-DD/ • /AMS-III. AV/ 						
Findings	<table border="1"> <tr> <td data-bbox="432 640 496 824"><input checked="" type="checkbox"/></td><td data-bbox="496 640 1453 824">Calibration is not under the purview of the CME; however, third party WBT agency has provided the complete calibration detail of the equipment in the report which were also checked during onsite inspection by the verification team and found to be appropriate. Thus, the verification team can confirm that all installed monitoring equipment has been duly calibrated for this entire monitoring period.</td></tr> <tr> <td data-bbox="432 824 496 1104"><input type="checkbox"/></td><td data-bbox="496 824 1453 1104">Based on the assessment and information as per appendix 6 delay(s) in calibration have been identified. The PP has applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration. From the related calibration certificates and emission reduction calculation the verification team confirms that the maximum permissible error has been applied in a conservative manner so that the adjusted measured values due to the delayed calibration result in fewer claimed emission reductions. For details please refer to appendix 6</td></tr> <tr> <td data-bbox="432 1104 496 1167"><input type="checkbox"/></td><td data-bbox="496 1104 1453 1167">In this context the following CARs, CLs, FARs have been raised:</td></tr> </table>	<input checked="" type="checkbox"/>	Calibration is not under the purview of the CME; however, third party WBT agency has provided the complete calibration detail of the equipment in the report which were also checked during onsite inspection by the verification team and found to be appropriate. Thus, the verification team can confirm that all installed monitoring equipment has been duly calibrated for this entire monitoring period.	<input type="checkbox"/>	Based on the assessment and information as per appendix 6 delay(s) in calibration have been identified. The PP has applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration. From the related calibration certificates and emission reduction calculation the verification team confirms that the maximum permissible error has been applied in a conservative manner so that the adjusted measured values due to the delayed calibration result in fewer claimed emission reductions. For details please refer to appendix 6	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
<input checked="" type="checkbox"/>	Calibration is not under the purview of the CME; however, third party WBT agency has provided the complete calibration detail of the equipment in the report which were also checked during onsite inspection by the verification team and found to be appropriate. Thus, the verification team can confirm that all installed monitoring equipment has been duly calibrated for this entire monitoring period.						
<input type="checkbox"/>	Based on the assessment and information as per appendix 6 delay(s) in calibration have been identified. The PP has applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration. From the related calibration certificates and emission reduction calculation the verification team confirms that the maximum permissible error has been applied in a conservative manner so that the adjusted measured values due to the delayed calibration result in fewer claimed emission reductions. For details please refer to appendix 6						
<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:						
Conclusion	<table border="1"> <tr> <td data-bbox="432 1167 496 1234"><input checked="" type="checkbox"/></td><td data-bbox="496 1167 1453 1234">No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.</td></tr> <tr> <td data-bbox="432 1234 496 1328"><input type="checkbox"/></td><td data-bbox="496 1234 1453 1328">The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.</td></tr> <tr> <td colspan="2" data-bbox="432 1328 1453 1478">The CPAs do not involve installation of monitoring equipment which requires calibration. Based on assessment of documents, sampling survey records, Aquagenx testing kit specifications, report and data maintenance and recording procedures, it can be concluded that the recording of all data related to monitoring is appropriate and accurate.</td></tr> </table>	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.	The CPAs do not involve installation of monitoring equipment which requires calibration. Based on assessment of documents, sampling survey records, Aquagenx testing kit specifications, report and data maintenance and recording procedures, it can be concluded that the recording of all data related to monitoring is appropriate and accurate.	
<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.						
<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.						
The CPAs do not involve installation of monitoring equipment which requires calibration. Based on assessment of documents, sampling survey records, Aquagenx testing kit specifications, report and data maintenance and recording procedures, it can be concluded that the recording of all data related to monitoring is appropriate and accurate.							

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>During the verification the calculation of baseline GHG emissions has been checked. In detail the following has been verified:</p> <ul style="list-style-type: none"> • <i>Transparency</i>: It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. • <i>Parameter consistency</i>: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet. • <i>Correctness</i>: It has been checked whether the applied formulae and methods for calculating baseline emissions are in accordance with the monitoring plan and the approved methodology. • <i>Completeness</i>: It has been checked whether all calculations are complete and without omissions.
------------------------------	---

Note: As per the registered PoA-DD^{PoA-DD/} "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 starting in 23/05/2019 and ending on 31/12/2019, therefore only the units installed till Nov 2019 (up to 30/11/2019) are eligible for crediting under the concerned monitoring period. Thus, the CME has considered 30/11/2019 as the cut-off date of installation for this monitoring period. Please also refer closure of CL 01.

Baseline emission is determined using the following equation as per applied methodology:

$$BE_y = QPW_y \times SEC \times f_{NRB,y} \times EF_{projected_fossilfuel} \times 10^{-9}$$

Where

BE_y	Baseline emissions during the year y in (tCO ₂ e)
QPW_y	Quantity of purified water in year y (Liters/yr).
SEC	Specific energy consumption required to boil one litre of water (kJ/L)
$f_{NRB,y}$	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable. 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.
$EF_{projected_fossilfuel}$	Emission factor when NRB is displaced or the emission factor of the fossil fuel substituted 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

Calculation of emission reductions is performed during the applied monitoring period as follows:

Step 1: Calculation of quantity of purified water in year y (QPW_y)

$$QPW_y = \sum (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times \text{Water Quality}_i \times \text{Operational Units}_i) \text{ for } 9948\text{-}P1\text{-}0002\text{-}CP1, 9948\text{-}P1\text{-}0016\text{-}CP1 - 9948\text{-}P1\text{-}0022\text{-}CP1$$

$$QPW_y = \sum (T_{y,i} \times N_{y,i} \times R_{y,i} \times 291.5 \times \text{Water Quality}_i \times \text{Operational Units}_i) \text{ for } 9948\text{-}P1\text{-}0014\text{-}CP1 - 9948\text{-}P1\text{-}0015\text{-}CP1$$

Where,

QPW_y	Quantity of purified water for drinking for all technologies type i in year y
$N_{y,i}$	The average population serviced by water purification systems (person/equipment)
$T_{y,i}$	Total distributed water purification systems
$R_{y,i}$	Average volume of drinking water per person per day (Liters/person)
Water Quality_i	Percent of units that meet water quality requirements
$\text{Operational Units}_i$	Percent of the monitoring period in which the units are in use

Step 2: Calculation of specific energy consumption [SEC] required to boil one litre of water.

$$SEC = [WH \times (T_f - T_i) + 0.01 \times WHE] / h_{wb}$$

Where,

WH	Specific heat of water (kJ/L °C)
T_f	Final temperature (°C)

T_i Initial temperature of water (°C)
 WHE Latent heat of water evaporation (kJ/L)
 n_{wb} Efficiency of water boiling system being replaced (fraction)

MP3 (data is reported for CPA which claimed ERs):

Data/Parameter	Data Unit	9948-P1-0002-CP1	9948-P1-0014-CP1	9948-P1-0015-CP1	9948-P1-0016-CP1	9948-P1-0017-CP1
Ty,i	Number	580	221	227	12	11
Operational Units i	percentage	92.04%	92.04%	92.04%	92.04%	92.04%
Ry,i	L/person/day	2.67	2.66	2.62	2.12	2.12
Ny,i	persons/equipment	592	514	500	717	639
Days	number	108	126	125	59	61
Water Quality i	proportion	0.98	0.98	0.98	0.98	0.98
QPWy	L/year	8,93,95,683	3,42,20,437	3,35,63,892	9,67,706	8,23,164
η_{wb}	Fraction	0.1172	0.1172	0.1172	0.1172	0.1172
Tf	C	100	100	100	100	100
Ti	C	20	20	20	20	20
WH	kJ/L - C	4.186	4.186	4.186	4.186	4.186
WHE	kJ/L	2260	2260	2260	2260	2260
SEC	kJ/L	3050.17	3050.17	3050.17	3050.17	3050.17
fNRB	Fraction	0.8304	0.8304	0.8304	0.8304	0.8304
EF _{projected_fossilfuel}	tCO ₂ e/TJ	80.12	80.12	80.12	80.12	80.12
Systems having access to public distribution system providing safe drinking water	percentage	0.0%	0.0%	0.0%	0.0%	0.0%
BEy	tCO ₂ e	18,142	6,944	6,811	196	167
PEy	tCO ₂ e	68	26	27		
L	tCO ₂ e	908	348	341	10	9
ERy	tCO ₂ e	17,166	6,570	6,443	186	158

Data/Parameter	Data Unit	9948-P1-0018-CP1	9948-P1-0019-CP1	9948-P1-0020-CP1	9948-P1-0021-CP1	9948-P1-0022-CP1
Ty,i	Number	11	11	11	11	11
Operational Units	Fraction	92.04%	92.04%	92.04%	92.04%	92.04%
Ry,i	L/person/day	2.14	2.05	2.15	2.26	2.30
Ny,i	persons/equipment	504	692	603	626	594
Days	number	69	57	52	40	87
Water Quality i	proportion	0.98	0.98	0.98	0.98	0.98
QPWy	L/year	7,38,563	8,07,360	6,63,644	5,58,039	11,73,497
η_{wb}	Fraction	0.1172	0.1172	0.1172	0.1172	0.1172
Tf	C	100	100	100	100	100
Ti	C	20	20	20	20	20
WH	kJ/L - C	4.186	4.186	4.186	4.186	4.186
WHE	kJ/L	2260	2260	2260	2260	2260
SEC	kJ/L	3050.17	3050.17	3050.17	3050.17	3050.17
fNRB	Fraction	0.8304	0.8304	0.8304	0.8304	0.8304
EF _{projected_fossilfuel}	tCO ₂ e/TJ	80.12	80.12	80.12	80.12	80.12
Systems having access to public distribution system providing safe drinking water	percentage	0.0%	0.0%	0.0%	0.0%	0.0%
BEy	tCO ₂ e	149	163	134	113	238
PEy	tCO ₂ e					
L	tCO ₂ e	8	9	7	6	12
ERy	tCO ₂ e	141	154	127	107	226

The calculation of emission reductions is stated under section E.3.6.3 below.

The following sources of information have been used in this context:

- /MR/
- /PoA-DD/

	<ul style="list-style-type: none"> • /CPA-DD/ • /XLS/ • /USAGE/ • /AMS-III.AV/
Findings	<input type="checkbox"/> <p>The calculation of the baseline emissions was found to be fully compliant with the above stated principles. The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information has been identified.</p>
	<input checked="" type="checkbox"/> <p>The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.</p>
	<input checked="" type="checkbox"/> <p>In this context the following CARs, CLs, FARs have been raised: CL 01, CAR 01, CAR 02 and CAR 03 has been raised</p>
Conclusion	<input type="checkbox"/> <p>No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.</p>
	<input checked="" type="checkbox"/> <p>The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 5.</p> <p>Number of days: The equation in CPA DDs uses 365 days (or the duration of monitoring period in case of less than annual monitoring period) for calculating QPWy.</p> <p>However, instead of using the duration of monitoring period, the CME has conservatively applied operational school days determined as per academic school calendar issued by “School and Other Institutions Calendar-2019” issued by the Ministry of Education and Sports Embassy, Uganda” ^{/DB/, /REC/}. For non-boarding schools, the weekends and school holidays (public holidays, mid-term and end term holidays) have been excluded as a conservative measure and for boarding schools, weekends and public holidays have been included but the CME has excluded mid-term and end term holidays because the boarding students/staff would still consume water during weekends and short public holidays as checked in the ER sheet ^{/XLS/}. Please refer the closure of CL 02.</p> <p>Residual capacity from previous MP: The Verification Team has reviewed the revised ER sheet (version 04) ^{/XLS/} and confirms that the values of ‘residual capacity from previous MP’, are accurately linked with the MP2 ER worksheet values submitted against RfR response to MP2 ^{/MP2/}.</p> <p>In the revised MP3 ER Calculator, the MP2-MS2 Sales database has been added (Tab: ‘MP2 Sales data MS2 ref only’) by the CME. The VT has verified that information in the revised MP3 ER Calculator, Tab: ‘MP2 Sales data MS2 ref only’ is fully consistent MP2 ER calculator ^{/MP2/}, available at UN webpage: (https://cdm.unfccc.int/PoAIssuance/iss_db/poaiss523838536/view).</p> <p>The VT confirmed that the residual capacity from previous MP in column AC, in tab MP3 Sales database, is correctly linked with ‘MP2 Sales data MS2 ref only’, column BA, thus establishing complete traceability of these values.</p> <p>It is further confirmed that the MP3 sales database, in column AC, correctly reflects, “new installation, not applicable” for systems that are not being carry forwarded from MP2.</p> <p>The assessment of the residual capacity from previous MP is assessed in detail under the CL 02, assessment under point 3 c).</p> <p><u>Subsequent supplies:</u> <u>No subsequent supplies have been made to the institutions in the concerned MP (column</u></p>

AD). The schools which have '0' residual capacity from previous MP along with 0 subsequent supplies), were verified to have 0 credited operational school days (column AP), thus substantiating that no ERs have been claimed for such cases^{/XLS/}.

Thus, it was confirmed that the CME has followed the implementation plan stated in the CPA DDs and claimed ERs only for the systems that are rendering clean water during the current monitoring period by virtue of their residual capacity from previous MP and/or subsequent supplies and/or initial installation capacity, as applicable. Please refer the closure of CL 02, assessment under point 3 c) and 3 d).

Lifetime of Multi-Barrier UV and UltraFlo WPS:

In case of Multi-barrier UV, the lifespan has been verified as 7 year by the VT as per supplier certificates/specifications^{/TS/}. Further, the review of MP3 sales database^{/DB/, /REC/} confirms that the earliest Multi-Barrier UV WPS was installed in June 2014. Thus, it is confirmed that no Multi-Barrier UV WPS shall exhaust its useful lifetime before the end of the concerned monitoring period ending 31 Dec 2019. Besides, the UV bulb can be replaced to further extend the device lifetime after 7 years, if desired.

Similarly, in case of UltraFLO, the 5-year lifespan/expiry has been verified by the VT as per supplier certificates/specifications^{/TS/}. Further, the review of MP3 sales database^{/DB/, /REC/} confirms that the earliest UltraFlo was installed in June 2018. Thus, it is confirmed that no UltraFlo WPS shall exhaust its useful lifetime before the end of the concerned monitoring period ending 31 Dec 2019. Besides, every-time a school receives a new supply UltraFLO cartridge, the lifetime of the system is automatically deemed extended. Please refer the closure of CL 02.

Other Determinants

The continuous running end date was merely a determinant to check compliance with the registered monitoring plan requirement and is not linked with lifetime of the installed devices. The same has been removed by the CME from the revised ER sheet to avoid any confusion.

The revised ER sheet^{/XLS/} tab, 'MP4 Sales Database' ensures that $(N_{yi} * R_{yi})$ * operational school days in the monitoring period, do not exceed the available treatment capacity for any unit (column AI). It also confirms that the total consumed capacity (column AN) remains lower of these two in all cases.

The verification team has checked all determinants (columns AK:AP) and confirms them to be correctly and accurately calculated and conservative with respect to ER calculations. Please refer the closure of CL 02, assessment under point 3 c).

The verification team has verified all corresponding calculations and found them accurate and correct. Based on above and verification of all input values (including fixed ex-ante), it can be concluded by verification team that, baseline GHG emissions calculation presented in the MR and corresponding ER sheet is deemed as appropriate.

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

Means of verification	<p>During the verification the calculation of project GHG emissions has been checked. In detail the following has been verified:</p> <ul style="list-style-type: none"> • Transparency: It has been checked whether the calculation of project emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. • Parameter consistency: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet. • Correctness: It has been checked whether the applied formulae and methods for calculating project emissions are in accordance with the monitoring plan and the approved methodology. • Completeness: It has been checked whether all calculations are complete and without omissions.
------------------------------	--

	<p>Project emissions are calculated as per the applied methodology for the registered PoA. $PE_y = 0$, for type 2 CPAs</p> <p>For type 3 CPAs, PE_y is calculated as follows:</p> $PE_y = T_{y,i} \times EC_{PJ,j,y} \times EF_{EL,j,y} \times (1 + TDL_{j,y})$																																	
	<table border="1"> <thead> <tr> <th>Data/ Parameter</th><th>Data Unit</th><th>9948-P1-0002-CP1</th><th>9948-P1-0014-CP1</th><th>9948-P1-0015-CP1</th></tr> </thead> <tbody> <tr> <td>$T_{y,i}$</td><td>-</td><td>580</td><td>221</td><td>227</td></tr> <tr> <td>$EC_{PJ,j,y}$</td><td>MWh/yr</td><td>0.07</td><td>0.07</td><td>0.07</td></tr> <tr> <td>$EF_{EL,j,y}$</td><td>tCO₂/MWh</td><td>1.30</td><td>1.30</td><td>1.30</td></tr> <tr> <td>$TDL_{j,y}$</td><td>%</td><td>0.20</td><td>0.20</td><td>0.20</td></tr> <tr> <td>PE_y</td><td>tCO₂e</td><td>68</td><td>26</td><td>27</td></tr> </tbody> </table>				Data/ Parameter	Data Unit	9948-P1-0002-CP1	9948-P1-0014-CP1	9948-P1-0015-CP1	$T_{y,i}$	-	580	221	227	$EC_{PJ,j,y}$	MWh/yr	0.07	0.07	0.07	$EF_{EL,j,y}$	tCO ₂ /MWh	1.30	1.30	1.30	$TDL_{j,y}$	%	0.20	0.20	0.20	PE_y	tCO ₂ e	68	26	27
	Data/ Parameter	Data Unit	9948-P1-0002-CP1	9948-P1-0014-CP1	9948-P1-0015-CP1																													
	$T_{y,i}$	-	580	221	227																													
	$EC_{PJ,j,y}$	MWh/yr	0.07	0.07	0.07																													
$EF_{EL,j,y}$	tCO ₂ /MWh	1.30	1.30	1.30																														
$TDL_{j,y}$	%	0.20	0.20	0.20																														
PE_y	tCO ₂ e	68	26	27																														
<p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /CPA-DD/ • /XLS/ • /AMS-III.AV/ 																																		
Findings	<input checked="" type="checkbox"/>	<p>The calculation of the project emissions was found to be fully compliant with the above stated principles.</p> <p>The calculations of project GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p>																																
	<input type="checkbox"/>	<p>The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.</p>																																
	<input type="checkbox"/>	<p>In this context the following CARs, CLs, FARs have been raised:</p> <p>-</p>																																
Conclusion	<input checked="" type="checkbox"/>	<p>No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.</p>																																
	<input type="checkbox"/>	<p>The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.</p>																																

E.3.6.3. Calculation of leakage GHG emissions

Means of verification	<p>During the verification the calculation of leakage has been checked. In detail the following has been verified:</p> <ul style="list-style-type: none"> • Transparency: It has been checked whether the calculation of leakage is fully traceable and, where used, the Excel calculation provides all calculation formulae. • Parameter consistency: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet. • Correctness: It has been checked whether the applied formulae and methods for calculating project emissions are in accordance with the monitoring plan and the approved methodology. • Completeness: It has been checked whether all calculations are complete and without omissions. <p>Leakage has been calculated using a default 95% leakage adjustment factor to baseline emissions as per applied methodology.</p> <p>PP has applied related default factor correctly to the baseline emissions.</p>
------------------------------	---

	$L_y = BE_y * (1 - 0.95)$ The following sources of information have been used in this context: <ul style="list-style-type: none"> • /MR/ • /CPA-DD/ • /XLS/ • /AMS-III.AV./
Findings	<input checked="" type="checkbox"/> The calculation of the leakage was found to be fully compliant with the above stated principles. The calculations of leakage GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information have been identified.
	<input type="checkbox"/> The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.
	<input type="checkbox"/> In this context the following CARs, CLs, FARs have been raised: -
Conclusion	<input checked="" type="checkbox"/> No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/> The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	Therefore, no further leakage emission result is separately indicated in monitoring report or this report.

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

Means of verification	The verification team has checked if the MR includes a summary table of the emission reductions calculation specifying separately.																																																											
	- Total baseline emissions, - Total project emissions, - Total leakage, - Total emission reductions																																																											
	The MR demonstrate the summary of GHG emission reductions for the monitoring period and calculated according to the applied methodology AMS-III.AV.as follows:																																																											
	$ER_y = BE_y - (PE_y + L_y)$																																																											
	<table border="1"> <thead> <tr> <th>CPA</th><th>BE_y (tCO₂e)</th><th>PE_y(tCO₂e)</th><th>L_y(tCO₂e)</th><th>ER_y(tCO₂e)</th></tr> </thead> <tbody> <tr> <td>9948-P1-0002-CP1</td><td>18,142</td><td>68</td><td>908</td><td>17,166</td></tr> <tr> <td>9948-P1-0014-CP1</td><td>6,944</td><td>26</td><td>348</td><td>6,570</td></tr> <tr> <td>9948-P1-0015-CP1</td><td>6,811</td><td>27</td><td>341</td><td>6,443</td></tr> <tr> <td>9948-P1-0016-CP1</td><td>196</td><td>-</td><td>10</td><td>186</td></tr> <tr> <td>9948-P1-0017-CP1</td><td>167</td><td>-</td><td>9</td><td>158</td></tr> <tr> <td>9948-P1-0018-CP1</td><td>149</td><td>-</td><td>8</td><td>141</td></tr> <tr> <td>9948-P1-0019-CP1</td><td>163</td><td>-</td><td>9</td><td>154</td></tr> <tr> <td>9948-P1-0020-CP1</td><td>134</td><td>-</td><td>7</td><td>127</td></tr> <tr> <td>9948-P1-0021-CP1</td><td>113</td><td>-</td><td>6</td><td>107</td></tr> <tr> <td>9948-P1-0022-CP1</td><td>238</td><td>-</td><td>12</td><td>226</td></tr> <tr> <td>Total</td><td>33,057</td><td>121</td><td>1,658</td><td>31,278</td></tr> </tbody> </table>	CPA	BE_y (tCO ₂ e)	PE_y (tCO ₂ e)	L_y (tCO ₂ e)	ER_y (tCO ₂ e)	9948-P1-0002-CP1	18,142	68	908	17,166	9948-P1-0014-CP1	6,944	26	348	6,570	9948-P1-0015-CP1	6,811	27	341	6,443	9948-P1-0016-CP1	196	-	10	186	9948-P1-0017-CP1	167	-	9	158	9948-P1-0018-CP1	149	-	8	141	9948-P1-0019-CP1	163	-	9	154	9948-P1-0020-CP1	134	-	7	127	9948-P1-0021-CP1	113	-	6	107	9948-P1-0022-CP1	238	-	12	226	Total	33,057	121	1,658
CPA	BE_y (tCO ₂ e)	PE_y (tCO ₂ e)	L_y (tCO ₂ e)	ER_y (tCO ₂ e)																																																								
9948-P1-0002-CP1	18,142	68	908	17,166																																																								
9948-P1-0014-CP1	6,944	26	348	6,570																																																								
9948-P1-0015-CP1	6,811	27	341	6,443																																																								
9948-P1-0016-CP1	196	-	10	186																																																								
9948-P1-0017-CP1	167	-	9	158																																																								
9948-P1-0018-CP1	149	-	8	141																																																								
9948-P1-0019-CP1	163	-	9	154																																																								
9948-P1-0020-CP1	134	-	7	127																																																								
9948-P1-0021-CP1	113	-	6	107																																																								
9948-P1-0022-CP1	238	-	12	226																																																								
Total	33,057	121	1,658	31,278																																																								
	It has been assessed whether the values are correct or need to be revised as a consequence of issues identified during the desktop reviews and onsite assessments. Findings have been raised and all monitored parameters have been duly verified.																																																											

	The following sources of information have been used in this context: <ul style="list-style-type: none"> • /MR/ • /XLS/ • /CPA-DD/ • /PoA-DD/ • /AMS-III.AV./ • /USAGE/ 	
Findings	<input checked="" type="checkbox"/>	Section F.4 of the MR includes in a summary table of the emission reductions calculation.
	<input type="checkbox"/>	The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately.
	<input type="checkbox"/>	The values as specified in the ER summary table are correct; no issues have been identified during the verification which requires changes in the ER calculation.
	<input checked="" type="checkbox"/>	During the verification issues with impact on the ER calculation have been identified. CL 01, CL 02, CAR 02 and CAR 03
Conclusion	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	The summary table in MR has been filled correctly and the values are in line with related emission reduction calculation spreadsheet.	

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-P1-0002-CP1	18,142	68	908	0	17,166	17,166
9948-P1-0014-CP1	6,944	26	348	0	6,570	6,570
9948-P1-0015-CP1	6,811	27	341	0	6,443	6,443
9948-P1-0016-CP1	196	-	10	0	186	186
9948-P1-0017-CP1	167	-	9	0	158	158
9948-P1-0018-CP1	149	-	8	0	141	141
9948-P1-0019-CP1	163	-	9	0	154	154
9948-P1-0020-CP1	134	-	7	0	127	127
9948-P1-0021-CP1	113	-	6	0	107	107
9948-P1-0022-CP1	238	-	12	0	226	226
Total	33,057	121	1,658	0	31,278	31,278

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

Means of verification	The verification team has checked if the MR includes a comparison of actual values of the monitoring period with the estimations in the included CPA-DD. It has further checked which of the below listed cases is applicable for the
------------------------------	--

	calculated ER of the current monitoring period.	
Findings	<input checked="" type="checkbox"/>	Case 1: The ex-ante estimated value was found to be proportionally higher than the ex-post determined value. No further action is deemed required.
	<input type="checkbox"/>	Case 2: The ex-ante estimated value fits very good to the actually monitored value. No further justification is deemed required.
	<input checked="" type="checkbox"/>	Case 3: The ex-ante estimated value was found to be proportionally lower than the ex-post determined value (for CPA 002).
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: -
Conclusion	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	CAR 03 was raised to provide the detailed assessment for the increase in the actual emission reduction compared to estimated emission reductions (limited to CPA 002). The CME has provided detailed assessment for the variation in the data parameters and justified the change. Refer closure of CAR 03.	

Title and UNFCCC reference number of the CPA	Actual values achieved by the CPAs during this monitoring period	Value estimated in ex ante calculation in the included CPA-DD(s)
9948-P1-0002-CP1	17,166	9,362
9948-P1-0014-CP1	6,570	12,861
9948-P1-0015-CP1	6,443	12,861
9948-P1-0016-CP1	186	36,397
9948-P1-0017-CP1	158	36,397
9948-P1-0018-CP1	141	36,397
9948-P1-0019-CP1	154	36,397
9948-P1-0020-CP1	127	36,397
9948-P1-0021-CP1	107	36,397
9948-P1-0022-CP1	226	36,397
Total	31,278	289,863

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

Means of verification	On the basis of the above comparison of actual values of the monitoring period with the estimations in the registered CPA-DD (for CPA 02) and section F.5 of the MR, the verification team has checked whether (in case 3) an appropriate explanation is included in the MR.	
Findings	<input type="checkbox"/>	No further justification or explanation is deemed required as actual emissions of this MP do not exceed significantly the ex-ante calculated emission reductions (applicable for case 1 and 2).
	<input checked="" type="checkbox"/>	For case 3: The PP has provided a related justification in the MR. The reasons for the increase are as follows: The higher ex-poste emission reductions in the current monitoring period is due to higher value of the parameters $R_{y,i}$, $N_{y,i}$ (not in control of the CME) as well as other monitoring parameters (refer section F.6 of MR)
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
		CAR 03
Conclusion	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	Emissions reductions achieved during the monitoring period are higher (for CPA 0002) than the values estimated in the ex-ante calculation of registered CPA-DD. Appropriate explanation is provided in the MR and assessed to be acceptable.	

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

Means of verification	<input checked="" type="checkbox"/>	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	<input type="checkbox"/>	<p>The project participants have monitored the sustainable development co-benefits of the registered CDM project activity and requested the DOE to verify them.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /PoA-DD/ • /CPA-DD/ • /unfccc/.
Findings	<input checked="" type="checkbox"/>	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	<input type="checkbox"/>	<p>Therefore, the DOE has assessed and confirms that:</p> <p>(a) The monitoring has been carried out in accordance with the document for monitoring sustainable development co-benefits, if such document was developed and published on the UNFCCC CDM website in accordance with the “CDM project standard for project activities”;</p> <p>(b) The reported monitoring results correspond to the sustainable development co-benefits of the project activity as observed by the DOE.</p>
	<input type="checkbox"/>	<p>In this context the following CARs, CLs, FARs have been raised:</p> <p>-</p>
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	<input checked="" type="checkbox"/>	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	-	

E.3.8. Global stakeholder consultation

Means of verification		<p>In accordance with the PCP the DOE has submitted the initial version of the monitoring report provided by the PP for this monitoring period to be published on the UNFCCC webpage.</p> <p>The monitoring report has been published for the period of three weeks before remote assessment.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /unfccc/.
Findings	<input checked="" type="checkbox"/>	No comments have been received on the published monitoring report for this monitoring period.
	<input type="checkbox"/>	Comments have been received and the DOE has concluded that comments are related to issues outside the CDM rules and requirements. Please refer to the list provided under Conclusion of this Section below for related information.
	<input type="checkbox"/>	<p>Comments have been received.</p> <p>The DOE has</p> <ul style="list-style-type: none"> - requested further information from the submitters of the comments - informed the project participants of the comments received, and requested their feedback within a specified timeframe, - considered the input received and has assessed whether such comments are relevant to the CDM project activity, - acknowledged receipt of all submitted comments on the MR of the proposed CDM project activity, - assessed whether the comments are related to the CDM rules and requirements (if so, related findings have been raised as per below),

		<ul style="list-style-type: none"> - used all possible means to determine the authenticity of the name and contact details of the individual or organization on whose behalf the comments have been submitted, - contacted the secretariat to make them publicly available (if only addressed to the DOE), - determined whether authentic and relevant comments in the global stakeholder consultation were taken into due account in the PDD of the proposed CDM project activity.
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised, i.e. as the DOE concludes that the comments are related to the CDM rules and requirements:
		-
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	<input checked="" type="checkbox"/>	No comments received during the stakeholder consultation process.

SECTION F. Internal quality control

Before the submission of the final verification report a technical review of the whole verification procedure was carried out. The technical reviewers are competent GHG auditors where at least one is being appointed for the scope this project falls under. The technical reviewers are not considered to be part of the verification team and thus not involved in the decision-making process up to the technical review.

As a result of the technical review process the verification opinion and the topic specific assessments as prepared by the verification team leader may have been confirmed or revised. Furthermore, reporting improvements might have been achieved.

After the successful technical review an overall (esp. procedural) assessment of the complete verification has been carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the submission for requesting for issuance is conducted.

SECTION G. Verification opinion

Impact Carbon has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 3rd periodic verification of the CDM PoA: “**Impact Carbon Global Safe Water Programme of Activities (PoA)**”, with regard to the relevant requirements for CDM Programme of Activities. The PoA reduces GHG emissions by avoiding usage of fuel wood and other fossil fuel for boiling water to make it suitable for drinking purpose. This verification covers the period from 23/05/2019 – 31/12/2019 (both days included)

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design documents,
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., AMS-III.AV. ver. 4.0,
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately,
- the monitoring system is in place and functional. The project has generated GHG emission reductions,
- the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

TÜV NORD JI/CDM CP further confirms that the project has achieved emission reductions in the above-mentioned reporting period as follows:

Emission reductions: **31,278 tCO₂e**

SECTION H. Certification statement

As a duly accredited DOE, TÜV NORD CERT confirms that the CDM PoA

“Impact Carbon Global Safe Water Programme of Activities (PoA)”

registered under

UNFCCC-No.: 9948

has achieved emission reductions in accordance with all applicable requirements for registered CDM project activities during the current monitoring period

MP-No.: 3

from: 23/05/2019

to: 31/12/2019

(including both days) as follows:

Emission reductions: **31,278 tCO₂e**

New Delhi, 16/05/2021



Prakash Kumar Mishra
Team Leader
TÜV NORD JI/CDM Certification Program

Appendix 1. Abbreviations

Abbreviations	Full texts
CAF	Customer Agreement Forms
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CME	Coordinating/Managing Entity
CO ₂	Carbon dioxide
CO _{2eq}	Carbon dioxide equivalent
CPA-DD	Component Project Activities Design Document
DOE	Designated Operational Entity
DVerR	Draft Verification Report
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IM	Interview Memo
MP	Monitoring Plan
MR	Monitoring Report
OSVEJ	On-site Visit Exemption Justification
PA	Project Activity
POA-DD	Project of Activities Design Document
PP	Project Participant
QA/QC	Quality Assurance / Quality Control
RC	Reliability check work sheets for WPS
SD	Standard deviation
UNFCCC	United Nations Framework Convention on Climate Change
VT	Verification Team
VVS	Validation and Verification Standard
WFT	Water Quality Field Test
WPS	Water Purification System
XLS	Emission Reduction Calculation Spread Sheet

Appendix 2. Competence of team members and technical reviewers

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2021-10-20
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2021-10-20

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy demand
13.2	Manure

251 - Rev. 7, Date: 2018-10-19

251_S01-VA005-F20_2018-10-19_rev7.doc

S01-VA005-F20 rev3 / 2012-10-25

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification)	2023-12-16
VCS / ISO 14064-2	Senior Assessor	2023-12-16

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy demand

146 - Rev. 7, Date: 2020-12-17

146_S01-VA005-F20_2020-12-17_rev7

S01-VA005-F20 rev3 / 2012-10-25

Appendix 3. Documents reviewed or referenced

No.	Author	Reference	Title	References to the document	Provider
1.	UNFCCC	/AMS-III.AV	<ul style="list-style-type: none"> AMS-III.AV. Low greenhouse gas emitting safe drinking water production systems (Version 4.0) 		Other
2.	PP	/CPA-DD/ /BOUND/	<ul style="list-style-type: none"> CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 2', Version 3.0, dated 24/03/2014 CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 14', Version 1.0, dated 26/10/2017 CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 15', Version 1.0, dated 26/10/2017 CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 16', Version 5.0, dated 22/03/2019 CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 17', Version 5.0, dated 22/03/2019 CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 18', Version 5.0, dated 22/03/2019 CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 19', Version 5.0, dated 22/03/2019 CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 20', Version 5.0, dated 22/03/2019 CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 21', Version 5.0, dated 22/03/2019 CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 22', Version 5.0, dated 22/03/2019 		Other
3.	PP	/DB/, /REC/	<ul style="list-style-type: none"> Sales Force Edition report Installation logs/ Records by Impact water Photographs and video clips of remotely assessed samples <ul style="list-style-type: none"> UltraFlo cartridges Dimensions Measurement Expiry label on UltraFlo Cartridges Telephonic/ skype call records SF ID, type of technology, unique serial number, name of institution etc. 		Other

No.	Author	Reference	Title	References to the document	Provider
			<ul style="list-style-type: none"> Academic school calendar issued by "School and Other Institutions Calendar-2019" issued by the Ministry of Education and Sports Embassy, Uganda 		
4.	DOE	/CPM/	<ul style="list-style-type: none"> TUV NORD JI / CDM CP Manual (incl. CP procedures and forms) 		Other
5.	PP	/USAGE/	<ul style="list-style-type: none"> Monitoring forms by Impact Water for survey carried out at different institutions (Scanned copies) PoA 9948_MP3_Uganda Sampling database.xlsx Citizens-Survey-on-Uganda-Vision-2040.pdf 		Other
6.	IPCC	/IPCC/	<ol style="list-style-type: none"> 1996 IPCC Guidelines for National Greenhouse Gas Inventories: workbook 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book 	www.ipcc-nggip.iges.or.jp	Other
7.	UNFCCC	/KP/	Kyoto Protocol (1997)	http://unfccc.int/kyoto_protocol/items/2830.php	Other
8.	UNFCCC	/MA/	Decision 3/CMP. 1 (Marrakesh – Accords)	http://cdm.unfccc.int/Reference/COPMOP/index.html	Other
9.	UNFCCC	/MP2/	<ul style="list-style-type: none"> PoA9948_MP2_Uganda_MR_ver 4.0_19032021 PoA 9948_MP2_Uganda ER Sheet_ver 4.0_19032021 FVR- MP2 Impact Carbon MP2_RFR 	https://cdm.unfccc.int/PoAIssues/db/poai/ss884778545/view	
10.	UNFCCC	/MR/	<p>Monitoring Report titled 'Impact Carbon Global Safe Water Programme of Activities (PoA)',</p> <ul style="list-style-type: none"> Version 1.0, dated 13/03/2020 Version 2.0, dated 10/07/2020 Version 3.0, dated 09/12/2020 Version 4.0, dated 26/04/2021 	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	Other
11.	UNFCCC	/MRT/	<ul style="list-style-type: none"> Monitoring Report Form (CDM-PoA-MR-FORM), Version 03.0 	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	Other
12.	UNFCCC	/PoA-DD/	<ul style="list-style-type: none"> Registered Project Design Document for CDM PoA: "Impact Carbon Global Safe Water Programme of Activities (PoA)" version 03.0, dated 24/03/2014 Revised Project Design Document for CDM PoA: "Impact Carbon Global Safe Water Programme of Activities (PoA)" version 6.1, dated 15/02/2017 Revised Project Design Document for CDM PoA: "Impact Carbon Global Safe Water Programme of 	https://cdm.unfccc.int/ProgrammeOfActivities/po_a_db/YNXCPIJ5ZO7DTRGMV0F2AKEU486LQS	Other

No.	Author	Reference	Title	References to the document	Provider
			Activities (PoA)" version 7.0, dated 18/04/2017		
13.	PP	/PRC/	<ul style="list-style-type: none"> • PRC-9948-003 Impact Carbon Global Safe Water Programme of Activities (PoA) approved on date 03 May 19 • PRC-9948-002 Impact Carbon Global Safe Water Programme of Activities (PoA) approved on date 03 Jul 17 • PRC-9948-001 Impact Carbon Global Safe Water Programme of Activities (PoA) approved on date 08 May 17 	-	Other
14.	UNFCCC	/PSI/	CDM Project Standard for Programme of activities (Version 2.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
15.	PP	/POI/	<ul style="list-style-type: none"> • Sales database included as part of the PoA 9948_MP2_Uganda ER Sheet_ver 2.0_10072020 • Sales Receipt in the form of Purchase order including SF ID 		Other
16.	PP	/VAL/	Validation Report for CDM PoA project "Impact Carbon Global Safe Water Programme of Activities (PoA)" version 02.0, dated 30/04/2014		Other
17.	UNFCCC	/VVS/	CDM validation and verification standard for programmes of activities (Version 2.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
18.	PP	/CBT/	Water Quality Test <ul style="list-style-type: none"> • CBT Instructions for DrinkingWater_Sobsey • IP Water Testing Certificate • Aquagenx New Test Kits 		Other
19.	PP	/ELIG/	Applied Technology: <ul style="list-style-type: none"> • Technical Specification of Multi-barrier UV System • Technical specification of UltraFlo and Ultra Tab System Location of CPA <ul style="list-style-type: none"> • Verifiable evidence – Address to confirm that the CPA is not located in regions of Uganda where a public distribution network supplying safe drinking water exists. • Operations Manual from Impact Water 		Other
20.	PP	/TS/	<ul style="list-style-type: none"> • Multi-Barrier UV - Technical Specification Supplier (Rotek) for Large and Small UV systems 		Other

No.	Author	Reference	Title	References to the document	Provider
			confirming treatment capacity and other parameters (inlet port size, pressure rating, wattage etc.) <ul style="list-style-type: none"> Multi-Barrier UV - Lifespan confirmation from Supplier (Rotek) Multi-Barrier UV - Certificate from Supplier (Rotek) on WHO compliance UltraFlo - Technical specification confirming capacity / expiry by Medentech (Technology Supplier) UltraFlo Installation Manual UltraFlo - Device Dimensions Declaration by CME 		
21.	UNFCCC	/SAMPLE/	<ul style="list-style-type: none"> "Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities" (Version 04.0) "Standard for Sampling and Surveys for CDM Project Activities and Programme Activities" (version 08.0) 	https://cdm.unfccc.int/Reference/Guidclarif/index.html http://cdm.unfccc.int/Reference/Standards/index.html	Other
22.	UNFCCC	/GOT/	<ul style="list-style-type: none"> Glossary "CDM terms" (version 10.0) 	https://cdm.unfccc.int/filestorage/e/x/t/extfile-20150226124447549-glos_CDM.pdf/glos_CDM.pdf?t=UmZ8bnFjODI3fDCW9A3vJwR03kQQh4sbLiYu	Other
23.	PP	/XLS/	<ul style="list-style-type: none"> 01 - PoA 9948_MP3_Uganda ER Sheet_ver 1.0_13032020 02 - PoA 9948_MP3_Uganda ER Sheet_ver 2.0_10072020.xlsx 03 - 9948 MP3 Uganda ER Sheet ver 3.0 09122020.xls 04- PoA 9948 MP3 Uganda ER Sheet ver 4.0 26042021.xlsx 	-	PP
24.	PP	/RC/	Reliability Check integrated into ER sheet <ul style="list-style-type: none"> Random number generator for selection of samples from the population Sample size and Reliability check for Operational Units, Water quality and Safe water distribution network 	=	PP
25.	UNFCCC	/unfccc/	UNFCCC	http://cdm.unfccc.int	Other
26.	IPCC	/ipcc/	IPCC publications	www.ipcc-nggip.iges.or.jp	Other
27.	PP	/TRG/	<ul style="list-style-type: none"> Certificate of Training for Surveys Certificate of Training for Tests Survey Training Module Aquagenix Test Training Module 		Other

No.	Author	Reference	Title	References to the document	Provider
28.	PP	/OSVEJ/	<p>Justification to UN interim exemption clause by CME for not postponing mandatory onsite visit:</p> <ol style="list-style-type: none"> 1. Letter/declaration for the reason 2. Delivery deadline related justification evidence inter alia ERPA/Term sheets 3. Contractual obligation on timeline with DOE 4. Undertaking that CME and on ground preparation is compatible and equipped with infrastructure to conduct remote assessment 		

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

Table 3. Remaining FARs from validation and/or previous verification

FAR ID	01 _{MP2}	Section no.	E.2, E.3	Date: 24/03/2021
Description of FAR				
(a) The verifying DOE shall ensure that the monitoring frequency for parameter "Operational units _i " is "At least once per verification or biennially as per the monitoring requirements in the methodology" whichever is earlier (more frequent).				
(b) The verifying DOE shall ensure that operational school days (excluding holidays) are properly accounted in calculation of parameter "QPWy" instead of duration of monitoring period, as applicable				
CME response				Date: DD/MM/YYYY
-				
Documentation provided by the CME				
-				
DOE assessment				Date: 16/05/2021
The FAR was addressed on 24/03/2021 with the Request for Issuance of MP2. The MP3 request for issuance was already published prior to this issuance of this FAR.				
Now, pertaining to RfR questions received on 22/04/2021, referring to the current monitoring period (MP3), the FAR is appropriately addressed in the revised project documents. Please refer to CL 02 for closing the FAR.				

Table 4. CLs from this verification

CL ID	01	Section no.	ER worksheet	Date: 15/05/2020
Description of CL				
Tab: Sales Database				
<ol style="list-style-type: none"> Clarification is requested on calculation of "Residual capacity from previous MP" under tab: Sales Database. Clarification is requested on calculation of "Person / Equipment (Ny,i)" as introduced under tab: Sales Database and application of 3,475 and 4,372 as person/equipment capping. Why is the cutoff date stated as 30/04/2019 for calculations under column 'System's Continuous running end date'. The f_{NRB} value for CPA 14, 15, 16, 17, 18, 19, 20 and 21 are 0.7867. Clarification is requested how the applied value of f_{NRB} is deemed as conservative and hence appropriate. 				
CME response				Date: 29/06/2020
<ol style="list-style-type: none"> The monitoring period begins on 23/05/2019, however there are significant number of units that are in continued use from previous monitoring period. For such systems, the residual (un-utilized) capacity of the system (at the end of the previous monitoring period) has been determined and has been used as the starting capacity at the beginning of the current monitoring period. For new systems installed in current monitoring period and not getting carry forwarded from previous monitoring period, the residual capacity has been considered as 0. As per registered PoA-DD, each water purification system in the CPA is limited to generate an emission reduction of 600 tCO₂e or less. The following texts are mentioned in respective CPA-DDs to ensure compliance with this cap. <p>For CPA 2 in order to ensure this cap is met, one unit of any technology type shall not purify more than 3,191,560 L/year. This is the maximum value for QPW_y, to ensure that ERs per unit do not exceed 600 tCO₂ equivalent/year. For these CPA, where $R_{y,i}$ is 2 L/person/day (for day schools) and 3.5L/person/day(for boarding schools and prisons), the maximum value for $N_{y,i}$ is 4,372 persons/institution.</p> <p>For CPA 14 and 15 in order to ensure this cap is met, one unit of any technology type shall not purify more than 2,226,500 L/year. This is the maximum value for QPW_y, to ensure that ERs per unit do not exceed 600 tCO₂ equivalent/year. For these CPA, where $R_{y,i}$ is 2 L/person/day (for day</p> 				

schools) and 3.5L/person/day(for boarding schools and prisons), the maximum value for $N_{y,i}$ is 3,050 persons/institution.

For CPA 16 to CPA 22 in order to ensure this cap is met, one unit of any technology type shall not purify more than 2,796,767 L/year. This is the maximum value for QPW_y, to ensure that ERs per unit do not exceed 600 tCO₂ equivalent/year, For these CPA where $R_{y,i}$ is 2 L/person/day (for day schools) and 3.5L/person/day(for boarding schools and prisons), the maximum value for $N_{y,i}$ is 3,475 persons/institution.

Hence the person/ equipment capping in the ER Sheet is in line with registered CPA-DDs as stated above.

3. The monitoring period is starting from 23/05/2019. As per registered PoA-DD, for any system installed/distributed, credit accrual will start from first date of next month. Thus, a WPS installed/distributed before 30/04/2019, would have been covered in the previous MP and hence would have some residual capacity from previous MP. On the other hand, a WPS system installed after 30-04-2019, would have not been covered in previous MP for crediting and hence will not have any residual capacity from previous MP. Such system's continuous running end date will be calculated considering the start date of the monitoring period or date of installation, whichever is later. Thus, the cut-off date of 30//2019 has been applied accordingly.
4. The monitoring parameter $f_{NRB,y}$ is a monitoring parameter that is determined using "EB 67 Annex 22" Default Values for f_{NRB} for LDCs and SIDS combined with survey, national, or regional data to determine the % of users using given fuel type (biomass / fossil fuels) as per the PoA-DD. The CME has used national data to determine the % users using biomass/ fossil fuel can be used for the next monitoring period, in case more recent data is not available. The data source used for determining $f_{NRB,y}$ is UNHS report dated 2018. No more recent national data, providing information on % population using different fuel types.

Documentation provided by the CME

NA

DOE assessment

Date: 08/07/2020

1. The explanation is accepted. The Verification Team has also added note in the FVR section E.3.6.1.
2. The Verification Team has verified the CPA-DD, technical specifications and the explanation provided by the CME. The explanation is accepted. CL has been CLOSED.
3. Explanation is accepted. CL has been CLOSED.
4. The CME is following the provisions of the registered monitoring plan. The explanation is accepted. The calculated value of 0.8304 is deemed as appropriate.

However below additional issues are identified:

- a. The formula to calculate the reliability/achieved precision is found not traceable. (refer tabs: "Sample Size Calculation")
- b. The " Cumulative treatment capacity of the system based on # units installed / supplied (l)" shown in tab "Sales Database". The values do not reflect the actual installed unit.
- c. It is not clear how CME is evaluating maximum output of the unit [per unit], provisions are missing in the ER worksheet.
- d. The MR is unclear how the applied value of the operation days includes non-school days, whereas the ER calculation considers both boarding and non-boarding persons.

CME response

Date: 23/08/2020

- a. The formula to calculate the reliability/achieved precision, given in worksheets "Sample size calculation" cell D25, D46 and D67 have been rectified in line with eq. 42, page 89 of the Guideline: Sampling and surveys for CDM project activities and PoAs (v.4). Similarly, cell D26, D47 and D68 in the worksheet "Sample size calculation" have been rectified to compare the achieved precision with the applicable precision limit (10%). The revised ER Sheet and MR are being submitted.
- b. In case of multiple units of Multi-barrier UV systems installed in an institution, it is deemed that the units will be used simultaneously (or in parallel) to service different persons and areas in that institution. Thus, in such cases, $N_{y,i}$ has been calculated as number of persons serviced / unit (e.g. refer "Sales Database" S. No. 4, excel row 6, AF6 = L6 / AE6). Accordingly, in column AI of the worksheet "Sales Database", the "Treatment capacity of a unit (based on residual/installation capacity + subsequent supplies) (Ltrs)" has been determined for a singular unit. This ensures consistency wrt application of $N_{y,i}$ calculated in AF6, for determining other values in cells AK6 and AF6 which determine the number of days the systems are expected to run continuously if used simultaneously (based on individual capacity of system and average number of person serviced per

system).

The aforesaid approach has been incorporated in the ER sheet to ensure $(N_{y,i} * R_{y,i})$ per unit does not exceed the maximum output of unit system for cases where multiple systems are used simultaneously as explained in response to question d) below.

Consideration of aggregate capacity of all systems in Cell AI6, would over-calculate the maximum output/system and would result in over-estimation of emission reductions.

While "Sales Database" does focus on $N_{y,i}$ per unit, the "ER Calculation" does consider the total number of units from column AE of "Sales Database" to calculate $T_{y,i}$.

c. Please note, that the registered monitoring plan mandates to limit $N_{y,i} * R_{y,i}$ at maximum output of unit [per unit]. The $N_{y,i}$ (per unit) * $R_{y,i}$ (Average Volume of drinking water per person per day) has been calculated in column AH of worksheets "Sales Database".

The treatment capacity (per unit) has been calculated in column AH of worksheets "Sales Database".

Subsequently, in Column AK of worksheet "Sales Database", "System's continuous running end date" has been determined based on treatment capacity of a unit divided by $(N_{y,i} \text{ (per unit)} * R_{y,i})$.

This "System's continuous running end date" is then used to determine the residual capacity of the system after the end of monitoring period in column AM of worksheet "Sales Database". If the "System's continuous running end date" is before the end of monitoring period, the residual capacity is calculated as 0. If the "System's continuous running end date" is after the end date of monitoring period, the residual capacity at the end of monitoring period, is calculated as the number of running days remaining after end of monitoring period * Total Volume of drinking water per day per unit (column AH).

Thus, a residual capacity of 0 indicates that the system was fully consumed before the end of monitoring period. This automatically ensures that $N_{y,i} * R_{y,i}$ never exceeds the maximum output capacity of the system. A non-zero residual capacity shows that the output capacity of the system is more than $N_{y,i} * R_{y,i}$ leaving some un-utilized capacity at the end of monitoring period.

Hence, in this way, it is ensured that $N_{y,i} * R_{y,i}$ never exceeds the maximum output of the unit [per unit].

d. The CPAs supply safe drinking water to institutions (day schools, boarding schools, prisons etc.). The application of 365 days of operation for the project units is justified on the basis of the following:

- I. The number of days of operation is mentioned as 365 days in the registered PoA-DD (refer equation 1.a. on page 70 of the registered PoA-DD). Similarly, the CPA-DDs also mention 365 days of operation in the ER calculation formulae.
- II. Besides, the number of days of operation is neither an ex-ante parameter nor an ex-post monitoring parameter as per the monitoring methodology or the registered monitoring plan in the PoA-DD.
- III. The application of 365 days of operation per year for project units is also corroborated by the subsequent versions of the methodology (refer para 17 of AMS-III AV. Version 08.0).
- IV. Last but not the least, the applied methodology (AMS III.AV version 4.0) caps the volume of drinking water per person per day at 5.5L/capita/day. The PoA has applied a much conservative cap of 2L/person/day (for day school) and 3.5L/person/day (for boarding schools /prison). These limits are already attributed to minimum survival levels advocated by WHO (Minimum water quantity needed for domestic uses, Technical Note No. 9, WHO/SEARO Technical Notes for Emergencies). Table 1 of the referred document mentions that minimum survival allocation for domestic use (i.e. full day service deemed equivalent to boarding schools and prisons) as 7 l/capita/day (sustainable only for few days), out of which 3-4 ltr is attributed solely for drinking. For schools, it specifies 2 ltr per student per day as the minimum requirement. Also, Water, Sanitation and Hygiene Standards for Schools in Low-cost Settings, published by WHO specified a basic water requirement of 5 l/per/day for day / non-residential schools and 20 ltr/per/day for boarding schools (Page 18, Water, Sanitation and Hygiene Standards for Schools in Low-cost Settings, Indicators for Guidelines). Thus, a consideration of 2 ltr/per/day for day schools and 3.5 ltr/per/day for boarding schools/prisons is already referring to minimum survival levels and is overly conservative and deemed applicable to entire year.
- V. Lastly, the weighted average value - $R_{y,i} = 2.62$ which is much less than the default value of 3 ltr per person per day given by AMS III.AV. version 8.0 that is also at 365 days of crediting."

The aforesaid approach has been discussed (via a clarification request from CDM EB) and approved by CDM-EB during PRC-9948-003. Please refer document DOE clarification 8 – "FVR 599 CPA 16 to 22 PRC VR Uganda 25.03.19 clean", page 20 of 26, CAR 01 dated 21/01/2019. (<https://cdm.unfccc.int/PRCContainer/DB/prcp52130222/view>).

Documentation provided by the CME

- Revised ER worksheet

- Revised MR

DOE assessment

Date: 02/11/2020
22/04/2021

The auditor's assessment is as below:

a. The auditor has checked the formula to calculate the reliability/achieved precision, given in worksheet, tab "Sample size calculation" for cell D25, D46 and D67 and confirms that the same has been rectified in line with eq. 42, page 89 of the Guideline: Sampling and surveys for CDM project activities and PoAs (v.4). Similarly, cell D26, D47 and D68 in the worksheet "Sample size calculation" have been rectified to compare the achieved precision with the applicable precision limit (10%). The revised ER Sheet and MR are being reviewed and deemed as appropriate.

b. Cumulative treatment capacity of the system based on # units installed / supplied (Ltrs)

The Verification Team accepts that case of multiple units of UltraFLO and Multi-Barrier UV systems installed in an institution, the same units will be used simultaneously (or in parallel) to service different persons and areas in that institution. Thus, in such cases, $N_{y,i}$ has been calculated as number of persons serviced / unit which is deemed logical and appropriate.

Accordingly, the tab "Sales Database" is evaluated. Furthermore, it is noted that the "Treatment capacity of a unit (based on installation + subsequent supplies) (Ltrs)" has been determined for a singular unit, which is also deemed appropriate as it ensures consistency w.r.t. application of $N_{y,i}$ calculated to determine the number of days the systems are expected to run continuously if used simultaneously (based on individual capacity of system and average number of person serviced per system). The verification team deems this approach as appropriate.

The applied approach also ensures $(N_{y,i} * R_{y,i})$ per unit does not exceed the maximum output of unit system for cases where multiple systems are used simultaneously. This approach avoids overestimation of ER's as consideration of aggregate capacity of all systems, would over-calculate the maximum output/system and would result in over-estimation of emission reductions. Thus, the principles of appropriateness and avoidance of over-estimation are observed and also confirmed by the Verification Team.

The Verification Team also noted that the "Sales Database" does focus on $N_{y,i}$ per unit, therefore considers the total number of units to calculate $T_{y,i}$.

c. Capping to Maximum Output:

The Verification Team Noted that, the registered monitoring plan mandates to limit $N_{y,i} * R_{y,i}$ at maximum output of unit [per unit].

The $N_{y,i}$ (per unit) * $R_{y,i}$ (Total Volume of drinking water per day per unit) has been calculated in under tab "Sales Database".

The treatment capacity (per unit) has been calculated appropriately as stated above. The parameter continuous running end date of a system has been determined based on treatment capacity of a unit divided by $(N_{y,i} \text{ (per unit)} * R_{y,i})$.

The Verification Team checked and confirms that the CME is utilizing this continuous running end date to determine the residual capacity of the system after the end of monitoring period. It is noteworthy that if the continuous running end-date is before the end of monitoring period, the residual capacity is calculated as '0' as per the applied logic. If the continuous running end date is after the end date of monitoring period, the residual capacity is calculated as number of unutilized days * Total Volume of drinking water per day per unit. The Verification Team has verified and deems the applied logic as appropriate for calculation of emission reduction.

A residual capacity of 0 indicates that the system was fully consumed before the end of monitoring period. This logic automatically ensures that $N_{y,i} * R_{y,i}$ never exceeds the maximum output capacity of the system. Whereas, a non-zero residual capacity shows that the output capacity of the system is more than $N_{y,i} * R_{y,i}$ leaving some un-utilized capacity at the end of monitoring period. Thus, it is ensured that $N_{y,i} * R_{y,i}$ never exceeds the maximum output capacity of the unit [per unit]. The said approach is verified by the Verification Team and deems the same as appropriate.

d. Determination of operating days:

The Verification Team has checked the CME's approach and deems that the approach has been already established (via a clarification request from CDM EB) and approved by CDM-EB during PRC-9948-003. Please refer document DOE clarification 8 – "FVR 599 CPA 16 to 22 PRC VR Uganda 25/03/2019 clean",

page 20 of 26, CAR 01 dated 21/01/2019. (<https://cdm.unfccc.int/PRCContainer/DB/prcp52130222/view>). Thus, the calculation of the operating days is deemed as appropriate. The Verification Team has further opened the additional findings in response to the CME response.

The CL 01 has been re-opened following the below I&R Incompleteness received on the MP11 issuance request:

- a) The CME shall provide information how it considered application of 365 days as appropriate for the calculation of the total quantity of water purified during the year y, considering that the CPA-DDs indicate that the quantity of purified water is based on the "average population serviced/system" while the systems do not service the population during periods when population (i.e. the students) are on holidays and the CPA-DDs for 9948-P1-0014 and 9948-P1-0015 provide 291.50 days/year which consider the school calendar.
- b) The registered CPA-DDS requires that the water quality will be tested as per paragraph 2(b) of AMS III.AV ver. 4 (i.e. Laboratory test report and/or official notifications (e.g. from national authority on health)). However, the monitoring report shows that Aquagenx testing kits were used to determine the water quality. The DOE shall elaborate how it verified compliance of monitoring with the registered monitoring plan in the included CPA-DDs
- c) The CPA-DDs indicate the monitoring frequency for the parameter "operational units" as "At least once per verification or biennially as per the monitoring requirements in the methodology". The applied methodology (AMS-III.AV. ver. 04, paragraph 15) requires "at least once every two years (biennial)". The DOE shall provide further information how it verified that the monitoring plan complies with the applied methodology
- d) The DOE shall provide further information on how it has crosschecked the operation of the project activity and continuous availability of safe drinking water as per paragraph 304 (c) of VVS for PoA, considering that the monitoring method was based on survey questionnaire alone (e.g. the question "When was the last time, a supply of cartridges/tablets were received?") and no information is provided regarding the crosschecking of the monitored data against other sources such as quantity of chlorine/No. of cartridges used during this monitoring period

CME response

Date: 11/05/2021

- (a) Please refer above response **(d) in previous round** for justification, furthermore, following the I&R Incompleteness and the reopening of the CL 01, and given that the CPA-DDs for CPA 14 and CPA 15 refer to 291.5 days per year for crediting, hence the ERs for CPA 14 and 15 have been revised conservatively to calculate emission reductions for 291.5 days in year instead of 365 days. Please refer revised ER calculator as follows:

MS#	Worksheet Name	Cell Reference	CPA reference	Description
1	9948 MP3 Uganda ER Sheet ver 3.0 09122020; Tab: ERs Summary	Cell: F6 and G6	CPA 14, CPA 15	Number of days of crediting has been multiplied with a fraction of 291.5/365 to ensure that ER equivalent to the service level mentioned in CPA-DD is being accounted.

- (b) The CPA-DDs on page 3 states the following:

"The application of technologies distributed under the CPA achieve compliance with "Interim or higher" performance target as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO 2011) or a comparable national standard or guideline, per the methodology AMS-III.AV Version 4." All technologies that are going to be distributed under this CPA, will be lab tested to ensure they adhere to these guidelines.

This has also been made an eligibility criterion (# 7, page 32 of CPA-DD) for inclusion of a technology in the CPA which states the following:

Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence
The water purification technology/equipment must achieve compliance with either: a) A relevant national standard or b) The interim performance targets as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011)	Verifiable evidence: – Laboratory test report and/or official notifications (e.g. from national authority on health). – Technical specifications document(s)	The water purification technology/equipment are in compliance with the following: (b) The interim performance targets as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011) Supporting Evidence: – – Technical specifications document(s)

Thus, the project technology (Ultra TAB, Ultra Flow or UV) needs to demonstrate that they comply with WHO, 2011 interim performance targets. This has already been confirmed via the technical specifications listed in CPA-DD wherein Log 4 reduction is achieved by UV systems and Log 2 reduction is achieved by Chlorination systems (as mentioned in CPA 02 CPA-DD on page 4 and CPA 16 CPA-DD on page 5, respectively). Thus, the technology's compliance with interim measures has already been demonstrated.

For ex-post water quality monitoring, the CPA-DD on page refers to the following:

"As per the World Health Organizations Guidelines¹⁰ it is more cost-effective and feasible to monitor indicator organisms such as E.Coli. Monitoring of proxies such as E. Coli, faecal coliform counts, chlorine levels may be used to assess water quality. CPA implementer shall be responsible for conducting testing. Enumerators will be trained on proper testing procedures and the appropriate testing technology will be used. CPA implementer shall be responsible for conducting testing".

The CME has used Aquagenx Compartment Based Test (CBT) E.Coli / Total Coliform (ECTC) testing kits to monitor E.Coli as the indicator organism to test the quality of water. Aquagenx CBT ECTC testing Kits are used extensively across the globe in low resource areas. The Aquagenx Test is very effective testing method in terms of flexibility wrt transportation, for cases involving institutional and community engagement. The test kits detect and quantify E.Coli in 100 mL samples.

The water quality assessment using Aquagenx CBT ECTC testing kit follows a standard testing procedure. Each kit includes a sample collection Whirl-Pak Thio-bag and a powder growth medium pack. The powder growth medium has a glucose substrate called X-Gluc. When E. coli metabolize this substrate in Aquagenx's growth medium, the color of the water turns blue, indicating the presence of E. coli.

The Aquagenx CBT ECTC is a laboratory-based test with provisions for sample collection in the field directly. Given the project systems are installed in institutions, thus, the water quality sample collection can only be done in the field. The portable water sample collection bags provisioned in Aquagenx CBT ECTC testing kit, renders it as a preferred and viable option for testing water quality for project devices installed in institutions and schools under the PoA.

The following standard sample collection procedure is followed:

1. At the time of sample collection in the field - the Whirl-Pak Thio-bag is labeled with the name of the institution, date and time of sample collection and the unique SF ID for that institution.
2. After labelling the bag, it is filled with 100 ml of water from the project system being monitored.
3. The powder growth medium is added to the Whirl-Pak Thio bag. The Whirl-Pak seal is rolled down and the Thio-bag is closed shut. This ensures that the sample collections remain free from any external contamination.
4. The powder medium is dissolved by gently swirling the bag.

The sealed Thio bag is then incubated in the in-house lab in the Impact Water's office. The incubation is an ambient temperature incubation for 48 hours. The incubation for 48 hours ensures that even the trace presence of E.Coli gets detected in the water sample collected. The bags are incubated in controlled environment in the lab to prevent contamination and health hazard in the Impact Water's office.

After the incubation of 48 hours the results of the water quality test are read by the qualified lab technician. A blue/green color indicates presence of E.Coli in water sample. After the test is completed, chlorine tablets

¹⁰ WHO 'Guidelines for Drinking-water Quality, Fourth Edition Page 41.

are added in the Thio bag and stranded for 30 minutes to ensure decontamination. The decontaminated water sample is then discharged in the in-house lab itself.

Thus, the water sample collection and testing have been conducted by trained staff with extensive prior experience of water quality testing using Aquagenx CBT ECTC testing kits. The same was cross verified by the Verification Team via interviews with the water quality testing staff wrt testing protocol, process of sample collection, testing procedure followed, test results assessment etc. The Verification Team also reviewed photographic evidence of water quality samples and test results to confirm the accuracy to results reported by the CME.

For details, refer the testing protocol is available at the following link:

<https://www.aquagenx.com/wp-content/uploads/2020/05/PA-CBT-ECTC-Instructions-DrinkingWater-May2020.pdf>

The use of Aquagenx CBT ECTC testing kit for determining water quality is therefore in line with the registered CPA-DDs as well as monitoring methodology. The tests have been conducted by trained staff with extensive prior experience of water quality testing.

Further, various studies conducted across many locations and environments around the world by academic institutions, national government agencies, international NGOs and United Nations agencies confirm that, the Aquagenx test a Compartment Bag Test (CBT) gives results comparable with more complicated, expensive and less portable tests conducted otherwise.

A paper published in "The American Journal of Tropical Medicine and Hygiene, Volume 96, Issue 4, 5 Apr 2017, p. 970 – 975¹¹ states that:

....., and one sample using membrane filtration (MF) was analyzed by reference laboratories. There were no statistically significant differences in E. coli concentrations between the field and laboratory CBT results, or when compared with MF results. These results suggest that the CBT for E. coli is an effective method to quantify fecal bacteria in household drinking water. The CBT can be incorporated into DHS and other national household surveys as a direct measure of drinking water safety based on microbial quality to better document access to safe drinking water.

Thus, the testing technology deployed by the CME/CPAI is deemed accurate, credible and reliable.

- (c) As per the applied methodology AMS-III.AV version 04.0 "Monitoring shall consist of checking of all appliances or a representative sample thereof, at least once every two years (biennial) to ensure that they are still operating or are replaced by an equivalent in service appliance as per the relevant sampling requirements of AMS-I.E".

The monitoring frequency of "at least once every two years", is deemed the maximum duration over which the parameter must be monitored at least once.

The term "per verification", on the other hand is provisioned to cover cases when the verification is being conducted for a monitoring period which is less than two years. For example, refer the following:

MP#	Duration	Start date of Monitoring	Justification
2	23 May 2017 – 22 May 2019	MS#1: 11 Nov 2018 MS#2: 03 Nov 2019	Over the two-year period, two annual monitoring events were conducted instead.
3	23 May 2019 – 31 Dec 2019	Jan 2020	MP3 is less than 2 years, still monitoring done again in Jan 2020 despite monitoring done in MP2 MS#2 in Nov 2019
4	01 Jan 2020 – 21 May 2020	Sep 2020	MP4 less than 2 years since MP3, still monitoring done again in Sep 2020 despite monitoring done in MP3 in Jan 2020.

This approach avoids application of values established in previous monitoring period (in above example, values determined in MP3), to the subsequent monitoring period (MP4) without monitoring the parameter (because the monitoring frequency is once every two years). Thus, the monitoring frequency of "at least once per verification" applicable to shortened MPs, results in yielding more representative and accurate

¹¹ <http://www.ajtmh.org/content/journals/10.4269/ajtmh.15-0717>

results of monitoring parameter rather than applying the values established in the previous monitoring period.

Further, the “biennial” monitoring frequency supersedes “per verification” and not the other way around. Thus, in case of a verification covering more than 2-year monitoring period, the PP shall need more than a singular monitoring event to ensure “at least biennial” monitoring frequency is met.

Lastly, the monitoring period under concern as shown in table above, still remains within the “biennial” monitoring frequency.

Thus, the monitoring plan and the concerned monitoring report is compliant with the monitoring methodology.

(d) Firstly, the monitoring methodology para 15 states:

“Monitoring shall consist of checking of all appliances or a representative sample thereof, at least once every two years (biennial) to ensure that they are still operating or are replaced by an equivalent in service appliance as per the relevant sampling requirements of AMS-I.E”.

Para 16(b) of the methodology states:

“The quantity of purified water in year y shall be derived from the capacity of the equipment established by manufacturers' specifications and the number of functional project appliances as per paragraph 15”

Thus, the continuity of service (continuous availability of safe drinking water) is to be determined via ex-post sampling and if the project device is found functional during ex-post monitoring, the continuity of service is deemed being maintained over the entire monitoring period.

However, during the ex-post monitoring, the CME has taken additional measures to ensure continuous availability of safe drinking water as follows:

The monitoring survey form consists of the following questions:

Question pertaining to continuity/Maintenance:

- Has routine supply/maintenance been conducted for the IW System? (Yes/No).
- When was the last time supply/maintenance was conducted? (DD-MMM-YYYY).

Question pertaining to usage:

- Is the IW unit being used for water treatment? (Yes/No)
- Presence of other water treatment technologies / devices in the institution

The question pertaining to continuity /maintenance is intended to ensure that the user is receiving regular supplies / maintenance which ensures system's continuity. The date of last supply / maintenance serves as an objective evidence to cross-verify regular supplies/ maintenance being received by the user at the time of survey.

Further the date of last supply / maintenance provides the surveyor an option to check if last delivery has reached the user and have been put in use. This is achieved by physically cross verifying the product ID mentioned in the last delivery note / installation log with the system found installed on site (TAB packs available in case of UltraTAB and cartridge installed in case of UltraFLO). This also confirms that earlier supplies have been consumed, ensuring continuous availability of safe drinking water.

The questions related to usage confirms that the system is functional as per para 16. Additionally, none of the monitored schools were found using any other form of water treatment technology / device. This further substantiates imperative use of project devices, given drinking water is a basic sustenance need, and continuity of use of project devices.

In addition, the CME has implemented the following system to ensure continuous availability of the safe drinking water in the institutions:

- At the time of installation/distribution of the water purification systems (WPS) in the institution, the CME train the institution staff on usage of the WPS to ensure that the project devices are put to use and any apprehension regarding their quality and safety is resolved.
- The CME Call Center in the country offices, regularly follow ups with the institution regarding operational status of the project system of their installed WPS as well as the expected date of next supply. The schools are supplied with reinforcements in time to ensure system's continuity.
- Additionally, the CME country office contact detail is available in the system Purchase Order and

Delivery Notes available with institution and also pasted on the system tank or school wall in form of sticker. The institution can anytime call the CME office for the subsequent supply of the UltraTab pack or UltraFlo cartridge if needed, or as and when required. It has been verified by the DoE during remote assessment that schools are aware of the phone number to contact in case of needing maintenance / supplies.

- Lastly, the subsequent supply of the UltraTab packs and UltraFlo cartridges in the institution is recorded in the CME database management software (SalesForce). The information on each supply made during the monitoring period (product quantity and serial number) has been provided for each school as well as for each supply (refer ER calculator, worksheet "Monitoring Data" column P:AE). The details of these supplies have also been cross verified against the delivery notes / installation records available at the CPAI office, by the DoE during remote assessment. Also, the DOE has cross verified the product ID reported in the last supply with the product ID found mentioned on the physical systems on site for sampled schools.

The above sales and monitoring provisions ensure as uninterrupted supply of safe drinking water in the institution

Documentation provided by the CME

- Revised ER worksheet
- Revised MR

DOE assessment

Date: 12/05/2021

(a) Verification team has assessed the justification provided by CME and confirms that this issue has been addressed as part of the closure of the CL 01, DOE Assessment dated 07/07/2020, point d) under "However below additional points are identified". The justification provided by the CME is acceptable since the "number of days of operation"

- is not a monitoring parameter;
- is deemed fixed as 365 as per the equation 1.a) in the registered PoA-DD;
- Subsequent versions of the applied methodology (AMS-III AV. Version 08.0) also utilize 365 days as the days of operation, in the applicable formulae and sample calculation shown in the methodology.
- conservative assumptions for the parameter " R_{yi} "; considering 2 ltr/person/day for day schools and 3.5 ltrs/person/day for boarding schools/prisons were found to be conservative and acceptable against WHO standards and/or latest version of the methodology.
- as well as the quoted PRC's also affirm this explanation provided by the CME;

Further, it has been assessed that the CME has updated the ER calculations for CPA-14 and CPA-15 considering 291.5 days of crediting in a year and hence is deemed most conservative and acceptable approach. During of the closure of the CL the ER have decreased to **31,278 tCO₂e**

(b) As per paragraph 2(b) of the applied methodology:

"It shall be demonstrated based on laboratory testing or official notifications (for example notifications from the national authority on health) that the application of the project technology/equipment achieves compliance either with: (i) at a minimum the performance target as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011); or (ii) an applicable national standard or guideline"

The CME used Aquagenx Compartment Based Test (CBT) E.Coli / Total Coliform (ECTC) testing kits to monitor E.Coli as the indicator organism to test the quality of water. The CME has also explained clearly that the test with its protocol (<https://www.aquagenx.com/wp-content/uploads/2020/05/PA-CBT-ECTC-Instructions-DrinkingWater-May2020.pdf>) qualifies as laboratory test and meets the compliance required by applied methodology.

The Verification Team has verified that the Aquagenix Water Testing kit meets the requirements of registered monitoring plan and conformance to WHO guidelines via "Aquagenix Testing Kit Specifications". Even during the concerned Verification, the conformance was verified. The Verification Team also took due account of the above explanation of eligibility criteria.

The Verification Team assessed the competency of the trained staff, their prior experience of testing via

interviews on the process of collecting samples, handling the samples, protocol followed for testing, lab incubation requirements, test results assessment etc to confirm that they had received training before conducting the test.

In addition, during the remote-site interviews, the Verification Team requested the CME to submit the evidences of water quality test reports, training procedure, training records, experience of enumerators' (refer CAR 04 under FVR and its resolution) and found the submitted evidences appropriate and confirming the testing to be conducted by experienced staff and under standard conditions. Thus, the results from the Aqugenx tests conducted by the monitoring team were found to be reliable and meeting the conditions of the applied methodology. **(CLOSED)**

- (c) The FVR under section D.4 Sampling Approach explains the appropriateness of the applied monitoring frequency. The CME has observed single monitoring event for applied monitoring period (Refer MR and corresponding ER worksheet). The applied monitoring frequency is in-line with the registered monitoring plan as the monitoring frequency follows the requirement of "atleast Once in two years" and/or "per verification". Besides, a review of subsequent MRs webhosted by CME on UNFCCC website, also confirms that the CME is following a higher monitoring frequency (even better than annual monitoring frequency @ per verification, which is in line with the methodology requirement of at-least biennially). The applied monitoring frequency is thus accepted by Verification Team. **(CLOSED)**.

- (d) The Assessment Team assessed the survey forms submitted by the CME. The Verification Team (during the remote audits) reconfirmed the below particulars with the end users to confirm the credibility of the monitoring data.

All the interviewed institution heads of "randomly sampled systems" were interviewed by the VT to confirm that

- the product installed in the school was currently in operational condition and
- they have been receiving continuous supply of cartridge/tablets thus, getting continuous supply of safe drinking water. Any institution reporting the product as being functional, cannot be out of supplies.

The Verification Team has assessed all the above data points while interviewing, the sampled school representatives. As stated above this data is already part of the submitted ER worksheet

Additionally, during the remote assessment the VT checked if there are provisions in place to ensure continuous supply of safe drinking water

- **Call Centers:** The CME representatives confirmed that follow up calls with the institutions regarding usage, users are performed to gauge the expected date of next supply next supply of (cartridge/tablets). This fact was also confirmed by the verification team with the school representatives.
- **Other Evidences (Purchase Order, delivery notes etc):** The objective evidences delivery notes, delivery notes, installation records, maintenance records and the traceability of customer care number/email for supply / repair on the system's tank or school wall in form of sticker were checked to confirm that the CME country office contact detail is available to the institution staff and they can contact the CME in case they find any issue with the performance, breakdown, problem with the product or need additional tablets / cartridge. The VT during the remote assessment (telephone call and video calls) with the institution heads confirmed about the availability and use of contact number to register their complaints regarding the product or their request for supplies.
- The VT is already in receipt of the sales database which captures the supplies with their product IDs for each institution, which is presented in the ER sheet (refer ER calculator, worksheet tab "Monitoring Data"). The VT has also assessed the scanned copies of delivery notes made available for cross verification of the subsequent supplies made to an institution. The verification team had checked it for the sampled institutions. The evidence reviewed confirmed the quantities of supplies mentioned in the ER sheet.

Thus, the above monitoring provisions ensure uninterrupted supply of safe drinking water in the institution.

Further, refer assessment under the CL 02 for revised approaches / calculations pertaining to RfR feedback

received from CDM secretariat.

The CL is CLOSED

CL ID	02	Section no.	UN RFR MP#3	Date: 22/04/2021
Description of CL				
<p>1. Refer to paragraph: VVS for PoA version 02, Para 340 (a). The baseline water source is mentioned as piped/ borewell/others etc in the emission reduction sheet. The included CPA-DDs and the monitoring report. indicate that UltraFlo WPS and Multi-barrier UV will be fixed and applicable for piped. However, it is not clear from verification report how the DOE confirmed whether the implementation of the WPS is in accordance with the description provided in the included CPA-DDs and whether the installed WPS is compatible with the available water source. Therefore, the DOE shall verify how it determined that the WPS is implemented in accordance with description contained in the included CPA-DDs and the installed WPS is compatible with the available water source. Please refer to paragraph340(a) of VVS for PoA version 02.</p> <p>2. Refer to paragraph: VVS-PoA, version 2, paragraph 344, Paragraph 15 of AMS-III.AV version 4 The DOE shall further substantiate how it has verified the compliance of the monitoring plan with the applied methodology, in particular the monitoring frequency of parameter “operational units”, since the CPA-DDs states that the monitoring frequency for the parameter as “At least once per verification or biennially as per the monitoring requirements in the methodology”, which could lead to possibilities whereby the monitoring frequency not meeting methodology requirement (i.e. at least once every two years) when the verification / monitoring period is conducted with a time gap of more than two years. Please refer to Paragraph 15 of AMS-III.AV version 4 and VVS-PoA, version 2, paragraph 344</p> <p>3. Refer to paragraph: VVS for PoA version 02, paragraph 304.(c) The DOE cross-verified continuous availability of safe drinking water based on the interviews with the users and delivery notes, and further confirmed that the subsequent supplies are reported in the emission reduction spreadsheet. However, it is observed in the emission reduction spreadsheet that:</p> <ul style="list-style-type: none"> a) There is no verification opinion on the implemented water purifier capacities (Tab "Assumptions" cells D9 and D10) of 340,000 L/unit (for UltraFlo WPS); Water Purification Capacity of one unit of Small UV (1GPM)- 2,044,116 L/unit and Water Purification Capacity of one unit of Large UV (2GPM)- 4,088,232 L/unit; b) The residual capacity (i.e. Tab “Sales Database” column AA) data is not traceable. The residual capacities from MP3 (i.e. column AC of tab “Sales Database”) are given without any elaboration by CME. c) The residual capacity of some purification devices indicates system continuous running until year 2073 or more, which is even beyond the device lifespan as described (i.e. 5 years) in page 15 of the monitoring report; d) All the schools in the CPAs indicate zero continuous supplies during this monitoring period (i.e. column ‘AD’ of tab ‘Sales Database’). <p>Taking into account the above, the DOE is requested to;</p> <ul style="list-style-type: none"> a) Substantiate how it has verified and concluded the installed water purifier capacities of 340,000 L/unit (for UltraFlo purifier); 2,044,116 L/unit for Capacity of one unit of Small UV (1GPM)- and 4,088,232 L/unit for Water Purification Capacity of one unit of Large UV (2GPM); b) Submit a traceable emission reduction spreadsheet for the calculation of the system residual capacities; c) Elaborate how a system’s continuous running end date can be beyond its lifespan (5 years); d) Substantiate continuous availability of safe drinking water to schools considering some water purifiers had no residual capacity from the previous monitoring period and received no supplies during the current monitoring period. <p>Please refer to paragraph 304(c) of VVS for PoA version 02.</p> <p>4. Refer to paragraph: VVS-PoA, version 2, paragraph 359 (d). The DOE shall further substantiate how it has verified the appropriateness of applying the entire days covered by the monitoring period when calculating parameter QPW_y (i.e. quantity of purified water for drinking during the year y), given the facts that the systems do not service the entire population (i.e. the students) during the school holidays. Further, the DOE should also check following clarifications issued by the Meth Panel in this regard.</p> <p>SSC_795: https://cdm.unfccc.int/methodologies/SSCmethodologies/clarifications/05721</p> <p>SSC_792: https://cdm.unfccc.int/methodologies/SSCmethodologies/clarifications/57226</p>				

Please refer to VVS-PoA, version 2, paragraph 359 (d)

CME response	Date: 11/05/2021
---------------------	-------------------------

1. The "Piped Water" cited as the application in Section A.3 of the CPA-DDs for both Multi-Barrier UV and UltraFLO Chlorination systems refers to pressurized piped water connection that is a pre-requisite for these two types of systems by virtue of their design. Thus, Both Multi-Barrier UV and UltraFLO systems can only be installed on piped applications.

In the revised emission reduction spreadsheet, tab "MP3 Sales Database" column R indicates the primary water source from where the water is extracted in a given school. In case of Multi-Barrier UV and UltraFLO Chlorination WPS, primary water sources like the surface water, well/borehole, rainwater etc. have a piping connection installed to transport water from these primary sources to the point of installation of Multi-Barrier UV and UltraFLO device.

Please note that schools having Primary Water Source marked as "Piped" in Column R, refers to only City Council / Government / Municipal Water Piped Connection in the school as the Primary Water Source.

For further detail, please refer to the table below:

Source of Water	# Multi Barrier UV Schools	# UltraFLO Schools	Comments
Well/Borehole	79	3	These wells/boreholes are connected to drinking water storage tanks via pipes. The water is pumped from wells/boreholes to these water storage tanks. The Multi-Barrier UV or UltraFLO Chlorination WPS is fitted in the tanks at the inlet to ensure that any water flowing in the tank is treated and rendered safe for drinking. The outlet of the tank is connected to the taps to facilitate the drinking of water by the school students and staff.
Surface Water	23	3	There is a private piped connection used for transporting water from the nearest surface water body source like nearby pond, canal etc. to the drinking water storage tank in the school premises. Multi-Barrier UV or UltraFLO Chlorination systems are fitted onto these piping connections same as that explained above
Rainwater	33	4	The rainwater is collected in a sump from where it is pumped via pipes to the drinking water storage tank, to which the Multi-Barrier UV or UltraFLO Chlorination systems are fitted same as that explained above.
Trucked Water	2	-	The trucked water is collected in a sump from where it is pumped, or otherwise, directly pumped to the drinking water storage tank, to which the Multi-Barrier UV or UltraFLO Chlorination systems are fitted, same as that explained above.
Others	3	-	Similar to above, these schools have a combination of aforesaid water sources (wells, surface water or rainwater sump), depending on the ease of access to the school to which Multi-Barrier UV or UltraFLO Chlorination systems are connected as explained above.

Therefore, both the project devices have been implemented in line with the description provided in the CPA-DD / MR.

2. CME would like to clarify that the term "at least" is deemed binding to both "once per verification" as well as "biennially as per the monitoring requirements in the methodology" and not to "once per verification" alone. Thus, under no circumstances, the monitoring frequency will extend beyond two years and shall remain compliant with the monitoring methodology requirement always. Further, please refer the PoA validation report, CAR 07, page 80 of 106 which states the following:

The PP revised the monitoring frequency to be "At least once per verification or biennially as per the monitoring requirements in the methodology" to ensure that the methodological requirements are met (at least biennial) and that each verification is based on relevant monitoring results.

Thus, this substantiates that "at least once per verification" was provisioned in the PoA-DD to prohibit the CME apply the value established in a given MP to the following MP (without monitoring it again) for cases where the combined length of two consecutive MPs is less than two years.

Please refer all previous monitoring periods for different batches where dedicated monitoring for each monitoring period has been conducted despite them being even less than one year duration. For example, the monitoring in MP2 MS2 was conducted in Nov 2019 and the monitoring in MP3 was conducted in Feb 2020 whereas combined duration of these two monitoring events is less than two years.

Also, for the first monitoring period, although the monitoring period was longer than 2 years (30/05/2014 – 22/05/2017) and was covered under single verification, the CME did not claim any ERs for the period 30/05/2014 – 21/05/2015 and followed the “at least biennially” monitoring frequency to ensure that methodology prevails over such cases. Hence, the CME affirms that in no case the methodology requirements with respect to monitoring frequency would be compromised.

3. Please refer the following in this regard:

- a) The capacity of 340,000L/unit (for UltraFLO) stated in worksheet “Assumptions” is consistent with latest version of CPAs 16-22 CPA-DDs page 4 and has already been validated during CPA PRC (PRC-9948-003, refer document “DOE clarification 8”), based on manufacturer technical specification, as mentioned in the CPA PRC validation report (Appendix 3, item /03/).

The capacity of 4,088,232 L/unit (for Multi-barrier UV Large (2GPM)) and 2,044,116L/unit (for Multi-barrier UV Small (1GPM)) is based on manufacturer technical specifications.

The CME accepts oversight in ER spreadsheet assumption tab where the reference for the Multi-Barrier UV system capacity is mentioned as CPA-DD. Revised ER sheet is being submitted.

The technical specification documents have also been cross verified by the verification team as listed in the verification report (Appendix 3, item /TS/).

- b) For MP3, the ‘system’s residual capacity from previous monitoring period’ (MP3 Sales Database, column AC) has been sourced from MP2 Sales Database-MS2 of MP2 ER calculator ver 4.0 dated 19/03/2021 submitted to UNFCCC as part of RfR documentation (https://cdm.unfccc.int/PoAIssuance/iss_db/poais884778545/view).

The CME extracted the above information from MP2 ER calculator (tab MP2 Sales Database-MS2, Column BA) by applying the vlookup function, using institution SF ID as a unique identifier, to call this information in MP3 ER calculator, tab: MP3 Sales database, column AC. Given the vlookup function does not work externally, hence the CME had to remove the external links in the MP3 Sales Database, column AC, which otherwise would have returned #Ref error in excel, once shared with DoE / UNFCCC.

The CME has now presented MP2 MS2 Sales database under tab ‘MP2 Sales Data MS2 ref only’ in the revised MP3 ER calculator being submitted. The column AC of ‘MP3 Sales database’ has now been linked with column BA of ‘MP2 Sales Data MS2 ref only’ to establish full traceability of values for ‘residual capacity from previous MP’. For systems that are newly installed in MP3, and don’t have any residual capacity being carry forwarded from MP2 MS2, the column AC in tab ‘MP3 Sales Database’ now indicates, **“new installation, not applicable,”** to avoid any confusion.

- c) The “system’s continuous running end date” was not depicting the lifetime/lifespan of the device. It was merely a determinant to check the compliance with the following requirement of the registered monitoring plan:

$(N_{y,i} * R_{y,i})$ should not exceed the maximum output capacity of the system installed.

The ER sheet tab, ‘MP3 sales database’ has been revised to determine the aforesaid in a better manner (refer column AN:AO). The revised functionality in the ER model ensures that $(N_{y,i} * R_{y,i})$ * operational school days in the monitoring period, does not exceed the available treatment capacity for any school and the total consumed capacity (column AN) is lower of the two as a conservative measure. Please refer below:

1. The treatment capacity of a unit (column AI) is the sum of residual capacity from the previous MP, if any, (column AC) and the supplies made during the monitoring period (column AD). For newly installed systems, it has been calculated as system's initial installation capacity (assumptions D9:D11) and the supplies made during the monitoring period (column AD), if any.
2. The total consumption of drinking water per day per unit has been calculated (column AH) and represents $(N_{y,i} * R_{y,i})$
3. The start date of the WPS crediting (column AK) in the monitoring period is considered as the latest of start date of MP3 or first day of the next month of its installation (column G).
4. The end date of WPS crediting (column AL) in the monitoring period is earliest of the end date of the monitoring period or the system breakdown date (column AJ), if any.
5. In case treatment capacity of a unit (column AI) is 0, no CERs are claimed (given column AK and AL are "NA", and column AP is "0").
6. Subsequently, the total number of available operational school days (column AM), falling between the start date (column AK) and end date (column AL) of crediting for a school, has been calculated weighted on the basis of boarding and non-boarding population (column M:P).
7. If a WPS unit has treatment capacity (column AI) less than the capacity required to run the entire available operational days in the monitoring period (i.e. $N_{y,i} * R_{y,i} * \text{available operational days}$) the residual capacity at end of MP (column AO) is calculated as 0. Otherwise, the residual capacity is calculated as net of treatment capacity (column AI) and consumed capacity during the monitoring period (column AN).
8. Limited by the treatment capacity consumed during the monitoring period (column AN), the credited school days for each system is calculated (column AP). Hence, the credited school days (column AP) is always less than or equal to available operational school days (column AM) for a given school.

The above approach is deemed better as it removes the confusion related to "continuous running end date" as well as calculates residual capacity at the end of MP3, based on operational school days during the monitoring period instead of the total duration of monitoring period.

In case of Multi-barrier UV, the expiry is 7 years with the earliest project device being installed in June 2014 hence no device shall end its lifetime before the end of the concerned monitoring period ending 31 Dec 2019. Besides, the UV bulb can be replaced to further extend the device lifetime further after 7 years.

Similarly, in case of UltraFLO, the expiry is 5 years with the earliest project device being installed in June 2018 hence no device shall end its lifetime before the end of the concerned monitoring period ending 31 Dec 2019. Besides, every-time a school receives a new supply of UltraFLO cartridge, the lifetime of the system is automatically deemed renewed, the supplies being a consumable.

- d) Please note that column AC in 'MP3 Sales Database' show a value of 0 if there is no residual capacity from the previous monitoring period and show **"new installation, not applicable"** in case of new installations in the concerned MP. Please refer the following in this regard:

Description	MP3 Sales Database
1) Schools with no residual capacity from the previous monitoring period	Select value "0" in column AC in MP3 Sales Database
2) Schools with no residual capacity from the previous monitoring period and received no supplies during the current monitoring period	Simultaneously Select value "0" in column AD in MP3 Sales Database
3) Total number of cases identified (Institutions)	134
4) Operational days for these schools	0 (refer column AP, MP3 Sales Database)

Thus, for the schools in (3) above, the operational days have been calculated as 0 because there is no residual capacity from the previous MP, neither continuous supplies have been made to the school in the current monitoring period and hence no ERs have been accounted.

On the other hand, "new installation, not applicable" cells in column AC in 'MP3 Sales

Databases indicate that these systems are newly installed and did not have any residual capacity from previous MP. This is verifiable against their installation dates. These systems provide continuous safe drinking water in the monitoring period by virtue of their initial installed capacity, even if no subsequent supplies have been made in these schools. Thus, the ER sheet is correctly ensuring that only those schools are credited that either have residual capacity from previous MP and/or, have received supplies and/or have been newly installed in the monitoring period.

Documentation provided by the CME

9948 MP3 Uganda MR ver 4.0 26042021

9948 MP3 Uganda ER Sheet ver 4.0 26042021

SCHOOL-CALENDAR-2019_Uganda issued by Federal Ministry of Education and Sports, Uganda

UltraFlo Installation Manual

DOE assessment

Date: 12/05/2021

- As mentioned in the CPA-DDs and MR, Multi-Barrier UV and UltraFLO Chlorination water purification systems (WPS) are fixed type water purification systems requiring pressurized piping connection to operate. The VT has reviewed the relevant information / specifications of these WPS (given below) to confirm that they require a piping connection to operate.

Table 1: System Specification

WPS Type	Model	Port size inlet	Pressure (psi)	Rated capacity (L)	Lifespan (year)	Reference
Multi Barrier UV	Small UV (1 GPM)	¼ inch	125	2,044,116	7	Technical Specification from Supplier (Rotek) for Large and Small UV Multi-Barrier UV Lifespan confirmation from Supplier (Rotek)
Multi Barrier UV	Large UV (2 GPM)	¼ inch	125	4,088,232	7	
UltraFlo	UltraFlo	20mm	As per line pressure	340,0000	5	Technical specification / expiry of UltraFlo by Medentech (technology supplier) UltraFLO Installation Manual

The Port size inlet rating and pressure rating mentioned in the manufacturer specifications / installation manual confirm that these systems require piping connection at their inlet ports for water purification. Thus, it is confirmed that a water connection is pre-requisite for these two types of systems by virtue of their design.

The Verification Team assessed the ER worksheet column R, and corresponding sampled end user forms to verify that "Piped" in column R refers only to the City Council / Government / Municipal Water Piped Connection in the school as the Primary Water Source.

Sample Snapshot:



Additionally, the VT secured photographs of the WPS installations during the physical site visits conducted previously, reviewed CME installation logs and monitoring survey records and observations made during remote site visit interviews to confirm that these WPS are installed on pressurized piping connection and are designed to operate exclusively for piped applications only. Please refer below:

Sample photographs:

The photographs confirm these systems being installed on piped applications only:



Picture 1: Multi-Barrier UV Installation



Picture 2: UltraFlo Installation

Installation Logs:

The Installation Logs of both Multi Barrier UV and UltraFlo systems were reviewed by the VT for each sample monitored by the CME. The installation logs were confirmed reporting length of ppr (poly-propylene random copolymer plastic) pipe used to complete the installations, further confirming that these systems can be and were installed on piped applications only.

Observations made during remote audit:

The list of samples (according to source) audited by the VT during the recent audits is as below:

Table 2: List of samples audited (Acceptance sampling)

MP#	WPS Type	Source	# Samples observed via acceptance sampling	Installation confirmed as piped application
MP2 MS1	Multi Barrier UV	Piped	6	Yes
MP2 MS1	Multi Barrier UV	Surface Water	1	Yes
MP2 MS1	Multi Barrier UV	Others	1	Yes
MP2 MS2	Multi Barrier UV	Piped	4	Yes
MP2 MS2	UltraFlo	Piped	2	Yes
MP2 MS2	Multi Barrier UV	Surface Water	1	Yes
MP2 MS2	Multi Barrier UV	Well/Borehole	1	Yes
MP3	Multi Barrier UV	Piped	6	Yes
MP3	UltraFlo	Piped	2	Yes

Thus, all Multi-Barrier UV and UltraFlo systems are confirmed to have been installed on piped applications (connecting the primary water source to the drinking water storage tank) in all cases (including those where the primary water source is other than the City Council / Government / Municipal Water).

Thus, the statements under the included CPA-DDs (section A.3) and the monitoring report (section C.1) are verified and deemed correct and both WPS types have been implemented in line with the description provided in the CPA-DD / MR. This, assessment is also included under the FVR section E.3.1, to enhance the clarity of reporting.

2. The below stated reference is considered

The applied methodology AMS-III.AV. version 4.0, para 15, states

"... Monitoring shall consist of checking of all appliances or a representative sample thereof, at least once every two years (biennial) to ensure that they are still operating or are replaced by an equivalent in service appliance as per the relevant sampling requirements of AMS-I.E...."

In Particular, the monitoring Frequency cited in the registered monitoring Plan (PoA-DD) is the following:

"...At least once per verification or biennially as per the monitoring requirements in the methodology..."

The monitoring Frequency cited in the registered monitoring Plan (CPA-DD's under MR) is the following: *"...At least once per verification or biennially as per the monitoring requirements in the methodology..."*

The FVR under section D.4 Sampling Approach explains the appropriateness of the applied monitoring frequency. The concerned monitoring period is 23/05/2019 to 31/12/2019, which is less than one year. For the concerned monitoring period, the CME performed random sample identification from sales database on date 10/01/2020 and initiated the monitoring surveys on 03/02/2020. The applied monitoring frequency is deemed in line with the registered monitoring plan and the monitoring methodology as the monitoring frequency falls within the requirement of "at least once in two years" as well as "per verification" when compared with the monitoring conducted in previous MP.

Besides, a review of subsequent MR (9948-MP4-MRP5) webhosted by CME on UNFCCC website, also

confirms that the CME is following a higher monitoring frequency (even better than annual monitoring frequency, which is within the methodology requirement of at least biennially).

The applied monitoring frequency is thus, accepted by Verification Team, for the current monitoring period.

However, to ensure that under no circumstances, the methodology requirement is compromised in future, a FAR has been raised. The DOE raised this issue under CL 01, DOE assessment dated 11/12/2020, point (c). the subsequent PP response has also been properly assessed.

However, FAR 01 was raised.

3. Please refer below detailed assessment of issued identified during RfR

a. The Verification Team has reviewed the below listed documentary evidence:

- Multi-Barrier UV - Technical Specification Supplier (Rotek) for Large and Small UV systems confirming treatment capacity and other parameters (inlet port size, pressure rating, wattage etc.)
- Multi-Barrier UV - Lifespan confirmation from Supplier (Rotek)
- Multi-Barrier UV - Certificate from Supplier (Rotek) on WHO compliance
- UltraFlo - Technical specification confirming capacity / expiry by Medentech (Technology Supplier)
- UltraFlo Installation Manual
- UltraFlo - Device Dimensions Declaration by CME
- UltraFlo cartridges are manufactured in a standardized size as per the dimensions specified in the CPA-DDs and MR (verified physically during previous site visits as well as from UltraFLO dimension declaration by CME) and pertains to the specifications issued by Medentech (Technology supplier)
- The expiry of the UltraFlo was also found mentioned on the cartridge as 5 years (verified physically during previous site visits and photographs of UltraFlo units.
- Installation Logs for Multi-Barrier UV and UltraFlo systems

Based on the aforesaid, and review of the concerned CPA-DDs, the PRC validation report, the VT confirmed that the capacity of the systems has been correctly stated in the ER sheet and MR. The FVR is updated, and the assessment is included under section E.3.1 of FVR.

b. The Verification Team has reviewed the revised ER sheet (version 04) and confirms that the values of 'residual capacity from previous MP' in column AC, are accurately linked with the MP2 ER worksheet values (PoA 9948_MP2_Uganda ER Sheet_ver 4.0_19032021, Tab MP2 Sales database-MS2 in particular) submitted against RfR response to MP2.

In the revised MP3 ER Calculator, the MP2-MS2 Sales database has been added (Tab: 'MP2 Sales data MS2 ref only') by the CME. The VT has verified that information in the revised MP3 ER Calculator, Tab: 'MP2 Sales data MS2 ref only' is fully consistent MP2 ER calculator version 4.0 dated 19032021, available at UN webpage:

https://cdm.unfccc.int/PoAIssuance/iss_db/poais523838536/view).

The CME has utilized vlookup function of excel to call the residual capacity values under tab "MP3 Sales Database" column AC. The VT confirmed that the residual capacity from previous MP in column AC, in tab MP3 Sales database, is correctly linked with 'MP2 Sales data MS2 ref only', column BA, thus establishing complete traceability of these values.

It is further confirmed that the MP3 sales database, in column AC, correctly reflects, "new installation, not applicable" for systems that are not being carry forwarded from MP2.

c. The Assessment Team noted the CME has updated the worksheet "MP3 Sales Database" while responding to the UNFCCC RfR review questions related to "continuous running end date". The Assessment on the revised 'MP3 Sales database' tab is as below. The VT also confirms that the revision is attributed to induct further transparency in the calculation of determinants and there is no material change.

Table 3: Assessment of MP3 Sales database tab, ER calculator version 4.0

Parameter	Is there change in reporting approach	Assessment	Is the change material (Yes/ No)?
"Source"	There is no change	There is no material change in the input values except that the in earlier worksheet (Version 03, submitted for RfI) it was	No

		presented in column 'Q' and now presented on column 'R' (Version 4.0).	
Residual capacity from previous MP (Ltrs)	Yes, the reporting approach has been updated to respond to the RfR review response. To provide the traceability values in column AC are now linked with column BA of tab "MP2 Sales Data MS2 ref only" which has been newly inserted in the ER calculator.	There is no material change in the input values except that in earlier worksheet (Version 03, submitted for RfI), the value was blank for new installations which is now clearly marked as "new installation, not applicable"	No
Treatment capacity of a unit (= residual or installation capacity + subsequent supplied capacity) (Ltrs)	<p>The logic is made more lucid though there is no material change on any of the reported value.</p> <p>The treatment capacity depends on summation of the "residual or installation capacity + subsequent supplied capacity". The parameter has been presented in column AI. The logic remains consistent to the Version 03 of the ER spreadsheet.</p>	<p>Existing WPS: The existing WPS are the one which are continuing from previous MP. Since no subsequent supplies have been made to the institutions in the concerned MP (column AD), the value of the parameter remains same as the "Residual capacity from previous MP (Ltrs)"</p> <p>New WPS: For new WPS, there is not residual capacity from previous MP. The treatment capacity for such systems is equivalent to the initial installed capacity as per technical specification of WPS, fetched from the worksheet 'Assumptions'</p>	No
"Start date of WPS crediting in the monitoring period" Column AK	<p>The "start date WPS of crediting in the monitoring period" has been determined as the start date of MP3 or first day of the next month of WPS installation (column F) whichever is later.</p> <p>Further, start date of WPS crediting has been calculated only for WPS that have non-zero value for Treatment capacity in column AI.</p>	The parameter "Start date of WPS crediting in the monitoring period" was also reported in earlier worksheet (Version 03, submitted for RfI) of ER sheet, in column AP. The parameter is reproduced without any material change.	No
"End date of WPS crediting in the monitoring period" Column AL	<p>The "End date WPS of crediting in the monitoring period" is determined as the earlier cut-off date between the "System Breakdown Date reported by User" in column AJ and the end date of the applied monitoring period (31/12/2019).</p> <p>Further, End date of WPS crediting has been calculated only for WPS that have a valid</p>	<p>The parameters "End date of WPS crediting in the monitoring period" Column AL is newly introduced to address the UNFCCC RfR questions.</p> <p>This parameter replaces the column "System's continuous running end date based on Monitoring Period duration" in earlier worksheet (Version 03,</p>	<p>No.</p> <p>The continuous running end date was merely a determinant to check compliance with the registered monitoring plan requirement and is not linked with the lifetime of the installed devices.</p>

	start date of crediting reported in column AK.	submitted for RfI).	The change in approach does not result in any material change.
“Available Operational School Days during the monitoring period (Days)” Column AM	<p>The CME has listed the available operational school days in Cells AW3:BD227.</p> <p>The operational days and the holidays in AW3:AZ227 are verified from the submitted “School and Other Institutions Calendar-2019” issued by the Ministry of Education and Sports Embassy, Uganda. The reported operational days for boarding and non-boarding institutions are deemed as appropriate.</p> <p>The available operational School Days during the monitoring are calculated as weighted average operational school days (considering boarding and non-boarding school population) falling between the “Start date of WPS crediting in the monitoring period” and “End date of WPS crediting in the monitoring period”.</p>	<p>Column AM is newly introduced in MP3 sales database to address the UNFCCC RfR questions.</p> <p>The VT noted that the schools are not operating for 365 days in a year. For non-boarding schools, the weekend and school holidays (public holidays, mid-term and end term holidays) have been excluded from available operational days as a conservative measure.</p> <p>For boarding schools, weekends and short public holidays have been included but the CME has excluded mid-term and end term holidays because the boarding students/staff would still consume water during weekends and short public holidays.</p> <p>The approach is deemed appropriate and conservative relative to considering the duration of monitoring period for crediting.</p>	<p>The Verification team confirms that the calculation of available operational school days, in column AM, in the ER sheet is correct and in accordance with the relevant academic calendars and results in conservative calculation of ERs.</p> <p>The consideration of operational school days instead of monitoring period duration results in reduction of ERs to 31,278 tCO₂e (former 46,324 tCO₂e).</p> <p>Please also refer to FAR 02.</p>
Treatment Capacity consumed during the Monitoring Period (Ltrs) Column AN	<p>The determinant “Treatment Capacity consumed during the Monitoring Period (Ltrs)” Column AN is newly introduced to address the UNFCCC RfR questions and ensure compliance with monitoring plan requirement.</p> <p>This approach ensures that the consumed capacity (ltrs) remains lower of the following:</p> <ol style="list-style-type: none"> 1. Treatment capacity of a unit (= residual or installation capacity + subsequent supplied capacity) (Ltrs) 2. $N_{y,i} * R_{y,i} * \text{Operational school day}$ 	<p>The calculation of consumed capacity is appropriate and in line with the registered monitoring plan.</p> <p>The revised approach ensures that $(N_{y,i} * R_{y,i}) * \text{operational school days}$ in the monitoring period, do not exceed the available treatment capacity for any unit (column AI).</p> <p>In case the treatment capacity (column AI) is enough to last for the available operational days (column AM), the consumed capacity (column AN) has been calculated as a product of Available operational school days (column AM)</p>	Not applicable

		<p>and Total daily water consumption per day (column AH). The surplus capacity would be left as residual capacity (column AO)</p> <p>However, in case the treatment capacity in column AI is not enough to last for the available operational days, then the consumed capacity is same as the treatment capacity (column AI) because the system will get fully consumed during the monitoring period and residual capacity (column AO) would be 0.</p>	
Residual Capacity at the end of monitoring period (Ltrs)	Approach remains the same however, the residual capacity has been determined considering the credited operational school days instead of duration of the monitoring period	The residual capacity at the end of the MP is based on the difference between the Treatment capacity of a unit (column AI) and the treatment capacity exhausted during the concerned MP.	No material change in the approach except the consideration of actual operational school days applicable to the monitoring period.

The total consumed capacity during the monitoring period (column AN), residual capacity at the end of MP (column AO) and credited operational school days (column AP) have been correctly calculated. The verification team has checked all determinants (column AC:AP) and confirms them to be correctly and accurately calculated and conservative with respect to ER calculations.

d. The reported WPS can be categorized into 03 categories: Following the RfR review question, the CME has transparently reproduced the parameter "Residual capacity from previous MP (Ltrs)" under column AC of the ER worksheet, tab "MP3 Sales Database".

- **The WPS with Zero residual capacity from previous MP** – These WPS are identified based on their 0 residual capacity at the end of previous MP (i.e. MP2-MS2). The number of such cases have been verified as 134 (column AC, tab "MP3 Sales Database").
- **Subsequent supplies to installed WPS** – In the current MP, no systems were provided with additional supplies. Thus, the aforesaid 134 cases with 0 residual capacity from previous MP have received 0 supplies during the monitoring period.
- **Available treatment capacity** – for aforesaid 134 cases, Available treatment capacity (column AI) is therefore 0. Accordingly, values in column AM:AP have been calculated as 0, thus confirming that no ER have been claimed for such cases. This has been evaluated by the VT for all the 134 institutions and found correct. The column AP "Credited School Day during the monitoring period considering capacity consumed (Days)" is confirmed as 0 for each of these 134 cases.
- **The WPS with available Residual capacity at the end of MP2** – Total number of cases with some carry forwarded residual capacity from previous MP are 875 (875 cases with 896 WPS, refer Column AE). These WPS systems operated by virtue of their residual capacity, thus additional supplies were not availed during the applied MP.
- **New WPS Installations** – These WPS were new (75 cases) and operated by virtue of their initial installed capacity. Thus, even if no additional supplies were made, these systems were able to provide treated water to the school/institution in accordance with their installed capacity.

Summary of assessment for Issue 3

Sr. No	RfR Issue	Assessment
3. a	Substantiate how it has verified and concluded the installed water purifier	The Assessment Team has verified the same based on the review of the technical specifications

	capacities of 340,000 L/unit (for UltraFlo purifier); 2,044,116 L/unit for Capacity of one unit of Small UV (1GPM)- and 4,088,232 L/unit for Water Purification Capacity of one unit of Large UV (2GPM);	as specified above. The table under Appendix-3 of FVR has been updated. The response under the raised CL 02 is also updated with respect to the assessment of the technical specifications against the reported values.
3. b	Submit a traceable emission reduction spreadsheet for the calculation of the system residual capacities;	A CL 02 was raised following the RFR issues. The CME has responded with the revised ER worksheet (version 04). The calculation of the residual capacity from previous MP is presented in a traceable manner as explained above. Please refer to the closure of raised CL 02.
3. c	Elaborate how a system's continuous running end date can be beyond its lifespan (5 years);	<p>The system's continuous running date is re-evaluated under the updated ER worksheet version 04. Please refer the detailed assessment above for the revised approach adopted by CME.</p> <p>In case of Multi-barrier UV, the lifespan has been verified as 7 year by the VT as per supplier certificates/specifications. Further, the review of MP3 sales database confirms that the earliest Multi-Barrier UV WPS was installed in June 2014. Thus, it is confirmed that no Multi-Barrier UV WPS shall exhaust its useful lifetime before the end of the concerned monitoring period ending 31 Dec 2019. Besides, the UV bulb can be replaced to further extend the device lifetime after 7 years, if desired</p> <p>Similarly, in case of UltraFLO, the 5-year lifespan/expiry has been verified by the VT. Further, the review of MP3 sales database confirms that the earliest UltraFlo was installed in June 2018. Thus, it is confirmed that no UltraFlo WPS shall exhaust its useful lifetime before the end of the concerned monitoring period ending 31 Dec 2019. Besides, every-time a school receives a new supply UltraFLO cartridge, the lifetime of the system is automatically deemed extended.</p> <p>Please refer the detailed assessment under CL 02.</p>
3. d	Substantiate continuous availability of safe drinking water to schools considering some water purifiers had no residual capacity from the previous monitoring period and received no supplies during the current monitoring period.	This issue is handled in detail under the CL 02. Please refer to the response under CL 02 above.

4. The actual number of operational school days are now incorporated, CME has discounted the school holidays.

The Verification team confirms that the calculation of available operational school days, in column AM, in the ER sheet is correct and in accordance with the relevant academic calendars and results in conservative calculation of ERs.

The school term duration and corresponding term holidays are found to be correctly calculated as per the submitted academic school calendars for the concerned period.

Furthermore, the tab "ERs Summary" of ER under row 6, parameter "Days" evaluates the weighted average number of days which are applicable for the monitoring period incorporating operational school days instead of duration of the monitoring period. The Verification Team has verified the calculations and deems the same as appropriate and accurate.

Please also refer to FAR 02.

By application of above corrections, the ER's have reduced from the existing value of 46,324 tCO₂ to 31,278 tCO₂. The achieved emission reductions in the current monitoring period thus are confirmed to be conservative, accurate and credible.

Table 5. CARs from this verification

CAR ID	01	Section no.	C, E and F	Date: 15/05/2020			
Description of CAR							
<div>1. The stated Emission Reductions stated in the submitted MR are inconsistent with the submitted ER worksheet (refer Cover page, section C, section E)</div> <div>2. Start date of the CPA i.e. date of installation of first ICS is inconsistently stated for CPA002, CPA015.</div> <div>3. The estimated emission reductions as stated in the MR are inconsistent with the submitted ER sheet on main page of MR (refer Cover page, section E, F)</div> <div>4. The reference numbers of CPA 29,103,104 and 105 under section A.1.2 of MR are not aligned with the PoA webpage.</div> <div>5. The format for Tables under section E.1 and E.2 are not in line with MR form.</div>							
CME response				Date: 29/06/2020			
<div>1. The Emission Reductions have been revised throughout in the MR and now consistent with the ER sheet.</div> <div>2. This is the second monitoring of CPA-02. The start date of CPA-02 and CPA-15 has been revised in MR and now consistent with the date of installation/distribution of first WPS in CPA 02 and CPA 15.</div> <div>3. The estimated emission reductions have been revised in MR and now consistent with the ER Sheet.</div> <div>4. The reference numbers of CPA 29, 103, 104 and 105 under section A.1.2 of MR has been revised and now aligned with the PoA webpage.</div> <div>5. The format for Tables under section E.1 and E.2 of MR has been revised and now consistent with the MR template.</div> <div>The revised MR and ER Sheet are being submitted.</div>							
Documentation provided by the CME							
PoA 9948_MP3_Uganda MR ver 2.0_29062020							
PoA 9948_MP3_Uganda ER Sheet_ver 2.0_29062020							
DOE assessment				Date: 08/07/2020			
<div>1. The stated Emission Reductions stated in the submitted MR are now consistent with the submitted ER worksheet (Cover page, section C, section E are verified). Finding is CLOSED.</div> <div>2. CPA-DD-02: The Verification Team has assessed the CPA-DD which referred start date as 19/08/2013 which was based on first purchase of water purification technology and followed by 30/05/2014 as start date of crediting period. Based on the review of the sales database, it is confirmed that the first installation under CPA 02 occurred on date 21/06/2014. Further justification is required for such time gap between purchase and dissemination of ICS. Finding remains OPEN. CPA-DD-15: The Verification Team has assessed the CPA-DD which referred start date as 30/11/2017 and followed by 15/12/2017 as start date of crediting period. Based on the review of the sales database, it is confirmed that the first installation under CPA 15 occurred on date 01-12-2017 and the credits is availed from the start date of the monitoring period. Finding is CLOSED.</div> <div>3. The estimated emission reductions as stated in the MR are now consistent with the submitted ER worksheet on main page of MR (Cover page, section E, F are verified). Finding is CLOSED.</div> <div>4. The verification Team confirms that the correction done for reference numbers of CPA 29,103,104 and 105 under section A.1.2 is now aligned with the PoA webpage and accurate. Finding is CLOSED.</div> <div>5. OK. The format is verified and deemed as consistent with the MR Form. Finding has been CLOSED.</div> <div>New Issues are identified as below:</div> <div>Section E.1 and E.2 of MR</div> <table><tr><td>Parameters</td><td>Units in MR</td><td>Units in ER worksheet tab (ERs Summary)</td></tr></table>					Parameters	Units in MR	Units in ER worksheet tab (ERs Summary)
Parameters	Units in MR	Units in ER worksheet tab (ERs Summary)					

WH	KJ/L ⁰ C	KJ/L C
T _f	⁰ C	C
T _i	⁰ C	C
R _{yi}	Liters/person/day	L/person/day
QPW _y	Litres/yr	L/yr
N _{yi}	Persons/equipment	Persons/technology
Operational Units	Percentage	Fraction

Section E. 2 of MR

Parameters mentioned in MR	Parameters mentioned in ER
Operational Units	Operational rate mentioned under tab (ERs Summary)

CME response	Date: 23/08/2020
<p>There was a significant time gap between the purchase of first system by Impact Water and its subsequent installation at school in CPA02 being the first CPA in Uganda. This was on account of various factors outside the control of CPA Implementer like the date of receiving the first order from a client (School), the date on which the school permitted IW to install the system on-site subject to clearance of payment by the school to IW as well as logistics required to take the system from Kampala office to the school in Wakiso for installation.</p> <p>New Issues: ER sheet has been revised to be consistent with MR.</p>	
Documentation provided by the CME	
Revised MR and ER worksheet	
DOE assessment	Date: 02/11/2020
<p>2. The explanation provided for the delay in implantation/installation of Water Purification System is deemed acceptable to the verification team.</p> <p>5. Further, revised ER sheet and MR assessed to be appropriately corrected with regards to the consistency of description of the parameters and denotation of units and found consistent.</p> <p>CAR 01 has been CLOSED.</p>	

CAR ID	02	Section no.	ER worksheet	Date: 15/05/2020
Description of CAR				
Tab: Assumption				
<ol style="list-style-type: none"> The Technical specifications of Small UV and Large UV are not evident under any of the CPAs which are part of the applied monitoring period/ report. Please clarify. The supportive and backup for the uniform value applied of parameter "Quantity of electricity consumed by the project electricity consumption source j in year y" i.e. 14 Wh applied for small UV and Large UV is also not evidenced. 				
Tab: Sales Database				
<ol style="list-style-type: none"> The Verification Team identified entries of non-boarding for the Institutions Types classified as "Boarding". Example School with unique id "U160114-A", "U160597-A", "U160683-2" (refer ER Worksheet, tab: "Sales Database"). The Verification Team is assessing the MR for MP2 and MP 3 and found that the school with SF ID number "U151202-A", "U151202-B" is stated as "Non boarding" and "Both" 				
Worksheet Reference	MP2 ER worksheet, tab: Sales Database-MS1	MP2 ER worksheet, tab: Sales Database-MS2	MP3 ER worksheet, tab: Sales Database	
MP	MP2	MP2	MP3	
SF ID	U151202-B	U151202-A	U151202-B	

Type	Both	Non-Boarding	Both
Population	782	782	782

Justification/ correction is requested.

Tab: ER Summary

- The parameter "Total distributed water purification systems" is incorrectly calculated under tab: "ER Summary". The total number of water purification systems are not consistent between the sales database tab: "Sales Database" and the corresponding ER calculation worksheets. Inconsistency needs to be addressed.
- The evidence to support the parameter "% of UBBS users" and "% of OBBS users" is requested.

CME response	Date: 29/06/2020
---------------------	-------------------------

Tab: Assumption

- The small UV and Large UV are types of Multi-barrier UV System. The technical specification of Small UV (1GPM) and Large UV (2GPM) are being submitted.
- The wattage of Small UV System is 10 Watts and Large UV System is 14 Watts. For calculation of project emissions, wattage of Small UV System has also been considered as 14 Watts as a conservative measure. The technical specification of Small UV (1GPM) and Large UV (2GPM) are being submitted

Tab: Sales Database

- The type of institution (Boarding/Non-Boarding/Both) have been rectified for "U160114-A", "U160597-A", "U160683-2" and some other institutions in sales database of ER Sheet based on the boarding and non-boarding student/staff count in the institute. The ERs have been updated accordingly.
- The type of institute (Boarding/Non-Boarding/Both) with SF ID "U151202-A" and "U151202-B" have been rectified as "Both" based on the boarding and non-boarding student/staff count in the institute. The ERs have been updated accordingly.

The revised ER Sheet is being submitted.

Tab: ER Summary

- The inconsistency has been addressed in ER sheet and MR.
- The "Citizens' Survey on Uganda, Vision 2040"¹² report has been used to demonstrate the % of users using Unimproved Biomass Burning Stoves (UBBS), Other Biomass Burning Stoves (OBBS) and Fossil Fuel Burning Stoves (FBBS). The report is being submitted.

Documentation provided by the CME

- PoA 9948_MP3_Uganda ER Sheet_ver 2.0_29062020
- Technical Specification of Multi-barrier UV System
- Citizens' Survey On Uganda, Vision 2040 Report

DOE assessment	Date: 08/07/2020
-----------------------	-------------------------

Tab: Assumption

- The Technical specifications of Small UV and Large UV are submitted by the CME and found consistent with the description under MR and values applied under ER worksheet. Finding is CLOSED.
- The verification team reviewed the submitted supportive document i.e. "Technical Specification of Multi-barrier UV System.pdf" which confirms that the highest power consumption from Multi-barrier UV is 14 W. Thus, the applied value is deemed as appropriate and conservative. Finding is CLOSED.

Tab: Sales Database – tab "Sales Database"

- The Verification Team checked the revised ER worksheet tab "Sales Database" entries and compared the same with the Sales Receipts, Installation Form and Sales Report and confirmed that the Institution Type (Boarding / Non-Boarding/Both) is appropriately reported. Finding is CLOSED.
- OK, Checked and verified based on Sales Receipts, Installation Form and Sales Report. Finding is CLOSED.

¹² Refer table 12 on page 23 of "Citizen Survey on Uganda, Vision 2040"

Tab: ER Summary

- The Verification Team has checked ER worksheet and MR. No inconsistency was identified. Finding is CLOSED.
- The Verification Team has checked page 23 Table 12 of "Citizens' Survey on Uganda, Vision 2040"¹³. It is confirmed that the applied value of Unimproved- 85.7%, Improved- 13.5% and Fossil fuel - 0.9% (0.4% for Gas stove/cooker + 0.2% for Paraffin stove + 0.2 % for others + 0.1% for Electric plate/cooker). Finding is CLOSED.

CAR 02 has been CLOSED.

CAR ID	03	Section no.	E and F of MR	Date: 15/05/2020
Description of CL				
Inconsistency between MR and ER				
<ol style="list-style-type: none"> The values of the parameter QPW_y, $N_{y,i}$, are inconsistent between MR and ER worksheet. The values of parameter for calculation of emission reductions as stated under the ER section E.2, E.3, F.1, F.2 and F.3 needs to be updated. 				
Additional Emission Reduction compared to envisaged values:				
The section F.6 is justifying the reasons for increase in the ERs, however the section is deficient with respect to the reasoning for the increase in the parameter example $T_{y,l}$, $R_{y,i}$, $N_{y,i}$, f_{NRB} .				
CME response				Date: 29/06/2020
<ol style="list-style-type: none"> The value of the parameter QPW_y, $N_{y,i}$, have been revised in MR and now consistent with the ER Sheet. The value of parameters has been updated. 				
The reason for increase in the parameter like $T_{y,l}$, $R_{y,i}$, $N_{y,i}$, have been added in section F.6 of the MR.				
The revised MR and MR are being submitted.				
Documentation provided by the CME				
PoA 9948_MP3_Uganda MR ver 2.0_29062020				
PoA 9948_MP3_Uganda ER Sheet_ver 2.0_29062020				
DOE assessment				Date: 08/07/2020
<ol style="list-style-type: none"> The verification team checked MR and the submitted ER sheet and found values of the parameter QPW_y, $N_{y,i}$, are consistent between MR and ER worksheet. Please also refer the closure of CL 02. Finding is CLOSED. The values of parameter for calculation of emission reductions under the ER section E.2, E.3, F.1, F.2 and F.3 are updated as per the recent submitted ER sheet. Finding is CLOSED. 				

CAR ID	04	Section no.	Various sections	Date: 15/05/2020
Description of CAR				
List of documents Requested:				
<ol style="list-style-type: none"> Random number generator Supportive documents for determination of the % of UBBS users, % of OBBS users, % of FFS users Evidences of start date of the CPA's (CPA 14, CPA 15, CPA 16, CPA 17, CPA 18, CPA 19, CPA 20, CPA 21, CPA 22) Technical specifications of all the technologies involved in both MPs Sample Sales receipt to cross check the Sales Record submitted in form of "Sample Sales Receipt" and "Sample Installation forms" together with "Sample Salesforce Reports" Monitoring records of complete samples monitored during MP#2 (MS1 and MS2) and MP#3 Conformance Certificate that the Aquagenx Water Testing kit meets the requirements of registered monitoring plan in form of "Aquagenx Testing Kit Specifications", the conformance to WHO guidelines Water Quality Testing Report on filtered water from the project technology under applied monitoring 				

¹³ Refer table 12 on page 23 of "Citizen Survey on Uganda, Vision 2040"

- report in form of "Sample Monitoring Records", section Water Quality
9. Competence check of with evidence (Training certificates) of the Enumerators who were employed for water testing
 10. Training procedure included in the "Aquagenx Test Training Module"
 11. Sampling Surveys (for each technology type)
 12. Sample training certificates of the Enumerators who were employed for survey of Operational Units - Training Cert for Survey and Test belong to person conducted testing and survey as per the initial sample records provided for interviewed
 13. Sample Lab test reports of filtration device including sample evidence that filters/cartridges have been replaced at stipulated interval
 14. Latest version of the Operations Manual for allocation of unique serial number to water purification system
 15. The life span of water treatment technologies supported by Sales Receipts / Technical Specification
 16. Evidence of the electrical load (in Wattage) for the water purification systems which are part of the monitoring report with the help of Technical Specifications

CME response**Date:** 29/06/2020

All the requested documents are being submitted.

Documentation provided by the CME

1. Random number generator
2. Supportive documents for determination of the % of UBBS users, % of OBBS users, % of FFS users
3. Evidences of start date of the CPA's (CPA 14, CPA 15, CPA 16, CPA 17, CPA 18, CPA 19, CPA 20, CPA 21, CPA 22)
4. Technical specifications of all the technologies involved in both MPs
5. Sample Sales receipt to cross check the Sales Record submitted in form of "Sample Sales Receipt" and "Sample Installation forms" together with "Sample Salesforce Reports"
6. Monitoring records of complete samples monitored during MP#2 (MS1 and MS2) and MP#3
7. Conformance Certificate that the Aquagenx Water Testing kit meets the requirements of registered monitoring plan in form of "Aquagenx Testing Kit Specifications", the conformance to WHO guidelines
8. Water Quality Testing Report on filtered water from the project technology under applied monitoring report in form of "Sample Monitoring Records", section Water Quality
9. Competence check of with evidence (Training certificates) of the Enumerators who were employed for water testing
10. Training procedure included in the "Aquagenx Test Training Module"
11. Sampling Surveys (for each technology type)
12. Sample training certificates of the Enumerators who were employed for survey of Operational Units - Training Cert for Survey and Test belong to person conducted testing and survey as per the initial sample records provided for interviewed
13. Sample Lab test reports of filtration device including sample evidence that filters/cartridges have been replaced at stipulated interval
14. Latest version of the Operations Manual for allocation of unique serial number to water purification system
15. The life span of water treatment technologies supported by Sales Receipts / Technical Specification
16. Evidence of the electrical load (in Wattage) for the water purification systems which are part of the monitoring report with the help of Technical Specifications

DOE assessment**Date:** 02/11/2020

1. Random number generator is submitted and it is confirmed that the samples were randomly selected across the population. Finding is CLOSED.
2. Supportive documents for determination of the % of UBBS users, % of OBBS users, % of FFS users - Citizens-Survey-on-Uganda-Vision-2040 submitted. The values are compared with Table 12, page 23 and found to be consistent and appropriate.
3. Evidences of start date of the CPA's (CPA 14, CPA 15, CPA 16, CPA 17, CPA 18, CPA 19, CPA 20, CPA 21, CPA 22) –are provided. It is confirmed based on the review of tab "Sales Database" that appropriate date of crediting period is availed for the applied monitoring.

S.No.	CPA Reference No.	Date of installation of first unit in the CPA	Check of date of installation (OK/Not OK)	Crediting Period Start date	Check of date of CER claim (OK/Not OK)
1	9948-P1-0002-CP1	21/06/2014	OK (21/06/2014)	30/05/2014	OK, start date of MP

2	9948-P1-0014-CP1	01/12/2017	OK (01/12/2017)	15/12/2017	OK, start date of MP
3	9948-P1-0015-CP1	01/12/2017	OK (01/12/2017)	15/12/2017	OK, start date of MP
4	9948-P1-0016-CP1	14/06/2018	OK (14/06/2018)	15/12/2017	OK, start date of MP
5	9948-P1-0017-CP1	06/07/2018	OK (06/07/2018)	15/12/2017	OK, start date of MP
6	9948-P1-0018-CP1	18/07/2018	OK (18/07/2018)	15/12/2017	OK, start date of MP
7	9948-P1-0019-CP1	20/07/2018	OK (20/07/2018)	15/12/2017	OK, start date of MP
8	9948-P1-0020-CP1	26/07/2018	OK (26/07/2018)	15/12/2017	OK, start date of MP
9	9948-P1-0021-CP1	31/07/2018	OK (31/07/2018)	15/12/2017	OK, start date of MP
10	9948-P1-0022-CP1	08/08/2018	OK (08/08/2018)	15/12/2017	OK, start date of MP

4. Technical specifications of all the technologies is submitted CAR point.
5. The submitted "Sample Sales Receipt" and "Sample Installation forms" together with "Sample Salesforce Reports" were verified with ER worksheet tabs "Sales Database". No inconsistency was identified.
6. The Verification team verified the monitoring records under ER worksheet tab "Monitored samples-". No inconsistency was identified.
7. The Verification team is in receipt of "Aquagenix Testing Kit Specifications". In addition, the web based check was undertaken (<https://www.aquagenix.com/cbt-ect/>) which confirm that the testing Kit meets the WHO guidelines.
8. The Verification team verified the Water Quality Testing Report under ER worksheet tab "Monitored samples". No inconsistency was identified.
9. Competence check of with evidence (Training certificates) of the Enumerators who were employed for water testing were deemed as appropriate. The Enumerators were also interviewed by the Verification Team.
10. Training procedure included in the "Aquagenix Test Training Module" found OK. The Verification Team verified it and deemed it as appropriate. The Enumerators were also interviewed who confirmed the training procedure.
11. Sampling Surveys (for each technology type) is verified. No inconsistency was identified.
12. Sample training certificates of the Enumerators who were employed for survey of Operational Units are provided, verified and deemed as appropriate. The trained Enumerators were employed for the monitoring and survey as per requirement of the monitoring plan.
13. Document "Salesforce - Enterprise Edition" for SF#U140506 is provided showing the date on which maintenance job is done which confirm that filters/cartridges have been replaced at stipulated interval. Furthermore, the Verification Team noted that additional comment which is part of the "Salesforce - Enterprise Edition" stated that "A yearly package of filters and UV Lamp were delivered- System working well".
14. OK, Operations Manual for Impact Water is provided
15. OK, "Technology Specification Documents" which confirms the life span of water treatment technologies supported by Sales Receipts / Technical Specification.
16. OK. Already assessed under closure of CAR 02 issue 2.

CAR 04 has been CLOSED.

Table 6. FARs from this verification

FAR ID	01	Section No.	E.3.4.2.	Date: 22/04/2021
Description of FAR				
The Verifying DOE shall confirm the provisions of the applied methodology AMS-III.AV, version 04 para 16, pertaining to monitoring frequency of parameter "operational units" as atleast once every two years (atleast biennial) are complied.				

CDM-PoA-VCR-FORM

CME response	Date: DD/MM/YYYY
Documentation provided by the CME	
DOE assessment	Date: DD/MM/YYYY

FAR ID	02	Section No.	E.3.4.2.	Date: 22/04/2021
Description of FAR				
The Verifying DOE involved in subsequent verifications shall ensure that the parameter QPW _y is determined accounting the operational school days instead of duration of the concerned monitoring period, as applicable (refer: SSC_795: https://cdm.unfccc.int/methodologies/SSCmethodologies/clarifications/05721 and SSC_792: https://cdm.unfccc.int/methodologies/SSCmethodologies/clarifications/57226)				
CME response				Date: DD/MM/YYYY
Documentation provided by the CME				
DOE assessment				Date: DD/MM/YYYY

Appendix 5. Monitored Parameters

Table A-5: Periodic Verification Checklist – Monitored Parameters

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
1. QPW_y		Quantity of purified water in year y (litres)		
a) Measurement / Determination method (VVS, §§ 389-393) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i> <i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i> <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/IM01/ /PoA-DD/ /AMS-III. AV./ /USAGE/ /XLS/ /SAMPLE/ /MR/	<p>Description: This is a calculated parameter. The value depends on the product of parameters “The average population serviced by water purification systems” (N_{y,i}) X “Total distributed water purification systems” (T_{y,i}) X “Average volume of drinking water per person per day” (R_{y,i}) X days per year (365) X “Water quality measurement” (Water Quality_i) X “Monitoring to check the percentage of the monitoring period which technologies are in use”(Operational Units_i). The PP has stated the annual calculated values for the parameter “QPW_y”. CL 02 has been further raised as the actual operational days of the school were not applied. However, please refer Appendix 4 for related findings.</p> <p>Verifier’s action: In addition to the remote assessment review, pending documentation was requested (e.g. Usage Survey Records, Water Quality records corresponding to applied monitoring session, sales database to cross verify the number of filtration devices being credited for each monitoring session) pertaining to the dependent parameters.</p> <p>Conclusion: Findings CL 01, CAR 02, CAR 03, CAR 04, CL 02 were raised. The VT has raised FAR#02 to ensure that QPW_y is determined accounting the operational school days instead of duration of the concerned monitoring period, as applicable.</p>	CL 01, CAR 02, CAR 03, CAR 04, CL 02,	OK, FAR 02
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if</i>	/DB/ /WC/ /MR/ /XLS/	<p>Description: It is calculated value. Additional QA/ QC measures are not applicable.</p>	CL 01, CAR 02, CAR	OK, FAR 02

CDM-PoA-VCR-FORM

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>		<p>Verifier's action: Dependent parameters were assessed. Pending documents were requested. Sampling data of related parameters under monitoring was assessed.</p> <p>Conclusion: Findings CL 01, CL 02, CAR 02, CAR 03, CAR 04 were raised.</p>	03, CAR 04	
<p>c) Correctness (VVS, §§ 389-393)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	/MR/ /DB/ /WC/ /XLS/	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p>Description: In absence of confirmation on the related parameters at draft verification stage, the calculated value of this parameter cannot be confirmed or considered correct.</p> <p>Verifier's action: In addition to the remote audit review observations, pending documentation pertaining to related parameters was requested, please refer above assessments.</p> <p>Conclusion: Findings CL 01, CL 02, CAR 02, CAR 03, CAR 04 were raised.</p>	CL 01, CAR 02, CAR 03, CAR 04	OK, FAR 02
2. η_{wb}		Efficiency of water boiling system being replaced		
<p>a) Measurement / Determination method (VVS, §§ 389-393)</p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/IM01/ /PoA-DD/ /MR/ /XLS/	<p>Description: The parameter is utilized to determine the baseline emissions. Default values from AMS III.V are utilized along with the national data for use of the different baseline technologies in the host country Uganda to arrive at a weighted value, which is more representative.</p> <p>Verifier's action: Applied methodology and the national data was reviewed.</p> <p>Conclusion: The parameter is determined in line with the method is in the registered monitoring plan.</p>	OK	OK
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and</i></p>	/DB/ /WC/ /MR/ /XLS/	<p>Description: It is calculated value. Additional QA/ QC measures are not applicable.</p>	OK	OK

CDM-PoA-VCR-FORM

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>		<p>Verifier's action: Applied methodology and the national data were reviewed.</p> <p>Conclusion: The verification team deemed the reported values as appropriate.</p>		
<p>c) Correctness (VVS, §§ 389-393)</p> <p>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</p>	<p>/MR/ / AMS-III. AV./ /XLS/</p>	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p>Description: No Pending issues were identified.</p> <p>Verifier's action: MR, applied methodology and the national data was reviewed.</p> <p>Conclusion: The verification team deemed the reported value as appropriate.</p>	OK	OK
3. T_{y,i}		Total distributed water purification systems		
<p>a) Measurement / Determination method (VVS, §§ 389-393)</p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	<p>/IM03/ /PoA-DD/ /CPA-DD/ / AMS-III. AV./ /CBT/ /XLS/ /TRG/</p>	<p>Description: The parameter represents the total number of units that are distributed till the applied monitoring period. The distributed units are included under the sales database. The paper records of sales invoices are the means of cross verification of the sales database. As per the provisions of the monitoring plan of CPA-DD, the parameter is reported based on the Sales receipts/purchase orders. During the remote assessment and interviews, the CPA Implementer confirmed that the units that are not part of the Project/ Sales Database are not considered for the calculation of the emission reductions been analysed. Please refer to Appendix-4 for details.</p> <p>Verifier's action: T_{y,i} covering this monitoring period was verified by requesting the sales receipts / database applicable to the monitoring period. This Sales database was verified. The monitoring management was also cross verified during the remote assessment and interview with the CME, CPA implementer,</p>	CAR 02, CAR 03, CAR 04	OK

CDM-PoA-VCR-FORM

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		consultant and verification of database system maintained by the CME Conclusion: CAR 02, CAR 03 and CAR 04 were raised.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/IM03/ /DB/ /WC/ /MR/ /XLS/	Description: The Sales Database was cross-checked with scanned copy of paper records to ensure transparent and robust data reporting. The CME also confirmed that the units that are not functional or replaced are captured in monitoring parameter Operational Units. However, at time of desk review, all the supporting documents were not submitted, thus findings are raised by the Verification Team. CAR 04 is raised. Verifier's action: Project personnel were remotely interviewed. CME and CPA Implementer QA/ QC measures were assessed. Pending documents for undertaking the implementation of QA/ QC measures was requested Conclusion: CAR 04 was raised.	CAR 04	OK
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /IM03/	<input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment) Description: In absence of requested supporting documents and closure of raised issues the reported data cannot be assessed. Verifier's action: In addition to the remote assessment review, sales receipts / database applicable to the monitoring period and QA/ QC measures were assessed. Conclusion: CAR 02, CAR 03 and CAR 04 were raised.	CAR 02, CAR 03 and CAR 04	OK
4. N_{y,i}		The average population serviced by water purification systems		
a) Measurement / Determination method (VVS, §§ 389-393) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL)</i>	/MR/ / AMS-III. AV./ /XLS/	Description: The parameter represents the average population serviced by water purification systems. The number of person/ equipment depends on the technical specification / design capacity of the	CL 01, CAR 03 CAR	OK

CDM-PoA-VCR-FORM

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>		<p>equipment. The Verification Team requested the Technical specification of the actually installed water purification systems and verified them with the sales receipts / database. During the remote audit assessment and interviews the PP confirmed that at the time of sale, the number of people using the unit is recorded in the sales receipt/purchase orders. Further this information is checked afterwards as well by CPA Implementer. The Verification Team requested the technical specification of the water purification systems to PP. The "Calculation method" for parameter $N_{y,i}$ is not transparent (refer CL 01). The data is taken as the input for the ER calculations meaning it is the basis for determining of the CPA baseline emission reductions. The values of $N_{y,i}$ are not consistently reported under ER and MR. CAR 03 has been raised. However, for submission of the supportive data CAR 04 has been raised. Please refer to Appendix-4 for detail.</p> <p>Verifier's action: The $N_{y,i}$ covering this monitoring period was verified by verification team by requesting the technical specification / design duty and other database applicable to the monitoring period. The monitoring management was also cross verified by the remote assessments observation and interview with the CME, CPA implementer, consultant and verification on database system maintained by the CME</p> <p>Conclusion: CL 01, CAR 03 and CAR 04 were raised.</p>	04	
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the</i></p>	/DB/ /WC/ /MR/ /XLS/	<p>Description: As per the interviews with the CPA Implementer and the CME the "The average population serviced by water purification systems" is recorded at the time of sale, the number of people using the unit is recorded in the sales receipt. The data of the water purification unit is entered into the sales database. This Sales database is verified from the hard copy of the sales receipt. In addition, the parameter can also be verified from the Sales force report of the Institutions where this number is also updated for a water purification unit. However, the document submission is still pending from the CME.</p>	CL 01, CAR 04	OK

CDM-PoA-VCR-FORM

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>installed monitoring equipment in the table in Appendix 6.</i>		<p>Verifier's action: Project personnel were interviewed. CME and CPA Implementer QA/ QC measures were assessed. Pending documents for undertaking the implementation of QA/ QC measures was requested</p> <p>Conclusion: CAR 01 and CAR 04 were raised.</p>		
<p>c) Correctness (VVS, §§ 389-393)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	/MR/ /IM03/	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p>Description: In absence of documentary evidence the reported data cannot be assessed as correct.</p> <p>Verifier's action: In addition to the onsite review, pending documentation was requested, please refer above assessments.</p> <p>Conclusion: CL 01, CAR 03, CAR 04 were raised.</p>	CL 01, CAR 03, CAR 04	OK
5. Water Quality_i		Water quality measurement		
<p>a) Measurement / Determination method (VVS, §§ 389-393)</p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i> <i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used.</i> <i>Furthermore, verify the frequency of measurements as per the requirements.</i> <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/IM03/ /PoA-DD/ /CPA-DD/ /USAGE/ /CBT/	<p>This parameter is crucial as it allows counting of only those purification units which meet the required water quality standards. According to MR, Aquagenx Water Testing kit was utilized for the water quality testing. Also, the CPA implementer is responsible to undertake the water testing with the help of the trained enumerators. During the desk review, the Verification team has requested below documents:</p> <ul style="list-style-type: none"> • Conformance Certificate that the Aquagenx Water Testing kit meets the requirements of applied monitoring plan • Technical Specification of the Aquagenx Water Testing kit • Water Quality Testing Report on filtered water from the project technology under applied monitoring report (minimum requirement E.coli, TC Coliform, faecal coliform counts, chlorine levels) • Training certificates of the Enumerators who were employed for water testing • Copy of the training procedure • Copy of water testing procedure Refer CAR 04 for 	CAR 04	OK

CDM-PoA-VCR-FORM

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>further details.</p> <p>Verifier's action: The sampling plan has been cross checked by verification team according to EB sampling guideline and applied methodology. The results of Water Quality measurement (especially as per requirements of the monitoring plan was assessed) has been also verified by means of remote assessment and interview (sample based). Technical Specification of the Aquagenx Water Testing kit was assessed with respect to the requirements of the monitoring plan</p> <p>Conclusion: Please refer to CAR 04</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>	<p>/PoA-DD/ /CPA-DD/ /USAGE/ /CBT/</p>	<p>Description: During the remote assessment and interviews, the CPA Implementer and CME confirmed that cost-effective and feasible water quality indicators like E.coli, faecal coliform counts, chlorine levels was utilized to assess water quality. CPA implementer conducted testing. CPA Implementer has trained enumerators with respect to standard testing procedures and the appropriate testing technology Aquagenx Water Testing kit was employed. However, documentary evidence for the same is requested by the Verification Team. Please refer CAR 04.</p> <p>Verifier's action: Enumerators undertaking testing were also interviewed. The sampling plan has been cross checked by verification team according to EB sampling guideline and applied methodology.</p> <p>Conclusion: Please refer to CAR 04.</p>	<p>CAR 04</p>	<p>OK</p>
<p>c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p>	<p>/PoA-DD/ /CPA-DD/ /USAGE/ /CBT/</p>	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p>Description: During the remote assessment, the Verification Team checked</p> <ul style="list-style-type: none"> Conformance Certificate that the Aquagenx Water Testing kit meets the requirements of applied 	<p>CAR 04</p>	<p>OK</p>

CDM-PoA-VCR-FORM

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>		<p>monitoring plan</p> <ul style="list-style-type: none"> • Technical Specification of the Aquagenx Water Testing kit • Water Quality Testing Report on filtered water from the project technology under applied monitoring report (minimum requirement E.coli, TC Coliform, faecal coliform counts, chlorine levels) • Training certificates of the Enumerators who were employed for water testing • Copy of the training procedure • Copy of water testing procedure Refer CAR 04 for further details. <p>Verifier's action: Enumerators undertaking testing were interviewed. The sampling plan has been cross checked by verification team according to EB sampling guideline and applied methodology.</p> <p>Conclusion: Please refer to CAR 04.</p>		
6. Operational Units;		Percent of the monitoring period in which the units are in use		
<p>a) Measurement / Determination method (VVS, §§ 389-393)</p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	<p>/IM03/ /PoA-DD/ /CPA-DD/ /USAGE/</p>	<p>Description:</p> <p>This parameter is determined based on surveys conducted on the sample units (per each technology type) to determine the percentage of days of monitoring period when the unit is in use by the end user.</p> <p>At the time of Desk Review, the Verification Team was not in receipt of the Survey records, thus appropriateness of conducted survey and the value of the parameter as applied in the emission reduction worksheet and monitoring cannot be confirmed. The Verification Team has requested below documents from the CPA-Operator:</p> <ul style="list-style-type: none"> • Sampling Surveys (for each technology type) • Training certificates of the Enumerators who were employed for survey of Operational Units Copy of the training procedure for survey of Operational Units • Copy of Questioner for undertaking the Sampling Survey <p>Refer CAR 02 and CAR 04 for further details.</p>	<p>CL 01, CAR 02, CAR 04, CL 02,</p>	<p>OK, FAR 01</p>

CDM-PoA-VCR-FORM

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>The verification team assessed the monitoring frequency for the current monitoring period and found it to be compliant with monitoring methodology and registered monitoring plan. Once the RfR review question were received, CL 02 was raised to confirm the appropriateness of the monitoring frequency for subsequent monitoring periods.</p> <p>Please refer to Appendix-4 for details.</p> <p>Verifier's action: The sampling plan has been cross checked by verification team according to EB sampling guideline and applied methodology. The results of technologies in use has been also verified by means of remote assessment and interview (sample based).</p> <p>Conclusion: Please refer to CAR 02, CAR 04, CL 01 and CL 02. FAR 01 has been raised to ensure that monitoring frequency of parameter "operational units", shall be at least biennial, in line with monitoring methodology requirements.</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>	<p>/PoA-DD/ /CPA-DD/ /USAGE/ /CBT/</p>	<p>Description: During the remote assessment and interviews, it is noted that the CPA Implementer employs enumerators to conduct the surveys with the help of the sales data which provides the unique identity of the water purification unit. The Enumerators also confirmed that the units are discarded from the survey if the unique serial number is no longer visible and date of purchase of the unit is not confirmed or if unit is replaced. However, the appropriate implementation is subjected to the submission of appropriate supportive evidence.</p> <p>Verifier's action: Enumerators undertaking testing were also interviewed. The sampling plan has been cross checked by verification team according to EB sampling guideline and applied methodology.</p> <p>Conclusion: CAR 02, CAR 04 were raised.</p>	<p>CAR 02, CAR 04</p>	<p>OK</p>
<p>c) Correctness</p>	<p>/MR/</p>	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p>	<p>CAR</p>	<p>OK</p>

CDM-PoA-VCR-FORM

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
(VVS, §§ 389-393) Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.	/IM03/ /USAGE/ /CBT/	Description: The value indicated could not be confirmed at draft verification stage. During the remote assessment, the Verification Team checked <ul style="list-style-type: none"> Sampling Surveys (for each technology type) Training certificates of the Enumerators who were employed for survey of Operational Units Copy of the training procedure for survey of Operational Units Copy of Questioner for undertaking the Sampling Survey. Verifier's action: In addition to the onsite review, surveys conducted on the sample units (per each technology type) to determine the if the unit is in use were checked. Enumerators were interviewed. Conclusion: CAR 02, CAR 04, CL 01, CL 02 were raised.	02, CAR 04, CL 01, CL 02	
7. $f_{NRB,y}$		Fraction of woody biomass saved by the project activity in year, y, that can be established as non-renewable biomass using national or local statistics, survey results, studies, maps or other sources of information, such as remote-sensing data.		
a) Measurement / Determination method (VVS, §§ 389-393) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/IM03/ /PoA-DD/ /CPA-DD/ /USAGE/	Description: The parameter is utilized to determine the baseline emissions. Below documents were assessed from the CPA Implementer: <ul style="list-style-type: none"> Survey report for determination of the fraction of the woody biomass saved by the project activity (CITIZENS' SURVEY ON UGANDA VISION 2040) Applied international reports (with traceability) which are utilized for determination of the parameter $f_{NRB,y}$ Training procedures for enumerator for determination of the parameter $f_{NRB,y}$ Please refer to Appendix-4 for details. Verifier's action: The verification team has verified the survey reports (as stated above) to evaluate the parameters “% of users using NRB” and “% of users using fossil fuels” evaluated its applicability and	CAR 02, CAR 04	OK

CDM-PoA-VCR-FORM

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		appropriateness. Conclusion: CAR 04 and CAR 02 were raised.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/IM03/ /PoA-DD/ /CPA-DD/ /USAGE/	Description: This is calculated value. Additional QA/ QC measures are not applicable. Verifier's action: The additional QA/ QC measures are not applicable as the applied values are based on the publically available data. Conclusion: The verification team confirms that the parameter is monitored appropriately.	OK	OK
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /IM03/ /PoA-DD/ /CPA-DD/ /USAGE/	<input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment) Description: In absence of <ul style="list-style-type: none"> Survey report for determination of the fraction of the woody biomass saved by the project activity Applied international reports (with traceability) which are utilized for determination of the parameter $f_{NRB,y}$ Training procedures for enumerator for determination of the parameter $f_{NRB,y}$ parameter cannot be considered as OK. Verifier's action: In addition to the remote assessment, pending documentation pertaining to parameter was requested, please refer above assessments. Conclusion: CAR 04, CAR 02 were raised.	CAR 02, CAR 04	OK
8. EF _{projected_fossilfuel}		Emission factor as per AMS-I.E. procedures when NRB is displaced or the emission factor of the fossil fuel substituted		
a) Measurement / Determination method (VVS, §§ 389-393) <i>Describe how the monitoring parameter was measured /</i>	/IM03/ /PoA-DD/ /CPA-DD/	Description: The parameter is used to determine the baseline emissions. Default emission factors as defined by the applied methodology	OK	OK

CDM-PoA-VCR-FORM

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</p> <p>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</p> <p>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	/CPA-DD/ /USAGE/	<p>AMS-III.AV and the national data base are utilized to derive the parameter. The parameters</p> $EF_{\text{projected_fossilfuel}} = [EF_{\text{NRB}}] * [\% \text{ of users using NRB}] + [EF_{\text{Natural Gas}}] * [\% \text{ of users using Natural Gas}] + [EF_{\text{Kerosene}}] * [\% \text{ of users using Kerosene}] + [EF_{\text{LPG}}] * [\% \text{ of users using LPG}]$ <p>The parameters, “% of users using NRB” (94.2%) and “% of users using fossil fuels” (5.8%) are sourced from publicly traceable database table 9.7 of UNHS, Household Survey Report 2016/17 https://www.ubos.org/wp-content/uploads/publications/03_20182016_UNHS_FINAL_REPORT.pdf. The Verification Team acknowledge that all fossil fuel used is assumed to be Natural Gas and the emission factors of NG - 56.1 tCO₂/TJ is utilized. The emission factor for EF_{NRB} is taken from AMS I.E as 81.6 tCO₂/TJ.</p> <p>The Verification Team confirms that the parameter has been appropriately determined as below: $EF_{\text{projected_fossilfuel}} = (81.6 * 0.942 + 56.1 * 0.058) = 80.12 \text{ tCO}_2/\text{TJ}$</p> <p>Verifier’s action: CPA-DD, PoA-DD, applied methodology and host country household surveys were utilized.</p> <p>Conclusion: The determination method of EF_{projected_fossilfuel} is in line with the registered monitoring plan and the applied methodology Value is correctly reported.</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</p> <p>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</p> <p>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</p>	/DB/ /WC/ /MR/ /XLS/	<p>Description: It is a default value. Additional QA/ QC measures are not applicable.</p> <p>Verifier’s action: Applied default value and national data base was reviewed.</p> <p>Conclusion: The reported value is accurate</p>	OK	OK

CDM-PoA-VCR-FORM

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>				
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /IM03/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment) Description: Applied value is correct. Verifier's action: MR was reviewed. Conclusion: The value given in the monitoring report is correct.	OK	OK
9. Existence of public distribution network of safe drinking water		Existence of public distribution network of safe drinking water in year y		
a) Measurement / Determination method (VVS, §§ 389-393) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i> <i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used.</i> <i>Furthermore, verify the frequency of measurements as per the requirements.</i> <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/IM03/ /PoA-DD/ /CPA-DD/ /USAGE/	Description: The parameter is utilized to determine the eligibility conditions. The value is based on survey records. The stated value between the ER and MR is consistent with the survey records. Verifier's action: Survey report was reviewed. Conclusion: The survey was reviewed and reporting deemed as appropriate.	OK	OK
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met.</i> <i>Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/DB/ /WC/ /MR/ /XLS/ /USAGE/	Description: It is a survey-based value. Additional QA/ QC measures are not applicable. Verifier's action: Survey report was reviewed. Conclusion: The reported value is deemed as appropriate.	OK	OK
c) Correctness	/MR/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)	OK	OK

CDM-PoA-VCR-FORM

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
(VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/IM03/	Description: It is a survey-based value. Verifier's action: MR and survey were reviewed. Conclusion: The reported value is appropriately determined based on survey results.		
10. EC_{PJ,i,y}		Quantity of electricity consumed by the project electricity consumption source j in year y		
a) Measurement / Determination method (VVS, §§ 389-393) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/IM03/ /PoA-DD/ /CPA-DD/ /USAGE/	Description: The parameter is utilized to determine the project emissions for Type 3 CPAs. The value of parameter is based on manufacturer's specification. It is also noted that there is provision for application of default value of 14 Watt for 24 hours a day and 365 days a year. However, actual power rating (in a conservative manner) is applied. CAR 02 has been raised to demonstrate appropriateness of applied value. Assumption of 14-watt hour capacity is not backed by credible substantiation. Requisite supporting documents are requested, CAR 04 has been raised. Verifier's action: CPA-DD, PoA-DD and MR were reviewed. Conclusion: Please refer CAR 02 and CAR 04	CAR 02, CAR 04	OK
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the</i>		Description: It is technical specification or default value. Additional QA/ QC measures are not applicable. Verifier's action: Manufacturer's specification and default value were reviewed. Conclusion: The QA/ QC measures are not applicable as the parameter is depend on the technical specification.	OK	OK

CDM-PoA-VCR-FORM

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>installed monitoring equipment in the table in Appendix 6.</i>				
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /IM03/	<input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment) Description: Pending closure of the raised findings, the correctness of project emission calculations cannot be reasonably confirmed. The technical specifications have been requested Verifier's action: Manufacturer's specification and default value were reviewed. Conclusion: CAR 02 and CAR 04 were raised.	CAR 02, CAR 04	OK

Appendix 6. Calibration dates and validity of installed monitoring equipment

Table A-6: Periodic Verification Checklist – Calibration details

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<input type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
-	-	-	-	-	-	-	-	<input type="checkbox"/> No <input type="checkbox"/> Yes	From: To:

++

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
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.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: programme of activities, verifying and certifying		