




**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 Ref. No.9948 | |
| Version number(s) of the PoA-DD(s) to which this report applies | 7.0 | |
| Version number of the verification and certification report | 3.1 | |
| Completion date of the verification and certification report | 26/11/2020 | |
| Monitoring period number and duration of this monitoring period | Monitoring Period Number: 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 | Version: 3 Monitoring Report Number: 1.0 | |
| 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 | No |
| | Nigeria | Yes |
| | 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 | Not Applicable | |
| Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report | 344,236 tCO ₂ e | |
| Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report | 247,410 tCO ₂ e | |
| Name and UNFCCC reference number of the | Earthood Services Private Limited | |

| | |
|---|---|
| DOE | E-0066 |
| Name, position and signature of the approver of the verification and certification report |  Dr. Kaviraj Singh Managing Director |

SECTION A. Executive summary

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

In absence of the PoA, boiling water using fossil fuels / non-renewable woody biomass would have been the means of availing safe drinking water. The project Water Purification Systems (WPS) provides safe drinking water without the use of non-renewable biomass/ fossil fuel, thus leading to reduction in Green-house gas (GHG) emissions attributed to boiling in the baseline. This verification covers implemented CPAs 9948-P1-0003-CP1, 9948-P1-0005-CP1 to 9948-P1-0013-CP1 (10 CPAs).

The verification team confirms that the total emission reductions achieved under this monitoring period from 23/05/2019 to 31/12/2019 (inclusive of both days) are 247,410 tCO_{2e}.

Scope of verification:

The verification is an independent and objective review, of ex-post determination of the monitored reductions in GHG emissions, by the DOE. The verification includes the implementation and operation of the PoA as set out in the revised accepted PoA-DD & CPA-DDs viz., 9948-P1-0003-CP1, 9948-P1-0005-CP1 to 9948-P1-0013-CP1 (10 CPAs) in the monitoring period.

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

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

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

Verification Process:

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

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

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

Verification Conclusion:

Based on the outcome of the verification process of the registered/revised accepted PoA “Impact Carbon Global Safe Water Programme of Activities (PoA)” and its 10 CPAs (**9948-P1-0003-CP1, 9948-P1-0005-CP1 to 9948-P1-0013-CP1**) for the monitoring period **23/05/2019 – 31/12/2019** (including both dates) we confirm that the implementation of referenced registered/revised accepted PoA and CPAs is complying with applicable CDM rules and regulations as stated in the Monitoring Report (final) **Ver 3, dated 08/09/2020 /13/**. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodologies AMS-III.AV. ver.4 Low greenhouse gas emitting safe drinking water production systems/6/ and the monitoring plan contained in the revised accepted PoA-DD/1/.

Earthood Services Private Limited is able to certify that the emission reductions from the registered CDM PoA UN#9948 “Impact Carbon Global Safe Water Programme of Activities (PoA)” in Nigeria during the period **23/05/2019 – 31/12/2019** (including both days) amount to **247,410 tCO₂e**. Therefore, this is being submitted for request for issuance, as per UNFCCC procedures

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team members

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

*Remote Audit Survey was conducted instead of on-site audit. Refer to section D.2 for details.

** Also, the interviews were conducted with the head of the institution of the schools who were well versed with the English language. They were able to understand and respond to our remote survey questions in English. Thus, no linguistic issue was faced during this remote survey.

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

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

SECTION C. Application of materiality in conducting the verification

C.1. Consideration of materiality in planning the verification

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

C.2. Consideration of materiality in conducting the verification

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

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

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

| Particulars / Monitoring Report | MR Version (Public) | MR Version (Revised/Final) |
|---|---------------------|----------------------------|
| Emission Reductions Achieved (tCO ₂ e) in this monitoring period | 245,803 | 247,410* |
| Applicable Threshold (%) as per CDM VVS for PoAs Version 02.0 | 5.0% | 5.0% |

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

| Monitored Parameter (Symbol / Description) | Reporting Frequency | Number of Discrete Data* (Total) Total (100%) | Sample selected for verification Sample (100%) | Type of error identified | Impact on ERs | |
|---|-----------------------------|--|--|--|-------------------------------------|--|
| | | | | | ERs impacted (Sample) | ERs impacted (Population based on extrapolation) |
| 9948-P1-0003-CP1, 9948-P1-0005 – 9948-P1-0013-CP1 | | | | | | |
| <u>For water purifier</u> | | | | | | |
| QPW _y | Annual or at least biennial | 10(calculated parameter for each CPA) | 10(100%) | There were errors in calculation which have been | All the errors have been corrected* | No extrapolation is required as 100% values |

| | | | | corrected (10). | | checked and corrected. |
|--|--|---|---|--------------------|----|---------------------------|
| nwb | Continuously or at least biennial | 1 | 1 | None | NA | NA |
| Tyi | Continuous | 6,637 UltraFLO 738 UltraTAB 273 Multi-UV Barrier (7,648) | 6,637 UltraFLO 738 UltraTAB 273 Multi-UV Barrier, Sales database/5/ was checked for the information. 11 WPS were checked during remote survey for cross check. | None | NA | NA |
| Nyi | Continuous | 7,648 | Entire sales database was checked for the information. | None | NA | NA |
| Water quality (WQ) | Annual or at least biennial | 69 | 11 (based on acceptance sampling) | None | NA | NA |
| Operational Units _i | At least once per verification or biennially | 74 | 11 (based on acceptance sampling) | None | NA | NA |
| f _{NRB} | Continuously or at least biennial | 1 | 1 | None | NA | NA |
| EF _{projected_fossil fuel} | Continuously or at least biennial | 1 | 1 | None | NA | NA |
| Existence of public distribution network of safe drinking water | Annual | 69 | 11 (based on acceptance sampling) | None | NA | NA |
| EG _{PJ,j,y} | Annual | 1 | 1 | None | NA | NA |

The ERs mentioned in MR (public) and the ER sheet were found to be different. An inconsistency/calculation error was identified by the CME in the ER calculator after the MR was published for webhosting. Thus, CAR#01 was raised and resolved.

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

SECTION D. Means of verification

D.1. Desk/document review

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

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

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

D.2. On-site inspection¹

| Duration of on-site inspection: NA* | | | | |
|-------------------------------------|--|---------------|-----------------------|-----------------------------------|
| No. | Activity performed on-site | Site location | Date | Team member |
| 1. | Interview of the monitoring personnel and CME representative | - | 31/03/2020-01/04/2020 | Deepika Mahala and Vaishali Vatsa |
| 2. | Interview of the head institutions of the school related to the deployed project devices | - | 31/03/2020-01/04/2020 | Deepika Mahala and Vaishali Vatsa |

*No site-visit was conducted, alternative means were adopted under which remote audit survey was conducted.

Mandatory Site-visit

A site-visit for the current verification was deemed mandatory (although this is second verification for these 10 CPAs) as these were being verified for the first time by Earthood, in-line to para 321 of VVS for PoA Version 2.0 /9/.

Planned Site-Visit

The site-visit was initially planned from 30th March,2020 - 4th March,2020. In view of the COVID-19 outbreak and increased exposure due to international travel and nation-wide lockdown in India (DOE office country), site-visit was not possible as per original plan. An advisory issued by Ministry of Health & FW on 19/03/2019 said that "No scheduled international commercial passenger aircraft shall take off from any foreign airport for any airport in India, after 0001 hrs GMT of March 22, 2020 (*i.e. 0531 hrs Indian Standard Time (IST) of March 22, 2020) - these instructions shall remain in force till 0001 hrs GMT of March 29, 2020"/43/.

Also, the Indian government has imposed 21-day lockdown. In an attempt to slow spread of the coronavirus with effect from 26/03/2020- 15/04/2020. During this, period there is total ban on venturing out of the homes/41,43/. In such situation, conducting a site visit in a foreign country became an implausible activity for the verification team.

Issue with the postponement of Site-visit:

The on-site audit visit for this verification could not be postponed as the cases of coronavirus started rising suddenly with a very high number of death rates in many countries/40/. The Indian government also foresaw the same situation to happen in India. The lockdown was imposed across the country. By each passing day it was not clear whether the lockdown would get relaxed or extended. Delaying the site visit would lead to delayed issuance of the CERs. The CME relies upon the CER revenue generated from the project as the working capital of the project. It was clarified by the CME that along with the impact on the working capital of the project, the delay might also cause ERPA/35/ being cancelled. In light of the argument and evidence (CME Mail /34/) made available by the CME a clarification for the exemption of the onsite visit was sought from CDM EB.

Exemption by CDM EB

in response to the clarification requested, an exemption (for the site-visits scheduled from.23/03/2020-23/06/2020) was provided by CDM EB. Due to the on-site visit exemption provided by the CDM-EB concerning the COVID-19 outbreak, a checklist as per the ESPL CDM QMS was made available for the application of alternative means for verifying the project related details. A declaration (Checklist for alternative means for site-visit exemption in accordance with the ESPL CDM QMS) was submitted to the Technical Manager for approval.

Alternative means applied

Following alternative means have been used to verify the project details:

1. Remote Audit Survey including interviews of CME/CPA Implementer, end users and the personnel's involved in monitoring and preparation of the monitoring report and related documents via skype meeting. Random samples for eleven WPS users (details on sampling provided in section D.3) were drawn from the sample survey sheet and interviewed through skype calls.

¹ This table lists down the activities conducted during the remote survey

2. Photographic evidences of the water quality testing kits /30/, WPS with Unique Product IDs/27/, Water Quality Test Photographs /36/, Monitoring Survey (filled) Forms/18/.
3. Complaint Log (Scanned Sample) /37/
4. Monitoring personnel certificates/20/
5. Review of Other Documentary evidences (ER sheet/4/, Sample Size Calculation sheet, Monitoring Data sheet)
6. Videos of the 11 selected samples of WPS showing the WPS installed along with the basic information related to the installation (Purchase order/14/, Delivery Notes/21/) and the interview of the respective school representative.

D.3. Interviews²

| No. | Interviewee | | | Date | Subject | Team member |
|-----|-------------|------------------|---|-----------------------|--|--------------------------------|
| | Last name | First name | Affiliation | | | |
| 1. | Brown | Julie | Impact Carbon | 31/03/2020-01/04/2020 | Sampling Surveys | Deepika Mahala, Vaishali Vatsa |
| 2. | Neville | Tim | Impact Water | 31/03/2020-01/04/2020 | Implementation | Deepika Mahala, Vaishali Vatsa |
| 3. | Akinyemi | Zacch | Impact Water Nigeria | 31/03/2020-01/04/2020 | Implementation, Sales records | Deepika Mahala, Vaishali Vatsa |
| 4. | Obunaya | Samuel | Impact Water Nigeria | 31/03/2020-01/04/2020 | Database management | Deepika Mahala, Vaishali Vatsa |
| 5. | Huelsenbeck | Mark | Impact Water Nigeria | 31/03/2020-01/04/2020 | Monitoring surveys | Deepika Mahala, Vaishali Vatsa |
| 6. | Lohia | Rohit | Climate Secure India Private Limited | 31/03/2020-01/04/2020 | Monitoring Report, Sampling methodology, ER calculations | Deepika Mahala, Vaishali Vatsa |
| 7. | - | Nihar | Climate Secure India Private Limited | 31/03/2020-01/04/2020 | ER calculation and Sampling | Deepika Mahala, Vaishali Vatsa |
| 8. | I.A. | Badrudeen | Baptist Elementary School (Head Mistress) | 01/04/2020 | DOE Remote survey | Deepika Mahala, Vaishali Vatsa |
| 9. | D.B. | Odegbenie | D.C. School (Head mistress) | 01/04/2020 | DOE Remote survey | Deepika Mahala, Vaishali Vatsa |
| 10. | - | Anne | Kingdom Pearls International School (School Head) | 01/04/2020 | DOE Remote survey | Deepika Mahala, Vaishali Vatsa |
| 11. | - | Hajia | Rahmat Islamic Nursery/Primary (Proprietress) | 01/04/2020 | DOE Remote survey | Deepika Mahala, Vaishali Vatsa |
| 12. | - | Ayeni | Treasure Fountain School (Proprietress) | 01/04/2020 | DOE Remote survey | Deepika Mahala, Vaishali Vatsa |
| 13. | - | Nnena | Daniella Montessori (Head Teacher) | 01/04/2020 | DOE Remote survey | Deepika Mahala, Vaishali Vatsa |
| 14. | Olalekan | Alhaji Al-Mauruf | Al-Maruf Nurser3y and Primary (Admininstrative) | 01/04/2020 | DOE Remote survey | Deepika Mahala, Vaishali Vatsa |

² Interviews were conducted via Skype Call

| | | | | | | |
|-----|-------------|----------------|--|------------|-------------------|--------------------------------|
| | | | Officer) | | | |
| 15. | - | Prince | Topresh-Tee Private School (Academic Staff) | 01/04/2020 | DOE Remote survey | Deepika Mahala, Vaishali Vatsa |
| 16. | Ohorumwemwu | Kenneth George | Sound Wisdom Nursery and Primary School (Proprietor) | 01/04/2020 | DOE Remote survey | Deepika Mahala, Vaishali Vatsa |
| 17. | - | Iwan | Mak-David Nursery Primary School (Head Teacher) | 01/04/2020 | DOE Remote survey | Deepika Mahala, Vaishali Vatsa |
| 18. | J O | Adurota | Sannyo Primary School (Head Teacher) | 01/04/2020 | DOE Remote survey | Deepika Mahala, Vaishali Vatsa |

D.4. Sampling approach

CME Sampling approach

For the purpose of sampling, CME has followed the CDM guidelines for Sampling and surveys for CDM project activities and programmes of activities version 4.0/31/ and Standard for Sampling and surveys for CDM project activities and programmes of activities, Version 8.0/19/ which is in-line with the revised accepted PoA DD/1/. The CME has applied Stratified Random Sampling at PoA level for different monitoring parameters as per validated revised accepted/registered PoA DD /1/and registered CPA DDs/2/. 95/10 confidence precision was applied by CME in the sampling which is appropriate as per the single sampling covering 10 CPAs. Thus, CPA wide single sampling plan was used by the CME.

DOE Sampling approach

In order to meet the requirements of paragraph 28 of Standard for Sampling and surveys for CDM project activities and programmes of activities, Version 8/19/ the verification team applied acceptance sampling in the verification (in accordance with para 28).

According to para 30 of Standard for Sampling and surveys for CDM project activities and programmes of activities, Version 8/19/, The maximum errors associated with the determination have been kept at following level:

- (a) A 10 per cent chance that the DOE will wrongly reject the project participants' or the coordinating/managing entity's records (i.e. reject a set of records of acceptable quality);
- (b) A 10 per cent chance that the DOE will wrongly accept the project participants' or the coordinating/managing entity's records (i.e. accept a set of records which is unacceptable).

Verification team has applied following AQL and UQL level using its own judgement:

0.5% AQL- Acceptable quality level (AQL) or the level of assurance, that is the proportion of acceptable discrepancies between the project participants' or the coordinating/managing entity's sample records and the DOE sample records

20% UQL- Unacceptable quality level (UQL), that is the proportion of unacceptable discrepancies between the project participants' or the coordinating/managing entity's sample records and the DOE sample records.

The verification team selected the sample size as 11 WPS for the purpose of remote survey to check the acceptability of CME's sampling results or otherwise.

Sample Size:

| CPA Ref No. | AQL | UQL | Producer Risk | Consumer Risk | Sample Size; Min | Acceptance No. |
|--|------|-----|---------------|---------------|------------------|----------------|
| 9948-P1-0003-CP1, 9948-P1-0005 to 9948-P1-0013-CP1 | 0.5% | 20% | 10% | 10% | 11 | 0 |

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

The distribution breakup from sales database is as follows:

| Type of WPS | No. of units |
|------------------|--------------|
| Ultra FLO | 6637 |
| Ultra Tab | 738 |
| Multi-Barrier UV | 273 |

Since, the distribution ratio between the three categories is 6:2:1, the DOE's sample size of 11 units was also divided in a similar ratio. These 11 samples were chosen randomly (using website www.randomizer.org) out of total of 74 CME's monitored samples (as part of monitoring survey). As per plan 11 systems (WPS) were required and DOE surveyed 8 samples of Ultra FLO type and 2 samples of Ultra Tab type and 1 sample of Multi-UV barrier type. No inconsistency between the CME results and DOE's observations during the remote audit survey were found.

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 | - | - | - |
| Remaining forward action requests from validation and/or previous verifications | - | - | - |
| CPAs considered for verification and covered in this report | - | CAR#04 | - |
| Programme of activities | - | - | - |
| Compliance of the programme implementation with the registered PoA-DD | - | - | - |
| Implementation and operation of the management system | - | CAR#02 | - |
| Post-registration changes | - | - | - |
| • Corrections | - | - | - |
| • Inclusion of a monitoring plan | - | - | - |
| • Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents ³ | - | - | - |
| • Changes to the programme design | - | - | - |
| • Addition of CPA inclusion template | - | - | - |
| • Change of coordinating/managing entity | - | - | - |
| • Changes specific to afforestation and reforestation activities | - | - | - |
| Component project activities | - | - | - |
| Compliance of the CPA implementation with the included CPA design document | - | - | - |
| Post-registration changes | - | - | - |
| • Temporary deviations from registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents | - | - | - |
| • Corrections | - | - | - |
| • Changes to the start date-of the crediting period | - | - | - |
| • Inclusion of a monitoring plan | - | - | - |
| • Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents | - | - | - |
| • Changes to the project design | - | - | - |
| • Changes specific to afforestation and reforestation activities | - | - | - |

³ 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).

| | | | |
|--|---|------------------|-----------|
| Compliance of the registered monitoring plan with applied methodologies and standardized baselines | - | - | - |
| Compliance of monitoring activities with the registered monitoring plan | - | - | - |
| <ul style="list-style-type: none"> Data and parameters fixed ex ante or at renewal of crediting period | - | - | - |
| <ul style="list-style-type: none"> Data and parameters monitored | CL#01 CL#04 CL#05 CL#06 CL#07 | CAR#02 CAR#03 | - |
| <ul style="list-style-type: none"> Implementation of sampling plan | CL#02 | CAR#03 | - |
| Compliance with the calibration frequency requirements for measuring instruments | - | - | - |
| Assessment of data and calculation of emission reductions or net removals | - | - | - |
| <ul style="list-style-type: none"> Calculation of baseline GHG emissions or baseline net GHG removals by sinks | CL#03 | - | - |
| <ul style="list-style-type: none"> Calculation of project GHG emissions or actual net GHG removals by sinks | - | - | - |
| <ul style="list-style-type: none"> Calculation of leakage GHG emissions | - | - | - |
| <ul style="list-style-type: none"> Summary of calculation of GHG emission reductions or net GHG removals by sinks | - | - | - |
| <ul style="list-style-type: none"> Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA | - | CAR#01 | - |
| <ul style="list-style-type: none"> Remarks on difference from estimated value in included CPA | - | - | - |
| Assessment of reported sustainable development co-benefits | - | - | - |
| Global stakeholder consultation | - | - | - |
| Others (please specify) | - | - | - |
| Total | 07 | 04 | 00 |

SECTION E. Verification findings

E.1. General

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

| | |
|------------------------------|---|
| Means of verification | The monitoring report form used is CDM-PoA-MR-FORM version 03.0/10/ which is an appropriate form and the latest version available at the time of verification/submission for request for issuance. All the sections of the aforesaid form were duly filled as per the guidelines and provided all the relevant details. |
| Findings | No findings were raised. |
| Conclusion | The final monitoring report /13/ is found to be in-line with the latest CDM-PoA-MR-form/10/ available and the instructions therein. |

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

No FAR was found to be raised during the validation of inclusion of CPAs/03/ or previous verification/40/.

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

| Title and UNFCCC reference number of the CPA included in the PoA as of the end of this monitoring period | Is the CPA considered for this verification? (yes/no) | The date when the CPA was included | Version of the PoA-DD | Confirmation that a request for issuance including the CPA has been published for the previous monitoring period (Y/N) |
|--|---|------------------------------------|-----------------------|--|
|--|---|------------------------------------|-----------------------|--|

| | | | | |
|---|-----|------------|-----|-----|
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 1, Version: 3.0, 9948-P1-0001-CP1 | No | 01/05/2014 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 2, Version: 3.0, 9948-P1-0002-CP1 | No | 01/05/2014 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 3, Version: 1.3, 9948-P1-0003-CP1 | Yes | 08/05/2017 | 7.0 | Yes |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 4, Version: 01.2, 9948-P1-0004-CP1 | No | 02/07/2017 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 5, Version: 5.0, 9948-P1-0005-CP1 | Yes | 04/10/2017 | 7.0 | Yes |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 6, Version: 5.0, 9948-P1-0006-CP1 | Yes | 04/10/2017 | 7.0 | Yes |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 7, Version: 5.0, 9948-P1-0007-CP1 | Yes | 04/10/2017 | 7.0 | Yes |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 8, Version: 5.0, 9948-P1-0008-CP1 | Yes | 04/10/2017 | 7.0 | Yes |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 9, Version: 5.0, 9948-P1-0009-CP1 | Yes | 04/10/2017 | 7.0 | Yes |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 10, Version: 5.0, 9948-P1-0010-CP1 | Yes | 04/10/2017 | 7.0 | Yes |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 11, Version: 5.0, 9948-P1-0011-CP1 | Yes | 04/10/2017 | 7.0 | Yes |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 12, Version: 5.0, 9948-P1-0012-CP1 | Yes | 04/10/2017 | 7.0 | Yes |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 13, Version: 5.0, 9948-P1-0013-CP1 | Yes | 04/10/2017 | 7.0 | Yes |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 14, Version: 1.0, 9948-P1-0014-CP1 | No | 21/11/2017 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 15, Version: 1.0, 9948-P1-0015-CP1 | No | 21/11/2017 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities | No | 21/11/2017 | 7.0 | NA |

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|--|----|------------|-----|----|
| (PoA): CPA 16, Version: 5.0, 9948-P1-0016-CP1 | | | | |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 17, Version: 5.0, 9948-P1-0017-CP1 | No | 21/11/2017 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 18, Version: 5.0, 9948-P1-0018-CP1 | No | 21/11/2017 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 19, Version: 5.0, 9948-P1-0019-CP1 | No | 21/11/2017 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 20, Version: 5.0, 9948-P1-0020-CP1 | No | 21/11/2017 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 21, Version: 5.0, 9948-P1-0021-CP1 | No | 21/11/2017 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 22, Version: 5.0, 9948-P1-0022-CP1 | No | 21/11/2017 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 23, Version: 4.0, 9948-P1-0023-CP1 | No | 18/11/2018 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 24, Version: 4.0, 9948-P1-0024-CP1 | No | 18/11/2018 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 25, Version: 4.0, 9948-P1-0025-CP1 | No | 18/11/2018 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 26, Version: 4.0, 9948-P1-0026-CP1 | No | 18/11/2018 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 27, Version: 4.0, 9948-P1-0027-CP1 | No | 18/11/2018 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 28, Version: 4.0, 9948-P1-0028-CP1 | No | 18/11/2018 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 29, Version: 4.0, 9948-P1-0029 | No | 18/11/2018 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 30, Version: 4.0, 9948-P1-0030-CP1 | No | 18/11/2018 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 31, Version: 4.0, 9948-P1-0031-CP1 | No | 18/11/2018 | 7.0 | NA |

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|--|----|------------|-----|-----------------|
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 32, Version: 4.0, 9948-P1-0032-CP1 | No | 18/11/2018 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 33, Version: 4.0, 9948-P1-0033-CP1 | No | 18/11/2018 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 34, Version: 4.0, 9948-P1-0034-CP1 | No | 18/11/2018 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 35, Version: 4.0, 9948-P1-0035-CP1 | No | 18/11/2018 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 36, Version: 4.0, 9948-P1-0036-CP1 | No | 18/11/2018 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 37, Version: 4.0, 9948-P1-0037-CP1 | No | 18/11/2018 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 38 supported by Republic of Korea, Version: 2.0, 9948-P1-0038-CP1 | No | 26/04/2019 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 39 supported by Republic of Korea, Version: 2.0, 9948-P1-0039-CP1 | No | 26/04/2019 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 40 supported by Republic of Korea, Version: 2.0, 9948-P1-0040-CP1 | No | 26/04/2019 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 41 supported by Republic of Korea, Version: 2.0, 9948-P1-0041-CP1 | No | 26/04/2019 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 42 supported by Republic of Korea, Version: 2.0, 9948-P1-0042-CP1 | No | 26/04/2019 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 43 supported by Republic of Korea, Version: 1.0, 9948-P1-0043-CP1 | No | 26/04/2019 | 7.0 | NA ⁴ |
| 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 | 7.0 | NA |

⁴ 9948-0043 to 9948-0077 are being verified for the first time therefore there is no verification history for these CPAs.

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|--|----|------------|-----|----|
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities | No | 26/04/2019 | 7.0 | NA |

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|--|----|------------|-----|----|
| (PoA): CPA 57 supported by Republic of Korea, Version: 1.0, 9948-P1-0057-CP1 | | | | |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 69 supported by Republic of Korea, Version: | No | 26/04/2019 | 7.0 | NA |

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|--|----|------------|-----|----|
| 1.0, 9948-P1-0069-CP1 | | | | |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| Impact Carbon Global Safe | No | 26/04/2019 | 7.0 | NA |

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|--|----|------------|-----|----|
| Water Programme of Activities (PoA): CPA 82 supported by Republic of Korea, Version: 1.0, 9948-P1-0082-CP1 | | | | |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 94 supported by | No | 26/04/2019 | 7.0 | NA |

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|---|----|------------|-----|----|
| Republic of Korea, Version: 1.0, 9948-P1-0094-CP1 | | | | |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | 7.0 | NA |
| 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 | NA |
| 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 | NA |
| 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 | NA |

E.2. Programme of activities

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

| Means of verification | <p>The PoA aims at disseminating water purification systems (WPS) technologies to target countries like Rwanda, Nigeria, Uganda, and Kenya for addressing the problem of safe drinking water. During this monitoring period, 9 CPA's of Type 2: Technologies for institutional water consumption, with no project emissions and 1 CPA of Type 3: Technologies for institutional water consumption, with project emissions have been covered under the MR. This monitoring period includes the implementation and monitoring of 10 CPAs from 9948-P1-0003-CP1, 9948-P1-0005-CP1 to 9948-P1-0013-CP1 in Nigeria. The coordinating and managing entity (CME) is Impact Carbon, and Impact Water is the CPA Implementer/15/. Their roles and responsibilities are defined in the signed agreement.</p> <p>In absence of the project activity, the water would have been boiled using non-renewable biomass/fossil fuels leading to release of GHG emissions in the baseline. The implementation of the technology helps in replacing the non-renewable biomass / fossil fuel for boiling with the WPS reducing amount of equivalent GHG emissions.</p> <p>CPAs of this PoA involve dissemination of two types of water purification systems:</p> <ol style="list-style-type: none"> 1. UltraFLO 2. UltraTab 3. Multi-UV Barrier <table border="1"> <thead> <tr> <th>Description</th><th>UltraFLO</th><th>UltraTab</th><th>Multi-UV Barrier</th></tr> </thead> <tbody> <tr> <td>Size / Dimensions</td><td>Cartridge Length: ~12 cm Cartridge height: ~10 cm Cartridge circumference: ~22 cm</td><td>Strip size: ~13 cm X ~5.5 cm (100 tablets per packet)</td><td>System Height: ~44cm System Length: ~36 cm System Width: ~19 cm</td></tr> <tr> <td>Application</td><td>Piped water</td><td>Un-piped water</td><td>Piped water</td></tr> <tr> <td>Flow rate</td><td>20L/min</td><td>1 tablet treats 100 L</td><td>5-12 L/min</td></tr> <tr> <td>Capacity/lifespan</td><td>340,000 L / 5-year expiry</td><td>10,000 L / 5-year expiry</td><td>7 years</td></tr> <tr> <td>Fixed or Portable</td><td>Fixed</td><td>Portable</td><td>Fixed</td></tr> <tr> <td>Removal of E. Coli</td><td>99 (2-log)</td><td>99 (2-log)</td><td>99 (4-log)</td></tr> <tr> <td>Watts/Voltage</td><td>Not applicable</td><td>Not applicable</td><td>14</td></tr> </tbody> </table> <p>All the deployed systems meet the eligibility requirements of the PoA DD, page 65/1/. The details of the systems were verified from the manufacturer's specification/28/ provided by the CME.</p> <p>Through the remote survey videos/38/ the installation of WPS claimed by the CME were checked and found to be in-line with the technical description provided in the registered PoA-DD/1/ and Monitoring report/13/.</p> <p>Also, the verification team checked the implementation status of the project activity through interviewing the CME, CPA implementer, Monitoring personnel and WPS User as defined in the registered PoA DD/1/, and MR/13/.</p> <p>Interview of the monitoring personnel via skype call involved in the QA/QC procedures revealed that the procedures mentioned in the PoA DD/1/ are being followed and the Training records/20/ regarding the trained personnel were checked.</p> <p>The project location and coordinates shared by CME were verified using the "Google Map app" and found to be in-line with the registered PoA-DD/1/ and MR/13/.</p> | | | Description | UltraFLO | UltraTab | Multi-UV Barrier | Size / Dimensions | Cartridge Length: ~12 cm Cartridge height: ~10 cm Cartridge circumference: ~22 cm | Strip size: ~13 cm X ~5.5 cm (100 tablets per packet) | System Height: ~44cm System Length: ~36 cm System Width: ~19 cm | Application | Piped water | Un-piped water | Piped water | Flow rate | 20L/min | 1 tablet treats 100 L | 5-12 L/min | Capacity/lifespan | 340,000 L / 5-year expiry | 10,000 L / 5-year expiry | 7 years | Fixed or Portable | Fixed | Portable | Fixed | Removal of E. Coli | 99 (2-log) | 99 (2-log) | 99 (4-log) | Watts/Voltage | Not applicable | Not applicable | 14 |
|------------------------------|--|--|---|-------------|----------|----------|------------------|-------------------|---|--|---|-------------|-------------|----------------|-------------|-----------|---------|-----------------------|------------|-------------------|---------------------------|--------------------------|---------|-------------------|-------|----------|-------|--------------------|------------|------------|------------|---------------|----------------|----------------|----|
| Description | UltraFLO | UltraTab | Multi-UV Barrier | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Size / Dimensions | Cartridge Length: ~12 cm Cartridge height: ~10 cm Cartridge circumference: ~22 cm | Strip size: ~13 cm X ~5.5 cm (100 tablets per packet) | System Height: ~44cm System Length: ~36 cm System Width: ~19 cm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Application | Piped water | Un-piped water | Piped water | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Flow rate | 20L/min | 1 tablet treats 100 L | 5-12 L/min | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacity/lifespan | 340,000 L / 5-year expiry | 10,000 L / 5-year expiry | 7 years | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fixed or Portable | Fixed | Portable | Fixed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Removal of E. Coli | 99 (2-log) | 99 (2-log) | 99 (4-log) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Watts/Voltage | Not applicable | Not applicable | 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| | <p>Further, based on the review of sales database (presented in ER sheet)/4/, remote audit survey observations and interview conducted during the remote audit survey, the verification team found that:</p> <ul style="list-style-type: none"> • The CPA(s) were implemented within the boundary of the PoA as described in the revised accepted PoA-DD/1/. • The CME is same as that mentioned in the revised accepted PoA-DD/1/ • The implementation and operation of the project activity has been conducted in accordance with the description contained in the revised accepted PoA-DD/1/ and included CPA-DDs/2/. • All physical features of the CPA proposed in the included CPA-DDs/2/ were in place • The project participants/CPA implementer has operated the CPAs as per the included CPA DDs/2/. <p>A remote audit survey was conducted by the verification team; 11 WPS (8 for Ultra FLO, 2 for Ultra TAB and 1 Multi-barrier UV units) were surveyed. The uniqueness of the system was identified from UID written on the units (either on UltraFLO cartridges or on TAB box packs or Multi Barrier UV device)/27/. Along with the unique ID the following details are also noted in the database:</p> <ol style="list-style-type: none"> a) Type of system (UltraFLO / UltraTAB / Multi-Barrier UV) b) Unique serial number of the units installed / distributed c) Date of installation / distribution d) Address and details of school and contact detail (if available) of representative e) Type of School (Boarding / Non-boarding) f) School population count (number of students / staff in boarding / non-boarding category) <p>The information of the installed device was also verified from the CME database/5/ which was cross checked for 11 WPS samples with the purchase orders/14/.</p> <p>The emission reductions being claimed during this monitoring period are lesser than the estimated emission reductions in the revised or included CPA-DDs/2/, as given in the table under section E.3.6.5. for comparable estimated ERs in the CPA DDs/2/ for the corresponding period.</p> <p>The CPAs are within the threshold limits of the applied methodology/6/.</p> <p>The monitoring report was compared and verified against the description provided in the revised accepted PoA-DD/1/ and found to be correct.</p> |
| Findings | No finding was raised. |
| Conclusion | <p>In view of the information's verified through the remote audit survey and interviews, the verification team is able to confirm that all physical features (technology, project equipment, and monitoring and metering equipment) of the registered CDM program of activities were in place and that the CME has operated the project activity as per the registered PoA-DD/1/ during the concerned monitoring period.</p> <p>The emission reductions achieved during the current monitoring period are 247,410 tCO₂e. Justification for this has been assessed in further sections of report.</p> |

E.2.2. Implementation and operation of the management system

| | |
|------------------------------|---|
| Means of verification | <p>The verification team through interviewing the CME, CPA Implementer, Monitoring Personnel and WPS End-users and reviewing the selected sample videos assessed the management systems in place to implement the monitoring of the PoA. This included the roles and responsibilities, data collection, transfer and aggregation procedures, data storage and archiving for the monitoring system through physical inspection. The roles and responsibilities, data collection, transfer and aggregation procedures, data storage and archiving for the monitoring system</p> |
|------------------------------|---|

| | |
|-------------------|---|
| | <p>have been provided in the MR /13/ and were verified through interviews with the CME and other people involved in the project.</p> <p>CPA implementers fill purchase order/14/ to note the details of the institution and provide delivery note/21/ at the time of installation (receipt of tablets in case of Ultra TAB). All the information is transferred to Salesforce software by the CME which was checked by interviewing the monitoring personnel to confirm that the management system is in place. The sales database was crosschecked with purchase order, delivery notes and Salesforce data to confirm that information for any system installed (unique ID) is consistent between the records. The unique ID code of WPS is combination of system type code, year code, country code and a serial number. The unique IDs of the WPS were checked for all the sampled systems surveyed during remote survey to ensure that no number is repeating in the database and the same system is not credited in any other CPA either, thus avoiding the double counting.</p> <p>The CME also has a customer care centre which contacts the schools to ensure if the cartridge replacement (Ultra FLO/Multi-barrier UV) or new packets of tablets (Ultra TAB) are required or not.</p> <p>For data survey, a monitoring team has been organized by the CME consisting of trained monitoring staff, who conducted the Aquagenx tests (water quality tests) and Usage surveys. The monitoring manager at the CME is responsible for QA/QC of the data, analysis and reporting in the monitoring report. QA/QC procedures were found being as confirmed from the CME during the interview via telephonic call. Scanned copies of purchase order /14/ and completed monitoring survey forms with test results/18/ were made available to the verification team for assessment of the information of institutions and survey and test results, in the sales data and monitoring data mentioned in ER calculator/5/. Monitoring team staff were interviewed by the verification team regarding the monitoring procedures, using the water quality testing kits and filling the monitoring questionnaires. The staff explained the complete procedure followed for Aquagenx tests and the monitoring survey form filling. The evaluation of the water quality test is done in the main office. The verification team also checked training records of the monitoring & data recording personnel/20/.</p> <p>Thus, it can be confirmed that the Implementation and operation of the management system has been done in line with the registered PoA DD/1/ and CPA DDs/2/.</p> |
| Findings | CAR#02 was raised and resolved. |
| Conclusion | The verification team from the desk review and remote survey assessment confirms that the monitoring management system of the PoA is in place with the responsibilities properly identified and established. |

E.2.3. Post-registration changes

E.2.3.1. Corrections

No correction observed

E.2.3.2. Inclusion of a monitoring plan

N/A

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

N/A

E.2.3.4. Changes to the programme design

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

| PRC request number | Approval Status | Date of Approval | Reference Link |
|--------------------|-----------------|------------------|----------------|
|--------------------|-----------------|------------------|----------------|

| | | | |
|--------------|----------|------------|---|
| PRC-9948-002 | Approved | 03/07/2017 | https://cdm.unfccc.int/PRCContainer/DB/prcp445611461/view |
| PRC-9948-001 | Approved | 08/05/2017 | https://cdm.unfccc.int/PRCContainer/DB/prcp266525508/view |

E.2.3.5. Addition of CPA inclusion template

N/A

E.2.3.6. Change of coordination/managing entity

N/A

E.2.3.7. Changes specific to afforestation and reforestation activities

N/A

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

| | | | | | | | | | |
|---|--|--|----------------------------------|----------------------------------|------------------------------------|-------------------------------------|-------------------|--------------------------------|--------------------------------|
| Means of verification | The registered PoA aims to provide safe drinking water to the institutions in Nigeria, Rwanda, Uganda and Kenya. The PoA is primarily designed to replace the existing fossil fuel / non-renewable woody biomass based means of purifying water by installing low emission / emission free Water purification systems to provide safe drinking water. Impact Water is the implementer of the CPAs and has fully implemented the CPAs with the help of Sales and Distribution Partners (SDP). The same has been verified from the agreement between the CME and CPAI/15/. This monitoring period includes the implementation and monitoring of 10 CPAs- CPA 9948-P1-0003-CP1,9948-P1-0005-CP1 to 9948-P1-0013-CP1 in Nigeria. | | | | | | | | |
| | CPA no. | First WPS Installation date | Inclusion date | Crediting period | No. of units | | | Estima ted ERs | ERs achiev ed |
| | | | | | FLO | TAB | Multi-barri er UV | | |
| | 9948-P1-0003-CP1 | 01/04/2017 | 08/05/2017 | 23/05/2017-22/05/2024 | 0 | 0 | 273 | 15,547 | 11,078 |
| | 9948-P1-0005-CP1 | 11/01/2018 | 04/10/2017 | 04/10/2017-03/10/2024 | 1,172 | 0 | 0 | 36,521 | 27,691 |
| | 9948-P1-0006-CP1 | 12/07/2018 | 04/10/2017 | 04/10/2017-03/10/2024 | 845 | 0 | 0 | 36,521 | 27,740 |
| | 9948-P1-0007-CP1 | 30/08/2018 | 04/10/2017 | 04/10/2017-03/10/2024 | 802 | 0 | 0 | 36,521 | 27,088 |
| | 9948-P1-0008-CP1 | 09/10/2018 | 04/10/2017 | 04/10/2017-03/10/2024 | 756 | 0 | 0 | 36,521 | 26,266 |
| | 9948-P1-0009-CP1 | 09/11/2018 | 04/10/2017 | 04/10/2017-03/10/2024 | 682 | 0 | 0 | 36,521 | 26,707 |
| | 9948-P1-0010-CP1 | 07/12/2018 | 04/10/2017 | 04/10/2017-03/10/2024 | 556 | 0 | 0 | 36,521 | 24,997 |
| | 9948-P1-0011-CP1 | 11/01/2019 | 04/10/2017 | 04/10/2017-03/10/2024 | 713 | 0 | 0 | 36,521 | 26,979 |
| | 9948-P1-0012-CP1 | 13/02/2019 | 04/10/2017 | 04/10/2017-03/10/2024 | 631 | 262 | 0 | 36,521 | 26,328 |
| | 9948-P1-0013-CP1 | 19/03/2019 | 04/10/2017 | 04/10/2017-03/10/2024 | 480 | 476 | 0 | 36,521 | 22,536 |
| | | As checked from the delivery notes/21/ | Checked from the UN website /12/ | Checked from the UN website /12/ | Check- ed from sales data base/5 / | Chec k- ed from sales data base/ 5/ | | Check ed from the ER sheet/ 4/ | Check ed from the ER sheet/ 4/ |
| As per the registered PoA-DD page 59 “products deployed under the project activity are assumed be | | | | | | | | | |

| | |
|-------------------|---|
| | <p><i>in operation as of the start of the next month following the date of sale</i>". Thus, any installation in the month of Dec 2019 will be eligible for crediting only in the month of Jan 2020. Given, the current monitoring period is ending in 31 Dec 2019, therefore only the units installed in Nov 2019 (up to 30-Nov-2019) are eligible for crediting under the concerned monitoring period. Thus, the CME has considered 30-Nov-2019 as the cut-off date of installation covered for this monitoring period.</p> <p>It has been checked by the verification team from the ER sheet/4/ that the ERs achieved for the CPAs lies between 11,078 tCO₂e – 27,740 tCO₂e, which is below the threshold of small-scale activity. It has been confirmed that:</p> <ol style="list-style-type: none"> 1. Each of these CPAs achieves an annual emission reduction equal to or less than 60,000 tCO₂e per year thus complying with the applied methodology SSC threshold/6/, 2. Each of the technologies installed under these CPAs achieves an annual emission reduction equal to or less than 3,000 tCO₂e per year (5% of the SSC limit) thus fulfilling the additionality criteria stated in the CPA DD/2/ and PoA DD/1/. 3. Each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the applied methodology (i.e. not exceeding 600tCO₂e for SSC type III methodologies) thus fulfilling the additionality criteria stated in the CPA DD/2/ and PoA DD/1/. <p>The implementation of the CPA as mentioned above is within the geographical boundary of PoA-DD/1/, which constitutes the physical boundary as well. Impact Carbon is the CME of the CPA and Impact Water is the CPAI/15/.</p> <p>The reference number and the inclusion date of CPAs have been checked and verified from the UN website/12/ and the details are found correct and consistent. The start date of CPAs was confirmed from the delivery notes/21/. The WPS are installed across Nigeria.</p> |
| Findings | No findings were raised. |
| Conclusion | <ol style="list-style-type: none"> a) The verification team is of the opinion that physical features of the CPA have been implemented in accordance with the registered CPA-DD. b) No specific monitoring equipment had to be installed according to the monitoring plan. c) It is also confirmed, through the remote audit survey and review of the supporting documentation that physical features of the component CPA have been implemented in accordance with the CPA-DD. d) The CPA was also found to be completely operational in line with the CPA-DD. e) The information provided in the relevant sections of the monitoring report appropriately describes the implementation and operational status of the PoA |

E.3.2. Post-registration changes

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

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

E.3.2.2. Corrections

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

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

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

No changes to the start date of crediting period.

E.3.2.4. Inclusion of a monitoring plan

Not Applicable

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

Not Applicable

E.3.2.6. Changes to the project design

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

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

E.3.2.7. Changes specific to afforestation and reforestation activities

Not Applicable

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

| | |
|------------------------------|---|
| Means of verification | The monitoring plan as contained in CPA-DDs/2/ were reviewed against the monitoring requirements of the applied methodology AMS-III.AV version 04 /6/ as well as PoA-DD/1/ with reference to the technology involved. Based on this review, it was found that the monitoring plan contained in the CPA DDs/2/ includes all the required parameters to be monitored in the context of the CPA design and description and allows proper determination of emission reductions in accordance with PoA DD/1/ and applied methodology AMS-III.AV version 04/6/. |
| Findings | No findings were raised |
| Conclusion | The monitoring plan is in line with the approved methodology AMS III A.V Ver.4/6/, that is included in the CPA-DDs/2/. |

E.3.4. Compliance of monitoring activities with the registered monitoring plan**E.3.4.1. Data and parameters fixed ex ante or at renewal of crediting period**

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

| | |
|------------------------------|--|
| Means of verification | The CPAs located in Nigeria fall under Case 1. It was checked from CPA DDs/2/ and study report MICS 2016-2017/23/ which states that only 22.7% of the Nigerian population has access to clean drinking water, hence Case 1 is applied. |
| Findings | No findings were raised |
| Conclusion | The value applied is found to be consistent with the registered CPA-DDs/2/ which is correct and justified. |

Specific Heat of water, WH, kJ/L °C

| | |
|------------------------------|---|
| Means of verification | The value of the parameter is fixed at the time of validation and the value has been sourced from Methodology A.M.S.-III.AV Ver.4/6/. The value considered is 4.186 kJ/L °C and is found to be consistent with the CPA-DD/2/. |
| Findings | No findings were raised |
| Conclusion | The value in the MR/13/ and ER sheet /4/ are consistent with the registered PoA-DD/1/ & CPA-DDs/2/. The applied value is correct and justified. |

Final Temperature, T_f, (°C)

| | |
|------------------------------|---|
| Means of verification | The value of the parameter is fixed at the time of validation and the value is sourced from the methodology AMS-III.AV version 4.0/6/. The values as available in MR is 100 which is found consistent with the values in CPA-DD/2/. |
| Findings | No findings were raised |
| Conclusion | The value in the MR/13/ and ER sheet /4/ are consistent with the registered PoA-DD/1/ & CPA-DDs/2/. The applied value is correct and justified. |

Initial Temperature, T_i

| | |
|------------------------------|---|
| Means of verification | The value of the parameter is fixed at the time of validation and the value is sourced from the methodology AMS-III.AV version 4.0/6/. The value considered is 20 and is found to be consistent with the CPA-DD/2/. |
| Findings | No findings were raised |
| Conclusion | The value in the MR/13/ and ER sheet /4/ are consistent with the registered PoA-DD/1/ & CPA-DDs/2/. The applied value is correct and justified. |

Latent heat of Water Evaporation, WHE, kJ/L

| | |
|------------------------------|---|
| Means of verification | The value of the parameter is fixed at the time of validation and the value is sourced from the methodology A.M.S.III AV- version 4/6/. The value considered is 2,260 kJ/L and is found to be consistent with the CPA-DDs/2/. |
| Findings | No findings were raised |
| Conclusion | The value in the MR and ER sheet /13,4/ are consistent with the registered PoA-DD/1/ & CPA-DDs/2/. The applied value is correct and justified. |

Leakage, L

| | |
|------------------------------|---|
| Means of verification | The value of the parameter is fixed at the time of validation and the value is sourced from the methodology AMS-I.E version 5.0 /25/. The value considered is 0.95 and is found to be consistent with the CPA-DDs/2/. |
| Findings | No findings were raised |
| Conclusion | The value in the MR /13/and ER sheet /4/ are consistent with the registered PoA-DD/1/ & CPA-DD/2/. The applied value is correct and justified. |

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

| | |
|------------------------------|---|
| Means of verification | The value of the parameter is fixed at the time of validation and the value is sourced from the report WHO Minimum water quantity needed for domestic use in emergencies/24/. The value considered is 2 (for day schools) and 3.5 (for boarding schools, prisons) and is found to be consistent with the CPA-DD/2/. |
| Findings | No findings were raised |
| Conclusion | The value in the MR and ER sheet /13,4/ are consistent with the registered PoA-DD/1/ & CPA-DD/2/. The applied value is correct and justified. |

Emission Factor for electricity generation for source j in year y, $EF_{EL,j,y}$, tCO_2/MWh

| | |
|------------------------------|--|
| Means of verification | The value of the parameter is fixed at the time of validation and the value is sourced from the "Tool 05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation, Version 1.0"/39/. The value considered is 1.3 tCO_2/MWh and was found to be consistent with the CPA-DD/2/. |
| Findings | No findings were raised |
| Conclusion | The value in the MR and ER sheet /13,4/ are consistent with the registered PoA-DD/1/ & CPA-DD/2/. The applied value is correct and justified. |

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

| | |
|------------------------------|--|
| Means of verification | The value of the parameter is fixed at the time of validation and the value is sourced from the "Tool 05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation, Version 1.0"/39/. The value considered is 20% which is a default value sourced from Tool 05 and was found to be consistent with the CPA-DD/2/. |
| Findings | No findings were raised |
| Conclusion | The value in the MR and ER sheet /13,4/ are consistent with the registered PoA-DD/1/ & CPA-DD/2/. The applied value is correct and justified. |

E.3.4.2. Data and parameters monitored

Quantity of purified water in year y, QPW_y (liters/year):

| Means of verification | Criteria/Requirements | Assessment/Observations |
|-----------------------|---|---|
| | Measuring /Reading /Recording frequency | Annually |
| | Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No) | Yes. |
| | Monitoring equipment | NA |
| | How were the values in the monitoring report verified? | <p>The value applied is 960,240,389 litres.</p> <p>The parameter is a calculated parameter determined through following equation:</p> $QPW_y = \sum (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times \text{Water Quality}_i \times \text{Operational Units}_i)$ <p>The formula is correct and in line to the applied methodology/6/, PoA DD/1/ and CPA DDs/2/.</p> <p>The installation for CPAs under the verification has been done between 01/04/2017-19/11/2019.</p> <p>As per the page 59 of revised approved PoA DD/1/, "The date of installation for each unit is used to determine the portion of the monitoring period during which the unit was active. Products deployed under the project activity are assumed be in operation as of the start of the next month following the date of sale, i.e. if the date of sale is April 1st, the start of operation is May 1"</p> <p>Thus, for all the systems installed in April 2019, ERs will be claimed in May 2019.</p> <p>The end date of the monitoring period is 31/12/2019.</p> <p>The ER sheet/4/ was checked to confirm that the formula has been applied correctly.</p> |
| | If applicable, has the reported data been cross-checked with other available data? | Yes. The equation used for the calculation is correct and is sourced from the paragraph 11 of the applied methodology/6/ |
| | Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place? | NA |
| | In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as | NA |

| | | |
|-------------------|---|--|
| | stipulated by Appendix 1 to the CDM Project Standard? | |
| Findings | CAR#01 was raised and resolved | |
| Conclusion | The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/. | |

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

| Means of verification | Criteria/Requirements | Assessment/Observations |
|-----------------------|---|--|
| | Measuring /Reading /Recording frequency | Continuously |
| | Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No) | Yes |
| | Monitoring equipment | NA |
| | How were the values in the monitoring report verified? | <p>The parameter is determined by sourcing a default value from the applied methodology/6/ and multiplying it with the proportion of population of the institutions different type of stove.</p> <p>The GACC report for Nigeria, 2016/16/ was reviewed to confirm that the all public institutions cook with wood on traditional three stone fire.</p> <p>Therefore, a value of efficiency for unimproved stove was applied.</p> |
| | If applicable, has the reported data been cross-checked with other available data? | Yes. Sampled number of entries (11) were surveyed. The head/deputy head of the institutions were interviewed to know the treatment method used in the absence of the WPS installation. All interviewed people replied that unsafe drinking water was used from boreholes/wells and boiling water would have been the cheapest option to get safe drinking water. No other means were deemed affordable by the institutions. |
| | Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place? | NA |
| | In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard? | NA |
| Findings | CL#01 was raised and resolved | |
| Conclusion | The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/. | |

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

| Means of verification | Criteria/Requirements | Assessment/Observations |
|-----------------------|---|---|
| | Measuring /Reading /Recording frequency | Continuously |
| | Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No) | Yes |
| | Monitoring equipment | NA |
| | How were the values in the monitoring report verified? | <p>The total number of systems reported in the monitoring report are as following:</p> <p>6637 UltraFLO</p> <p>738 UltraTAB</p> <p>273 Multi-Barrier UV</p> <p>The CME keeps purchase order/14/, delivery notes/21/ and details of each system on salesforce as checked from the survey videos provided by CME.</p> <p>Each unit of Ultra FLO system has unique ID, which is listed in the database and has been claimed for ERs.</p> <p>For Ultra TAB system, the value of the parameter has been determined by considering each institution as a system. Therefore, for institutions with Ultra TAB, the number of tab systems is same as number of institutions.</p> <p>Again, each unit of for Multi-UV Barrier has a UID, each of which has been listed in the database and ERs have been claimed.</p> <p>The entries in database were checked to confirm the total number presented in the MR. 11 WPS samples were remotely surveyed also, to confirm that the details of the entries in the database/5/ are correct.</p> |
| | If applicable, has the reported data been cross-checked with other available data? | Yes. Sampled number of entries (11) were checked with the installation invoices/14/ and the delivery notes/21/. |
| | Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place? | Yes |
| | In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard? | NA |
| Findings | CL#01, CL#06 were raised and resolved | |
| Conclusion | The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) | |

and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.

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

| Means of verification | Criteria/Requirements | Assessment/Observations |
|-----------------------|--|--|
| | Measuring /Reading /Recording frequency | Continuously |
| | Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No) | Yes |
| | Monitoring equipment | NA |
| | How were the values in the monitoring report verified? | <p>At the time of installation, the purchase order form is filled by the CME. This form/14/ notes down the total number of students and staff in boarding/non-boarding schools.</p> <p>These numbers are mentioned for each school in the sales database. For the 11 WPS samples checked by the DOE during the remote audit survey, the same numbers were checked and found to be correct.</p> <p>The CME has also applied formula in the ER sheet/4/ to ensure that the $N_{y,i}$ multiplied by $R_{y,i}$ does not exceed the maximum output of the unit [per unit].</p> <p>An average value of all the adjusted $N_{y,i}$ has been used for ER calculation respective of each CPA. In general, the average of $N_{y,i}$ for all the CPAs was found to be 364 person/technology.</p> <p>The parameter value is noted at the time of installation by the CME and as the number of systems increases over the time, the value will change continuously. The institutions were checked to confirm that CME is recording this information in database and the implementation is in line with PoA DD/1/.</p> <p>As per the CPA DDs (9948-P1-0003, 9948-P1-0005-CP1 to 9948-P1-0013-CP1) page 15/2/, The value of $N_{y,i}$ is effectively the number of people in the institution. The number of people in the institution will be updated (at least biennially) to reflect change in the institution size over time. The value will be updated in the sales database biennially.</p> <p>For the current monitoring, the value of the parameter was verified from the sales database /5/ and purchase orders/14/. This parameter is neither prescribed nor monitored by CME on sample basis as per registered monitoring plan. The parameter is</p> |

| | | |
|-------------------|---|---|
| | | monitored on absolute basis for each of the installation. |
| | If applicable, has the reported data been cross-checked with other available data? | Yes. The values in the ER sheet were checked with remote survey observations by the DOE which was further cross-checked with the purchase orders/14/. |
| | Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place? | Yes |
| | In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard? | NA |
| Findings | CL#07 was raised and resolved. | |
| Conclusion | The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/. | |

Water quality measurement, Water Quality, Proportion

| Means of verification | Criteria/Requirements | Assessment/Observations |
|------------------------------|--|---|
| | Measuring /Reading /Recording frequency | Annually |
| | Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No) | Yes |
| | Monitoring equipment | Aquagenx testing kits |
| | Calibration details | Not Applicable. |
| | How were the values in the monitoring report verified? | <p>The CME conducted Aquagenx testing kits to monitor the E.Coli value for sampled institutions.</p> <p>The Head teachers/ Deputy Head teachers of the schools interviewed by the DOE during the remote survey confirmed that they were visited by monitoring team for the tests.</p> <p>The monitoring forms/18/, Aquagenx testing kits photographs showing achieved results /30/ for all the institutions were checked by the verification team to confirm the monitoring parameter value. It was found that all the tests gave positive results confirming safe drinking water except four sampled schools. Hence, the applied value of 0.95 was found acceptable.</p> |
| | If applicable, has the reported data been cross-checked with other available data? | Photos of the test/30/ conducted during the monitoring were shared by the CME which confirmed the results in monitoring forms. |

| | | |
|-------------------|---|---|
| | Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place? | The staff conducting the tests were found to be trained as confirmed from training evidences/20/ provided by the CME confirmed that the tests are conducted and evaluated by trained staff. |
| | In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard? | NA |
| Findings | CL#01, CL#05 was raised and resolved | |
| Conclusion | The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/. | |

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

| Means of verification | Criteria/Requirements | Assessment/Observations |
|-----------------------|---|--|
| | Measuring /Reading /Recording frequency | At least once per verification |
| | Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No) | Yes |
| | Monitoring equipment | NA |
| | How were the values in the monitoring report verified? | <p>The sampled systems were checked by the CME's monitoring team to monitor the operational status of the WPS units installed in the institutions as checked from the monitoring survey forms/18/.</p> <p>The Head teachers/ dy. Head teachers of the schools visited by the CME representative during the monitoring survey were confirmed to the DOE through the remote audit survey that the monitoring team visits the school regularly for the monitoring.</p> <p>All the systems checked by the CME representative during the remote audit survey were found to be operational.</p> <p>Thus, the applied value of 93.75% was found acceptable.</p> |
| | If applicable, has the reported data been cross-checked with other available data? | Results presented in the ER sheet were checked with monitoring survey forms/18/ and remote survey visit videos. |
| | Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place? | The staff conducting the tests were found to be trained as confirmed from training evidences/20/ provided by the CME confirmed that the tests are conducted and evaluated by trained staff. |
| | In case project participants have | NA |

| | | |
|-------------------|---|--|
| | temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard? | |
| Findings | CAR#02, CL#01, CL#06 and CL#04 were raised and resolved. | |
| Conclusion | The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/. | |

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

| Means of verification | Criteria/Requirements | Assessment/Observations |
|-----------------------|---|--|
| | Measuring /Reading /Recording frequency | Continuously |
| | Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No) | Yes |
| | Monitoring equipment | NA |
| | How were the values in the monitoring report verified? | <p>The parameter is determined by sourcing a default value from UNFCCC SSC WG 37th Meeting Report for Nigeria /26/ and multiplying it with the proportion of population of the institutions using different type of stove.</p> <p>The GACC report for Nigeria, 2016/16/ was reviewed to confirm that the all public institutions cook with wood on traditional three stone fire.</p> <p>Therefore, a value 100% of efficiency for unimproved stove was multiplied with default value of 0.93 UNFCCC SSC WG 37th Meeting Report for Nigeria /26/ to the final value = 0.93, which was applied in the ER calculation sheet/4/. The applied value was found to be correct.</p> <p>The value has been determined is in line with the PoA DD/1/ and CPA DDs/2/.</p> |
| | If applicable, has the reported data been cross-checked with other available data? | NA |
| | Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place? | NA |
| | In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard? | NA |
| Findings | CL#01 and CAR#03 was raised and resolved | |

| | |
|-------------------|--|
| Conclusion | The values in the Monitoring Report /13/ and corresponding Emission Reduction Spreadsheet /4/ are consistent with the revised accepted PoA-DD/1/ and CPA-DDs/2/. The values applied for ER calculations/4/ in the relevant CPAs are correct and justified. |
|-------------------|--|

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

| Means of verification | Criteria/Requirements | Assessment/Observations |
|-----------------------|---|---|
| | Measuring /Reading /Recording frequency | Continuously |
| | Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No) | Yes |
| | Monitoring equipment | NA |
| | How were the values in the monitoring report verified? | <p>The parameter is determined by sourcing a default value from AMS-I.E /25/ and multiplying it with the % population using non-renewable woody biomass / fossil fuel.</p> <p>The GACC report for Nigeria, 2016/16/ was reviewed to confirm that the all public institutions cook with wood on traditional three stone fire.</p> <p>Therefore, a value 100% users using non-renewable woody biomass / fossil fuel was multiplied with default value of 81.6 sourced from AMS-I.E./25/ to give the final value = 81.6, which was applied in the ER calculation sheet/4/. The applied value was found to be correct.</p> <p>The value has been determined is in line with the PoA DD/1/ and CPA DDs/2/.</p> |
| | If applicable, has the reported data been cross-checked with other available data? | Yes. The value sourced form AMS-I.E./25/ was also cross-checked from the IPCC greenhouse gas inventories report/22/. |
| | Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place? | Yes. |
| | In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard? | NA |
| Findings | CL#01 was raised and resolved | |
| Conclusion | The values in the Monitoring Report /13/ and corresponding Emission Reduction Spreadsheet /4/ are consistent with the revised accepted PoA-DD/1/ and CPA-DDs/2/. The values were found consistent with IPCC default values for fossil fuels /22/. The applied values are correct and justified. | |

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

| Means of verification | Criteria/Requirements | Assessment/Observations |
|-----------------------|---|--|
| | Measuring /Reading /Recording frequency | Annually |
| | Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No) | Yes |
| | Monitoring equipment | NA |
| | How were the values in the monitoring report verified? | <p>The institutions of sampled WPS were visited by the CME's monitoring team to check the existing public distribution network with safe drinking water as checked from the monitoring survey forms/18/.</p> <p>The Head teachers/ dy. Head teachers of the schools visited by the CME representative during the monitoring survey were confirmed to the DOE through the telephonic interview that the monitoring team visits the school regularly for the monitoring.</p> <p>All the institutions of the sampled WPS visited by the CME representative during the remote audit ssurvey were found to not have any access to public distribution network. Their source of water was found to be Borewell/ Well. Besides, review of other monitoring survey forms and sales database indicated that safe drinking water based public distribution network was not accessible to project schools.</p> <p>Thus, the applied value of 0 was found acceptable for the current verification.</p> |
| | If applicable, has the reported data been cross-checked with other available data? | Results presented in the ER sheet were checked with monitoring survey forms/18/ and remote survey results. |
| | Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place? | The staff conducting the tests were found to be trained as confirmed from training evidences/20/ provided by the CME confirmed that the tests are conducted and evaluated by trained staff. |
| | In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard? | NA |
| Findings | CL#01 and CAR#03 was raised and resolved | |
| Conclusion | The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/. | |

Quantity of electricity consumed by the project electricity consumption source j in year y, EG_{PJ,j,y}, MWh/yr

| Means of verification | Criteria/Requirements | Assessment/Observations |
|-----------------------|---|--|
| | Measuring /Reading /Recording frequency | Annually |
| | Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No) | Yes |
| | Monitoring equipment | NA |
| | How were the values in the monitoring report verified? | The capacity of the disinfection was found to be 14 watts as checked from the WPS manufacturer specification for Multi-barrier UV/28/. Thus, taking an assumption a technology was considered to be operational for 24 hours a day and 365 days in a year. Thus, the applied value of 0.1226 was found to be conservative and acceptable for the current verification. |
| | If applicable, has the reported data been cross-checked with other available data? | Results presented in the ER sheet were checked with DOE remote survey end-users interviews. |
| | Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place? | NA |
| | In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard? | NA |
| Findings | CL#01 was raised and resolved | |
| Conclusion | The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/. | |

E.3.4.3. Implementation of sampling plan

| | |
|------------------------------|--|
| Means of verification | <p>The monitoring has been carried out in accordance with the monitoring plan contained in the revised approved PoA DD/1/ and CPA DDs/2/.</p> <p>Sampling Design/Target Population/Sampling Frame/Reliability:</p> <p>The CME has applied single sampling plan for all of the 10 CPAs. According to the 'Sampling and Survey standards,' version 8.0/19/, the sampling plan applied by the PP for the following CPAs are found to be appropriate. As per the sampling plan stated in the PoA DD/1/, a minimum 90% confidence interval and a 10% margin of error requirement is achieved for the sampled parameters. When a single sampling plan covers a group of CPAs or when monitoring is conducted biennially (every two years), confidence/precision of 95/10 for the sample size calculation is applicable. Since the sampling has been done across the CPAs, the CME has taken 95/10 as the confidence precision levels which is found to be in line with the registered</p> |
|------------------------------|--|

monitoring plan/1,2/.

The target population for the parameters stated above are Water purification systems⁵ installed / distributed in institutions and recorded in the project sales database

Sampling Frame:

There are three different type of units under the CPAs. 6637 UltraFLO units, 738 UltraTAB units and 273 Multi-barrier UV have been listed in the sales database. However, the parameters for monitoring are homologous (i.e. implemented in schools). Thus, the CME has applied a common sampling for all the parameters monitored which was found acceptable.

Sampling Method and selection:

The CME has applied Stratified Random Sampling by dividing the population into three strata (UltraFLO, UltraTAB, Multi-barrier UV). The samples have been chosen randomly from three of the strata's as checked from the excel sheets with random numbers/33/.

Sample Size for Parameter of Interest:

The sampling is applied to the following monitoring parameters:

- Water Quality- Aquagenix Tests
- Operational Units
- Existence of public distribution network of safe drinking water

The sample size is chosen using the equation inline to CDM guidelines for Sampling and surveys for CDM project activities and programmes of activities.

In this regard, sample size calculation spreadsheet /4/ was checked and found correct as per registered monitoring plan. The complete details are given in E.3 section of Monitoring Report/13/.

Implementation of Sampling Survey and Field Test Records:

Based on interviews with the CME and surveyors during the the remote audit survey, in addition to simply asking this question to the end users, the surveyors were also trained to evaluate to results of Aqua-genix tests. Therefore, the implementation of surveys and tests was considered reliable. The surveyors also took photos of the school name, test results which was shared by CME and were checked during the desk-review by the verification team.

Monitoring survey (by CME) duration:

The monitoring survey (field survey / tests) was carried out by CME representatives between following duration for the current monitoring period.

| CPA Ref.No. | Technology | From | To |
|--|----------------------------|------------|------------|
| 9948-P1-0003-CP1, 9948-P1-0005-CP1 to 9948-P1-0013-CP1 | Water Purification systems | 13/01/2020 | 05/02/2020 |

Reliability and precision calculation:

The verification team has verified the ER calculation spreadsheets /4/ with the monitored data, where the actual achieved precision is calculated against the Guidelines outlined under "Standard for sampling and surveys for CDM project activities and Programme of Activities" /19/ and confirms that the calculation of

⁵ The definition of each system considered for ER is different for Ultra FLO and Ultra Tab. Each unit of Ultra FLO having unique ID as listed in the database, is considered as individual system for CER calculations. For Ultra TAB, the value of the parameter has been determined by considering each institution as one system. Therefore, for institutions with Ultra TAB, the number of TAB systems is same as the number of institutions.

| | |
|-------------------|---|
| | <p>achieved reliability was done correctly.</p> <p>All parameters of interest are included in the ER spreadsheet for the revised approved CPAs. These were checked for the input values as well as formula applied and were found consistent. The reliability (demonstration of precision achieved after the survey results) is depicted in the ER calculation sheets /4/ corresponding to final Monitoring Report /13/, which were also found correct. Thus, the verification team confirms that required precision has been met and the results are reliable.</p> |
| Findings | CL#02 and CAR#03 was raised and resolved |
| Conclusion | The verification team has found out that the sampling plan applied is found to be in-line with the monitoring plan mentioned in the registered PoA-DD/1/ and CPA-DDs/2/ and Sampling and survey standards, ver.8/19/ |

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

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

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

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

| | | | | | | | | | | | |
|-------------------------------------|--|--------|--|---------|---|-----|--|-------------|--|-------------------------------------|---|
| Means of verification | <p>The following equations were used to determine the baseline emissions as provided in the monitoring report /13/ and applied in the corresponding ER calculations sheet /4/. The expressions used were found consistent with the revised accepted PoA DD /1/, CPA DDs /2/ and the applied methodology AMSIII.AV, version 04 /6/:</p> $BE_y = QPW_y * SEC * f_{NRB,y} * EF_{\text{projected_fossilfuel}} * 10^{-9}$ <p>Where,</p> <table border="1"> <tr> <td>BE_y</td><td>Baseline emissions during the year y in (tCO₂e)</td></tr> <tr> <td>QPW_y</td><td>Quantity of purified water in year y (Liters/yr).</td></tr> <tr> <td>SEC</td><td>Specific energy consumption required to boil one litre of water (kJ/L)</td></tr> <tr> <td>$f_{NRB,y}$</td><td> <p>Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable.</p> <p>For biomass, the default values of f_{NRB} shall be used from EB67. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of biomass and other fuels (e.g. fossil fuels) are used, a weighted average renewability factor shall be applied.</p> </td></tr> <tr> <td>$EF_{\text{projected_fossilfuel}}$</td><td> <p>Emission factor when NRB is displaced or the emission factor of the fossil fuel substituted</p> <p>Default emission factors from AMS-I.E as referenced in AMS-III.AV version 4 and IPCC shall be used. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of woody biomass and fossil fuels are used in the absence of the project activity a weighted average value shall be applied, as described in parameter box in section E.2</p> </td></tr> </table> | 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) | $f_{NRB,y}$ | <p>Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable.</p> <p>For biomass, the default values of f_{NRB} shall be used from EB67. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of biomass and other fuels (e.g. fossil fuels) are used, a weighted average renewability factor shall be applied.</p> | $EF_{\text{projected_fossilfuel}}$ | <p>Emission factor when NRB is displaced or the emission factor of the fossil fuel substituted</p> <p>Default emission factors from AMS-I.E as referenced in AMS-III.AV version 4 and IPCC shall be used. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of woody biomass and fossil fuels are used in the absence of the project activity a weighted average value shall be applied, as described in parameter box in section E.2</p> |
| 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) | | | | | | | | | | |
| $f_{NRB,y}$ | <p>Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable.</p> <p>For biomass, the default values of f_{NRB} shall be used from EB67. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of biomass and other fuels (e.g. fossil fuels) are used, a weighted average renewability factor shall be applied.</p> | | | | | | | | | | |
| $EF_{\text{projected_fossilfuel}}$ | <p>Emission factor when NRB is displaced or the emission factor of the fossil fuel substituted</p> <p>Default emission factors from AMS-I.E as referenced in AMS-III.AV version 4 and IPCC shall be used. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of woody biomass and fossil fuels are used in the absence of the project activity a weighted average value shall be applied, as described in parameter box in section E.2</p> | | | | | | | | | | |

Calculation for CPA 9948-P1-0003-CP1 (as an example):

$$= 43,191,965 \times 3574.80 \times 0.93 \times 81.60 \times 10^{-9}$$

$$= 11,717 \text{ tCO}_2\text{e}$$

Specific energy consumption (SEC) i.e. energy required to boil one litre of water is calculated as

$$\text{SEC} = [\text{WH} \times (\text{T}_f - \text{T}_i) + 0.01 \times \text{WHE}] / n_{wb}$$

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)

Calculation for CPA 9948-P1-0003-CP1:

$$\text{SEC} = [4.186 \times (100 - 20) + 0.01 \times 2260] / 0.10$$

$$\text{SEC} = 3574.80 \text{ kJ/L.}$$

And QPW_y is calculated through following equation:

$$\text{QPW}_y = \sum (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times \text{Water Quality}_i \times \text{Operational Units}_i)$$

The installation for CPAs under the verification has been done between 01/04/2017-19/11/2019.

As per the page 59 of revised approved PoA DD/1/, "The date of installation for each unit is used to determine the portion of the monitoring period during which the unit was active. Products deployed under the project activity are assumed to be in operation as of the start of the next month following the date of sale, i.e. if the date of sale is April 1st, the start of operation is May 1"

Thus, for all the systems installed in November, ERs will be claimed in December 2019. The end date of the monitoring period is 31/12/2019.

Thus, only 365 days have been considered for ER calculation. The approach was found to be conservative and in line with PoA DD/1/.

The number of days for the current monitoring period is 728 days. Thus, the revised formula is:

$$\text{QPW}_y = \sum (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times \text{Water Quality}_i \times \text{Operational Units}_i)$$

Where:

QPW_y: Quantity of purified water for drinking for all technologies type i in year y (Liters)

T_{y,i}: Total distributed water purification system

R_{y,i}: Average volume of drinking water per person per day (Liters/person/day)

Water Quality_i: Proportion of units that meet water quality requirements

Operational Units_i: Percent of the monitoring period in which the units are in use

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

Calculation for CPA 9948-P1-0003-CP1:

$$\text{QPW}_y = 273 \times 2.32 \times 356 \times 214 \times 93.75 \times 0.95$$

$$\text{QPW}_y = 43,191,965 \text{ L}$$

The verification team has checked that the calculation for other CPAs (9948-P1-0005-CP1 to 9948-P1-0013-CP1) have also been done in the worksheet 'ERs

| | |
|-------------------|--|
| | <p>Summary' /4/ in the same manner.</p> <p>The calculations for all the CPAs (9948-P1-0005-CP1 to 9948-P1-0013-CP1) were checked in the ER sheet/4/ and it was found that calculations have been done inline to the PoA DD/01/ and in accordance to the applied methodology/6/.</p> <p>All the parameters are assessed in detail under section E.3.4. of this report.</p> |
| Findings | CL#03 was raised and resolved. |
| Conclusion | <p>The verification team confirms that</p> <ul style="list-style-type: none"> a) The complete data was available and is duly reported; b) As indicated above, the description with regard to cross-check of reported data is included under respective parameter above; c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals were followed; d) Appropriate emission factors, IPCC default factors and other reference values were correctly applied. e) There is no pro-rata approach applied in the current monitoring period as entire monitoring period falls into period that is after the end of first commitment period of Kyoto Protocol. |

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

| | |
|------------------------------|--|
| Means of verification | <p>The project activity involves no emissions for type 2 CPAs as it involves dissemination of water purification systems and replaces the non-renewable woody biomass fossil fuel way of boiling water with the transitioned way of water purification by the chlorination technologies. The project emissions for type 3 CPAs were found to be calculated as follows:</p> $PE_y = T_{y,i} \times EC_{PJ,j,y} \times EF_{EL,j,y} \times (1 + TDL_{j,y})$ <p>For CPA 9948-P1-0003-CP1, $PE_y = 273 \times 0.1226 \times 1.3 \times (1 + 0.20)$ $= 53 \text{ tCO}_2\text{e}$</p> |
| Findings | None. |
| Conclusion | The project emissions have not been considered for Type 2 CPAs and have been considered for Type 3 CPAs. The approach is in line with the PoA DD/1/. |

E.3.6.3. Calculation of leakage GHG emissions

| | |
|------------------------------|---|
| Means of verification | <p>The PoA-DD/1/, CPA DDs/2/ and applied monitoring methodologies does not prescribe any leakage emissions to be considered. The remote survey and project design also did not reveal any potential source to be considered in this regard. However, the leakage adjustment factor that is required to adjust the baseline emissions has been duly accounted in baseline calculations.</p> <p>BE_y is multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required. Therefore, the leakage is calculated as follows:</p> $\text{Leakage} = BE_y \times (1 - 95\%)$ <p>Calculation for 9948-P1-0003-CP1 is as follows:</p> $LE = 11,717 \times (1 - 0.95)$ $LE = 586 \text{ tCO}_2\text{e}$ <p>The verification team has checked that the calculation for other CPAs (9948-P1-0005-CP1 to 9948-P1-0013-CP1) have also been done in the worksheet 'ERs Summary' /4/ in the same manner.</p> <p>The calculations for all the CPAs (9948-P1-0003-CP1, 9948-P1-0005-CP1 to 9948-P1-0013-CP1) were checked in the ER sheet/4/ and it was found that calculations have been done inline to the PoA DD/01/ and in accordance to the applied</p> |
|------------------------------|---|

| | |
|-------------------|---|
| | methodology/6/. |
| | The verified value of Leakage for all the CPAs is 13,029 tCO ₂ e. The value is mentioned CPA wise in the table presented under the next section. |
| Findings | None. |
| Conclusion | No additional leakage emissions (other than what is already considered in baseline calculations) were required in accordance with the methodology AMS-III.AV, version 04 /6/. |

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

| | |
|------------------------------|---|
| Means of verification | As elaborated above, the entire emission reductions from the PoA were based on baseline emissions. The calculations presented in this regard in the final monitoring report /13/ and corresponding ER calculations sheet /4/ were found appropriate and complying with the provisions prescribed in the registered monitoring plan of respective CPA-DDs/2/, PoA-DD/1/ and applied methodology/6/. |
| | The verification team confirms that from the remote survey where all the evidence and records that validated the stated figures were checked and found acceptable. |
| Findings | No findings were raised. |
| Conclusion | The verification team confirms that a) The complete data was available and is duly reported; b) As indicated above, the description with regard to cross-check of reported data is included under respective parameter (refer Section E.5.4 of this report); c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals, project emissions and leakage emissions were followed; d) The total number of ERs achieved (on account of water purifiers installation) during the current monitoring period were 247,410 tCO ₂ e. |

| 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-P1-003-CP1 | 11,717 | 53 | 586 | 0 | 11,078 | 11,078 |
| 9948-P1-005-CP1 | 29,149 | 0 | 1,458 | 0 | 27,691 | 27,691 |
| 9948-P1-006-CP1 | 29,201 | 0 | 1,461 | 0 | 27,740 | 27,740 |
| 9948-P1-007-CP1 | 28,514 | 0 | 1,426 | 0 | 27,088 | 27,088 |
| 9948-P1-008-CP1 | 27,649 | 0 | 1,383 | 0 | 26,266 | 26,266 |
| 9948-P1-009-CP1 | 28,113 | 0 | 1,406 | 0 | 26,707 | 26,707 |
| 9948-P1-0010-CP1 | 26,313 | 0 | 1,316 | 0 | 24,997 | 24,997 |
| 9948-P1-0011-CP1 | 28,399 | 0 | 1,420 | 0 | 26,979 | 26,979 |
| 9948-P1-0012-CP1 | 27,714 | 0 | 1,386 | 0 | 26,328 | 26,328 |
| 9948-P1-0013-CP1 | 23,723 | 0 | 1,187 | 0 | 22,536 | 22,536 |

| | | | | | | |
|--------------|----------|----|--------|---|---------|---------|
| Total | 2,60,492 | 53 | 13,029 | 0 | 247,410 | 247,410 |
|--------------|----------|----|--------|---|---------|---------|

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

| | | | | | | | |
|---|---|--------------------------|---------------|---|---------------------|-----------------|--------------------------|
| Means of verification | <p>Earthood Services Private Limited is able to certify that the emission reductions from the CDM project activity 9948 "Impact Carbon Global Safe Water Programme of Activities (PoA)" in Nigeria for the monitoring period 23/05/2019-31/12/2019 (including both days) amount to 247,410 tCO₂.</p> <p>Verified and certified emission reductions as per commitment period:</p> <table> <tr> <td>Commitment period</td><td>Amount</td></tr> <tr> <td>Upto 31/12/2012 (1st commitment period)</td><td>0 tCO_{2e}</td></tr> <tr> <td>From 01/01/2013</td><td>247,410 tCO₂</td></tr> </table> | Commitment period | Amount | Upto 31/12/2012 (1 st commitment period) | 0 tCO _{2e} | From 01/01/2013 | 247,410 tCO ₂ |
| Commitment period | Amount | | | | | | |
| Upto 31/12/2012 (1 st commitment period) | 0 tCO _{2e} | | | | | | |
| From 01/01/2013 | 247,410 tCO ₂ | | | | | | |
| Findings | CAR#01 was raised and resolved | | | | | | |
| Conclusion | The actual ERs achieved in included CPAs are not higher than the estimated quantity of ERs in the CPA-DDs/2/. Accordingly, it was accepted by verification team. | | | | | | |

| 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-P1-003-CP1 | 11,078 | 15,547 |
| 9948-P1-005-CP1 | 27,691 | 36,521 |
| 9948-P1-006-CP1 | 27,740 | 36,521 |
| 9948-P1-007-CP1 | 27,088 | 36,521 |
| 9948-P1-008-CP1 | 26,266 | 36,521 |
| 9948-P1-009-CP1 | 26,707 | 36,521 |
| 9948-P1-0010-CP1 | 24,997 | 36,521 |
| 9948-P1-0011-CP1 | 26,979 | 36,521 |
| 9948-P1-0012-CP1 | 26,328 | 36,521 |
| 9948-P1-0013-CP1 | 22,536 | 36,521 |
| Total | 247,410 | 344,236 |

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

| | |
|------------------------------|--|
| Means of verification | <p>As verified and evident from the Monitoring Report /13/ and corresponding ER calculations sheet /4/, the actual emission reductions achieved for Water Purification systems for the CPAs under this verification in the current monitoring period were found less than the estimated quantity in the CPA-DDs/2/ for the comparable period. This is largely due to lower number of water purifiers that were sold.</p> <p>Considering, there is no increase in ERs no further verification effort was put in. The quantitative details of actual values of achieved ERs for the CPA and value estimated in the CPA- DDs/2/ is presented in the next table.</p> |
| Findings | No findings were raised |
| Conclusion | The actual emission reductions achieved in any of specific CPAs are not higher than the estimated quantity of ERs in the CPA-DDs/2/. Accordingly, it was accepted by the verification team. |

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

| | |
|------------------------------|--|
| Means of verification | The coordinating/managing entity did not identify and establish the monitoring of the sustainable development benefits of the registered CDM PoA/1/ and no such document was developed and published on the UNFCCC CDM website/12/. Therefore, assessment is not required. |
| Findings | No findings were raised |
| Conclusion | The CME is not required to monitor the sustainable development benefits of the |

| | |
|--|---------------------|
| | registered CDM PoA. |
|--|---------------------|

E.3.8. Global stakeholder consultation

| | |
|------------------------------|---|
| Means of verification | The global stakeholder consultation was not found applicable because period under verification is 3rd monitoring period. |
| Findings | No findings were raised |
| Conclusion | The requirement is applicable for situations when global stakeholder consultation was carried out after the publication of first monitoring report. Therefore, this was not found applicable. |

SECTION F. Internal quality control

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

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

SECTION G. Verification opinion

Earthood Services Private Limited (ESPL), contracted by Impact Carbon (the CME for the PoA), has performed the second independent verification of the emission reductions for the registered CDM PoA 9948 "Impact Carbon Global Safe Water Programme of Activities (PoA)" for the third monitoring period 23/05/2019-31/12/2019 (both days included) as reported in the Monitoring Report (final) Version 3 dated 08/09/2020/13/. The CME is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

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

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

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

As a result, it is confirmed that the emission reductions from the CDM PoA 9948 "Impact Carbon Global Safe Water Programme of Activities (PoA)" are correctly reported in the Monitoring Report Version 3/13/ dated 08/09/2020 and corresponding ER sheets for the monitoring period 23/05/2019-31/12/2019(including both days) amount as 247,410 tCO₂e. Therefore, this will be submitted as part of request for issuance as per CDM PCP Version 02/8/.

SECTION H. Certification statement

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

In our opinion the GHG emissions reductions reported for the PoA for the monitoring period 23/05/2019 – 31/12/2019 (MP 03) are fairly stated in the Monitoring Report (final) Version 3 dated 08/09/2020.

ESPL, based on outcome of verification activities, certify in writing that, during the monitoring period 23/05/2019-31/12/2019 (including both days), the registered CDM PoA "Impact Carbon Global Safe Water Programme of Activities (PoA)" and the included CDM CPAs achieved the verified amount of **247,410** tCO₂e reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the CPAs.

Appendix 1. Abbreviations

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

Appendix 2. Competence of team members and technical reviewers

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

| Competence Statement | | | |
|---------------------------|--|-------------|------------|
| Name | Vaishali Vatsa | | |
| Education | M.Sc. (Environmental Studies and Resource Management), TERI University | | |
| Experience | 4 months | | |
| Field | Climate Change | | |
| Approved Roles | | | |
| Team Leader | NO | | |
| Validator | Yes | | |
| Verifier | Yes | | |
| Methodology Expert | NO | | |
| Local expert | NO | | |
| Financial Expert | NO | | |
| Technical Reviewer | NO | | |
| TA Expert (X.X) | NO | | |
| Trainee | NO | | |
| Reviewed by | Shreya Garg | Date | 30/12/2019 |
| Approved by | Anshika Gupta | Date | 02/01/2020 |

| Competence Statement | |
|----------------------|--|
| Name | Kumden Nanbal Luka |
| Country | Nigeria |
| Education | B.tech. in Urban and Regional Planning |

| | | | |
|---------------------------|-----------------------------------|-------------|------------|
| Experience | 1+ years | | |
| Field | Environment; Urban-Rural planning | | |
| Approved Roles | | | |
| Team Leader | No | | |
| Validator | No | | |
| Verifier | No | | |
| Methodology Expert | No | | |
| Local expert | Yes (Nigeria) | | |
| Financial Expert | No | | |
| Technical Reviewer | No | | |
| TA Expert | No | | |
| | | | |
| Reviewed by | Shreya Garg | Date | 23/11/2018 |
| Approved by | Anshika Gupta | Date | 23/11/2018 |

| | | | |
|-----------------------------|--|-------------|------------|
| Competence Statement | | | |
| Name | Ashok Gautam | | |
| Country | India | | |
| Education | M. Sc. (Environmental Sciences) M. Tech. (Energy & Environmental Management) | | |
| Experience | 16 Years + | | |
| Field | Energy, Climate Change & Environment | | |
| Approved Roles | | | |
| Team Leader | YES | | |
| Validator | YES | | |
| Verifier | YES | | |
| Methodology Expert | AMS-I.D., AMS-I.A., AMS-I.C., AMS-I.E, AMS-II.D., AMS-II.G., AMS-III.E., AMS-III.H., AMS-III.Q, AMS-III.Z., AMS-III.AV., AM0029, AM0025, AM0056, ACM0001, ACM0002, ACM0004, ACM0012, ACM0006, AM0018, ACM0009, AM0034, AMS.I.B, ACM0003 | | |
| Local expert | YES (India) | | |
| Financial Expert | YES | | |
| Technical Reviewer | YES | | |
| TA Expert | YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1) | | |
| | | | |
| Reviewed by | Shreya Garg | Date | 23/10/2019 |
| Approved by | Anshika Gupta | Date | 23/10/2019 |

Appendix 3. Documents reviewed or referenced

| No. | Author | Title | References to the document | Provider |
|-----|---------------|--|--|----------|
| 1 | Impact Carbon | Registered PoA-DD Revised Approved PoA-DD (Version 6.1) Revised Approved PoA-DD Version 7.0) | Dated:24/03/2014 Dated: 15/02/2017 Dated: 18/04/2017 | CME |
| 2 | Impact | Registered CPA-DD-03 | Version 1.3, Dated: 17/02/2017 | Other |

CDM-PoA-VCR-FORM

| | | | | |
|----|--------------------------------|--|---|--------|
| | Carbon | Registered CPA-DD-05 Registered CPA-DD-06 Registered CPA-DD-07 Registered CPA-DD-08 Registered CPA-DD-09 Registered CPA-DD-10 Registered CPA-DD-11 Registered CPA-DD-12 Registered CPA-DD-13 | Version 5, Dated: 22/03/2019 | |
| 3 | Carbon check India Pvt Ltd. | CPA Inclusion Report (9948-P1-0003-CP1, 9948-P1-0005-CP1 to 9948-P1-0013-CP1) | Version 3, Dated: 06/03/2017, Version 2, Dated: 22/09/2017 | Other |
| 4 | Impact Carbon | ER sheet (Version 3.0) | Corresponding to the current monitoring period | CME |
| 5 | Impact Carbon | Sales Database | - | CME |
| 6 | UNFCCC | Methodology: AMS III A.V. | Version 4 | Others |
| 7 | UNFCCC | PS for PoA | Version 2 | Others |
| 8 | UNFCCC | PCP for PoA | Version 2 | Others |
| 9 | UNFCCC | VVS for PoA | Version 2 | Others |
| 10 | UNFCCC | CDM-PoA-MR-Form | Version 3 | Others |
| 11 | UNFCCC | CDM-PoA-VCR-Form | Version 3 | Others |
| 12 | UNFCCC | PoA UN webpage | https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/5J36IFUKQVNMRA0OZPGLH9C7STED1W/viewCPAs?s=0 | Others |
| 13 | Impact Carbon | Monitoring Report (Final) | Version 3 Dated:08/09/2020 | CME |
| 14 | Impact Carbon | Purchase Orders | Various | CME |
| 15 | Impact Carbon | Agreement between CME and CPA Implementer | Dated: 09/06/2017 | CME |
| 16 | GACC | GACC Analysis report (The Truth About Cooking Landscape Analysis, Nigeria) | Dated:14/10/2016 | CME |
| 17 | DHS | DHS Report, Nigeria 2016 | 2016 | CME |
| 18 | Impact Carbon | Monitoring forms (Scanned and filled) | Various (November 2019-December 2019) | CME |
| 19 | UNFCCC | Standards for Sampling and survey for CDM PoA | Version 8.0 | Others |
| 20 | Impact Carbon | Training Records | - | CME |
| 21 | Impact Carbon | Delivery Notes | Multiple Dates | CME |
| 22 | IPCC | IPCC default values for fossil fuels | https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf | Other |
| 23 | MICS | MICS 2016-2017 survey report for Nigeria | https://www.unicef.org/nigeria/reports/multiple-indicator-cluster-survey-2016-17-mics | CME |
| 24 | WHO | WHO Technical Notes on Drinking -Water sanitation and Hygiene | https://www.who.int/water_sanitation_health/emergencies/WHO_TN_10_Hygiene_promotion_in_emergencies.pdf?ua=1 | CME |
| 25 | UNFCCC | AMS-I.E. | Version 5.0 | Other |
| 26 | UNFCCC | UNFCCC SSC WG 37 th Meeting Report for Nigeria | http://cdm.unfccc.int/Panels/ssc_wg/meetings/037/ssc_37_an14.pdf | CME |
| 27 | Impact Carbon | UID photographs of WPS | - | CME |
| 28 | Impact Carbon | Manufacturer's Specifications | - | CME |
| 29 | Impact | Evaluating household water | https://www.who.int/water_sanitation_health/emergencies/WHO_TN_10_Hygiene_promotion_in_emergencies.pdf?ua=1 | CME |

| | | | | |
|----|---------------|---|--|--------|
| | Carbon | treatment options: Health based targets and microbiological performance specifications" (WHO 2011) | alth/publications/2011/evaluating_water_treatment.pdf | |
| 30 | Impact Carbon | Photos of Aquagenix test | - | CME |
| 31 | UNFCCC | Guidelines for sampling and surveys for CDM project activities and programme of activities | Version 4.0 | Other |
| 32 | Stat Trek | Screenshot- Stat trek | - | CME |
| 33 | Impact Carbon | Random number -excel sheet | - | CME |
| 34 | Impact Carbon | Site-exemption Clarification Mail | 16/03/2020 | CME |
| 35 | Impact Carbon | Emission Reduction Purchase Agreement | 2016-2020 | CME |
| 36 | Impact Carbon | Water Quality test Photographs | - | CME |
| 37 | Impact Carbon | Complaint Log (Sample) | - | CME |
| 38 | Impact Carbon | Remote Survey Files Selected Sample Videos, Interview video of the school representative | 17/03/2020-23/03/2020 | CME |
| 39 | UNFCCC | Tool 05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation | Version 1.0 | Others |
| 40 | ESPL | Verification report for MP 2 | Version 3.0 | Other |

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

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

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

Table 2. CLs from this verification

| | | | | |
|--|----|--------------------|---------|--------------------------|
| CL ID | 01 | Section no. | E.3.4.2 | Date : 15/05/2020 |
| Description of CL | | | | |
| 1. Considering that η_{wb} is defined as data to be monitored and the question is also listed under monitored data worksheet (column P and Q), why the responses were not captured or reported? The | | | | |

parameter defines the default value depending upon the baseline device. How the type of baseline device was not identified as part of monitoring survey in spite of having question for that? Please clarify?

- Several parameters under Section E.2 define multiple frequencies as permitted by registered monitoring plan. However, it is not clear what has been following in the current monitoring period? para 263c of CDM PS PoA V2)
- Several parameters e.g., $EC_{pj,i,y}$ defines multiple sources of data viz., manufacturers' specifications, surveys or direct monitoring. Therefore, it is not clear which one(s) are/were used in the current monitoring period. (para 263d of CDM PS PoA V2)

| | |
|-------------------------------------|--------------------------|
| Project participant response | Date : 21/05/2020 |
|-------------------------------------|--------------------------|

- The question listed under monitored data worksheet (column P and Q) captures the likelihood of project users boiling water after treatment by the project devices. If any of the sampled user is found boiling water after water treatment by project device, appropriate discounts need to be applied to emission reduction calculations (given boiling water after purification by project device will neutralize the baseline emissions avoided by the corresponding project device). No sample users were found boiling water after treatment with project device. Hence the columns P and Q don't show any response as they are only attributed to post project device treatment boiling cases.

Additionally, please refer page number 82 and 115 of the registered PoA-DD which states the following:

Default values as per AMS-III.AV combined with survey, national, or regional data to determine the percent of users using different types of water boiling systems in the baseline scenario.

Thus, % users using unimproved biomass burning stove, other biomass burning stove and/or fossil fuel stove in Nigeria has been updated as the per the Global Alliance for Clean Cookstoves, Nigeria report and a weighted average value has been applied to determine η_{wb} . This remains the most recent national data available. Hence determination of η_{wb} value is in line with the registered PoA-DD.

- The monitoring frequencies under section E.2 of the MR have been revised as per the monitoring frequency followed for various monitoring parameters in the current monitoring period. The revised MR is being submitted.
- The source of data of $EC_{pj,i,y}$ and other monitoring parameters have been revised in the MR. Only the source of data used in the current monitoring period is mentioned under section E.2 of the revised MR. The revised MR is being submitted.

| |
|--|
| Documentation provided by project participant |
|--|

| |
|---|
| PoA 9948_MP3_Norway 2 Nigeria MR ver 2.1_21052020 |
|---|

| | |
|-----------------------|-------------------------|
| DOE assessment | Date: 01/06/2020 |
|-----------------------|-------------------------|

- The parameter nwb is monitored to calculate the efficiency of baseline device and the discount factor is applied when the end-user is found to be using the baseline device along with the deployed project device. As per the GACC report it was confirmed that all the public institutions cook with wood on traditional three stone fire and in-line to the default value stated in the applied methodology 10% was used as the efficiency of traditional stove.

The question listed under column P and Q was found to be appropriate for the users using boiling of water post the use of project device. From the monitoring survey forms it was also confirmed that none of the users were boiling water post the treatment from the project device. Thus, no responses were recorded under the respective columns which was found to be appropriate and correct.

CME would apply the weighted average value of the % users using unimproved biomass burning stove other biomass burning stove or fossil fuel stove in Nigeria so as to determine nwb value for the users using more than one baseline device in-line to the Source of data of the parameter mentioned on page 82 and 115 of the registered PoA-DD (Version 7.0) . Thus, the clarification provided by the CME of using the default value for the monitored parameter as all the end-users were found using unimproved biomass burning stove as confirmed from the monitoring sheet as well as survey forms. The approach for the determination of nwb value was found to be in-line with the measurement methods and procedure mentioned in the registered PoA-DD (on page 83).(Closed)

- The MR has been revised to mention only the chosen frequency. The frequency is in line with the

applied methodology and registered PoA DD. Thus, the revisions to the MR were found to be correct and were accepted by the verification team.

- The MR has been revised to mention only the chosen source of the parameter. The source now mentioned in the MR was provided to the verification team as an evidence. The source is in line with the applied methodology and registered PoA DD. Thus, the revisions to the MR were found to be correct and were accepted by the verification team.

Thus, CL#01 stands closed.

| CL ID | 02 | Section no. | E.3.4.3 | Date : 15/05/2020 |
|---|----|-------------|---------|--------------------------|
| Description of CL | | | | |
| <ol style="list-style-type: none"> Sample size calculation worksheet the text mentioned in row 25 (column A to c) is not clear, given that the parameter discussed is Operational Units. Please clarify. The reported monitored value in MR is 94% for Operational Units, whereas the weighted average results in ER sheet is 93.75%. Please clarify. Similarly, the reported value of Water Quality in MR is 0.95, whereas the weighted average value in ER sheet is 95.17%. Please clarify. Please clarify when was the sampling conducted in order to confirm whether the monitoring frequency for parameters monitoring through sampling are in accordance with the registered monitoring plan (of (also refer e.g., CPA DD 05 Section B.5.3 para (a)) given the monitored data worksheet in the ER does not contain the date the survey was carried out. In MR, it is indicated that it was carried out in November and December 2019 without specifying the actual start date and end date. (para 263c of CDM PS PoA V2) PP shall explain how vintage or age of devices has been considered in sampling by CME | | | | |
| Project participant response | | | | Date : 21/05/2020 |
| <ol style="list-style-type: none"> The text mentioned in row 25 (column A to C) of Sample Size Calculation worksheet has been revised as "Operational Units". The value of Operational Units_i has been revised in the MR as per the ER Sheet to be consistent with the ER Sheet. The value of parameter "Water Quality_i" has also been revised in the MR to be consistent with the ER Sheet. The revised MR and ER sheet are being submitted. The duration of monitoring has been specified in section E.3 of the revised MR. The revised MR is being submitted. CME has applied stratified random sampling for the current monitoring period on the basis of technology (UV, Ultra TAB, UltraFlo). The water purification systems (WPS) installed/distributed across different CPAs (as recorded in the sales database) were stratified based on technology and desired number of samples were drawn from each stratum. The registered monitoring plan does not mandate sampling based on the vintage or age of WPS unit. Further, the WPS technology installed/distributed in among various CPAs does not have age dependent performance hence, stratification on the basis of age is not deemed applicable. | | | | |
| Documentation provided by project participant | | | | |
| PoA 9948_MP3_Norway 2 Nigeria MR ver 2.1_21052020 | | | | |
| PoA 9948_MP3_Norway 2 Nigeria ER Sheet ver 2.1_21052020 | | | | |
| DOE assessment | | | | Date: 01/06/2020 |
| <ol style="list-style-type: none"> PP has revised the values in the MR (Version 2.1) for both parameters 'Operational Units' (93.75%) and Water Quality (0.95) in-line to the ER sheet (Version 2.1). PP has also, revised the text mentioned in row 25 of the Sample Size Calculation worksheet as "Operational units". The information was found to be correct. (Closed) The CME has now included the dates of monitoring under section E.3 of the revised MR (version 2.1). The dates were checked with the survey forms and it was confirmed that the surveys have been conducted with the period mentioned in the revised MR. The installed project devices have been sampled by applying stratified random sampling for the current monitoring period on the basis of the technology distributed. As per the assessment of the CPA sales database sheet it was found out that a desired number of samples were drawn from each stratum of applied technology and in-line to the registered monitoring plan the sampling was based on the technology type and not based on age or vintage of WPS unit. Also, the applied methodology AMS-III.A.V version 4.0, does not have any provision to consider the vintage. <p>Thus, the clarification provided by PP was found to be justified.</p> | | | | |

Thus, the CL is closed.

| CL ID | 03 | Section no. | E.3.6.1. | Date : 08/09/2020 |
|--|----|-------------|----------|--------------------------|
| Description of CL | | | | |
| <p>a. The "System's residual capacity at the end of monitoring period (Ltrs)" shown in column AL of sheet "Sales Database". The formula does not reflect the residual capacity at the end of the monitoring period, i.e. it does not subtract the total water consumption from the residual capacity from previous MP and any additional capacity.</p> <p>b. In light of issue (a) above, the "Residual capacity from previous MP (Ltrs)" shown in column AB of sheet "Sales Database", it is not clear whether the values have been correctly determined.</p> <p>c. It is not clear how the CME calculated the reliability/achieved precision. The formula used to calculate the reliability/achieved precision was not found to be correct. For example, it is observed that the formula does not include z-value but include a factor 0.5, and the formula compares the achieved precision with z-value.</p> <p>d. The CME is requested to clarify the ER calculation in particular for the cumulative treatment capacity. In column AH of Sales Database spreadsheet, the value of "Cumulative treatment capacity of the system based on # units installed / supplied (Ltrs)" does not reflect the actual installed unit. For example, it is observed that the S.No. 162 have installed 3 UltraFLO units ($Ty_i = 3$) respectively, but the respective cell under AG shows the cumulative treatment capacity only based on one unit.</p> <p>e. The "Total Distributed Water Purification Systems (Ty_i)" In column AD of Sales Database spreadsheet, the value for UltraTAB is always 1 regardless the number of units supplied shown under column E .</p> <p>f. The formula in column AD of Sales Database spreadsheet includes figures "3050" and "3185" which purpose is not explained.</p> <p>g. The CME has applied formula in the ER sheet to ensure that the Ny_i multiplied by Ry_i does not exceed the maximum output of the unit [per unit] as per the same provision reported in the monitoring report page 20. However, it is not clear how and where such provision has been applied in the ER sheet.</p> <p>h. The operation days considered in the ER calculation includes non-school days. However, the ER calculation considers both boarding and non-boarding persons.</p> | | | | |
| Project participant response | | | | Date : 08/09/2020 |
| <p>a. The "System's residual capacity at the end of monitoring period (Ltrs)" as shown in column AL of "Sales Database", duly incorporates the residual capacity from previous MP and any additional capacity as follows:</p> <ol style="list-style-type: none"> Firstly, the "Treatment capacity of a unit (based on residual/installation capacity + subsequent supplies (Ltrs))" has been calculated (column AH) in worksheet "Sales Database" considering the residual capacity per unit, at the end of previous monitoring period (column AB) and any additional capacity added (column AC) during the monitoring period. Thereafter, "System's Continuous running end date" (column AJ) has been determined based on treatment capacity of a unit (calculated in column AH as explained above) divided by total water consumption per unit (column AG) of worksheet "Sales Database". 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 AL. If the "System's continuous running end date" is before the end date of the 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 AG). <p>Thus, the aforesaid ensures that residual capacity at the end of monitoring period is correctly calculated.</p> <p>b. Although, the concerned monitoring period begins on 23 May 2019, however, there are significant number of systems that are in continued use from the previous monitoring period. For such systems, the residual (remaining) capacity of the system (determined at the end of the previous monitoring period following the same approach as that explained in a above) has been used as the starting capacity for the current monitoring period. This has been listed in column AB of worksheet "Sales Database". For new systems installed in current monitoring period (hence not having any residual capacity carrying forwarded from the previous monitoring period), the residual capacity at the end of previous monitoring period has been considered as 0 in column AB. The calculator showing residual capacity determined at the end of MP#2 is being submitted.</p> <p>c. The formula in worksheet "Sample size calculation" cell D27, D50 and D73 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 D28, D51 and D74 in the worksheet "Sample size calculation" have been rectified to</p> | | | | |

compare the achieved precision with the applicable precision limit (10%). The revised ER Sheet and MR are being submitted.

- d. In case of multiple units of UltraFLo or Multi Barrier UV systems installed in an institution, it is deemed that these 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 (refer "Sales Database" for S. No. 160, excel row 162, where AE162 = K162 / AD162).

Accordingly, in column AH 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 AE162 and for determining other values in cells AJ162 and AE162 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 persons serviced per unit 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 a unit system for cases where multiple systems are used simultaneously as explained in question (g) below.

Consideration of aggregate capacity of all systems in Cell AH162, 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 Summary" considers the total number of units from column AD of "Sales Database" to calculate $T_{y,i}$.

- e. Please refer registered CPA-DDs 9948-P1-0005-CP1 To 9948-P1-0013-CP1, page 15, "Additional comment" under parameter table for $T_{y,i}$, which states the following:

*In case of Ultra tabs, parameter $T_{y,i}$ shall be the number of institutions where Ultra Tabs are being supplied. Thus, each school receiving Ultra tab will be counted as one unit, for the purpose of determining $T_{y,i}$. As Ultra tabs get consumed over time, institutions will receive regular supplies to ensure continuous disinfection. The total number of Ultra Tabs supplied to a given institution shall also be monitored and documented (to ensure capping of $N_{y,i} * R_{y,i}$ as explained in the following table for $N_{y,i}$).*

Thus, in line with aforesaid, the PP has monitored the total number of UltraTAB units initially supplied to an institution in column E and subsequent supplies in column R:AA. Further, in column AG, each institution receiving UltraTAB system has been counted as singular unit for determining $T_{y,i}$. This has been specified in additional comments section of parameter $T_{y,i}$ in MR, page 20.

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 5 to 13 PRC VR Nigeria 25.03.19 clean", page 20 of 26, CAR 02 and 03 dated 18/02/2019 and 18/03/2019 respectively. (<https://cdm.unfccc.int/PRCContainer/DB/prcp52130222/view>)

- f. The emission reduction generated by each water purification system is limited to 600 tCO₂e / annum in line with the eligibility criteria #16 for inclusion of a CPA in the PoA. Thus, to ensure compliance with the aforesaid, the CPA-DDs have put a cap on $N_{y,i}$ as follows:

| CPA number | Cap on $N_{y,i}$ | Reference |
|--------------------------------------|------------------|------------------------------|
| 9948-P1-0003-CP1 | 3,050 | Page # 6 of included CPA-DD |
| 9948-P1-0005-CP1 to 9948-P1-0013-CP1 | 3,185 | Page # 6 of included CPA-DDs |

Hence, the formula in column AE in worksheet "Sales Database" includes the aforesaid cap to ensure that no system generates more than 600 tCO₂e / annum in line with registered PoA/CPA-DDs.

- g. 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 AG of worksheet "Sales Database". The treatment capacity (per unit) has been calculated in column AH.

In Column AJ, continuous running end date of a system has been determined based on treatment capacity of a unit divided by $(N_{y,i} \text{ (per unit)} * R_{y,i})$. Thus, continuous running end date is then used to determine the residual capacity of the system after the end of monitoring period in column AL. 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].

- h. 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 and page 101 of the registered PoA-DD). Similarly, the CPA-DDs also mention 365 days of operation in the ER 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 ltrs/per/day for boarding schools/prisons is already referring to minimum survival levels and is overly conservative and deemed applicable to entire year.

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 5 to 13 PRC VR Nigeria 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 project participant

PoA 9948_MP3_MR1 Nigeria ER Sheet ver 3.0 08092020

PoA 9948_MP3_MR1 Nigeria MR ver 3.0 08092020

PoA 9948_MP2_MR4_Nigeria ER Sheet_ver 3.0 10082020 (for leftover residual capacity from previous MP)

DOE assessment

Date: 10/09/2020

- a. The system's residual capacity at the end of the monitoring period as mentioned in column 'AL' of the sales database worksheet is found to be dependent on the residual capacity from the previous monitoring period (MP2), additional capacity supplied during the monitoring period and the water consumption during the current monitoring period. The residual capacity of the systems at the end of MP2 has been cross-checked with the “MP2 residual capacity calculation sheet” shared by the CME and found to be correctly calculated.
The CME's approach of calculating the residual capacity of the system at the end of the monitoring period as a function of “system continuous running days”, “duration of the monitoring period” and “total water consumption per unit per day” was evaluated and found to be correct. Besides, the same approach is consistent with the assessment of $(N_{y,i} * R_{y,i}) < \text{maximum output capacity of a unit}$ discussed in point g) below.
- b. The column AB of the sales database worksheet was checked to confirm that it correctly reflects system's leftover residual capacity (i.e. remaining capacity at the end of MP2 which is being carried forward from MP2 to MP3) and has been considered as the initial capacity for the current monitoring period.
Accordingly, for the systems installed in the current MP, the CME considered the value of

residual capacity at the end of MP2 as zero because there was no leftover residual capacity in MP2. The residual capacity calculation for the system's in use from MP2 were cross-checked from the "MP2 residual capacity calculation sheet" shared by CME and were found to be correct as mentioned in the current sales database CERPD2 sheet under column AB.

- c. CME has rectified the formula in cell D27, D50 and D73 of the Sample Size calculation worksheet of ER sheet (Version 3.0). The rectification of formula in cell D27, D50 and D73 was found to be made in-line with the eq.42 (on page 89) of the Guideline: Sampling and surveys for CDM project activities and PoAs (v.4). Also, Cell D28, D51 and D74 of the 'Sample size calculation' sheet was found to be rectified and reflects the comparison of the achieved precision with the applicable precision limit of 10%.

The revisions in the sample size calculation sheet were found to be made in-line with the provisions stated in the appendix 4 of the Guideline: Sampling and surveys for CDM project activities and PoAs (v.4).

- d. The "Treatment capacity of a unit (based on installation + subsequent supplies) (Ltrs)" (in column AH of sales database) reflects treatment capacity for one unit only, in case of institutions with multiple units. This is deemed in sync with the parameter 'Ny,i' found to be calculated as Numbers of persons serviced / unit as verified from column AE of the 'Sales database sheet'.

The approach of calculating treatment capacity and number of persons serviced per unit by CME to ensure that the value of $(N_{y,i} * R_{y,i})$ does not exceed the maximum output of a unit system for cases where multiple systems are being used simultaneously, is found acceptable and correct.

It is further confirmed that the aggregation of capacity (in column AH) of all the systems installed in an institution (for UltraFLO or Multi Barrier UV) would over-calculate the maximum output per system and would result in the over-estimation of ERs. Also, from the 'ER summary sheet' (Row=2) it has been verified, that CME has considered total number of units from column AD of 'Sales database' to calculate $T_{y,i}$ even though column AE of the 'Sales database' calculates $N_{y,i}$ per unit. Thus, the cumulative treatment capacity value of per unit under column AH of the ER sheet was found to be acceptable.

- e. The number of units (under column AC of sales database worksheet) distributed ($T_{y,i}$) for Ultra Tab system was found to be 1 for all the institutions. It is in line with the additional comment under parameter table of 'Ty,i' of the referred registered CPA-DDs 9948-P1-0005-CP1 To 9948-P1-0013-CP1, page 15 that in case of Ultra Tabs the value of parameter $T_{y,i}$ shall be the number of institutions where the Ultra Tabs were being supplied i.e. each institutions to be counted as 1. Due to the consumption of the Ultra Tabs over time, CME ensured that there would be continuous disinfection through regular supplies of the Tablets to these institutions.

From the 'Sales database sheet' it was verified that CME has monitored the total number of units supplied to an institution initially under column E and the subsequent supplies were also found to be monitored and captured by the CME under column R:AA. Further, in case of UltraTAB, Column AH (Treatment Capacity = number of tablets supplied * 100 ltrs) of the Sales database Worksheet corresponds to this approach of Ultra Tab system received by the institution being counted as single unit for determining parameter $T_{y,i}$.

The approach of calculating parameter $T_{y,i}$ for UltraTAB has already been discussed and approved by CDM-EB under PRC-9948-003 as verified from the 'DOE clarification- CCIPL 599 revised FVR'.

- f. The eligibility criteria #16 (De-bundling) for the inclusion of CPA in PoA, was found to state that the emission reduction generated by each Water purification system is limited to 600 tCO₂e/annum as verified from the registered CPA-DDs. CME has capped the value of $N_{y,i}$ to be in compliance with the eligibility criteria #16.

The capped value for $N_{y,i}$ was found to be 3050 persons /unit (for CPA-9948-P1-0003-CP1) and 3185 persons /unit (for CPA-9948-P1-0005-CP1 to 9948-P1-0013-CP1) as verified from page 6 of the respective included CPA-DDs.

So, CME's approach of applying these values in column AE of the sales database worksheet (of the ER sheet version 3.0) was found to be acceptable as it ensured that no system would

generate more than 600 tCO₂e/annum in line with the eligibility criteria set in the registered CPA-DDs and PoA-DDs.

- g. As per the registered monitoring plan, the value of $Ny_i \cdot Ry_i$ should not exceed the maximum output of the unit (per unit). The calculation of $Ny_i \cdot Ry_i$ provides the total volume of drinking water consumption per day per unit under column AF of the Sales Database Worksheet.

In order to ensure that the system does not exceed maximum output of the unit, CME has calculated the treatment capacity of the system (per unit) under column AH. The treatment capacity value was then divided by the calculated value of $(Ny_i \text{ (per unit)} \cdot Ry_i)$ of the unit to determine the continuous running end date of a system (under column AJ). The residual capacity of the system after the end of monitoring period is determined through the continuous running end-date. The residual capacity of 0 reflected the complete consumption of system ensuring $Ny_i \cdot Ry_i$ value has not been exceeded whereas the non-zero value were indicative of the un-utilized system capacity by the end of the monitoring period (as evident from the column AL of Sales database sheet).

Thus, this approach of CME was found to be acceptable as it ensured that $Ny_i \cdot Ry_i$ never exceeds the maximum output of the unit [per unit] which was found to be in-line with the registered monitoring plan.

- h. CME has applied the value of 365 for the number of days of operation for the project units, which was found to be acceptable because of following justifications provided:

- I. Both PoA-DD and the CPA-DDs mention 365 days as the number of days of operation as verified from page 70 and page 101 of PoA-DD and ER formulae of the CPA-DDs.
- II. Again, days of operation, was neither found to be an ex-ante parameter nor to be an ex-post monitoring parameter as verified from the registered monitoring plan.
- III. The subsequent versions of the applied methodology (AMS-III AV. Version 08.0) was reviewed and it was confirmed that value of 365 days for the days of operation has been applied in the applicable formulae and sample calculation shown in the methodology.
- IV. The capped volume of drinking water per person per day of 2L/person/day (for day school) and 3.5L/person/day (in boarding school) in the PoA was found to be conservative as these value were found to be meeting the minimum survival levels set by WHO. As per Technical Notes for emergencies by WHO, the minimum survival capacity has been allocated 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, minimum requirement for day schools were found to be 5l/person/day and 20l/person/day as verified from water sanitation and Hygiene standards for Schools in Low-cost settings by WHO.

Thus, following the above set levels CME's approach of considering 2 ltr/per/day for day schools and 3.5 ltrs/per/day for boarding schools/prisons were found to be conservative and acceptable. This, approach has already been discussed and approved by CDM-EB as verified from DOE clarification 8 "FVR 599 CPA 5 to 13 PRC VR Nigeria 25.03.19 clean"

Thus, CL#03 stands closed.

| | | | | |
|---|----|--------------------|----------|--------------------------|
| CL ID | 04 | Section no. | E.3.4.2. | Date : 26/03/2020 |
| Description of CL | | | | |
| 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. | | | | |
| Project participant response | | | | Date : 17/11/2020 |
| 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 | 12 Nov 2019 | -- |
| 3 | 23 May 2019 – 31 Dec 2019 | 13 Jan 2020 | MP3 is less than 2 years, still monitoring done again in Jan 2020 despite monitoring done in MP2 in Nov 2019 |
| 4 | 01 Jan 2020 – 21 Ma 2020 | 05 Aug 2020 | MP4 less than 2 years since MP3, still monitoring done again in Aug 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 current 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 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.

Documentation provided by project participant

DOE assessment

Date: 19/11/2020

The applied methodology AMS-III.A.V. version 4.0 prescribes the parameter to be monitored at least once every two years (biennial) to ensure that they are still operating or are replaced by an equivalent in service appliance.

The word ‘atleast’ in the required frequency atleast biennial does not refrain the CME to conduct the monitoring with a better frequency and a higher frequency (i.e. more than once in two years) is still in line with the requirement.

The CPA-DDs stating the monitoring frequency for the parameter "operational units" as "At least once per verification or biennially as per the monitoring requirements in the methodology" is still in line with the applied methodology AMS-III.A.V. version 4.0.

The CME has demonstrated in the table above that the parameter is monitored at a frequency higher than the minimum required frequency. The results from the sampling surveys conducted for every verification are deemed more accurate than following a at-least biennial monitoring frequency. Thus, the approach was found to be in line with the applied methodology and was accepted by the verification team.

Thus, the finding is closed.

| CL ID | 05 | Section no. | E.3.4.2. | Date | : 26/03/2020 |
|--|----|-------------|----------|------|--------------|
| Description of CL | | | | | |
| 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. | | | | | |
| Project participant response | | | | | Date |
| The CPA-DD (CPA05 for instance) on page 3,4 states the following: “The application of technologies distributed under the CPA achieve compliance with “Interim or higher” | | | | | : 25/11/2020 |

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 Multi Barrier UV) needs to demonstrate that they comply with WHO, 2011 interim performance targets as per aforesaid.

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 03 CPA-DD on page 4 and CPA 05 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 refers to the following:

“As per the World Health Organizations Guidelines⁶ 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

⁶ WHO 'Guidelines for Drinking-water Quality, Fourth Edition Page 41.

- 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 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 – 975⁷ 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.

Documentation provided by project participant

DOE assessment

Date: 26/11/2020

The applied methodology requires the water quality to monitored following para 2(b) of the applied methodology.

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)

⁷ <http://www.ajtmh.org/content/journals/10.4269/ajtmh.15-0717>

an applicable national standard or guideline”

As responded by CME above, they have 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 monitoring team was also interviewed during the remote audit, during which they confirmed the entire process they follow for collecting each sample, handling the sample, reading results etc. and also confirmed that they have received training before conducting the test.

Thus, the results from the Aquagenx tests conducted by the monitoring team were found to be reliable and meeting the conditions of the applied methodology.

The C#05 stands closed.

| CL ID | 06 | Section no. | E.3.4.2. | Date : | 26/03/2020 |
|--|----|-------------|----------|--------|--------------------------|
| Description of CL | | | | | |
| 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 | | | | | |
| Project participant response | | | | | Date : 17/11/2020 |
| <p>Firstly, the monitoring methodology para 15 states:</p> <p><i>"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".</i></p> <p>Para 16(b) of the methodology states:</p> <p><i>"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"</i></p> <p>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.</p> <p>However, during the ex-post monitoring, the CME has taken additional measures to ensure continuous availability of safe drinking water as follows:</p> <p>The monitoring survey form consists of the following questions:</p> <p>Question pertaining to continuity/Maintenance:</p> <ul style="list-style-type: none"> • Has routine supply/maintenance been conducted for the IW System? (Yes/No). • When was the last time supply/maintenance was conducted? (DD-MMM-YYYY). <p>Question pertaining to usage:</p> <ul style="list-style-type: none"> • Is the IW unit being used for water treatment? (Yes/No) • Presence of other water treatment technologies / devices in the institution <p>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.</p> <p>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.</p> <p>The questions related to usage confirms that the system is function as per para 16. Additionally, none of the</p> | | | | | |

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.

In addition to aforesaid the CME has 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 "Sales database" column R:AA). 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 interrupted supply of safe drinking water in the institution

Documentation provided by project participant

DOE assessment

Date: 19/11/2020

The continuous availability of safe drinking water is ensured by confirming the operational status of sampled systems and checking the provisions put in place by the CME other than the survey questionnaire.

During the survey, the CME checks that continuous supply of cartridge/tablets, through the questions stated above as 'Question pertaining to continuity/Maintenance' and also checks the operational status through 'Question pertaining to usage' stated above.

The questions pertaining to continuity/maintenance ensures that the institution is receiving continuous supplies and questions pertaining to usage confirms that those supplies are being used. Any institution reporting the product as being functional, cannot be out of supplies.

All the institution heads of "DOE sampled systems" were interviewed by the verification team 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.

Additionally, the DOE checked the provisions in place to ensure continuous supply of safe drinking water

- The institution head confirmed during the interview that staff from the institution have received adequate training on the usage of the installed WPS. They can detect if they are running out of supplies(cartridge/tablets) and accordingly contact the CME/CPAI for subsequent supplies to ensure continuous availability.
- The CME representatives interviewed during the remote audit confirmed that they have a Call Centre in the country offices which regularly takes follow up calls with the institutions regarding usage and headcount to gauge the expected date of next supply.
- The copies of Purchase Order and Delivery Notes and the presence 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 problem with the product or need additional tablets / cartridges. Moreover, during the remote survey calls, the institution heads confirmed to the verification team that they are aware about the contact number to which they can register their complain regarding the product or their request for supplies.

- The CME provided a detailed sales database which records the subsequent supplies with their product IDs for each institution, which is presented in the ER sheet (refer ER calculator, worksheet "Sales database" column R:AA). The CME has provided scanned copies of delivery notes available at the CPAI office to the verification team 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 verification team confirms that all the institutions (with systems claiming emission reductions) have received continuous supply and provide continuous safe drinking water during the monitoring period.

Thus, the CL stands closed

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|--|----|--------------------|----------|--------------------------|
| CL ID | 07 | Section no. | E.3.4.2. | Date : 26/03/2020 |
| Description of CL | | | | |
| The CME/DOE 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. | | | | |
| Project participant response | | | | Date : 17/11/2020 |
| 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: | | | | |
| <ol style="list-style-type: none"> 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 more 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 ltrs/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 if $R_{yi} = 2.05$ which is much less than a default value of 3 ltrs 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 5 to 13 PRC VR Nigeria 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 project participant | | | | |
| DOE assessment | | | | Date: 19/11/2020 |
| The application of 365 days as the number of days of operation for the project units, was found to be acceptable because of following justifications provided. | | | | |
| <ol style="list-style-type: none"> I. Both PoA-DD and the CPA-DDs mention 365 days as the number of days of operation as verified from page 70 of PoA-DD and ER formulae of the CPA-DDs. II. Again, days of operation, was neither found to be an ex-ante parameter nor to be an ex-post monitoring parameter as verified from the registered monitoring plan. III. The applied methodology (AMS-III AV. Version 04.0) and subsequent versions of the applied methodology (AMS-III AV. Version 08.0) were reviewed and it was confirmed that value of 365 days for the days of operation has been applied in the applicable formulae and sample | | | | |

calculation shown in the methodology.

- IV. The capped volume of drinking water per person per day of 2L/person/day (for day school) and 3.5L/person/day (in boarding school) in the PoA was found to be conservative as these values were found to be meeting the minimum survival levels set by WHO. As per Technical Notes for emergencies by WHO, the minimum survival capacity has been allocated 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, minimum requirement for day schools were found to be 5l/person/day and 20l/person/day as verified from water sanitation and Hygiene standards for Schools in Low-cost settings by WHO. Thus, following the above, the CME's approach of considering 2 ltr/per/day for day schools and 3.5 ltrs/per/day for boarding schools/prisons were found to be conservative and deemed acceptable. This, approach has already been discussed and approved by CDM-EB as verified from DOE clarification 8 "FVR 599 CPA 5 to 13 PRC VR Nigeria 25.03.19 clean"

Hence, application of 365 days of crediting for a systems is deemed appropriate and in line with applied methodology and registered PoA/CPA-DD.

Thus, the CL stands closed.

Table 3. CARs from this verification

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|---|----|--------------------|---------|--------------------------|
| CAR ID | 01 | Section no. | E.3.6.5 | Date : 26/03/2020 |
| Description of CAR | | | | |
| <ol style="list-style-type: none"> 1. Achieved ERs mentioned in the MR (Version 1.0) was found to be inconsistent with the ER sheet (Tab: ER summary; Cell: O21). 2. Estimated ERs mentioned on cover page of MR version 1.0 as 572,602 tCO₂ was found to be inconsistent with the estimated ERs mentioned as 349,836 tCO₂ under section F.5 of MR Version 1.0. 3. The start date of the monitoring period is 23/05/2019 as per the project webpage. However, the start date of the monitoring period mentioned under section E.3 of the MR version 1.0 is 23/05/2018. | | | | |
| Project participant response | | | | Date : 29/04/2020 |
| <ol style="list-style-type: none"> 1. The ERs volume have been rectified in the revised MR to be consistent with the ER Sheet. Revised MR is being submitted. 2. The estimated ERs have been rectified in the revised MR to be consistent with the ER Sheet. The revised MR is being submitted. 3. The start date of the monitoring period has been revised in section E.3 of the MR. The revised MR is being submitted. | | | | |
| Documentation provided by project participant | | | | |
| PoA 9948_MP2_Norway 1B Nigeria MR ver 2.0_29042020 | | | | |
| PoA 9948_MP2_Norway 1B Nigeria ER Sheet_ver 2.0_29042020 | | | | |
| DOE assessment | | | | Date: 04/05/2020 |
| <ol style="list-style-type: none"> 1. PP has now consistently mentioned the achieved ERs in the MR (Version 2.0, Dated: 29/04/2020) and the ER sheet (Title: PoA 9948_MP2_Norway2 Nigeria ER sheet_ver 2.0_29042020). (Closed) 2. PP has now rectified the estimated ERs in the revised MR version 2.0, Dated:29/04/2020 and the ER sheet (Title: PoA 9948_MP2_Norway2 Nigeria ER sheet_ver 2.0_29042020). (Closed) 3. PP has now revised the start date of the monitoring period under section E.3 of the revised MR Version 2.0, Dated: 29/04/2020. (Closed) | | | | |

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|---------------------------|----|--------------------|----------------|--------------------------|
| CAR ID | 02 | Section no. | E.3.4.2, E.2.2 | Date : 26/03/2020 |
| Description of CAR | | | | |

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|---|--------------------------|
| <p>1. For the parameter (Water Quality, Operational Units), The MRs for MP2 and MP3 mention that the monitoring was conducted on Nov 2019-Dec 2019 date. The previous period for MP2 is from (23/05/2017-22/05/2019 = 2years), the current MR is for MP3 (23/05/2019-31/12/2019= 7months, 8days. CME shall clarify how the frequency of biennial has been followed if the survey has been conducted only once for both the periods with same samples.</p> <p>2. The date of last time the cartridges were received for following schools were found to be inconsistent:</p> <ol style="list-style-type: none"> MT Bizben International School (SF ID: N1836092) in monitoring survey form was found to be inconsistent with the date mentioned in the monitoring sheet (Title: PoA 9948_MP3_Norway 2 Nigeria, Tab: Monitoring Data, Cell: H11). The date of last time the cartridges were received for Adeola Memorial College (SF ID: N1836091) in monitoring survey form was found to be inconsistent with the date mentioned in the monitoring sheet (Title: PoA 9948_MP3_Norway 2 Nigeria, Tab: Monitoring Data, Cell: H10). The date of last time the cartridges were received for D.C. Elementary School (SF ID: N1826664) in monitoring survey form was found to be inconsistent with the date mentioned in the monitoring sheet (Title: PoA 9948_MP3_Norway 2 Nigeria, Tab: Monitoring Data, Cell: H63). | |
| Project participant response | Date : 29/04/2020 |
| <p>1. Firstly, the monitoring for MP2 was conducted in Nov- Dec 2019 and that for MP3 has been conducted in Jan- Feb 2020. Please refer the survey records submitted for MP2 and MP3 where the date of survey is clearly mentioned. The MR has been rectified to reflect the correct monitoring survey duration in section E.3. Secondly, the sampling and monitoring for MP2 and MP3 have been conducted separately and the samples for MP2 and MP3 are different and not common. Kindly refer the ER calculator, monitoring data sheet where the survey samples for MP2 and MP3 are different.</p> <p>2. The date of last supply of cartridge/tablets mentioned in the worksheet "monitoring data" of ER sheet have been made consistent with the date of last supply of cartridge/tablets written in the survey forms. The revised ER Sheet is being submitted.</p> | |
| Documentation provided by project participant | |
| PoA 9948_MP2_Norway 1B Nigeria ER Sheet_ver 2.0_29042020 | |
| DOE assessment | Date: 04/05/2020 |
| <p>1. The sample survey records both for MP2 and MP3 were checked by the DOE and the samples were found to be different for each of the periods as referred by CME. Secondly, the monitoring survey for MP2 was conducted in Nov-Dec 2019 and for MP3 in Jan-Feb 2020 as verified from the monitoring survey forms. CME has conducted monitoring more frequently than the required annual/biennial frequency. Thereby, it has been accepted by the DOE as CME was found to follow the compliance of the applicable monitoring frequency. (Closed)</p> <p>2. PP has now revised the last date of supply of cartridges/tablets in the worksheet "monitoring data" of ER sheet (Title: PoA 9948_MP2_Norway2 Nigeria ER sheet_ver 2.0_29042020) and have made it consistent with the Monitoring Survey Forms. (Closed)</p> | |

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|---|----|--------------------|------------------|--------------------------|
| CAR ID | 03 | Section no. | E.3.4.3, E.3.4.2 | Date : 15/05/2020 |
| Description of CAR | | | | |
| <p>1. Caption of Section E.3 of the MR is truncated. Please correct.</p> <p>2. Given that the parameter $f_{NRB,y}$ is being defined as parameter to be monitored annually or at least biennial in the CPA DD, how the value applied from a source that dates 2012 is deemed appropriate. Please also consider the point (a) mentioned at https://cdm.unfccc.int/DNA/fNRB/index.html while responding to the issue.</p> <p>3. The parameter "existence of PDN of SDW" is required to be monitored annually as per applied methodology AMS III AV V4 para 2(a) and 17. However, the CPA DD defines the monitoring frequency to be also biennial. Please clarify how the registered monitoring plan of the CPA is in line to methodology.</p> | | | | |
| Project participant response | | | | Date : 21/05/2020 |
| <p>1. Caption of section E.3 of the MR has been corrected.</p> <p>2. The default value for $f_{NRB,y}$ for biomass (=0.93 sourced from EB97) has been fixed at the PoA level. Please refer page number 69 and 82 of the registered PoA-DD which states the following: EB 67 Annex 22 Default Values for Fraction of Non-Renewable Biomass for Least Developed Countries and Small Island Developing States, combined with survey, national, or regional data to</p> | | | | |

determine the percent of users using woody biomass and fossil fuel in the baseline scenario. Thus, the continuous or at least biennial monitoring, as per PoA-DD, refers to determining the % mix of fuels (% of beneficiaries using non-renewable biomass and/or other fossil fuels in the baseline) and updating the applicable weighted average $f_{NRB,y}$ as per the formula stated in the monitoring parameter table – Measurement Methods and procedures, on page 49 of the PoA-DD. The percentage of users using non-renewable biomass and percentage of users using fossil fuel in Nigeria has been updated as the per the Global Alliance for Clean Cookstoves, Nigeria report and a weighted average value has been applied to determine $f_{NRB,y}$. The GACC report remains the most recent data publicly available.

3. The included CPA-DDs defined the monitoring frequency for parameter “existence of PDN of SDW” as “Annual or at least biennial as per the monitoring requirements in the methodology”. CME is monitoring the parameter “existence of PDN of SDW” annually and applying this annual value in ER calculations. Thus, the registered CPA-DD and the implemented monitoring plan and the monitoring frequency being followed are deemed in line with the methodology with respect to monitoring frequency.

Documentation provided by project participant

PoA 9948_MP3_Norway 2 Nigeria MR ver 2.1_21052020

DOE assessment

Date: 01/06/2020

1. Section E.3 caption has now been revised in the MR (Version 2.1). The caption is exactly same as the MR template present on UN website. Thus, the distortion in the template has been corrected now. (Closed)

2. The f_{NRB} value for biomass is determined by the the default value stated in EB 67 Annex 22 for LDC and SIDS combined with survey, national or regional data to determine the percent of users using woody biomass and fossil fuel in the baseline scenario. CME's approach for determining the f_{NRB} value was found to be in-line to the measurement methods and procedure of the parameter on page 49 of the PoA-DD.

The frequency of continuous or at least biennial under the parameter is required for determining the % mix of fuels and there by updating the f_{NRB} value as per the applied formula for the parameter. The percent mix of fuel was found to be determined from the GACC Nigeria report which was found to be latest applicable national data available at the time of f_{NRB} value being determined at PoA level (Closed)

3. The team has checked the monitoring survey to confirm that the CME is annually monitoring the parameter “existence of PDN of SDW”. This is in-line with the monitoring frequency stated in the CPA-DD and the applied methodology. The monitoring frequency for the parameter in the revised MR (Version 2.1) now mentions ‘Annually’ making it consistent with the frequency stated in the CPA-DD and applied methodology and the value of the parameter obtained annually was found to be applied in the ER calculation. (Closed)

Thus, the CAR is closed.

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|---|----|-------------|--------|-------------------|
| CAR ID | 04 | Section no. | E.1.3. | Date : 15/05/2020 |
| Description of CAR | | | | |
| As per VVS for PoA para 335, it needs to be confirmed that a request for issuance of CERs for the previous monitoring period that included the particular CPA has been published. However, the issuance of CERs for the previous monitoring period has not been submitted yet. | | | | |
| Project participant response | | | | Date : 21/05/2020 |
| The VVS para 335, requires publishing of request for issuance of previous MP, to allow a verifying DOE confirm, that the monitoring period of CPAs covered in the concerned MR (MP3 MR1) are in continuation with the specified end date of monitoring period of these CPAs in the previous MR (MP2 MR4). Unless the request for issuance of previous MP is published, it is not possible for the verifying DOE, in general, to issue confirmation as required by VVS para 335. | | | | |
| However, in this case, in particular, the MP2 MR4 has also been verified by ESPL and request for issuance for MP2 MR4 is under process. Thus, ESPL can confirm that the CPAs covered in current Mp3 MR1 have their monitoring period continuous with that specified in previous MP2 MR4, without needing to wait for publication of request for issuance of MP2 MR4. | | | | |
| Documentation provided by project participant | | | | |
| NA | | | | |
| DOE assessment | | | | Date: 08/09/2020 |
| The justification does not comply with para 335 of VVS for PoA version 2.0. open | | | | |

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|--|--------------------------|
| Project participant response | Date : 08/09/2020 |
| The RFI for MP2 for the CPAs covered under MP3 has now been published. | |
| Documentation provided by project participant | |
| | |
| DOE assessment | Date: 10/09/2020 |
| The RFI for the previous monitoring period (MP2) for the CPAs (9948-P1-0003-CP1 and 9948-P1-0005-CP1 to 9948-P1-0013-CP1) under consideration during the current MP(MP3) was found to be published as verified from the PoA-webpage. | |
| Thus, CAR#04 stands closed. | |

Table 4. FARs from this verification

| | | | | |
|--|----|--------------------|--|-------------------------|
| FAR ID | xx | Section No. | | Date: DD/MM/YYYY |
| Description of FAR | | | | |
| | | | | |
| CME response | | | | Date: DD/MM/YYYY |
| | | | | |
| Documentation provided by the CME | | | | |
| | | | | |
| DOE assessment | | | | Date: DD/MM/YYYY |
| | | | | |

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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 | | |