

VERIFICATION & CERTIFICATION REPORT

Aqua Clara Foundation

AQUA CLARA WATER FILTRATION PROGRAM IN KENYA

(GS Ref. No. 1078)

Monitoring Period

22/07/2014 to 18/02/2016

(Including both the days)

REPORT NO.
GS.16.VER.001 MP02

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|---|---------------------------|--|------------|
| <i>Date of this issue:</i> 07/12/2016 | | KBS Ref. No.: GS.16.VER.001.MP02 | |
| <i>Project Title:</i> | | Aqua Clara Water Filtration Program in Kenya | |
| <i>Organization:</i> | | KBS Certification Services Pvt. Ltd. | |
| <i>Client:</i> | | Aqua Clara Foundation | |
| <i>Monitoring Period:</i> | | 22/07/2014 to 18/02/2016 (including both dates) | |
| <i>Summary:</i> | | | |
| <p>KBS Certification Services Pvt. Ltd. has performed the 2nd periodic verification of the GS project Aqua Clara Water Filtration Program in Kenya and Gold Standard Ref. Number 1078. The verification includes confirming the implementation of the monitoring plan of the registered PDD and the application of the monitoring methodology as per “Technologies and Practices to Displace Decentralized Thermal Energy Consumption”. A site visit was conducted to check the implementation of registered monitoring plan and verify the data submitted in the monitoring report. KBS confirms the following has been reviewed;</p> <ul style="list-style-type: none"> (a) The registered PDD and the monitoring plan, and the corresponding validation opinion; (b) The validation report; (c) Previous verification reports, if any; (d) The applied monitoring methodology(ies); (e) The monitoring report to verify that it is as per the standardized format; (f) Any other information and references relevant to the project activity’s emission reductions (e.g. IPCC reports, data on electricity generation in the national grid or laboratory analysis and national regulations); (g) CER calculations sheets and all supporting documents; <p>KBS Certification Services Pvt. Ltd. Confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements.</p> <p>Based on the information seen and evaluated we confirm that the implementation of the project has resulted in 36,356 tCO₂e emission reductions during period 22/07/2014 to 18/02/2016 (Including both the days).</p> | | | |
| <i>Subject Group:</i> | <i>Sectoral Scope(s):</i> | <i>Methodology:</i> | |
| GS Verification | 1, 03, 13 | Technologies and Practices to Displace Decentralized Thermal Energy Consumption | |
| Verification Team: | | Monitoring report: | |
| <i>Team Leader, Technical Expert (1.1), Local Expert</i> | Chetan Swaroop Sharma | First version | 23/05/2016 |
| <i>Technical Expert (3.1, 13.1)</i> | MP Kanal | Final version | 06/12/2016 |
| Independent Technical Reviewer Team | | Verification status: | |
| Date:07/12/2016 | | | |
| <i>Technical Reviewer</i> | Sanjay Kandari | <input type="checkbox"/> Findings not closed. | |
| <i>Technical Expert (1.1, 3.1, 13.1)</i> | Sanjay Kandari | <input type="checkbox"/> Draft verification opinion | |
| Manager T&C | Sanjay Kandari | <input checked="" type="checkbox"/> Final verification opinion | |
| Date | 07/12/2016 | | |
| Authorized Signatory: | | | |
| Date: 07/12/2016 | | | |
| Managing Director | Kaushal Goyal | <input checked="" type="checkbox"/> No distribution without permission from client | |
| Revision history: | | <input type="checkbox"/> Unrestricted distribution | |
| <i>Date</i> | <i>Rev. No.</i> | <input type="checkbox"/> Limited distribution | |
| 17/08/2016 | 0 | | |



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| 19/08/2016 | 1 | |
| 10/11/2016 | 2 | |
| 07/12/2016 | 3 | |

Abbreviations

| | |
|-------------------|---|
| ACF | Aqua Clara Foundation |
| BE | Baseline Emissions |
| BSF | Bio Sand Filter |
| CAR | Corrective Action Request |
| CDM | Clean Development Mechanism |
| CDM EB | CDM Executive Board |
| CL | Clarification Request |
| CO ₂ e | Carbon dioxide equivalent |
| DNA | Designated National Authority |
| DOE | Designated Operational Entity |
| EF | Emission Factor |
| ERs | Emission Reductions |
| FAR | Forward Action Request |
| GHGs | Greenhouse Gas(es) |
| GIS | Geographic Information System |
| GS | Gold Standard |
| ISO | International Organization of Standardization |
| IPCC | Intergovernmental Panel on Climate Change |
| KP | Kyoto Protocol |
| LE | Leakage Emissions |
| MR | Monitoring Report |
| MP | Monitoring Plan |
| PE | Project Emissions |
| PDD | Project Design Document |
| QA/QC | Quality Assurance/Quality Control |
| SAM | Sand and Membrane Filter |
| SD | Sustainable Development |
| VCS | Voluntary Carbon Standard |
| VVS | Validation & Verification Standard |

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1. INTRODUCTION

1.1 Objective

KBS has been commissioned by “Aqua Clara Foundation” to perform an independent verification of its registered GS project “Aqua Clara Water Filtration Program in Kenya”, GS: 1078 for the reported GHG emission reductions for the given monitoring period 22/07/2014 to 18/02/2016 (both dates included). The Gold Standard projects must undergo independent third party verification and certification of emission reductions as the basis for issuance of Gold Standard Voluntary Emission Reductions (GS VERs).

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- The project activity has been implemented and operated as per the registered PDD and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- Monitoring report and other supporting documents are complete;
- The actual monitoring systems & procedures and monitoring report conforms with the requirements of the approved monitoring plan and the approved monitoring methodology;
- The data is recorded and stored as per the monitoring methodology and approved monitoring plan.

1.2 Scope

The scope of the verification is the independent and objective review and ex post determination of the monitored reductions in GHG emission by the project activity. The verification is based on review of monitoring report, supporting information and

- (a) The registered PDD, including the monitoring plan, GS passport and the corresponding validation opinion(s);
- (b) Previous verification reports, deviation requests, requests for revision of monitoring plan;
- (c) Monitoring report for the monitoring period under verification including GS VER calculations sheets and all supporting documents;
- (d) The applied monitoring methodology;
- (e) Relevant decisions, clarifications and guidance from the CMP and the Gold Standard Board;
- (f) All information and references relevant to the project activity’s resulting in emission reductions

The project is assessed against the requirements of the Kyoto Protocol, the CDM Modalities and Procedures and related rules and guidance.

KBS has, based on the recommendations in the latest version of Gold Standard Toolkit and CDM Validation and Verification Standard, employed a rule-based approach in the verification, focusing on the identification of significant reporting risks and the reliability of project monitoring.

1.3 Description of the Project Activity

| | |
|-----------------------------------|---|
| Title of project activity: | Aqua Clara Water Filtration Program in Kenya |
| Gold Standard Id: | GS 1078 |
| Applied methodology: | Technologies and Practices to Displace Decentralized Thermal Energy Consumption |
| Start date of crediting period: | 01/07/2007 |
| Project Participants: | Aqua Clara Foundation |
| Location of the project activity: | Kenya, The project activity is spread across 23 Counties. |

The project activity aims at GHG reduction through implementation of the ACF Bio Sand Filter (BSF), Household Hollow Fibre filter and the Sand and Membrane (SAM) large-scale filter. These ACF water purifiers displace the use of firewood fuel traditionally used to boil water for domestic consumption and in the alternative offer an affordable, long-term solution for households that typically consume raw water from turbid sources. The project activity seeks to introduce approximately 7,424 BSF purifiers, 4 FHFFs and 1,842 household Hollow fibre filters with a capacity of up to 15-100 litres per day and 425 Institutional/commercial-use HFF units with a production capacity of 100 – 400 litres of water per day throughout the 10-year crediting period in rural and peri-urban Kenya.

The project technologies offer an affordable, clean, efficient and easy-to-use alternative for water purification within the rural area that the project activity seeks to operate in. In addition the project activity will actively reduce CO₂ emissions and diminish the associated risks of Indoor Air pollution.

To date the PP has installed a total of 3,389 Bio Sand and 316 HHFF units used for domestic use in the project boundary.

The emission reductions achieved during the current monitoring period starting from 22/07/2014 to 18/02/2016 (including both days) is 36,356 tCO₂e.

2. METHODOLOGY

KBS follows a rule based verification approach, wherein, as a first step, the contract review is undertaken as per latest version of CDM Accreditation Standard. Subsequently, after the contract is signed, the monitoring report of the project activity is made available at Gold Standard registry as per CDM procedures in accordance with Gold Standard rules. Since the Gold Standard prescribes the application of CDM rules and guidelines which are followed along with the Gold Standard rules.

A desk review of the project documentation is undertaken, which is followed by an onsite visit by the members of verification team in accordance with the latest version of CDM AS. The verification protocol is filled by the verification team that is based on standard auditing practices and latest version of CDM VVS, to capture the assessment of applicable CDM requirements viz., latest version of CDM Project Standard, registered PDD, applied methodology/ies and/or tools and recent decisions. The verification protocol provides transparent means to record the observations and compliances by the verification team members and the nonconformities, if any. The verification protocol is an internal document, and is available on request. Following are the major milestones for the verification under consideration.

Duration of verification

| | |
|----------------------------------|---------------------------------|
| <i>Verification Contract</i> | <i>01/02/2016</i> |
| <i>On site verification</i> | <i>30/06/2016 to 01/07/2016</i> |
| <i>Draft Verification Report</i> | <i>17/08/2016</i> |
| <i>Final Verification Report</i> | <i>07/12/2016</i> |

2.1 Review of Documentation

A desk review is undertaken, involving but not limited to,

- A review of the data and information presented to verify their completeness;
- A review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
- An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

The list of documents reviewed is included in the section 'References'

2.2 Site Visits

A site visit is undertaken by members of verification team, involving but not limited to,

- An assessment of the implementation and operation of the proposed CDM project activity as per the registered PDD;
- A review of information flows for generating, aggregating and reporting the monitoring parameters;
- Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the approved monitoring plan;
- A cross-check between information provided in the monitoring report and data from other sources such as plant log books, inventories, purchase records or similar data sources;
- A check of the monitoring equipment, including calibration performance and observations of monitoring practices against the requirements of the PDD and the selected methodology;
- A review of calculations and assumptions made in determining the GHG data and emission reductions;

- An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

The site visit for this verification assessment was undertaken by Chetan Swaroop Sarma (Team Leader, Local Expert & Technical Expert) and details are mentioned below;

| | | |
|---|----------------------------|---------------------------------|
| Location | Kenya | |
| Dates | 30/06/2016 to 01/07/2016 | |
| Key points discussed | Name of person interviewed | Designation, Organization |
| Operational data Data collection QA/QC procedures | Douglas Makora Mokong'u | Incharge, Aqua Clara Foundation |
| | Douglas Makora Mokong'u | Incharge, Aqua Clara Foundation |
| | Douglas Makora Mokong'u | Incharge, Aqua Clara Foundation |
| | Douglas Makora Mokong'u | Incharge, Aqua Clara Foundation |
| Calculation of Ers | Natasha Georgete Kalanda | Consulatnt, Viability Africa |
| CDM requirements | Natasha Georgete Kalanda | Consulatnt, Viability Africa |

2.3 Reporting of Findings

During the course of verification the findings may be raised as under;

CAR is raised if one of the following occurs:

- Non-compliance with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- Issues identified in a FAR during validation to be verified during verification(s) have not been resolved by the project participants.

Clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

FAR is raised during verification if the monitoring and reporting require attention and/or adjustment for the next verification period.

The verification report contains (section 7) all CARs, CLs and FARs raised during this verification in transparent manner and provides clear information of the issues raised, response received and its resolutions, including the changes in the documents. Additionally, major changes between the webhosted MR and final MR are presented under Section 6 (below the Reference) for easy reference.

2.4 Verification Assessment

Based on the desk review and site visit the team leader follows the verification protocol to identify and record the findings in the context of the project activity. The findings are communicated to the client in the findings document (section 7 of report). The project documentation, including responses to the findings is reviewed by the team leader in consultation with team members, wherever appropriate. The team leader prepares the draft verification report subject to closure or non closure of the findings.

2.5 Internal Quality Control

The draft verification report prepared by team leader is reviewed by an independent technical reviewer (having competence of relevant technical area himself/herself or through an independent technical area expert) to confirm the internal procedures established by KBS are duly followed and

the verification report/opinion is reached in an objective manner and complies with the applicable CDM requirements.

The independent technical reviewer may approve or reject the draft verification report. The findings may be identified even at this stage, which needs to be satisfactorily resolved, before the request for issuance is submitted to Gold Standard. The final decision is taken by the Manager Technical and Certification. The technical reviewer and Manager T&C can be same person.

The final decision is authorized by Managing Director, KBS once the report is approved by the Manager T&C.

3. VERIFICATION FINDINGS

3.1 Remaining Issues (FARs from Previous Validation or Verification)

Discussion:

A FAR was raised during validation regarding post registration baseline survey/water boiling tests prior to 2nd issuance considering in a representative way the target population in the project boundary and considering households prior to adopting the project technology. The same has been kept as FAR#09 in the previous verification (1st periodic verification) as it was pertinent to 2nd issuance. CAR-02 has been raised corresponding to the FAR#09 raised during previous verification and successfully closed.

Also there were three FARs raised during the 1st verification GS review for which three CAR i.e. CAR-03, CAR-04 and CAR-05 have been raised and successfully closed. Please refer section 7 for details. In addition to this CAR-06 has been raised corresponding to the FAR#12 raised during the previous verification (1st verification) and successfully closed.

Findings:

CAR-02, CAR-03, CAR-04, CAR-05 and CAR-06 were raised. This is discussed in detail in section 7 of this report.

Opinion:

The project activity is in compliance with the revised PDD.

3.2 Compliance of project implementation with registered PDD

Discussion:

The project activity consists of implementation of water filters in the households across 23 counties across the host country Kenya. To date the PP has installed a total of 3,389 Bio Sand and 316 HHFF units used for domestic use in the project boundary. There are no operational Large scale SAM filters during this monitoring period. The same has been checked from the project sales record and also during site visit.

- Annual BSF Filter sales since start date of the project:
 - July 2009 to June 2010: 400 filters
 - July 2010 to June 2011: 617 filters
 - July 2011 to June 2012: 1010 filters
 - July 2012 to June 2013: 790 filters
 - July 2013 to June 2014: 349 filters
 - July 2014 to June 2015: 115 filters
 - July 2015 to January 2016: 108 filters

- Annual HFF filters sales start date of the project:
 - 1st Nov 2013 to 31st Oct 2014: 110 filters
 - 1st Nov 2014 to 31st Oct 2015: 181 filters
 - 1st Nov 2015 to 18th Feb 2016: 25

The current verification includes monitoring period starting from 22/07/2014 to 18/02/2016 (Including both the days). The project started commercial operation in July 2009. The company has its distribution network that involves the use of Community Development Officers (CDOs) and Community Health Promoters (CHPs) who work within the various communities under which Aqua Clara serves. At the time of installations of BSF/HHFF filters, households are issued with receipts and each filter is assigned a unique identification number to avoid double counting. The same has been evidenced during the site visit.

Sampling Plan:

As per the sampling approach defined in the revised PDD, Simple Random Sampling method was used to determine the random test subjects from the total sales record. A total of 231 households were selected for BSF and 40 for HFF for monitoring survey. However it was found that some households were unreachable as the home owner moved, contact information changed, etc. To compensate for the loss of these households within the sample frame, the PP replaced these households with other households and conducted the Monitoring survey.

Project participant again tried to contact Replaced households and a conclusion was taken whether the replaced household are user or non-user and considered accordingly in the usage survey calculation. The final frame for usage rate was considering the original households and the new households selected for the compensation against the replaced households. During the follow ups of original households, some household were found to be not traceable and hence not considered for the usage rate calculation. Final weighted usage rate is calculated considering all these factors. The calculation of the sample size for the monitoring surveys for the BSF units was based upon a 0.7 Coefficient of Variation under a 90/10 approach as mentioned in the PDD and also in Table 3 of Annex 4 of the approved Gold Standard baseline and monitoring methodology.

In accordance with the §26(a) of Standard for “Sampling and surveys for CDM project activities and programmes of activities” (version 05.0)^{13/} and based on verification team’s professional judgment, the verification team has chosen a sample size of 61 households. Further, the verification team has confirmed the following sampling approach –

- The sample size is based on the Acceptable Quality Level (AQL) of 1% and Unacceptable Quality Level (UQL) as 10% (as per §26b and §27 of Standard for “Sampling and surveys for CDM project activities and programmes of activities” (version 05.0)).
- The sample size considered appropriate as the Table 1 of Standard for “Sampling and surveys for CDM project activities and programmes of activities” (version 05.0)^{13/} has already provided the sample size for verifying PP’s data to be 61, for AQL=1% and UQL=10%.
- The maximum errors associated with the determination indicated in §27 of Standard for “Sampling and surveys for CDM project activities and programmes of activities” (version 05.0) is considered as 5% for producer’s risk and 5% for consumer’s risk.

Based on the sampling approach the verification team has selected the household’s. The household sampled in the survey during site visit, were cross verified with the sales record as well as with monitoring survey record to confirm the correctness of the data gathered at the time of survey. The result of verification team’s observation based on the chosen sample are found consistent with the sales record. No discrepancy was found during on site visit. Thus, according to the result of verification team’s random sampling as a part of the on site visit, the water filters were found installed and operating as per PP’s sales records.

Opinion:

- a) In opinion of the assessment team the implementation and operation of the project activity is in compliance with the description in the revised PDD/1/. However, the filters sold are less than the estimated in the PDD for the corresponding period.
- b) The project activity consists of 3389 BSF filters and 316 HFF filters installed during this verification period as verified from the sales records.
- c) The verification team reviewed the revised PDD, including the monitoring plan and the corresponding validation report and the applied monitoring methodology, relevant decisions from the CMP and the CDM EB and found that the MR for this monitoring period is line with all the above mentioned documents.

- d) The actual emission reductions for the current monitoring period are 36,356 tCO₂e which are lower than the estimated ERs (121,582 tCO₂e) for the comparable period. The difference in the actual emission reduction is due to lower sales of the water filter per annum than the estimated in the revised PDD.

3.3 Compliance of monitoring plan with the monitoring methodology including applicable tool(s)

Discussion:

The monitoring plan mentioned in the monitoring report/4/ is in line to the revised PDD/1/ and passport/3/ and in accordance with the approved methodology applied by the project activity, i.e. "Technologies and Practices to Displace Decentralized Thermal Energy Consumption" (V1.0)/5/. All the ex-post monitoring parameters as per the applied methodology/5/ are included in the monitoring report/4/ and ER sheet/6/. However there is temporary deviation observed during this monitoring period regarding delay of annual monitoring to the beginning of 2016 rather than July 2015. CL-03 has been raised and successfully closed. Refer CL-03 for more details.

Also the registered PDD refers to the frequency of conducting the WCFT as annually however the PP would like to amend this frequency to every other year (biennially). The methodology employed for this project, i.e. 'Technologies and Practices to Displace Decentralized Thermal Energy Consumption - 11/04/2011' states:

'For each baseline scenario and project scenario the BFT and PFT is updated every two years, Respectively',

At registration, the PP had chosen a conservative approach of annually monitoring this parameter, however, the PP now wishes to conduct this as per the methodological threshold of once every 2 years. Seeing as the PP has conducted this exercise the past 2 monitoring periods back to back, the parameters related to this exercise would remain fixed in the next verification.

Findings:

CL-03 was raised and closed successfully. This is discussed in detail in section 7 of this report.

Opinion:

The monitoring plan mentioned in the revised PDD is in line with the applied methodology i.e. "Technologies and Practices to Displace Decentralized Thermal Energy Consumption (V1.0)/6/. The monitoring mechanism is in line with the methodology and is effective and reliable

3.4 Post registration changes, if any

PP has proposed to change the frequency of conducting the WCFT as biennially rather than annually.

3.5 Compliance of monitoring activities with registered monitoring plan

Discussion:

During the verification all relevant monitoring parameter have been verified with regard to the appropriateness of the verification method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. It is confirmed that the monitoring parameter has been measured / determined without material misstatements. The monitoring parameters involved in the project activity as per revised PDD/1/ are analysed in detail in the subsections below:

3.5.1. Data/Parameter, Unit: Q_{p,y_{BSF}}, Litres per person per day

Quantity of safe water in litres consumed in the project scenario p and supplied by BSF project technology per person per day

* Page 22 of the referenced methodology

| | |
|--|--|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Baseline emissions |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</i> | Calibrated Buckets for measuring water |
| <i>Measuring/Reading/Recording frequency</i> | Biennially, 3 consecutive days of the monitoring exercise with exception of holidays |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | The Water Consumption Field Test results were collected for three consecutive days in each household included in the sample frame. An average of this was then obtained. The figure was then divided by the average number of people in the household. |
| <i>Verified value</i> | 6.78 |
| <i>Cross checks</i> | This has been cross checked by surveying the households during the verification site visit. The household surveyed during the monitoring survey by project participant were interviewed by the verification team and It has been confirmed that the figures mentioned in the survey sheet/11/ and considered for emission reduction are appropriate. |
| <i>QA/QC procedures applied</i> | <i>The enumerators were provided with calibrated buckets to ensure they took accurate measurements during the WCFT protocol</i> |

3.5.2. Data/Parameter, Unit: Q_p, y_{HHFF} , Litres per person per day

Quantity of safe water in litres consumed in the project scenario p and supplied by HHFF units

| | |
|--|--|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Baseline emissions |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</i> | Calibrated Buckets for measuring water |
| <i>Measuring/Reading/Recording frequency</i> | Biennially, 3 consecutive days of the monitoring exercise with exception of holidays |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | The Water Consumption Field Test results were collected for three consecutive days in each household included in the sample frame. An average of this was then obtained. The figure was then divided by the average number of people in the household. |
| <i>Verified value</i> | 2.44 |
| <i>Cross checks</i> | This has been cross checked by surveying the households during the verification site visit. The household surveyed during the monitoring survey by project participant were interviewed by the verification team and It has been confirmed that the figures mentioned in the survey sheet/11/ and considered for emission reduction are appropriate. |

| | |
|---------------------------------|---|
| <i>QA/QC procedures applied</i> | <i>The enumerators were provided with calibrated buckets to ensure they took accurate measurements during the WCFT protocol</i> |
|---------------------------------|---|

3.5.3. Data/Parameter, Unit: Q_p, y_{FHHF} , Litres of safe water produced per day from project technology

Quantity of safe water supplied in the project scenario p using the Large Scale Community SAM Filter

| | |
|--|---|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Baseline emissions |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</i> | No Large scale SAM Filter has been distributed during this monitoring period |
| <i>Measuring/Reading/Recording frequency</i> | No Large scale SAM Filter has been distributed during this monitoring period |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | No Large scale SAM Filter has been distributed during this monitoring period |
| <i>Verified value</i> | No Large scale SAM Filter has been distributed during this monitoring period |
| <i>Cross checks</i> | This has been cross checked from the total sales record that No SAM filters has been sold during this monitoring period, So this parameter is not monitored |
| <i>QA/QC procedures applied</i> | NA |

3.5.4. Data/Parameter, Unit: $Q_p, \text{clean,boil}, y_{BSF}$, Litres per person per day

Quantity of safe water boiled in the project scenario p per person per day

| | |
|--|---|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Project emissions |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</i> | Calibrated Buckets for measuring water |
| <i>Measuring/Reading/Recording frequency</i> | Biennially |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | The amount of filtered water boiled was obtained for the three consecutive days during the water consumption field test before the water was poured into the boiling pot. An average of this amount was then obtained and divided by the average number of people in the household. |
| <i>Verified value</i> | 0.0 |

| | |
|---------------------------------|---|
| <i>Cross checks</i> | This has been cross checked by surveying the households during the verification site visit. The household surveyed during the monitoring survey by project participant were interviewed by the verification team and It has been confirmed that the figures mentioned in the survey sheet/11/ and considered for emission reduction are appropriate |
| <i>QA/QC procedures applied</i> | The enumerators were trained how to accurately measure this parameter using calibrated buckets. |

3.5.5. Data/Parameter, Unit: Qp, clean,boil,y_{HFF}, Litres per person per day

Quantity of safe water boiled in the project scenario p per person per day

| | |
|--|---|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Project emissions |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</i> | Calibrated Buckets for measuring water |
| <i>Measuring/Reading/Recording frequency</i> | Biennially |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | The amount of filtered water boiled was obtained for the three consecutive days during the water consumption field test before the water was poured into the boiling pot. An average of this amount was then obtained and divided by the average number of people in the household and thereafter the number of people in the sample frame. |
| <i>Verified value</i> | 0.23655914 |
| <i>Cross checks</i> | This has been cross checked by surveying the households during the verification site visit. The household surveyed during the monitoring survey by project participant were interviewed by the verification team and It has been confirmed that the figures mentioned in the survey sheet/11/ and considered for emission reduction are appropriate |
| <i>QA/QC procedures applied</i> | The enumerators were trained how to accurately measure this parameter using calibrated buckets. |

3.5.6. Data/Parameter, Unit: Qp, rawboil,y_{BSF}, Litres per person per day

Quantity of raw water boiled in the project scenario p per person per day

| | |
|--|--|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Project emissions |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</i> | Calibrated Buckets for measuring water |
| <i>Measuring/Reading/</i> | Biennially |

| | |
|---|--|
| <i>Recording frequency</i> | |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | The amount of raw water boiled was obtained for the three consecutive days during the water consumption field test before the water was poured into the boiling pot. An average of this amount was then obtained and divided by the average number of people in the household. (There were no households boiling water in the project scenario) |
| <i>Verified value</i> | There were no households boiling water in the project scenario |
| <i>Cross checks</i> | This has been cross checked by surveying the households during the verification site visit. The household surveyed during the monitoring survey by project participant were interviewed by the verification team and It has been confirmed that the figures mentioned in the survey sheet/11/ and considered for emission reduction are appropriate. |
| <i>QA/QC procedures applied</i> | The enumerators were trained how to accurately measure this parameter using calibrated buckets. |

3.5.7. Data/Parameter, Unit: $Q_p, \text{rawboil}, y_{\text{HHFF}}$, Litres per person per day

Quantity of raw water boiled in the project scenario p per person per day

| | |
|--|--|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Project emissions |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</i> | Calibrated Buckets for measuring water |
| <i>Measuring/Reading/Recording frequency</i> | Biennially |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | The amount of raw water boiled was obtained for the three consecutive days during the water consumption field test before the water was poured into the boiling pot. An average of this amount was then obtained and divided by the average number of people in the household. (There were no households boiling water in the project scenario) |
| <i>Verified value</i> | There were no households boiling water in the project scenario |
| <i>Cross checks</i> | This has been cross checked by surveying the households during the verification site visit. The household surveyed during the monitoring survey by project participant were interviewed by the verification team and It has been confirmed that the figures mentioned in the survey sheet/11/ and considered for emission reduction are appropriate. |
| <i>QA/QC procedures applied</i> | The enumerators were trained how to accurately measure this parameter using calibrated buckets. |

3.5.8. Data/Parameter, Unit: N_p, y_{BSF} , Person.days

Number of persons consuming water supplied by project scenario p through year y

| | |
|--|---|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Baseline emissions |
| <i>Monitoring equipment (type, accuracy class,</i> | No Equipment Used, Calculated from the results of Monitoring survey |

| | |
|---|---|
| <i>serial number, calibration frequency, date of last calibration, validity)</i> | |
| <i>Measuring/Reading/Recording frequency</i> | Biennial |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | Households were asked the number of people living in their household for that particular day in the three consecutive days during the water consumption field test. An average of this number was then obtained for each household and an average of total obtained. The figure was multiplied by 365 days in a year to obtain the figure. |
| <i>Verified value</i> | 1978 |
| <i>Cross checks</i> | This has been cross checked by surveying the households during the verification site visit. The household surveyed during the monitoring survey by project participant were interviewed by the verification team and It has been confirmed that the figures mentioned in the survey sheet/11/ and considered for emission reduction are appropriate |
| <i>QA/QC procedures applied</i> | NA |

3.5.9. Data/Parameter, Unit: N_p, y_{HHFF} , Person.days

Number of persons consuming water supplied by project scenario p through year y

| | |
|--|---|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Baseline emissions |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</i> | No Equipment Used, Calculated from the results of Monitoring survey |
| <i>Measuring/Reading/Recording frequency</i> | Biennial |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | Households were asked the number of people living in their household for that particular day in the three consecutive days during the water consumption field test. An average of this number was then obtained for each household and an average of total obtained. The figure was multiplied by 365 days in a year to obtain the figure. |
| <i>Verified value</i> | 2555 |
| <i>Cross checks</i> | This has been cross checked by surveying the households during the verification site visit. The household surveyed during the monitoring survey by project participant were interviewed by the verification team and It has been confirmed that the figures mentioned in the survey sheet/11/ and considered for emission reduction are appropriate |
| <i>QA/QC procedures applied</i> | NA |

3.5.10. Data/Parameter, Unit: U_p, y_{BSF} , Percentage

Usage rate in project scenario p during year y. This data will be used to account for households which discontinue use of the filters from the monitored sample frame and thereafter be extrapolated across the total sales record.

| | |
|--|--|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Calculation of total emission reductions |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</i> | No Equipment Used, Calculated from the results of survey |
| <i>Measuring/Reading/Recording frequency</i> | Annually |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | The usage parameter for each vintage was calculated by getting the fraction of users in the sample frame for that vintage and getting the percentage in relation to the total in the sample frame. Thereafter, the weighted average per vintage was obtained by extrapolating the usage in the sample per vintage into the entire population of the TSR for that particular vintage. Each of the usage rates for each vintage was then used for calculation of emission reduction The PP has provided excel based calculations that demonstrate the calculation of the usage parameter. |
| <i>Verified value</i> | 2014 = 68.31% 2015 = 68.52% 2016 = 69.29% |
| <i>Cross checks</i> | This has been cross checked by surveying the households during the verification site visit. The household surveyed during the monitoring survey by project participant were interviewed by the verification team and It has been confirmed that the figures mentioned in the survey sheet/11/ and considered for emission reduction are appropriate |
| <i>QA/QC procedures applied</i> | The guidance questions in the usage survey clearly determined the operational and non-operational filters in the project scenario. |

3.5.11. Data/Parameter, Unit: $U_{p,y}$ BSF(waterquality), Percentage

Usage rate based solely on water quality. This data will be used to account for households which failed in the water quality test.

| | |
|--|--|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Calculation of total emission reductions |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</i> | No Equipment Used, Calculated from the results water quality test analysis |
| <i>Measuring/Reading/Recording frequency</i> | Annually |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | There were 182 water quality tests carried out for the BSF filters, with 178 samples demonstrating safe water standards. To determine usage rate, the PP divided the number of safe water samples with the total number of samples collected. The PP has provided excel based calculations that demonstrate the calculation of the usage parameter. |
| <i>Verified value</i> | Users = 98.35% Non-users = 1.65% |

| | |
|---------------------------------|---|
| <i>Cross checks</i> | - |
| <i>QA/QC procedures applied</i> | - |

3.5.12. Data/Parameter, Unit: $U_{p,y_{HHFF}}$, Percentage

Usage rate in project scenario p during year y. This data will be used to account for households which discontinue use of the filters from the monitored sample frame and thereafter be extrapolated across the total sales record.

| | |
|--|--|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Calculation of total emission reductions |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</i> | No Equipment Used, Calculated from the results of survey |
| <i>Measuring/Reading/Recording frequency</i> | Annually |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | The usage parameter for each vintage was calculated by getting the fraction of users in the sample frame for that vintage and getting the percentage in relation to the total in the sample frame. Thereafter, the weighted average per vintage was obtained by extrapolating the usage in the sample per vintage into the entire population of the TSR for that particular vintage. Each of the usage rates for each vintage was then used for calculation of emission reduction The PP has provided excel based calculations that demonstrate the calculation of the usage parameter. |
| <i>Verified value</i> | 2014 = 72.73% 2015 = 71.55% 2016 = 71.49% |
| <i>Cross checks</i> | This has been cross checked by surveying the households during the verification site visit. The household surveyed during the monitoring survey by project participant were interviewed by the verification team and It has been confirmed that the figures mentioned in the survey sheet/11/ and considered for emission reduction are appropriate |
| <i>QA/QC procedures applied</i> | The guidance questions in the usage survey clearly determined the operational and non-operational filters in the project scenario. |

3.5.13. Data/Parameter, Unit: $U_{p,y_{HHFF}(\text{waterquality})}$, Percentage

Usage rate based solely on water quality. This data will be used to account for households which failed in the water quality test.

| | |
|--|--|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Calculation of total emission reductions |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration,</i> | No Equipment Used, Calculated from the results water quality test analysis |

| | |
|---|--|
| <i>validity)</i> | |
| <i>Measuring/Reading/Recording frequency</i> | Annually |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | There were 34 water quality tests carried out for the BSF filters, with 34 samples demonstrating safe water standards. To determine usage rate, the PP divided the number of safe water samples with the total number of samples collected. The PP has provided excel based calculations that demonstrate the calculation of the usage parameter. |
| <i>Verified value</i> | Users = 100% Non-users = 0% |
| <i>Cross checks</i> | - |
| <i>QA/QC procedures applied</i> | - |

3.5.14. Data/Parameter, Unit: Quality of the treated water_{BSF}, NA

Performance of the project technologies shall be based on percentage reduction of E.Coli examined through field tests in the project boundary .

| | |
|--|---|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Sustainable development Monitoring; Methodological Requirement |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</i> | Field Laboratory Tests |
| <i>Measuring/Reading/Recording frequency</i> | Annually |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | The water quality tests were conducted using 3M Petrifilm Plate instructions/16/. Water samples were collected from raw water and water filtered using the project technologies to determine coliform levels in both water samples. |
| <i>Verified value</i> | The complete data set is provided in Monitoring Summary Sheet/7.1/ |
| <i>Cross checks</i> | This has been cross checked from the laboratory test results/15/ of the surveyed household and found correct. |
| <i>QA/QC procedures applied</i> | NA |

Data/Parameter, Unit: Quality of the treated water_{HFF}, NA

Performance of the project technologies shall be based on percentage reduction of E.Coli examined through field tests in the project boundary.

| | |
|--|--|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Sustainable development Monitoring; Methodological Requirement |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration,</i> | Field Laboratory Tests |

| | |
|---|---|
| <i>validity)</i> | |
| <i>Measuring/Reading/Recording frequency</i> | Annually |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | The water quality tests were conducted using 3M Petrifilm Plate instructions/16/. Water samples were collected from raw water and water filtered using the project technologies to determine coliform levels in both water samples. |
| <i>Verified value</i> | The complete data set is provided in Monitoring Summary Sheet/7.1/ |
| <i>Cross checks</i> | This has been cross checked from the laboratory test results/15/ of the surveyed household and found correct. |
| <i>QA/QC procedures applied</i> | NA |

3.5.15. Data/Parameter, Unit: Water Treatment Practices in the baseline scenario, Treatment Descriptions

Water Treatment Practices in the baseline scenario

| | |
|--|--|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Calculation of baseline emissions |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</i> | Monitoring Survey |
| <i>Measuring/Reading/Recording frequency</i> | Annually |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | Households were asked their baseline water treatment before they obtained the water filter. Appropriate answers were then put in the survey sheet/13/. |
| <i>Verified value</i> | NA |
| <i>Cross checks</i> | This has been cross checked by surveying the households during the verification site visit. The household surveyed during the monitoring survey by project participant were interviewed by the verification team and It has been confirmed that the response of households mentioned in the survey sheet/11/ and considered for emission reduction are appropriate |
| <i>QA/QC procedures applied</i> | Multiple options in an open ended questionnaire were used, so as to eliminate any possibility of bias. |

3.5.16. Data/Parameter, Unit: LEp,y, t_CO2e per year

Leakage in project scenario p during year y

| | |
|--|--|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | <i>Leakage Emission</i> |
| <i>Monitoring equipment (type, accuracy class,</i> | NA |

| | |
|---|--|
| <i>serial number, calibration frequency, date of last calibration, validity)</i> | |
| <i>Measuring/Reading/Recording frequency</i> | Biennially |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | Literature Review |
| <i>Verified value</i> | 0 |
| <i>Cross checks</i> | There are no perceived monitoring requirements for leakage emissions for this project. The same has been cross checked from the revised PDD/1/ also. |
| <i>QA/QC procedures applied</i> | NA |

Gold Standard Sustainable Development Indicators

3.5.17. Data/Parameter, Unit: Water quality and quantity: + Positive score, %

This is the quality of filtered water with regards to presence of coliforms in the water. Water quality was assessed by comparing the levels of coliforms in water from raw water and filtered water of the same sample.

| | |
|--|---|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Sustainability Indicator |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</i> | 3M Petrifilm |
| <i>Measuring/Reading/Recording frequency</i> | Annually |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | The enumerators were provided with cooling jars which were collected from the field within six hours of collection of the samples and then tested with the 3M plates to ensure quality results. The total samples showing reduction/increment/no change in coliform levels divided by the total number of samples in the sample frame, multiplied by 100. The results were then recorded in the monitoring survey sheet. |
| <i>Verified value</i> | Out of the 180 tests done for BSF filters, and 34 tests for HHFF units: BSF: 180 tests were conducted. Out of these, 168 samples (93%) had percentage reduction of E. coli that was greater than 95% reduction of E. coli, while 12 samples (7%) had percentage reduction of E. coli that is less than 95% removal. HHFF: 34 water quality tests were conducted out of the sample frame of 40 households because 6 of the 40 households had abandoned their water filters. Out of the 34, 32 (94%) water samples had percentage reduction |

| | |
|---------------------------------|--|
| | of E. coli that was greater than 95% removal, while 2 samples (6%) had percentage removal less than 95% removal. |
| <i>Cross checks</i> | This has been cross checked from the laboratory test results/15/ of the surveyed household and found correct. |
| <i>QA/QC procedures applied</i> | NA |

3.5.18. Data/Parameter, Unit: Quality of Employment+ Positive score, **NA**

Improvement in the skill level of the community members within the project boundary

| | |
|--|---|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Sustainability Indicator |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</i> | Attendees list/14/ |
| <i>Measuring/Reading/Recording frequency</i> | Monitored annually |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | The trainees from the community are trained by highly skilled personally on various aspects of the project e.g. sales, assembly of the project technology, etc. |
| <i>Verified value</i> | NA |
| <i>Cross checks</i> | This has been cross checked by interviewing the enumerators during site visit and from the Attendees list/14/ |
| <i>QA/QC procedures applied</i> | NA |

3.5.19. Data/Parameter, Unit: Livelihood of the poor + Positive score, Percentage

The parameter refers to the number of people in the project activity whose livelihoods had improved in terms of savings of money used to get fuel and the time used to collect firewood. Households in the sample frame were asked these questions to attesting the same.

| | |
|--|---|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Sustainability Indicator |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</i> | NA, Calculated |
| <i>Measuring/Reading/Recording frequency</i> | Monitored annually |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | Households were asked if there was reduction of time and money used to acquire fuel in the project scenario. The answers were recorded in the monitoring survey sheet. Percentages were obtained from the answers provided. |

| | |
|---------------------------------|--|
| <i>Verified value</i> | <p>For time: 75% of the households interviewed from the HFF users reported to have had a reduction in the amount of time spent in acquiring fuel since they began using the water filters, while 25% of the households using the same filters reported having seeing no change in the amount of time spent in acquiring fuel.</p> <p>On the other hand, 94% of the BSF users reported that they noticed a reduction in the amount of time spent in collecting fuel, 6% reported that they did not notice any change in the expenditure of time in gathering or acquiring fuel.</p> <p>For Money: BSF: 6% reported no change in the amount of money spent to acquire fuel, while 94% reported that the amount of money spent on the same reduced since they started using the water filter.</p> <p>HFF: 24% of those interviewed reported that the amount of money spent on getting household fuel didn't change since they started using the filter, while 76% of the households interviewed said the amount of money reduced to acquire household fuel.</p> |
| <i>Cross checks</i> | This has been cross checked by surveying the households during the verification site visit. The household surveyed during the monitoring survey by project participant were interviewed by the verification team and It has been confirmed that the response of households mentioned in the survey sheet/11/ are appropriate. |
| <i>QA/QC procedures applied</i> | NA |

3.5.20. Data/Parameter, Unit: Access to affordable and clean energy services + Positive score

This parameter refers to the number of people who have had access to affordable and clean energy services in the project scenario.

| | |
|--|--|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Sustainability Indicator |
| <i>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</i> | N/A |
| <i>Measuring/Reading/Recording frequency</i> | Monitored annually |
| <i>Data collection (from data generation, aggregation, to recording, calculation and reporting)</i> | The PP tracks the number of filters sold in the project boundary. This data is kept in form of hard copies which are then transferred into an electronic sheet. The PP then submits these data sheets to the carbon asset development consultant, who verifies the information to make sure the data meets the carbon asset standards. |
| <i>Verified value</i> | 3389 households BSF units and 316 HHFF units |
| <i>Cross checks</i> | The value has been cross checked from the sales record/10/ and found correct. |
| <i>QA/QC procedures</i> | NA |

applied

Opinion:

The adequacy and compliance of the monitoring plan in the Monitoring report/4/ was found as per the requirements laid by the GS Passport, monitoring methodology/5/ and the registered PDD/1/. The information flow (from data generation, aggregation, to recording, calculation and reporting) is already included under respective parameter above. The verification team has verified all the data and collected evidence as per the required monitoring frequency and found to be correct and appropriate meeting the requirements of the GS Passport, applied methodology and registered PDD. The sustainability parameters were also reviewed and the assessment team is of the opinion that the project elevates the living standard of the rural population and aids in better health by reducing the exposure to water borne diseases.

3.6 Compliance with the calibration frequency requirements for measuring instruments

The monitoring for the project activity is done through the surveys conducted for the sample population. The data from the survey sheets is transferred to the excel sheet which is further used for calculation of emission reductions. Therefore there are no instruments involved in monitoring.

3.7 Data not monitored (ex ante or external parameters)

3.7.1. Data/Parameter, Unit: Wb,y, Tonnes/litre

Quantity of fuel in tons required to treat 1 litre of water using technologies representative of baseline scenario b

| | |
|-----------------|--|
| | Discussion and verification assessment |
| Purpose of data | Calculation of Baseline Emissions |
| Verified value | Households – 0.00054960 Institutions/commercial facilities – 0.00054458 |
| Source of value | Baseline water Boiling test The value provided above was derived from water boiling tests as recommended by the methodology. The value selected is the mean value derived from 144 households and 62 institutions/commercial facilities respectively. |
| Justification | The value applied is consistent with the Revised PDD/1/ |

3.7.2. Data/Parameter, Unit: EF_b,fuel,CO₂, tCO₂/TJ

CO₂ emission factor of the wood fuel

| | |
|-----------------|---|
| | Discussion and verification assessment |
| Purpose of data | Baseline and Project emissions |
| Verified value | 112 |
| Source of value | IPCC Default emission factor |
| Justification | The value is conservative as IPCC values are prescribed by the applied Methodology/21/. |

3.7.3. Data/Parameter, Unit: NCV_b, TJ/ton

Net calorific value of wood fuel used in the baseline

| | |
|-----------------|--|
| | Discussion and verification assessment |
| Purpose of data | Baseline and Project emissions |
| Verified value | 0.015 |

| | |
|-----------------|---|
| Source of value | IPCC default value |
| Justification | The value is conservative as IPCC values are prescribed by the applied methodology/21/. |

3.7.4. Data/Parameter, Unit: EF_{b,fuel,CH4}, tCH₄/TJ
CH₄ emission factor of the wood fuel

| | |
|-----------------|---|
| | Discussion and verification assessment |
| Purpose of data | Calculation of baseline missions |
| Verified value | 0.300 |
| Source of value | IPCC Default value |
| Justification | The value is conservative as IPCC values are prescribed by the applied methodology/21/. |

3.7.5. Data/Parameter, Unit: EF_{b,fuel, N2O}, t N_{2O} /TJ
N_{2O} emission factor of the wood fuel

| | |
|------------------------|---|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Calculation of baseline missions |
| <i>Verified value</i> | 0.004 |
| <i>Source of value</i> | IPCC Default value |
| <i>Justification</i> | The value is conservative as IPCC values are prescribed by the applied methodology/21/. |

3.7.6. Data/Parameter, Unit: GWP, Fraction
Global Warming Potential of CH₄

| | |
|-----------------|--|
| | Discussion and verification assessment |
| Purpose of data | Calculation of baseline missions |
| Verified value | 25 |
| Source of value | IPCC Fourth Assessment Report: Climate Change 2007/21/ |
| Justification | The PP has used the value 25 for the period after 1st January 2013. This is in accordance to Gold Standard rule on GWP for project activities. |

3.7.7. Data/Parameter, Unit: GWP, Fraction
Global Warming Potential of N_{2O}

| | |
|------------------------|--|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Calculation of baseline missions |
| <i>Verified value</i> | 298 |
| <i>Source of value</i> | IPCC Fourth Assessment Report: Climate Change 2007/21/ |
| <i>Justification</i> | The PP has used the value 25 for the period after 1st January 2013. This is in accordance to Gold Standard rule on GWP for project activities. |

3.7.8. Data/Parameter, Unit: C_j, %

Expressed as a percentage, this is the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it

| | |
|------------------------|--|
| | Discussion and verification assessment |
| <i>Purpose of data</i> | Calculation of baseline missions |
| <i>Verified value</i> | 18% - Households 76% - Institutions and commercial facilities |

| | |
|-----------------|---|
| Source of value | Baseline Surveys |
| Justification | The value is consistent with Baseline Testing Survey (July 2015) Summary /19/ |

Opinion:

The default values applied were found to be consistent with the revised PDD and the source.

3.8 Assessment of Data & calculation of GHG Emission Reductions

Discussion:

The emission reductions have been changed from 30,522 tCO₂ to 36,356 tCO₂ because of the raised CAR-09 and CL-06. Earlier the usage rate calculation was not calculated on weighted average basis. Refer CAR/CL for more information.

The emission reductions for the project activity are calculated based on the data from the survey sheets. The formulae used for the calculations are in line to the revised PDD and in accordance to the applied methodology as checked by the assessment team. The data from the sheets is transferred to the excel sheet and emission reductions are obtained. A brief description on the calculation of emission reductions is as follows:

Baseline emissions

As described in section A3.1 of the Gold Standard methodology, the baseline scenario wood fuel consumption is back calculated by multiplying the safe water consumption of end users observed in the project scenario by the amount of fuel required to boil a specific quantity of water. The equation below therefore draws on this premise to calculate baseline emissions.

$$BE_{b,y} = B_{b,y} * ((f_{NRB,b,y} * EF_{b,fuel,CO2}) + EF_{b,fuel,nonCO2}) * NCV_{b fuel}$$

Where

$$B_{b,y} = (1 - C_j) * N_{j,y} * W_{i,y} * (Q_{j,y} + Q_{j,rawboil,y})$$

BSF Filter-Vintage Year 2014, 2015 & 2016

$$BE_y = B_{by} * ((f_{NRB,b,y} * EF_{b,fuel,CO2}) + (EF_{b,fuel,CH4} + E_{fb,fuel,N2O})) * NCV_{bfuel}$$

f_{NRB, b, y}=0.92
 EF_{b, fuel, CO2}=112
 EF_{b, fuel, CH4}=7.5(0.3*25)
 E_{fb, fuel, N2O}=1.192 (0.004*298)
 NCV_{b, fuel}=0.015

=10.144 tCO₂e (per filter, per year)

HFF Filter-Vintage Year 2014, 2015 & 2016

$$BE_y = B_{by} * ((f_{NRB,b,y} * EF_{b,fuel,CO2}) + (EF_{b,fuel,CH4} + E_{fb,fuel,N2O})) * NCV_{bfuel}$$

f_{NRB, b, y}=0.92
 EF_{b, fuel, CO2}=112
 EF_{b, fuel, CH4}=7.5(0.3*25)
 E_{fb, fuel, N2O}=1.192 (0.004*298)
 NCV_{b, fuel}=0.015

=4.704 tCO₂e (per filter, per year)

Project emissions

Project Emissions are calculated as follows:

$$PE_{p,y} = B_{p,y} * ((f_{NRB,p,y} * EF_{p,fuel,CO2}) + EF_{p,fuel,nonCO2}) * NCV_{p, fuel}$$

$$B_{p,y} = (1 - C_j) * N_{p,y} * W_{b,y} * (Q_{p,rawboil,y} + Q_{p,cleanboil,y})$$

BSF -Vintage Year 2014, 2015 & 2016

$$PE_{y} = B_{p,y} * ((f_{NRB,b,y} * EF_{b,fuel,CO2}) + (EF_{b,fuel,CH4} + EF_{b,fuel,N2O})) * NCV_{bfuel}$$

$f_{NRB, b,y} = 0.92$

$EF_{b, fuel, CO2} = 112$

$EF_{b, fuel, CH4} = 7.5(0.3 * 25)$

$EF_{b, fuel, N2O} = 1.192 (0.004 * 298)$

$NCV_{bfuel} = 0.015$

=0 tCO₂e (per filter, per year)

HFF -Vintage Year 2014, 2015 & 2016

$$PE_{y} = B_{p,y} * ((f_{NRB,b,y} * EF_{b,fuel,CO2}) + (EF_{b,fuel,CH4} + EF_{b,fuel,N2O})) * NCV_{bfuel}$$

$f_{NRB, b,y} = 0.92$

$EF_{b, fuel, CO2} = 112$

$EF_{b, fuel, CH4} = 7.5(0.3 * 25)$

$EF_{b, fuel, N2O} = 1.192 (0.004 * 298)$

$NCV_{bfuel} = 0.015$

=0.456 tCO₂e (per filter, per year)

Leakage:

There are no leakage emissions from the project activity.

Emission Reductions:

The overall GHG reductions are calculated as follows:

$$ER_y = (\sum BE_{b,y} - \sum PE_{p,y}) * Up_{y} - \sum LE_{p,y}$$

| Period | BSF | HFF |
|--|------------------------|---------------------|
| From 22/07/2014 to 31/12/2014 | 9756 | 139 |
| From 01/01/2015 to 31/12/2015 | 22466 | 726 |
| From 01/01/2016 to 18/02/2016 | 3145 | 126 |
| | (Round down) 35,366 | (Round down) 990 |
| Total Emission Reduction (tCO₂e) | 36,356 | |

Opinion:

The verification team confirms that

- a) The complete data set for the monitoring parameters was available as mentioned in the monitoring plan in the revised PDD for the duration of 22/07/2014 to 18/02/2016.
- b) The cross checks were undertaken for all the parameters indicated in the respective sections and were found complying with the requirements of the monitoring plan of the revised PDD;
- c) Appropriate methods and formulae for calculating baseline emission, project emissions and leakage have been followed;
- d) The claimed emission reductions are free from material errors, omissions or misstatements, with a reasonable level of assurance.

3.9 Quality of Evidence to Determine Emission Reductions

The evidences (Documents/interview/site visit) referred for verification of individual monitoring parameter and fixed parameters are defined section 3.5 and section 3.7 respectively. It can be confirmed by the assessment team that the reported emission reductions have been conservatively calculated. A list of referred documents for verification is also included in section 6 of this report.

3.10 Management System and Quality Assurance

Aqua Clara Foundation has developed GHG emission reduction management system for management of the project. The procedures cover the quality assurance of the monitoring systems for the project activities. The monitoring is in the purview of The Carbon Asset Development Consultant, Viability Africa.

Out of the total installed filters, the verification team has chosen a sample size of 61 filters. The household sampled in the survey during site visit, were cross verified with the sales record as well as with monitoring survey record to confirm the correctness of the data gathered at the time of survey. The result of verification team's observation based on the chosen sample are found consistent with the sales record. No discrepancy was found during on site visit. Thus, according to the result of verification team's random sampling as a part of the on site visit, the water filters were found installed and operating as per PP's sales records.

4. RECOMMEDATIONS / FORWARD ACTION REQUEST

This is the 2nd periodic verification. There is no FAR is raised during this monitoring period.

5. VERIFICATION & CERTIFICATION STATEMENT

KBS Certification Services Pvt. Ltd. has been contracted by “Aqua Clara Foundation” to undertake independent verification and certification for the greenhouse gas (GHG) emission reductions reported from the “Aqua Clara Water Filtration Program in Kenya”, GS Id. 1078 for the monitoring period 22/07/2014 up to 18/02/2016 in the Monitoring Report Version 01 (first version) dated 23/05/2016.

The verification is based on the registered PDD, GS Passport and the monitoring report for this project. Our verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakech accord, as well as those defined by the Gold Standard Board.

The management of the “Aqua Clara Foundation” is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project Final Monitoring Report Version 08 dated 06/12/2016. The calculation and determination of GHG emission reductions from the project is the responsibility of the management of the “Aqua Clara Foundation”. The development and maintenance of records and reporting procedures are in accordance with the Monitoring Report Version 08 dated 06/12/2016.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the monitoring period 22/07/2014 up to 18/02/2016 based on the reported emission reductions in the Final Monitoring Report Version 08 dated 06/12/2016 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, KBS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

KBS confirms the following;

Reporting period: From 22/07/2014 up to 18/02/2016 (Including both the days)

Verified and certified emission in the above reporting period:

| Gold Standard Voluntary emission reductions (GS VERs) | BSF | HFF | Unit |
|---|---------------------|------------------|--------------------|
| From 22/07/2014 to 31/12/2014 | 9756 | 139 | tCO ₂ e |
| From 01/01/2015 to 31/12/2015 | 22466 | 726 | tCO ₂ e |
| From 01/01/2016 to 18/02/2016 | 3145 | 126 | tCO ₂ e |
| | (Round down) 35,366 | (Round down) 990 | |
| Total | 36,356 | | tCO ₂ e |

Location: Faridabad

Date: 07/12/2016



Kaushal Goyal

Managing Director



KBS Certification Services Pvt. Ltd.

6. REFERENCES

| | | |
|-------|--|--|
| S.No. | | |
| /1/ | Revised Project Design Document (Version 24, dated 25/05/2016) | |
| /2/ | Design Change Assessment Report issued by Carbon Check India Private Limited (Revision no. 7, dated 31/05/2016) | |
| /3/ | Revised Gold standard passport (Version: 10, date: 4/4/2016) | |
| /4/ | Monitoring report version 01, dated 23/05/2016 | |
| | Monitoring report version 02, dated 13/07/2016 | |
| | Monitoring report version 03, dated 03/08/2016 | |
| | Monitoring report version 04, dated 09/08/2016 | |
| | Monitoring report version 05, dated 15/08/2016 | |
| | Monitoring report version 06, dated 17/08/2016 | |
| | Monitoring report version 07, dated 04/11/2016 | |
| | Monitoring report version 08, dated 06/12/2016 (Final) | |
| /5/ | GS methodology: Technologies and Practices to Displace Decentralized Thermal Energy Consumption (Version 1.0; Dated 11/04/2011) | |
| /6/ | Emission Reduction (ER) Sheets | |
| | /6.1/ | ER Sheets corresponding to version 01 |
| | /6.2/ | ER Sheets corresponding to final version |
| /7/ | Worksheets | |
| | /7.1/ | Monitoring Survey Excel sheet records |
| | /7.2/ | Usage rate calculation-excel sheet |
| | /7.3/ | Outlier calculation excel sheets |
| /8/ | The Gold standard Toolkit Version 2.2 | |
| /9/ | CDM Validation and Verification Standard version 9.0 | |
| /10/ | Aqua Clara foundation: total sales record for the filters sold till the end of this monitoring period i.e. 18/02/2016 | |
| /11/ | ACF: Monitoring Survey Template and Filled forms | |
| /12/ | VER right transfer sheets | |
| /13/ | Sampling and surveys for CDM project activities and programme of activities version 05.0 | |
| /14/ | Training issued by Aqua Clara Foundation | |
| /15/ | Laboratory test results for the water samples collected from the surveyed households | |
| /16/ | 3M Petri film Instructions manual | |
| /17/ | Technical specification of the water filters | |
| /18/ | GS clarification/approval regarding delaying the annual monitoring | |
| /19/ | Baseline Testing Survey (July 2015) Summary | |
| /20/ | Default values of fraction of non-renewable biomass http://cdm.unfccc.int/DNA/fNRB/index.html | |
| /21/ | IPCC Fourth Assessment Report: Climate Change 2007 http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html | |
| /22/ | Markit Environmental Registry: | |
| | 1. http://www.markit.com/sites/en/products/environmental/markit-environmental-registrypublic-view.page 2. https://products.markit.com/home/index.jsp#REGISTRY.ProjectIssuance.ProjectIssuance | |
| /23/ | Gold Standard Foundation: http://www.cdmgoldstandard.org | |

7. FINDINGS DOCUMENT

| <i>Summary of findings</i> | <i>CAR</i> | <i>CL</i> | <i>FAR</i> |
|----------------------------|------------|-----------|------------|
| | 9 | 6 | 0 |

| <i>Date</i> | <i>Type & Number</i> | <i>Raised by</i> | <i>Reference</i> |
|--|--------------------------|-----------------------------------|------------------------|
| 11/07/2016 | CAR-01 | Assessment Team | MR |
| Non conformities raised | | | |
| PP is requested to justify the estimated emission reductions i.e. 162,990.98 tCO ₂ mentioned on page 1 of the MR for the current monitoring period i.e. 22/07/2014 to 18/02/2016 (including both the days). | | | |
| Project Participant's response | | Date: 03.08.2016 | |
| PP has seen to and corrected the ER worksheet to show the changes made. The total ERs for the BSF units in the Ex-ante have been corrected from 150,157.98 tCO ₂ to 108,749.81 tCO ₂ and the ERs for the HFF units are 12833 tCO ₂ . Now the Estimated ERs are 121,582.83 tCO ₂ for the current monitoring period. | | | |
| Documentation Provided as Evidence by Project Participant | | | |
| - BSF Emissions Reduction Spreadsheet - HFF Emission reduction spreadsheet | | | |
| Information Verified by Team Leader | | Date of review: 05.08.2016 | |
| - BSF Emissions Reduction Spreadsheet /6.1/ - HFF Emission reduction spreadsheet /6.1/ | | | |
| Reasoning for not acceptance or close out | | | |
| Verification team has checked calculation of the revised estimated ERs /6.1/ for the current monitoring period and found OK. Hence CAR is closed. | | | |
| Date of acceptance or non- acceptance | | Date: 05.08.2016 | Status: closed. |

| <i>Date</i> | <i>Type & Number</i> | <i>Raised by</i> | <i>Reference</i> |
|--|--------------------------|-----------------------------------|------------------------|
| 11/07/2016 | CL-01 | Assessment Team | MR |
| Non conformities raised | | | |
| From the review of the previous monitoring period MR, verification team has found that the no. of filters distributed during the period July 2012 to June 2013 is not consistent with the MR for this monitoring period which mentions as 795. PP is requested to justify the difference. Also there is a discrepancy for the year 2014. | | | |
| Project Participant's response | | Date: 03.08.2016 | |
| The PP erroneously entered the wrong figure for the total filters sold between July 2012 and June 2013 as 795 rather than 790. This has also been reflected in the ER calculations. All other totals per year are consistent with between this and the last monitoring period. | | | |
| The 2014 tab in the previous monitoring period was up to May 2014, while this is a more complete version of the same making up a full 12-month period. This explains the difference in the total filter sales. | | | |
| Documentation Provided as Evidence by Project Participant | | | |
| N/A | | | |
| Information Verified by Team Leader | | Date of review: 05.08.2016 | |
| Total Sales record /10/ | | | |
| Reasoning for not acceptance or close out | | | |
| Verification team has checked the sales record /10/ and found that the PP response OK. Hence CL is closed. | | | |
| Date of acceptance or non- acceptance | | Date: 05.08.2016 | Status: closed. |

| <i>Date</i> | <i>Type & Number</i> | <i>Raised by</i> | <i>Reference</i> |
|--------------------------------|--------------------------|------------------|------------------|
| 11/07/2016 | CL-02 | Assessment Team | MR |
| Non conformities raised | | | |

In the verification report of previous MP, section 6 refers PDD dated 19/05/2014 however from the GS website, verification team has found that the PDD dated 25/5/2016 available. PP is requested to clarify if any changes have happened and incorporate them in the section B.2 of the MR. Also PP is requested to submit the latest PDD and the passport in track change (whichever applicable).

| | |
|--|--|
| Project Participant's response | Date: 03.08.2016 |
| The PP has provided the tracked version of the PDD as well as the clean version for DOE's review. The changed PDD and GS passport include the main change made to the project design, which is the inclusion of institutions and commercial facilities as part of the project boundary. Additionally, the PP also includes changes in the baseline survey output based on the FAR raised at the time of Registration review with the GS. The PP has included this permanent change in section B.2 of the MR. | |
| Documentation Provided as Evidence by Project Participant | |
| <ul style="list-style-type: none"> - Tracked and clean version of latest PDD - Tracked and clean version of the GS passport - Final Design change report from the GS. | |
| Information Verified by Team Leader | Date of review: 05.08.2016 |
| <ul style="list-style-type: none"> - Tracked and clean version of latest PDD /1/ - Tracked and clean version of the GS passport /3/ - Revised MR /4/ | |
| Reasoning for not acceptance or close out | |
| Required documents have been provided and found OK. The corresponding changes have been happened in the revised MR. hence CL is closed. | |
| Date of acceptance or non- acceptance | Date: 05.08.2016 Status: Closed. |

| Date | Type & Number | Raised by | Reference |
|------------|---------------|-----------------|-----------|
| 11/07/2016 | CL-03 | Assessment Team | MR |

Non conformities raised

From the PDD dated 19/05/2014, Verification team has found that the Monitoring survey, Usage survey and Project Field Test Update has to be completed annually however in the submitted MR for this monitoring period:

1. The last Monitoring/Usage survey was done in July 2014 but the latest survey done from feb-april 2016. PP need to clarify.
2. The mentioned frequency in the MR for "Project Field Test Update" is biennially but as per the PDD it should be monitored annually. PP need to clarify.

| | |
|---|-------------------------|
| Project Participant's response | Date: 03.08.2016 |
| <p>1. The PP got approval from the GS to delay annual monitoring to the beginning of 2016 rather than July 2015 because of the additional FAR raised during the GS 6-week registration review requiring the PP to carry out baseline testing. The PP has provided a screenshot of the GS approval email as supporting document.</p> <p>2. The PP modified the frequency of this based on the methodology statement that states:</p> <p>"For each project scenario a monitoring survey and usage survey is conducted annually while a leakage assessment is conducted every two years to update monitoring parameters over time. For each baseline scenario and project scenario the BFT and PFT is updated every two years, respectively, except in cases of fixed baseline implying no need for a BFT"</p> <p>More specifically, the methodology for monitoring this parameter states for the frequency of monitoring that "As per FT updates"</p> <p>Therefore, the PP would like to follow this methodological stipulation and revise the monitoring frequency of this parameter to be once in 2 years. The PP has provided the methodology excerpt that shows this frequency is applicable. The same has been described in the Monitoring report section B.2.3.</p> | |
| Documentation Provided as Evidence by Project Participant | |

| | | |
|---|-----------------------------------|-----------------|
| Screenshot of GS approval email. | | |
| Information Verified by Team Leader | Date of review: 05.08.2016 | |
| Screenshot of GS approval email. /18/ | | |
| Reasoning for not acceptance or close out | | |
| <p>1. Verification team has checked the GS approval for delaying the annual monitoring and found OK. Hence this part of CL is closed.</p> <p>2. The response from the PP found OK. Hence this part of CL is closed.</p> | | |
| Date of acceptance or non- acceptance | Date: 05.08.2016 | Status: closed. |

| Date | Type & Number | Raised by | Reference |
|------------|---------------|-----------------|---|
| 11/07/2016 | CAR-02 | Assessment Team | FAR#09 of previous verification (1 st periodic verification) |

Non conformities raised

The PP shall conduct a post registration baseline survey/water boiling tests prior to 2nd issuance considering in a representative way the target population in the project boundary and considering households prior to adopting the project technology.

Project Participant's response

Date: 03.08.2016

The PP has provided the baseline testing summary as supporting document for DOE review. This summary was reviewed and approved by the GS in the design change process in the first quarter of year 2016.

Documentation Provided as Evidence by Project Participant

- Baseline Testing summary

Information Verified by Team Leader

Date of review: 05.08.2016

- Baseline Testing summary /19/

Reasoning for not acceptance or close out

Verification team has checked the baseline survey/water boiling tests (done during July 2015) and found OK. Hence this CAR is closed.

Date of acceptance or non- acceptance

Date: 05.08.2016

Status: closed.

| Date | Type & Number | Raised by | Reference |
|------------|---------------|-----------------|-----------------|
| 11/07/2016 | CAR-03 | Assessment Team | GS Reveiw FAR#1 |

Non conformities raised

The PP shall ensure that a proper question related to the last water filtration and to check if tap/external parts of the filter are in a good working order will be added to the monitoring survey for the next verification. This question shall be responded by the enumerator with either Yes or No.

Project Participant's response

Date: 03.08.2016

The PP complied with this FAR raised by including in the monitoring survey's section 4 number 4-6:

4. *Is the filter still dripping from the last filtration?*

Yes No

5. *Are the external parts of the filter in good working condition? (e.g. Taps)*

Yes No

6. *Is the safe water storage container wet from the last water filtered or still contains filtered water?*

Yes No

In relation to the last time of water filtration the PP asked in section 3:

1. *Is there a safe storage container which contains the filtered water? (Observed by the interviewer)*

Yes No

If the answer is "No" in Section 3 Question 1 above ask question 2 below:

2. When was the last time there was filtered water in the container?

The PP has therefore complied with the GS FAR in relation to the above mentioned.

Documentation Provided as Evidence by Project Participant

Monitoring Survey Template

Information Verified by Team Leader | **Date of review: 05.08.2016**

Monitoring Survey Template /11/

Reasoning for not acceptance or close out

Required questions have been added and used during the survey. Hence this CAR is closed.

Date of acceptance or non- acceptance | **Date:** 05.08.2016 | **Status:** closed.

| Date | Type & Number | Raised by | Reference |
|------------|---------------|-----------------|-----------------|
| 11/07/2016 | CAR-04 | Assessment Team | GS Review FAR#2 |

Non conformities raised

The PP shall ensure that all vintages will be considered in future samples. If the usage survey reveals an underestimated drop-out rate, the difference related to the 1st verification period would be compensated by reducing the amount of credits issued in the 2nd verification period accordingly.

Project Participant's response | **Date:** 17.08.2016

The FAR being referred to here is from the last verification by the GS states in full:

*"The PP shall take into consideration the vintage 'July 2013 to May 2014' when calculating the weighed usage rate. Since no sample has been drawn from this vintage, the PP may apply an assumption based conservative usage factor; the PP shall justify its assumption. Though it should be noted that if the next usage survey indicates **lower usage rate for this vintage, the difference in emission reduction corresponding to the current verification period (1st) would be adjusted by reducing the amount of credits issued for the 2nd verification period.** However, in case of **higher usage rate, no extra emission reduction unit corresponding to 1st verification will be issued**"*
See FAR#2.

The PP has used the GS methodology for calculating weighted usage rate for that particular vintage. This has been provided in the tab 'FAR 2 – Weighted Usage' in the supporting document, 'GS 1078_Sample Frame_Aug2016.exe'.

The PP has provided an exhaustive detailed calculation in step-wise manner for determining the weighted usage parameter per year being credited. Based on these calculations, the weighted parameter estimated in the last verification that prompted FAR 02 was 58.27%, whereas, the weighted parameter based on actual filter sales this verification round is 67.40% for the vintage 'July 2013 to May 2014'. Therefore, based on the FAR, there will be no justification to deduct carbon credits from what was issued last verification (because what was estimated was significantly conservative as compared to what was actually achieved this round of verification).

Documentation Provided as Evidence by Project Participant

Weighted Usage rate calculation

Information Verified by Team Leader | **Date of review: 17.08.2016**

Weighted Usage rate calculation /7.3/

Reasoning for not acceptance or close out

Verification team has checked the Weighted Usage rate calculation and found the PP response OK. Since the weighted usage rate for the year **July 2013 to May 2014** is higher than the assumption taken during previous monitoring period. Hence there is no requirement for any adjustment of emission reduction. Hence this CAR is closed.

Date of acceptance or non- acceptance | **Date:** 17.08.2016 | **Status:** closed.

| Date | Type & Number | Raised by | Reference |
|------------|---------------|-----------------|-----------------|
| 11/07/2016 | CAR-05 | Assessment Team | GS Reveiw FAR#3 |

Non conformities raised

The PP shall revise the Water Consumption Field Test (WCFT) template in a way that it captures the option for filling the filters with raw water several times a day and that it informs about different times of measurement.

Project Participant's response | **Date:** 03.08.2016

The PP has provided the monitoring survey template that shows the WCFT section in compliance with this FAR. The PP had in section 6 of the Monitoring survey asked the following question to know the frequency per day when the household purified their water either by boiling or using the water filters:

"How many times in a day do you filter or boil your raw water? _____"

Depending on that feedback, the PP also provided in the WCFT survey a table that allowed the interviewer to record the water measured at multiple times in a day. The PP has provided the Monitoring survey template where on page 7 to 12, the WCFT questionnaire have been shown with the FAR put into consideration. Additionally, the PP, through the monitoring survey template asked the household how many times in a day water was purified.

Documentation Provided as Evidence by Project Participant

Monitoring survey template and WCFT template

Information Verified by Team Leader | **Date of review:** 05.08.2016

Monitoring survey template and WCFT template /11/

Reasoning for not acceptance or close out

Required corrections have been done and found OK. Hence CAR is closed.

Date of acceptance or non- acceptance | **Date:** 05.08.2016 | Status: closed.

| Date | Type & Number | Raised by | Reference |
|------------|---------------|-----------------|---|
| 11/07/2016 | CAR-06 | Assessment Team | FAR#12 of previous verification (1 st periodic verification) |

Non conformities raised

This FAR is raised to include the timings and volumetric assessments per session in the next monitoring survey exercise.

Project Participant's response | **Date:** 03.08.2016

The PP included a table in the WCFT section of the Monitoring survey a table that allows for the inclusion and recording of the time of day when the tests were done. The PP categorized these times of day as morning, mid-morning, afternoon and evening.

Documentation Provided as Evidence by Project Participant

WCFT template

Information Verified by Team Leader | **Date of review:** 05.08.2016

WCFT template /11/

Reasoning for not acceptance or close out

Required corrections have been done in the template and found OK. Hence CAR is closed.

Date of acceptance or non- acceptance | **Date:** 05.08.2016 | Status: closed.

| Date | Type & Number | Raised by | Reference |
|------------|---------------|-----------------|-----------|
| 11/07/2016 | CL-04 | Assessment Team | MR |

Non conformities raised

In the MR, for the SD parameter "Water quality and quantity" it is mentioned that out of water quality testing done out of 181 tests for BSF filters and 34 tests for HHFF units. The results are mentioned below. PP need to clarify how there is no change for the 2% (BSF) and 3% (HHFF) representative samples compare to passport where project technology has been tested and confirmed to reduce 96-99% of coliforms in water. Need clarification

| | |
|--|---|
| BSF Reduction – 98% Increment – 0% No change – 2% | HHFF Reduction – 97% Increment – 0% No change – 3% |
|--|---|

| | |
|---|---|
| Project Participant's response | Date: 03.08.2016 |
| <p>The PP attributes the above as an error in reporting. The parameter monitored here is water quality as water quantity has been accounted for in the WCFT. The PP has included the correct monitoring analysis as :</p> <p>Out of the 180 tests done for BSF filters, and 34 tests for HHFF units:</p> <p>BSF: 180 tests were conducted. Out of these, 168 samples (93%) had percentage reduction of E. coli that was greater than 95% reduction of E. coli, while 12 samples (7%) had percentage reduction of E. coli that is less than 95% removal.</p> <p>HHFF: 34 water quality tests were conducted out of the sample frame of 40 households because 6 of the 40 households had abandoned their water filters. Out of the 34, 32 (94%) water samples had percentage reduction of E. coli that was greater than 95% removal, while 2 samples (6%) had percentage removal less than 95% removal.</p> <p>This has been demonstrated in the monitoring report.</p> | |
| Documentation Provided as Evidence by Project Participant | |
| - | |
| Information Verified by Team Leader | Date of review: 05.08.2016 |
| Monitoring survey analysis /7/ | |
| Reasoning for not acceptance or close out | |
| Verification team has checked the PP response along with the Monitoring survey analysis and found the PP response OK. The MR has been corrected accordingly as verified. Hence this CL is closed. | |
| Date of acceptance or non- acceptance | Date: 05.08.2016 Status: closed. |

| Date | Type & Number | Raised by | Reference |
|---|-----------------------------------|-----------------|-----------|
| 11/07/2016 | CAR-07 | Assessment Team | MR |
| Non conformities raised | | | |
| Under the SD parameter "Quality of Employment" in the MR, the source of data mentioned is Training Manual but as per the passport the chosen parameter is "Training manuals and training certificates". PP need to correct and submit the supportive documents. | | | |
| Project Participant's response | Date: 03.08.2016 | | |
| The PP has shown compliance with this requirement by providing training manual. | | | |
| Documentation Provided as Evidence by Project Participant | | | |
| Training manual Training Participant List Pictures of Training | | | |
| Information Verified by Team Leader | Date of review: 05.08.2016 | | |
| Training manual Training Participant List Pictures of Training /14/ | | | |
| Reasoning for not acceptance or close out | | | |
| Verification team has checked the participation list and training pictures for the training done during this monitoring period and found OK. Hence this CAR is closed. | | | |
| Date of acceptance or non- acceptance | Date: 05.08.2016 | Status: closed. | |

| Date | Type & Number | Raised by | Reference |
|--|-------------------------|-----------------|-----------|
| 11/07/2016 | CL-05 | Assessment Team | MR |
| Non conformities raised | | | |
| The value of Cj reported in the MR is 18% i.e. the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it but on the other hand for the SD parameter "Livelihood of the poor" it is mentioned 100% of household interviewed reported reduction in the amount of money and time to acquire fuel in the project scenario. PP need to clarify. | | | |
| Project Participant's response | Date: 03.08.2016 | | |

The PP attributes this analysis as an error and has rectified. The PP has revised the Monitoring documents to reflect this revision.

Documentation Provided as Evidence by Project Participant

Revised MR

Information Verified by Team Leader | **Date of review: 05.08.2016**

Monitoring survey analysis /7/

Revised MR /4/

Reasoning for not acceptance or close out

Verification team has checked Monitoring survey and the revised MR and found the MR corrections OK. Hence CL is closed.

Date of acceptance or non- acceptance | **Date:** 05.08.2016 | **Status:** closed.

| Date | Type & Number | Raised by | Reference |
|------------|---------------|-----------------|-----------|
| 11/07/2016 | CAR-08 | Assessment Team | MR |

Non conformities raised

From the review of the revised PDD (Version 24, Dated: 25/5/2016), verification team has found that the parameter Cj is given in the section "B.6.2: **Data and parameters that are available at validation:**" however the same is given in the section D.2 of the MR "Data and Parameters monitored" and the Measuring/Reading/Recording frequency is mentioned as Annually.

Project Participant's response | **Date:** 03.08.2016

The PP has revised the MR. The Cj factor has been set as fixed. The Cj was only to be monitored until it was investigated prior to the 2nd verification baseline testing. This has been done by the PP, and therefore this will now be a fixed parameter.

Documentation Provided as Evidence by Project Participant

Baseline testing summary

Information Verified by Team Leader | **Date of review: 05.08.2016**

Revised PDD /1/

Reasoning for not acceptance or close out

Corrections have been done in the revised MR and found OK. Hence this CAR is closed.

Date of acceptance or non- acceptance | **Date:** 05.08.2016 | **Status:** Closed.

| Date | Type & Number | Raised by | Reference |
|------------|---------------|-----------------|-----------|
| 29/07/2016 | CAR-09 | Assessment Team | MR |

Non conformities raised

From the review of the MR, verification team has found that monitoring parameters "Qp, clean,boil,y_{H_{HHFF}}" is stated as zero however from the review of the question asked in WCFT i.e. "**Do you boil water from the fillter? (Yes/No)**" under tab "HHFF WCFT" of Monitoring survey sheet, it was stated yes.

Project Participant's response | **Date:** 03.08.2016

The PP has revised the parameter Qp, clean,boil,y_{H_{HHFF}} to 0.026. The calculations have been provided in the 'HHFF Analysis' tab in the *Monitoring Survey Summary* document provided as a supporting document

Documentation Provided as Evidence by Project Participant

Monitoring Survey Summary

Information Verified by Team Leader | **Date of review: 05.08.2016**

Monitoring Survey Summary /7/

Reasoning for not acceptance or close out

Verification team has checked the calculation of "Qp, clean,boil,y_{H_{HHFF}}" from the Monitoring Survey Summary sheet and found OK. Corrections have been done in the revised MR. Hence this CAR is closed.

Date of acceptance or non- acceptance | **Date:** 05.08.2016 | **Status:** closed

| Date | Type & Number | Raised by | Reference |
|------------|---------------|-----------------|-----------|
| 29/07/2016 | CL-06 | Assessment Team | MR |

Non conformities raised



| | | |
|---|-----------------------------------|------------------------|
| The value considered for the ER calculation of the usage rate "UP,y" for both the filter types is not clear. | | |
| Project Participant's response | Date: 03.08.2016 | |
| The PP has revised the Usage parameter, based on weighted usage calculations for both the BSF and the Household Hollow Fiber filters. The explanations of the calculation process have been provided in the supporting documents mentioned below. | | |
| Documentation Provided as Evidence by Project Participant | | |
| 1. GS 1078_Sample Frame 2. GS 1078_HFF Sample Frame | | |
| Information Verified by Team Leader | Date of review: 05.08.2016 | |
| 1. GS 1078_Sample Frame /7.2/ 2. GS 1078_HFF Sample Frame /7.2/ | | |
| Reasoning for not acceptance or close out | | |
| Verification team has checked the revised weighted usage rate calculation and found OK. Hence this CL is closed. | | |
| Date of acceptance or non- acceptance | Date: 05.08.2016 | Status: closed. |

8. CERTIFICATE OF COMPETENCE

| | | | |
|---|--|------------------------------|-------------------------------------|
| Personnel Name: | | Chetan Swaroop Sharma | |
| Qualified to work as: | | | |
| Team Leader | <input checked="" type="checkbox"/> | Technical Expert | <input checked="" type="checkbox"/> |
| Validator/Verifier | <input checked="" type="checkbox"/> | Financial Expert | <input checked="" type="checkbox"/> |
| Technical Reviewer | <input checked="" type="checkbox"/> | Local Expert (India) | <input checked="" type="checkbox"/> |
| Area(s) of Technical Expertise | | | |
| Sectoral Scope | | Technical Area | |
| Energy industries (renewable/non-renewable sources) | TA 1.2: Energy generation from renewable energy sources | | |
| | TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar | | |
| Approved by (Manager C & T) | | Gagandeep Kakkar | |
| Approval date: | | 09/10/2015 | |

| | | | |
|---|---|-----------------------|-------------------------------------|
| Personnel Name: | | M.P. Kanal | |
| Qualified to work as: | | | |
| Team Leader | <input checked="" type="checkbox"/> | Technical Expert | <input checked="" type="checkbox"/> |
| Validator/Verifier | <input checked="" type="checkbox"/> | Financial Expert | <input type="checkbox"/> |
| Technical Reviewer | <input checked="" type="checkbox"/> | Local Expert (India) | <input checked="" type="checkbox"/> |
| Area(s) of Technical Expertise | | | |
| Sectoral Scope | | Technical Area | |
| Energy industries (renewable/non-renewable sources) | TA 1.2: Energy generation from renewable energy sources | | |
| Energy demand | TA 3.1. Energy Demand | | |
| Waste Handling and Disposal | TA 13.1 Waste Handling and Disposal | | |
| Agriculture | TA 15.1 Agriculture | | |
| Approved by (Manager C & T) | | Gagandeep Kakkar | |
| Approval date: | | 03/11/2015 | |

| | | | |
|---|--|-----------------------|-------------------------------------|
| Personnel Name: | | Sanjay Kandari | |
| Qualified to work as: | | | |
| Team Leader | <input checked="" type="checkbox"/> | Technical Expert | <input checked="" type="checkbox"/> |
| Validator/Verifier | <input checked="" type="checkbox"/> | Financial Expert | <input checked="" type="checkbox"/> |
| Technical Reviewer | <input checked="" type="checkbox"/> | Local Expert (India) | <input checked="" type="checkbox"/> |
| Area(s) of Technical Expertise | | | |
| Sectoral Scope | | Technical Area | |
| Energy Industries (renewable/non-renewable sources) | TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar | | |
| Energy industries (renewable/non-renewable sources) | TA 1.2: Energy generation from renewable energy sources | | |
| Energy demand | TA 3.1. Energy Demand | | |
| Waste Handling and Disposal | TA 13.1 Waste Handling and Disposal TA 13.2 Manure | | |
| Approved by (Manager C & T) | | Akhilesh Joshi | |



| | |
|----------------|------------|
| Approval date: | 11/12/2015 |
|----------------|------------|

History of the document

| Version | Date | Nature of revision | Reviewed by | Approved by |
|---------|------------|----------------------------|-----------------------------------|---------------------------------|
| 4.0 | 14/12/2013 | Guidance included/improved | Manager CDM Quality 23/12/2013 | Managing Director 23/12/2013 |
| 3.1 | 29/10/2012 | Updated for EB69 Annex6 | Manager CDM Quality 29/10/2012 | Managing Director 29/10/2012 |
| 3.0 | 31/08/2012 | Revised for VVS Track | Manager CDM Quality 08/09/2012 | Managing Director 10/09/2012 |
| 2.0 | 21/12/2011 | Comprehensively revised | Manager CDM Quality 21/12/2011 | Managing Director 21/12/2011 |