



# VERIFICATION REPORT PT HOLLAND FOR WATER

## VERIFICATION OF THE NAZAVA WATER FILTER PROJECT

BUREAU VERITAS (INDIA) PRIVATE LIMITED

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## VERIFICATION REPORT

Date of first issue: 19/05/2021	Organizational unit: Bureau Veritas (India) Private Limited
Client: PT Holland For Water	Client ref.: Mr. Guido Van Hofwegen
<p>Summary:</p> <p>Bureau Veritas (India) Private Limited has conducted the 2nd periodic verification of Nazava Water Filter Project, GS Registration Reference Number GS4290, owned by PT Holland For Water, which is located in Jalan Kolonel Masturi 345. Kav 1, KM 1.4 RW 22, RT 01 Kel. Cipageran Kec. Cimahi Utara, 40511 Cimahi Indonesia, and applying the methodology AMS-III.AV, version 04.0, Small-scale Methodology, "Low greenhouse gas emitting safe drinking water production systems", on the basis of UNFCCC criteria for the CDM &amp; GS, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM/GS rules and modalities and the subsequent decisions by the CDM Executive Board/ GS Secretariat as well as the host country criteria.</p> <p>The verification scope is defined as an independent and objective review and ex-post determination of the monitored GHG emission reductions, and consisted of the following three phases: i) desk review of the project design, the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report &amp; Opinion, was conducted using Bureau Veritas (India) Private Limited internal procedures.</p> <p>In summary, Bureau Veritas (India) Private Limited confirms that the project is implemented as planned and described in the submitted revised project design documents. Installed equipment's being essential for generating emission reduction run reliably and are calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions. The GHG emission reductions are calculated without material misstatements, and the emission reductions verified totalized 44,942 tons of CO<sub>2</sub>e for the monitoring period.</p> <p>Our opinion relates to the projects' GHG emissions and resulting GHG emission reductions reported and related to the valid and registered project baseline, submitted revised monitoring plan and its associated documents.</p> <p>Reporting period: 19/12/2018 to 18/12/2020</p> <p>Baseline emissions: 47,309 t CO<sub>2</sub> equivalents.</p> <p>Project emissions: 00,000 t CO<sub>2</sub> equivalents.</p> <p>Leakage emissions: 2,367 t CO<sub>2</sub> equivalents.</p> <p>Emission Reductions: 44,942 t CO<sub>2</sub> equivalents.</p>	

Report No.: BVC Brunei/VRBrunei/001/2021	Subject Group: Gold Standard
Project title: Nazava Water Filter Project	
Work carried out by: Mr. Ram M. Desai - Team Leader Mr. Pradana F. Zumario - Local Surveyor (Independent)	
Internal Technical Review carried out by: Mr. Hong Linh Nguyen - Internal Technical Reviewer Mr. Murugappan Palanisamy - Technical Expert - Internal Technical Review	
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## Indexing terms

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## Abbreviations

CAR	Corrective Action Request
GS	Gold Standard
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CL	Clarification Request
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2e</sub>	Carbon Dioxide Equivalent
VVB	Validation & Verification Body
DRR	Daily Reading Record
ETN	Electricity Transaction Note
FAR	Forward Action Request
GHG	Green House Gas(es)
MoV	Means of Verification
MP	Monitoring Plan
MR	Monitoring Report
MRR	Monthly Reading Record
PDD	Project Design Document
PLF	Plant Load Factor
PP	Project Participant
PPA	Power Purchase Agreement
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard
CWF	Ceramic Water Filter



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## 1. INTRODUCTION

PT Holland For Water has commissioned Bureau Veritas (India) Private Limited to verify the emissions reductions of its GS project Nazava Water Filter Project (hereafter called “**the Project**”) at Jalan Kolonel Masturi 345. Kav 1, KM 1.4 RW 22, RT 01 Kel. Cipageran Kec. Cimahi Utara, 40511 Cimahi Indonesia.

This report summarizes the findings of the verification of the Project, performed on the basis of Gold Standard criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

### 1.1. Objective

The objective of GS verification is to conduct a thorough, independent assessment of the registered project activities.

In carrying out its verification work, the VVB shall ensure that the project activity complies with the requirements of paragraph 62 of the CDM modalities and procedures. In particular, this assessment shall:

- (a) Ensure that the project activity has been implemented and operated as per the registered PDD or any approved revised PDD, and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- (b) Ensure that the monitoring report and other supporting documents provided are complete in accordance with latest applicable version of the completeness checklist for requests for issuance of VERs, verifiable, and in accordance with applicable Gold Standard for the Global Goals, Version 1.0 / CDM requirements;
- (c) Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan or any revised approved monitoring plan, and the approved methodology including applicable tool(s) / Gold standard for the Global Goals, Version 1.0 and Sustainable development goals;
- (d) Evaluate the data recorded and stored as per the monitoring methodology including applicable tool(s).

### 1.2. Scope

The verification scope is defined as an independent and objective review and ex-post determination of the monitored GHG emission reductions. The verification is based on the validated and registered project design document, the monitoring report, emission reduction calculation spreadsheet, and supporting documents. The information in these documents is reviewed against Gold Standard Rules, Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

The verification is not meant to provide any consulting service towards the PPs. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.



### 1.3. GHG Project Description

The Project involves production and distribution of Ceramic Candle water filters in Indonesia.

The project owner PT Holland For Water (PTH) is a social enterprise that distributes ceramic candle water filters across Indonesia, targeting low-income households (<\$7/day) in rural and urban areas through a wide network of resellers or micro-entrepreneurs under the brand name Nazava Water Filters which means “cleanliness” in Arabic.

The activity that is implemented under the “Nazava Water Filter Project” (here referred as “the proposed project”) is the sale and distribution of Nazava ceramic water filtration technology by PT Holland For Water (PTH) in regions of Indonesia. The applied technology is a ceramic water filter that produces water of safe drinking water quality

Prior to the implementation of this project within the project boundary, there is limited access to clean drinking water. Lack of ready access to a water source also limit the quantity of suitable drinking water that is available to a household. Even if the water is obtained from an improved source, water that must be fetched from a source that is not readily accessible to the household and may be contaminated during transport or storage. Nationally, boiling water prior to drinking is the most common treatment method (70.1 percent of total population). The percentage of urban people and rural people boiling water is 60.0 percent and 80.1 percent, respectively.

The baseline scenario is the continuation of current practice, thus identical to the existing scenario prior to the implementation of this project. Under the project scenario, dissemination of Nazava Filter will reduce GHG emissions by replacing the use of non-renewable biomass or fossil fuel to boil water to purify the water for drinking purposes. This purification method is energy intensive, creates indoor air pollution that is damaging to health, and emits significant GHG. Thus, the project activity contributes to the reduction in the GHG emissions associated to fossil fuel combustion for obtaining safe drinking water (SDW) as per conventional methods of water purification and also provides access to SDW to the consumers at an affordable price.

PT Holland for Water aims to enhance the dissemination of Ceramic Candle Water Filter (CWF) as a way to filter safe drinking water for end-users in Indonesia. The CWF units treat contaminated drinking water and reduce conventional water treatment through boiling water with non-renewable biomass thus reducing carbon emissions. The project aims to address the issues described in the scenario existing prior to the implementation of the project activity below, by introducing CWFs to effectively remove over 99% of bacteria. The primary objective of the project activity is to disseminate over 165,379 CWFs between 2014 and 2024 i.e. during entire crediting period, potentially providing safe water to approximately 0.83 million people and reducing water boiling using non-renewable biomass.

Ceramic water filtration unit uses porous candle filters installed in the plastic container (housing Unit) which are produced locally. CWF has three main components as mentioned below.

#### **Ceramic filter**

The filters are made of diatomaceous earth with pores of 0.4 micron (0.0004 millimeter) and remove micro-organisms: bacteria, cysts, parasites, fungi, sand, clay and other particles greater than 0.4 micron.

#### **Activated Carbon**

The ceramic is filled with activated carbon which reduces the content of harmful chemicals such as pesticides and chlorine. It improves the taste and reduces smell.

#### **Anti-microbial Silver**

The ceramic is impregnated with silver (0.08 % by weight), which kills micro-organisms like bacteria that are trapped at the surface of the ceramic. The silver content is very low and not harmful for frequent use.



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PTH's filters are ceramic filters that remove microorganisms such as bacteria, fungi, sand, clay and other particles greater than 0.4 micron. PTH's water filter technologies conservatively purifies 2 litres per hour, is certified to last for 7,000 litres.

PT Holland for Water has introduced Ceramic Candle Water Filter in Indonesia with the specifications as provided in the table below. PP has provided detailed specifications along with pictures of CWF's in the PDD section A.3. The actual production and dissemination is found in accordance with the specifications provided in the Registered PDD. Verification team herewith confirms that the specifications of Ceramic Candle Water Filter (CWF) /Ref-48/ are same as provided in the registered PDD Section A.3 /Ref-1/. There is no deviation / change evidenced during this monitoring period.

PT Holland for Water has so far distributed 116,222 units of Ceramic Candle Water Filter in different provinces of host country Indonesia since start of the project. During this 2nd monitoring period i.e. from 19/12/2018 - 18/12/2020 total sale of Ceramic Candle Water Filter is 28,343 units. and the annual average estimated emission reductions over 10 years crediting period is 22,735 tCO<sub>2e</sub> /Ref-1/.

Project title: Nazava Water Filter Project  
 GS ref number: GS4290  
 Registration Date: 15/02/2016  
 Crediting Period: 01/03/2014 to 29/02/2024  
 Monitoring Period: 19/12/2018 to 18/12/2020  
 Project Participants: PT Holland For Water  
 Nexus, Carbon for Development  
 Methodologies used: AMS-III.AV, version 04.0, Small-scale Methodology, "Low greenhouse gas emitting safe drinking water production systems"  
 Location of the Project: Jalan Kolonel Masturi 345. Kav 1, KM 1.4 RW 22, RT 01 Kel. Cipageran Kec. Cimahi Utara, 40511 Cimahi Indonesia

**[Post Registration Changes]**

During this verification of 2nd monitoring period, there was no post registration changes to the project design hence not applicable.

**1.4. Verification Team**

The assessment team and internal technical reviewer team consist of the following personnel:

FUNCTION	NAME	TA 1	TA 3	TASK PERFORMED*
Team Leader	Mr. Ram M. Desai	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> DR <input checked="" type="checkbox"/> SV <input type="checkbox"/> RI <input type="checkbox"/> TR
Team Member	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI <input type="checkbox"/> TR
Technical Specialist	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI <input type="checkbox"/> TR
Internal Technical Reviewer (ITR)	Hong Linh Nguyen	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI <input checked="" type="checkbox"/> TR
Specialist supporting ITR	Murugappan Palinisamy	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI <input checked="" type="checkbox"/> TR
Final Approval	Sanjay Patankar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> DR <input type="checkbox"/> SV <input checked="" type="checkbox"/> RI <input type="checkbox"/> TR

\*DR = Document Review; SV = Site Visit; RI = Report issuance; TR = Internal Technical Review



## 2. METHODOLOGY

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas (India) Private Limited internal procedures.

In order to ensure transparency, a verification protocol was customized for the project, according to the version 02.0 of the CDM Validation and Verification Standard for Project Activities (CDM-EB93-A05-STAN), issued by CDM Executive Board /9/, and Gold Standard Validation & Verification Manual and Gold Standard for the Global Goals (GS4GG) /Ref-2/. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

- It organizes, details and clarifies the requirements a Gold Standard project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been verified and the result of the verification.

The completed verification protocol is enclosed in Appendix A to this report.

### 2.1. Review of Documents

The assessment of the project documentation provided by the project participant is based upon both quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the monitoring report (MR) version 4.0 dated 12/08/2021 /6/ and emission reduction calculation spreadsheet version 3.0 dated 12/08/2021 /7/. Qualitative information comprises information on internal management controls, calculation procedures, and procedures for transfer of data, frequency of emissions reports, and review and internal audit of calculations.

The monitoring report Version 01, dated 14/04/2021 submitted by the project participant was considered as an initial input to verification and remote verification. However PD revised the Monitoring report to Version 2.0 Dtd. 20/05/2021 to address reported CL's during verification activity. Subsequently MR were revised to address the performance review comments and the current revision of the verification report addresses the changes included in the Monitoring Report version 4.0 Dated 12/08/2021.

In addition to the monitoring documentation provided by the project participants, the VVB reviews:

- (a) The registered PDD and the monitoring plan, including any approved revised monitoring plan and/or changes from the registered PDD, and the corresponding validation opinion /1//3/;
- (b) The validation report
- (c) The applied monitoring methodology /8/;
- (d) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board / GS Secretariat;
- (e) Other information and references relevant to the project activity's resulting emission reductions (e.g. IPCC reports, laboratory analysis or national regulations).

### 2.2. Follow-up Interviews

Due to COVID-19 outbreak and lock down situation it was decided to perform the verification through remote audit (Online assessment) and hence physical site visit is Not Applicable (Remote Verification) during this verification. Bureau Veritas (India) Private Limited performed this verification through remote audit using its own procedure which is in accordance with Accreditation requirements i.e. IAF Mandatory Documents (IAF MD 4 and IAF MD 5). Verification team has enough experience in performing such audits/ verifications remotely. During this verification appropriate stakeholders were identified and engaged / interviewed remotely to confirm selected information and to resolve issues identified in the





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document review. Representatives of PT Holland For Water and Nexus, Carbon for Development were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Verification of 2nd monitoring period has to be performed during difficult situation i.e. COVID 19 emergency and this compels VVB to perform remote verification. Interview of Households / End user is an integral part of the verification where relevant project specific information could be gathered to crosscheck the accuracy and conservativeness of the monitoring information presented by PP in the Monitoring report. Since Host country Indonesia is under lockdown and has enforced a movement control order, it is very difficult to access the household physically. Considering this situation it is decided to perform interview of household by appointing a local surveyor who will be calling each selected household and interview telephonically and record the answer in a specified data sheet which will be checked and discussed with the surveyor by the VVB Team Member for accuracy. VVB has identified the sample size for interview and sample population was selected from the Usage survey data presented by the PP.

To verify the accuracy and correctness of monitored data, verification team has utilized sampling approach. The sample size for the verification of monitored data was determined as per the International Accreditation Forum (IAF): Guidance on the Application of ISO/IEC Guide 62:1996: 'General Requirements for Bodies Operating Assessment and Certification/registration of Quality Systems'/**Ref-37**/. In line with the mentioned IAF guidance, the sample size from the verification body should be square root of the total sample size. Based on this approach verification team has made a sample plan and utilized the same during verification site visit to cross check the Sales Records, Invoices and Manufacturing data etc. which are the input to the calculation Baseline emission, Leakage emissions, project emissions and Emission reductions.

VVB made the sampling plan for visiting house hold during this verification using Simple random Sampling approach as specified in the CDM-EB67-A06-GUID, Version 4.0 "Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities"/**Ref-32**/.

VVB selected Simple random Sampling approach as specified in the EB67-A06 –GUID, Version 4.0 "Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities", in order to determine the sample size from the Sales Data Base since the start of the project. The selection of Simple Random Sampling method is justified as below

- *A simple random sample is a subset of a population (e.g. villages, individuals, buildings, pieces of equipment) chosen randomly, such that each element (or unit) of the population has the same probability of being selected. The sample-based estimate (mean or proportion) is an unbiased estimate of the population parameter.* – Yes the database provided by the PP has the same probability of being selected. Hence found applicable.
- *Simple random sampling is conceptually straightforward and easy to implement – provided that a sampling frame of all elements of the population exists. Its simplicity makes it relatively easy to analyse the collected data. It is also appropriate when only minimum information of the population is known in advance of the data collection* – Yes this method is a straightforward method and is helpful to gather enough information against the total number of household recorded in the sales data base since the implementation of this project.
- *Simple random sampling is suited to populations that are homogeneous.* – Yes, the population i.e. the house hold using the Nazava Water Filters as households are using similar type of Nazava Water Filters and there is no impact of any factor on the usage of CWF and the Population.
- Confidence/precision factor that needs to be met as part of the PS. The methodology VVBs, however, require in-person interviews with a robust sample of end-users that are representative of end users targeted in the project activity. As the targeted group size with the project is > 1000, a minimum



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sample size of 100 is required for the PS with at least 30 samples for project technologies of each age being credited as part of the usage survey.

### 1.2 Target population

The project boundary is defined as the host country of Indonesia. Since PP is distributing Ceramic Water Filters (CWF) to cater clean drinking water requirement of a household, hence household unit is considered as an appropriate component of the population. Thus the target population for this interview shall be those household which has purchased the CWF during 16/07/2012 to 15/07/2019.

The sample of HHs was chosen from Project Survey data submitted by PP during this verification. Database is representing the house holds participated during project survey. This approach is adopted as the contact information is validated during project survey and will not result in delay in accessing the household. Villages have been identified from the project survey.

### 1.3 Sample size calculation and implementation

Sample size calculation is done using Equation 1 given in the CDM guideline Sampling and surveys for "CDM project activities and programmes of activities" (CDM-EB67-A06-GUID). The calculation approach is demonstrated as below.

**Equation used:**

$$n \geq \frac{1.645^2 N \times p(1-p)}{(N-1) \times 0.1^2 \times p^2 + 1.645^2 p(1-p)}$$

**Inputs for Calculation:**

Inputs	Description	Results
n	Sample size	31
N	Total number of Households in the project Activity using CWF	28,343
p	Our expected proportion	90%
1.645	Represents the 90% confidence required	1.645
0.1	Represents the 10% relative precision ( $0.1 \times 0.5 = 0.05 = 5\%$ points either side of p)	0.1

\*From the previous experience and the level of confidence established in methods of survey implemented by PP during crediting period, VVB expects that 90% of the samples taken / visited shall comply with the project requirements.

By applying the equation for calculating sample size based on the total household number i.e. 28,343 from the Monitoring report and Sales Data base submitted by PP, the sample size determined is 31 number of household. However If we expect the response rate from the sampled households to be only 80% then we would need to scale up this number accordingly. Thus it is decided to sample  $31/0.8 = 39$  households.

### Implementation:

We have to conduct these interviews during difficult situation i.e. COVID 19 emergency and Host country Indonesia has also enforced a movement controls which makes it very difficult to access the household physically. Considering this situation it is decided to perform interview of household by appointing a local surveyor who will be calling each selected household and interview telephonically and record the answer in a specified data sheet which will be checked and discussed with the surveyor by the VVB Team Member for accuracy.

Considering this methodology, there is an uncertainty related to the access of household using mobile numbers due to following potential reasons

- User is not available and went out of home



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- User mobile number is not valid

To address this uncertainty VVB has further considered to increase the sample selection by applying 0.5 factor, hence total samples selected are  $39/0.5 = 78$  households, to compensate the possible uncertainty due to adoption of the remote interview.

If Surveyor managed to reach 50 households using telephonic interview and the data is consistent surveyor shall stop the interview otherwise he/ she shall continue reaching household until 50 data points is reached.

In case the interview results are not consistent i.e. surveyor is not able get complete information against the question framed, surveyor shall continue interviewing the sampled population.

A list of sampled house hold is prepared by VVB team member and shared with the surveyor for interview purpose. List comprised of 88 Households with relevant information.

**Survey Questions:**

1. What is your name?
2. What is your Village name?
3. How many people are there in your house?
4. What is the source of Drinking Water?
5. When did your purchased the CWF? Approximately month and year
6. Before purchasing Nazava Filter, what was the method adopted by you to treat the water?
7. How frequently you top up the Water Filter in a day?
8. Did you faced any problem with the CWF?
9. If yes how you resolved it?
10. Are you still boiling the Drinking Water?
11. Which type of fuel you use for boiling of drinking water?
12. In case of any problem with CWF how do you access Nazava team for rectification / replacement?
13. Have you ever replaced the Ceramic pot since purchase of filter?
14. What is your overall feedback on the performance and usefulness of the CWF you purchased?

Based on the review of background documents submitted by PP prior to actual remote verification, VVB selected 3 provinces for selection of House hold visit during this monitoring plan and this selection is done using following criteria

1. Selection of Provinces based on the project database and sales data base
2. Number of CWF sales in the province against overall sales.

**Sampling Plan:**

<i>Important Records as supporting evidences to calculate ER</i>	<i>Total Data Points</i>	<i>Sampled Data Points</i>	<i>Remark</i>
<b>Sales Records of CWF units</b> [For sales records sampling during this Verification Team used CDM-EB67-A06-GUID, Version 4.0 "Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities"]	28,343	50	OK
<b>Project survey Records</b> [International Accreditation Forum (IAF): Guidance on the Application of ISO/IEC Guide 62:1996: 'General Requirements for Bodies Operating Assessment and Certification/registration of Quality Systems']	732	41	OK
<b>Households selected for the interview during Site Visit</b> [For Household sampling during site visit Verification Team used CDM-EB67-A06-GUID, Version 4.0 "Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities"]	-	50	OK



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Table 1 Interview topics

Date	Interviewed organization	Interview topics
20/04/2021 23/04/2021 28/04/2021 05/05/2021	PT Holland For Water (the Project Owner)	<ul style="list-style-type: none"> <li>➤ Kick off Meeting, and review of Monitoring reports. Project Design and implementation</li> <li>➤ Discussion on Sampling plan and Planning and arrangement of the Remote interview of households.</li> <li>➤ Collection of background information related to the household.</li> <li>➤ Technical equipment, calibration and operation</li> <li>➤ Monitoring Plan and management procedures</li> <li>➤ Monitoring data</li> <li>➤ Data uncertainty and residual risks (QA/QC)</li> <li>➤ GHG Calculation</li> <li>➤ Environmental Impacts</li> <li>➤ Compliance with National Laws and Regulations</li> <li>➤ Compilation of the Interview outcome and discussion with PP on the results of the household Interview.</li> </ul>
	Nexus, Carbon for Development (the Consultant)	<ul style="list-style-type: none"> <li>➤ Monitoring Plan</li> <li>➤ Monitored data and Monitoring Report</li> <li>➤ GHG Calculations</li> </ul>
24/04/2021 25/04/2021 01/05/2021 02/05/2021	House Holds	<ul style="list-style-type: none"> <li>➤ CWF Usage practices</li> <li>➤ CWF Benefits</li> <li>➤ CWF Problems while using it</li> <li>➤ Boiling water consumption for house</li> <li>➤ Wood Consumption and charcoal Consumption pre and post usage of CWF.</li> <li>➤ Health Issues after using CWF</li> <li>➤ Accessibility to PT Holland for Water Sales personnel</li> <li>➤ After sale services by PT Holland for Water</li> </ul>

### 2.3. Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the verification is to resolve issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of the registered project activity to achieve emission reductions or influence the monitoring and reporting of emission reductions prior to Bureau Veritas (India) Private Limited's positive conclusion on the GHG emission reduction calculation.

Findings established during the verification can either be seen as a non-fulfillment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

A Corrective Action Request (CAR) is raised, if one of the following situations occurs:

- (a) 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;
- (b) Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;



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- (c) Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- (d) Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

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

A Forward Action Request (FAR) is raised, for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Appendix A.

## 2.4. Internal Technical Review

The verification report underwent an Internal Technical Review (ITR) before requesting issuance of CERs for the project activity.

The ITR is an independent process performed to examine thoroughly that the process of verification has been carried out in conformance with the requirements of the verification scheme as well as internal Bureau Veritas (India) Private Limited procedures.

The Team Leader provides a copy of the verification report to the reviewer, including any necessary verification documentation. The reviewer reviews the submitted documentation for conformance with the verification scheme. This will be a comprehensive review of all documentation generated during the verification process.

When performing an Internal Technical Review, the reviewer ensures that:

- The verification activity has been performed by the team by exercising utmost diligence and complete adherence to the CDM / GS rules and requirements.
- The review encompasses all aspects related to the project which includes project design, baseline, additionality, monitoring plans and emission reduction calculations, internal quality assurance systems of the project participant as well as the project activity, review of the stakeholder comments and responses, closure of CARs, CLs and FARs during the verification exercise, review of sample documents.

The reviewer may raise Clarification Requests to the verification team and discusses these matters with Team Leader.

After the agreement of the responses on the Clarification Requests from the verification team as well as the PP(s), the finalized verification report is accepted for further processing such as uploading / submitting to Gold Standard.

## 3. VERIFICATION CONCLUSIONS

In the following sections, the conclusions of the verification are stated.



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The findings from the desk review of the original monitoring documents and the findings from interviews during the follow up visit are described in the Verification Protocol in Appendix A.

The Clarification, Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Appendix A. The verification of the Project resulted in 00 CAR(s), 04 CL(s) and 00 FAR(s).

The CARs, CLs and FARs were closed based on adequate responses from the Project Participant(s) which meet the applicable requirements. They have been reassessed before their formal acceptance and closure.

The number between brackets at the end of each section corresponds to the VVS paragraph.

### 3.1. Remaining issues from validation or previous verification

During this Verification visit CARs and CLs raised during previous verification were verified and found that all are closed successfully, no remaining issues were left open.

There was one FAR reported during previous GS review process and VVB reviewed the corrective actions implemented and the effectiveness of these actions. Due diligence was done by the VVB and confirmed that the reported FAR was closed effectively. Verification comments are provided as below.

FAR reported during last issuance review by Sustaintcert is

- *PD should be able to clarify how it takes into account households not using their filters every day into the emission calculation.*

VVB's Verification Remark:

- In order to address the FAR reported, PD revised the Project survey questionnaire and included question i.e. "How often do you Drink / use water from CWF?" – Based on the submission of project survey data submitted by the PD, this was confirmed by verifying the responses towards this question and it was observed that there was 100% response from sampled household that they are using water from CWF on daily basis. And hence there is no impact to the emissions reduction calculation is noted. Also the Usage rate calculation found to be transparent and provides information that how many household amongst sampled household are using the CWF regularly.

PD has provided the response to the FAR in Section B.1.1 in Monitoring report and thus it is concluded that PD has established relevant corrective actions to monitor the Daily usage rate during project survey.

### 3.2. Compliance of the project implementation with the registered project design document

Bureau Veritas (India) Private Limited has performed a site visit and found that the Project has been put into operation and Ceramic Candle Water Filter are being distributed and it is found that the implementation of the project activity is in accordance with the registered PDD. The changes in the factors and parameters used during this 2nd monitoring period to arrive at the emission reduction calculations are transparently described in the Monitoring Report Section 3.3., PP has provided justifications for the changes and these changes are accounted correctly while calculating emission reductions.





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The details of verification against changes incorporated by PP during this monitoring period are provided in the respective sections and there is no significant change observed in the listed monitoring parameters since last verification.

This is the 2<sup>nd</sup> monitoring period and verification team herewith confirms that the project implementation is consistent since the Start date of project as mentioned in the Registered PDD. There are no major obstructions or gaps noted in the implementation of project as described in the registered PDD during this monitoring period.

As per the revised PDD it is noted that the emission reductions are calculated on the basis of number of Ceramic Candle Water Filter units sold ( $\tau_{Y,i}$ ) and hence it is considered as an important parameter for calculation of Emission reductions during particular monitoring period. PP has an effective system to keep a track of manufactured number of Ceramic Water filters through unique Serial number and a Sales record. PP has established adequate QA /QC methods and reporting structure to capture relevant information in transparent manner. The data collected and processed is found auditable.

### Application of Materiality:

With reference to Guideline on Application of Materiality in Verification, EB69 annex 6, Para (d) The CMP materiality decision prescribes the thresholds for the application of materiality in verifications, by defining that information is material if it might lead, at an aggregated level, to an overestimation of the total emission reductions or removals achieved by a CDM project activity equal to or higher than 5 per cent of the emission reductions or removals for small-scale project activities other than project activities covered under subparagraph (e) of EB 69 Annex 6. Since the Emission Reductions achieved during this 2<sup>nd</sup> monitoring period by the project activity is 45,791 tCO<sub>2</sub>e, the materiality threshold for project activity determined is 5 percent (5 %).

### Consideration of materiality in planning the verification

No	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Risk of human error in transferring monitoring data from Survey Results (Primary sources) to calculation spreadsheet (secondary sources). This including transferring of data against various monitoring parameters which are having direct bearing on the Emission reduction calculations.	High	Though PP has established comprehensive sampling methods and Survey Protocols for verifying the Usage rate during project scenario. However there is a risk of error in transferring the data to the Emission Reduction Calculation spreadsheet which will has significant impact on total Baseline calculation and emission reductions.	Survey results to be verified in detailed and Verification Team has established a sampling plan which is in accordance with the International Accreditation Forum (IAF): Guidance on the Application of ISO/IEC Guide 62:1996: 'General Requirements for Bodies Operating Assessment and Certification/registration of Quality Systems'/ <b>Ref-37/</b> . Total Survey records for Project Survey and Usage Survey are 732 and hence during this verification 78 samples of Project Survey records were sampled randomly for cross checking the Emission Reduction calculations.  Also remote interview with households during this verification totally 78 House hold samples were selected randomly to confirm that the information obtained is representative and reflecting actual project scenario.
2.	Inaccuracy in Sales Data base and number of Sales reported during monitoring	High	PP has established a suitable method to record the sales. Sales are done through	During 2 <sup>nd</sup> monitoring period PP has reported that 28,343 number of CWF's are sold. Verification Team



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	period.		different channels i.e. Direct Sales, NGO sales and Agent Sales. However there is a risk of overestimation of Sales due to the error in recording and reporting sale as the baseline emissions and Emission Reductions are directly proportional to the number of CWF sold during monitoring period.	derived 78 samples across all months to check the accuracy. Invoices were verified against the sales data base and found that the sales data is correct and has no materiality. The random sample is determined using CDM-EB67-A06-GUID, Version 4.0 "Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities"  Sales data base is also supported with the Accounting system where payment received against each invoice is traceable. During this verification no Data Errors found during verification and hence it is found satisfactory.
3.	Human error in providing incorrect calculation formulae in calculation spreadsheet	Medium	The Calculation is done using Excel based spreadsheet and the calculations are done as per the PDD requirement. Formulae used in the Excel sheet are transparently demonstrated and is found verifiable.  The spread sheet used is found correct and correctly calculating the Baseline emissions, project emissions and emission reductions. The Formulae presented in the spreadsheet are validated during validation.	Conducting calculation formulae check at stage of document review prior to remote verification covering these calculations <ul style="list-style-type: none"> <li>• Baseline Emission</li> <li>• Project Emission</li> <li>• Leakage Emissions</li> <li>• Total Emission Reduction</li> </ul> Done and confirmed that there is no material error evidence during Verification of Emission Reduction spreadsheet.
4.	Error due to delay of calibration on monitoring equipment	Low	The project activity VVBs not include any monitoring and measurement equipment, hence calibration is not required, and hence there is no perceived risk.	Not Required.
5.	Risk related to Survey methods and accuracy	High	Although PP has established comprehensive protocols and methods to perform various survey during project scenario, there is an inherent risk in the accuracy and transparency. Field staff engaged for such activities are either PT Holland for Water own staff or hired staff for temporary purpose. The accuracy is depends on the competence of the person and the quality controls established by the PP on survey activities. Since the data obtained from survey is very crucial and is directly proportional to the assumptions and calculations for emission reductions.	Conduct cross-checking of all survey analysis spreadsheets for survey submitted to verification to verify the trends and accuracy.  The sampled survey questionnaires also to be verified during remote verification team selected adequate number of Samples of each survey records to verify the input values / information.  In order to ensure that surveys are carried out under controlled conditions PP has ensure that teams selected for survey has a proper composition i.e experienced personnel from PT Holland for Water and trained hired staff on the survey requirement. Training records of survey staff is maintained





			<p>There is risk of wrong data provided by the field staff which will misrepresent the actual project condition and results into overestimation of Emission Reductions.</p>	<p>appropriately.</p> <p>Photographic evidences are also taken against each house hold surveyed.</p> <p>Program manager supervises entire process and ensures that the data obtained is correct and transferred to survey data base accurately.</p> <p>There is no material error noted during verification and it is confirmed that the surveys are accurate.</p>
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During Remote verification, verification team took a due account of this method by cross checking Monitoring information Flow as well as manufacturing data base and sales data base /Ref-11/ and warrantee cards issued against each CWF. Sales Data and Sales invoices were verified in detailed for each month during the 2<sup>nd</sup> monitoring period based on the sampling approach described in section 2.2. above.

### [Management and Operation]

The PP has operated the Project as per the registered PDD. The monitoring organization has been set up and all monitoring staff have been trained. Relevant data monitoring and reporting activity is been practiced as per the registered PDD. Staff engaged in the monitoring, surveying, marketing and manufacturing is found adequately trained and PP has maintained relevant training records to demonstrate that the Project activity is monitored by competent staff and follows the monitoring plan correctly /Ref-33/



Corresponding to the paragraph 360 - 364 of CDM Validation and Verification Standard for Project Activities, Version 02.0, as well as relevant sections of Gold Standard Validation & Verification Manual and Gold Standard for the Global Goals (GS4GG), Bureau Veritas (India) Private Limited can confirm that:

- The implementation of the Project is consistent with the approved revised PDD.
- The Project is operated as per the approved revised PDD by the PP.

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

The verification team has verified the monitoring plan, including the data and parameters required to be monitored, measurement procedures, monitoring frequency and QC/QA procedures as described in the approved/submitted revised PDD.



Corresponding to the paragraph 357 - 359 of CDM Validation and Verification Standard for Project Activities, Version 02.0, as well as relevant sections of Gold Standard Validation & Verification Manual and Gold Standard for the Global Goals (GS4GG), Bureau Veritas (India) Private Limited can confirm that the monitoring plan is in accordance with the approved methodology including applicable tool(s) applied by the Project.



### 3.4. Compliance of monitoring activities with the monitoring plan

Monitoring has been carried out in accordance with the monitoring plan contained in the approved/submitted revised PDD and transition annex.

#### [Parameters and information flow]

The parameters required by the monitoring plan and how Bureau Veritas (India) Private Limited has verified the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the values in the monitoring report are described below:

#### Parameters monitored:

Operational Parameter	Data Parameter as per monitoring plan	Frequency of Monitoring	Monitoring Arrangement	Accuracy Class and Calibration Frequency and status
Quantity of purified water in year y (litres)	QPW <sub>y</sub>	Every two years.	<p>This Parameter represents The Quantity of safe / purified water per supplied by each filter unit for the period of one year.</p> <p>PP has applied 5,164 (L/yr/unit) for this monitoring period. This value is the calculated value, arrived using equation</p> $QPW_y = \sum_{i=1}^n V_{p,i} \times R_{p,i} \times 365 \text{ * Water Quantity * Operational Units * } N_{unit}$ <p>The Formula was verified in detailed and found correct and suitable to calculate the quantity of Purified water in year y supplied by each individual unit.</p> <p>This formula is correctly applied by the PP in the emission reduction calculation spreadsheet.</p>	<p>- Not Applicable as there is no measurement required to determine this parameter. This parameter is established based on the result of project survey and default values fixed at ex ante.</p>
Total distributed water purification units	Ty,i	Continuous and aggregated monthly	<p>This Parameter represents the number of water purification units distributed by the PP during monitoring period. During this monitoring period PP has distributed 28,343 units.</p> <p>This value is obtained from the Sales Data base /Ref-11/, in order to assess the accuracy in accounting the distributed filter units during this monitoring period Verifier took random samples of invoices /Ref-12 -14 &amp; 16-17/ and other relevant records for verification. Out of total 2185 Data points in the sales data base Verifier selected 50 samples and found that there is no material error in the data presented in the Sales data base. Accuracy level found satisfactory and it is noted that PP has implemented relevant QA/QC controls in order to ensure that the data is consistent and accurate and reliable.</p> <p>There is duplication of the Data observed ant PP has ensured method for checking duplicated entry in the sales data base.</p>	<p>- Not Applicable as there is no measurement required to determine this parameter.</p>
The average population serviced by water purification system	N <sub>y,i</sub>	Every two years	<p>This Parameter represents the number of persons served by one unit of CWF during year y.</p> <p>PP has applied 4.66 persons/unit person for this monitoring period. This value is obtained from the Project Survey /Ref-30/and usage survey conducted by PP during year 2021 /Ref-23/. The value applied is found statistically correct. PP has ensured that adequate QA/QC measures are implemented and the</p>	<p>- Not Applicable as there is no measurement required to determine this parameter.</p>



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<p>data is verified, entered and analyzed independently. As per the Registered PDD it was noted that PP has applied Value of 4.57 person/unit. Since the value presented in the Monitoring Report is based on the Actual Survey result it was considered correct, based on the verification of Results of Project and usage survey presented by PP during remote verification PP has established a comprehensive Sampling approach /Ref-34 &amp; 40/ based on the approved Gold standard procedure for Sampling. Statistical calculations are found addressing all points and found that stratified sampling is followed. This is confirmed using Sampling protocol /Ref-40/ and Sample Calculation Spreadsheets /Ref-34/</p> <p><b>During This verification Validation team interviewed sampled household and it is observed that on an average 4.87 persons are serviced by the water purification system and hence it is concluded that the value applied by the PP is representative.</b></p>												
<b>Water Quality Passed Rate (WHO standard)</b>	<b>WQ<sub>passedWHO</sub></b>	Every two years	<p>PP has maintained in-house test reports to demonstrate that the purified water meets the WHO Standard for drinking water quality.</p> <p>In order to test the Water sample collected from the house hold, PP has proposed to use mobile test kit to monitor the E-Coli content in the water. However in the registered PDD it was mentioned that water samples shall be tested through approved laboratory, hence the method adopted by the PP is considered as deviation to the registered PDD.</p> <p>PP has requested an approval on this deviation from Gold Standard and in regards to this PP submitted a Deviation Request form /Ref-46/ Dtd. 12/04/2018. The deviation was found approved by the Gold Standard and hence it is concluded that the water quality test results presented during this monitoring period are acceptable.</p> <p>Verifier further checked the specification of the Test kit /Ref-50/ and observed that the test method and test kit utilized by the PP for gathering information on Water Quality results found to be correct.</p> <p>PP has applied the water quality pass rate as 92.28% Verification team verified the results of analysis submitted by the PP in the form of MP2 Water Quality Test Survey Report /Ref-27&amp;28/,</p> <ul style="list-style-type: none"><li>- Not Applicable as there is no measurement equipment is used which needs calibration for determining this parameter.</li><li>- However PP has used a Portable / Mobile test kit to monitor the water quality. Mobile testing kit: Compact dry Compact Dry E. coli/Coliform Count (EC) <a href="https://www.ncbi.nlm.nih.gov/pubmed/1651235">https://www.ncbi.nlm.nih.gov/pubmed/1651235</a>./Ref-50/</li></ul>									
<b>Usage rate in project scenario p during year y</b>	<b>Usage rate</b>	Every two years	<p>This is the calculated (Weighted Average) value to know what the usage rate of the CWF's Sold is during this Monitoring Period. The Value applied earlier by PP for this monitoring period was 63.91% this Monitoring period.</p> <p>PP has applied the usage rate based on the age of the filter unit and hence this approach is found conservative. The usage rate applied by the PP for different age groups of filter units is assessed based on the usage survey results presented in the form of Excel spreadsheet, where PP has provided the Raw survey data and statistical calculation. /Ref-22/ Age wise USAGE rates applied by PP are provided in the below table</p> <table><thead><tr><th>Age</th><th>Year of Installment of Filter</th><th>Usage rate</th></tr></thead><tbody><tr><td>Year 1</td><td>1<sup>st</sup> Jan – 18<sup>th</sup> Dec 2020</td><td>93.55%</td></tr><tr><td>Year 2</td><td>1<sup>st</sup> Jan – 31<sup>st</sup> Dec 2019</td><td>99.13%</td></tr></tbody></table> <ul style="list-style-type: none"><li>- Not Applicable as there is no measurement required to determine this parameter.</li><li>- Usage rate is determined age wise and it is an average based on the feedback during usage survey conducted by the PP.</li></ul>	Age	Year of Installment of Filter	Usage rate	Year 1	1 <sup>st</sup> Jan – 18 <sup>th</sup> Dec 2020	93.55%	Year 2	1 <sup>st</sup> Jan – 31 <sup>st</sup> Dec 2019	99.13%
Age	Year of Installment of Filter	Usage rate										
Year 1	1 <sup>st</sup> Jan – 18 <sup>th</sup> Dec 2020	93.55%										
Year 2	1 <sup>st</sup> Jan – 31 <sup>st</sup> Dec 2019	99.13%										
<b>Percentage of sold unit in operation</b>												



Year 3	1 <sup>st</sup> Jan – 31 <sup>st</sup> Dec 2018	84.57%
Year 4	1 <sup>st</sup> Jan – 31 <sup>st</sup> Dec 2017	57.29%
Year 5	1 <sup>st</sup> Jan – 31 <sup>st</sup> Dec 2016	68.24%
Year 6	1 <sup>st</sup> Jan – 31 <sup>st</sup> Dec 2015	63.33%
Year 7	1 <sup>st</sup> Jan – 31 <sup>st</sup> Dec 2014	36.17%
Year 8	1 <sup>st</sup> Jan – 31 <sup>st</sup> Dec 2013	9.02%
Year 9	1 <sup>st</sup> Jan – 31 <sup>st</sup> Dec 2012	0%

The Usage Survey (Project Survey) is found conducted as per "Guidelines for carrying out usage surveys for projects implementing household water filtration technologies – 05/02/2014"

A detailed Usage Survey Questionnaire has been established and presented during site visit for assessment – PP has done tablet based survey and the format created in the tablet is found complying with the established Questionnaire.

<b>Existence of public distribution network of safe drinking water</b>	<b>SDW</b>	Annually	<p>In order to assess the existence of Public Distribution Networks of safe drinking water in host country Indonesia, PP has adopted two approaches i.e. Desk Review and Project Survey.</p> <p>During Desk review PP has obtained relevant information on the Host country status of having distribution network of Safe drinking water across the country, however from the reliable sources i.e. WHO / Unicef (Published Data in year 2019) <b>/Ref-20/</b> and the survey results published in 2017 by IPB (agricultural institute in Bogor ) <b>/Ref-51/</b> as well as using reference documents published and media reports i.e. BNPD agency that water supplied by the local water utility company is not safe and needs boiling prior to the consumption. This is confirmed using a partner website from Indonesian ministry of health it is stated that PDAM water needs to be boiled first <b>/Ref-44/</b> it was confirmed that there is no existence of the Public distribution network of safe drinking water in host country Indonesia.</p> <p>Also it is observed that Local water company (PADM) are assessed for the performance every year by the relevant government authority and it is evident that the service levels are still not meeting minimum standard established by WHO safety plan methodology, especially in the area of bacteriological load and pipe pressure. Pipe pressure is an indicator that there is a contamination of groundwater while water is served to the end user <b>/Ref-54/</b></p> <p>This was further confirmed using the result of Water quality Test using mobile test kit during month Jan – Feb 2021 that the Water used by Public / house hold within the project boundary is not safe for drinking as it is. PP conducted microbial tests on water before the CWF and water after filtration. In conclusion it is confirmed that in host country public distribution network for safe drinking water is still not up to the mark and hence there is a need of alternative treatment facility to be adopted including boiling of water before consumption.</p> <p>PP is maintaining a brief SDW monitoring report to summarize the finding of desktop review and other published data available in Host country Indonesia to demonstrate actual situation of public distribution</p>	- Not Applicable as there is no measurement required to determine this parameter.



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			network of drinking water in the form of "SDW Monitoring Report" /Ref-36/ Found satisfactory in arriving at the conclusion in a transparent manner. <b>PP has applied Value as 0 towards this parameter and it is found satisfactory.</b>	
<b><u>Default Values fixed at Validation / prior to the 1<sup>st</sup> Verification</u></b>				
Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable	$f_{NRB,y}$	The NRB will be updated when new values are available.	PP has applied value of 82.1%, this value is a default value applied by PP for the entire crediting period. The Value is determined by PP using credible references and the calculation is presented transparently in the Spreadsheet /Ref-25/ and a detailed report i.e. "Appendix 4 in the Registered PDD" is made available for verification/Ref-1/. This was confirmed using UNFCCC Information note/Ref-26/. The Value was validated earlier and GS has approved this value earlier.	- Not Applicable as there is no measurement required to determine this parameter.
The average volume of drinking water per person per day	$R_{y,i}$	Default Value	PP has applied a default value of 3.5 liters/person/day as the average volume of drinking water per person per day - The Value is found obtained from "Minimum water quantity needed for domestic uses" by WHO Regional Office for South-East Asia. - This is found to be a reliable source for the information and this was also validated earlier and approved by the GS as default value hence accepted.	- Not Applicable as there is no measurement required to determine this parameter.
Emission factor for the substitution of non-renewable woody biomass or the emission factor of the fossil fuel substituted by similar consumers.	$EF_{projected\_fossilfuel}$	Default Value	PP has applied a default value of 81.6 tCO <sub>2</sub> /TJ for this monitoring period, and the value is representing Emission factor for the substitution of non-renewable woody biomass or the emission factor of the fossil fuel substituted by similar consumers.  The Value is a default value and it is obtained from Approve Small scale Methodology AMS-I.E and it is found in accordance with the applied methodology AMS-III.AV Version 4 for this project activity. – This value is found correct and conservative hence acceptable.	- Not Applicable as there is no measurement required to determine this parameter.
Specific Heat of Water	WH	Default Value	PP has applied a default value of 4.186 kJ/L for this monitoring period, and the value is obtained from AMS-III.AV Version 4 – This value is found correct and conservative hence acceptable.	- Not Applicable as there is no measurement required to determine this parameter.
Final Temperature	$T_f$	Default Value	PP has applied a default value of 100 °C for this monitoring period, and the value is obtained from AMS-III.AV Version 4 – This value is found correct and conservative hence acceptable.	- Not Applicable as there is no measurement required to determine this parameter.
Initial Temperature	$T_i$	Default Value	PP has applied a default value of 20 °C for this monitoring period, and the value is obtained from AMS-III.AV Version 4 – This value is found correct and conservative hence acceptable.	- Not Applicable as there is no measurement required to determine this parameter.
Latent Heat of Water Evaporation	WHE	Default Value	PP has applied a default value of 2,260 kJ/L for this monitoring period, and the value is obtained from AMS-III.AV Version 4 – This value is found correct and conservative hence acceptable.	- Not Applicable as there is no measurement required to determine this parameter.
Leakage relating to non-renewable woody biomass	L	Once before first verification	- PP has applied 0.95 as default value for this Monitoring period. This value is obtained from AMS I.E, Version 6 /Ref-52/ and it is found in line with the applied Small Scale Methodology AMS III.V, Version 4. - The Value is validated using Registered PDD /Ref-	- Not Applicable as there is no measurement required to determine this parameter.



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1/and the Value applied by the PP is found correct and conservative hence accepted.												
Fraction of the population serviced by the project activity for which the common practice of water purification is or would have been water boiling	$X_{Boil}$	Once before first verification.	<ul style="list-style-type: none"><li>- During this Monitoring period PP applied 88.26% as the value based on the result of project survey completed by PP in year 2018 /Ref-30/.</li><li>- During this verification it was noted that PP has changed the value from 70.1 % which was applied at the time of validation.</li><li>- In Section D.1 of the Monitoring Report it is observed that X Boil factor is described as the fixed ex Ante parameter and it is taken from the registered PDD however PP has changed it from 70.1% to 88.26% which is impacting the baseline significantly. There is no clarity how this increase is justified? During Last Verification it was mentioned that 88.26% is applied as Xboil value based on the result of the Project survey which is found in accordance with para 11 of applied Methodology, against the PDD value of 70.1% and PP had proved a justification during last verification. However, during this Verification, PP applied the value of Xboil factor of 88.26% which was the value from previous monitoring (MP1) without clear explanation i.e. why the current monitored Xboil factor was not applied – Please explain how this is accordance with Methodological requirement as well as how this is conservative.- CL 1 was reported – PD responded to the CL and confirmed that the Value applied during this monitoring period is 88.26%, which is correct and in accordance with Methodological requirement and hence PD has not applied value obtained during this project survey i.e. 90.71%, which is found conservative hence acceptable.</li></ul>	<ul style="list-style-type: none"><li>- Not Applicable as there is no measurement required to determine this parameter.</li></ul>								
Efficiency of water boiling system being replaced	$\eta_{wb,y}$	Once before first verification.	<ul style="list-style-type: none"><li>- The Value applied by the PP i.e. 0.4 is found correct and conservative hence accepted.</li><li>- Default efficiencies from AMS-III.AV Version 4 for each baseline technology Percentage of fuel types i.e. LPG, Wood, Charcoal, Kerosene and other.</li><li>- This is found validated earlier and hence acceptable.</li></ul>	<ul style="list-style-type: none"><li>- Not Applicable as there is no measurement required to determine this parameter.</li></ul>								
Percentage of household using biomass for boiling water	% HH	Default Value	<ul style="list-style-type: none"><li>- The Value applied by the PP is 38% of households are using biomass for boiling water in the baseline.</li><li>- This is the weighted average calculated from the default value from AMS III.AV and percentage of fuel types according to the table below:<table><tr><th>Fuel type</th><th>Percentage</th></tr><tr><td>Wood</td><td>37.6%</td></tr><tr><td>Charcoal</td><td>0.4%</td></tr><tr><td>38%</td><td></td></tr></table></li><li>- Application of percentage Fuel type used in above table is confirmed and found correctly applied.</li></ul>	Fuel type	Percentage	Wood	37.6%	Charcoal	0.4%	38%		<ul style="list-style-type: none"><li>- Not Applicable as there is no measurement required to determine this parameter.</li></ul>
Fuel type	Percentage											
Wood	37.6%											
Charcoal	0.4%											
38%												
Percentage of household using LPG for boiling water	%HH using LPG	Default value	<ul style="list-style-type: none"><li>- The Value applied by the PP is 51.8 % of households are using LPG for boiling water in the baseline.</li><li>- This is the weighted average calculated from the default value from AMS III.AV and percentage of fuel types according to the table below:<table><tr><th>Fuel type</th><th>Percentage</th></tr></table></li></ul>	Fuel type	Percentage	<ul style="list-style-type: none"><li>-</li></ul>						
Fuel type	Percentage											



LPG

51.8%

### Compliance of the monitoring with Sustainability Monitoring Plan:

During verification of the monitoring period 3 verification team verified compliance towards Sustainability Monitoring plan. PP has established Monitoring plan in the Passport and established suitable methods for monitoring the same and ensuring compliance towards project objective of sustainable development.

During Verification validation team reviewed approved Transition Annex /**Ref-53**/ where applicability of each SDG indicator and their calculation methods are described and same is implemented during this Monitoring period.

Verification Team Verified the compliance in detailed and verification conclusion is provided in the following table.

Parameter	Description of Parameter	Unit	Value Applied by PP for this Monitoring period	Verification Conclusion
SDG1	SDG1 – No Poverty (a) Biomass saved)	tonne	18,399.82	<p>This parameter was not monitored in the previous MP as the project was not transited at the time last verification to GS4GG requirements – During this monitoring period project completed the transition and ensure that relevant SDG indicators are identified and monitored. PP has demonstrated the method of monitoring against this SDG indicator and found satisfactory.</p> <p>The Data is found obtained from the project survey conducted by the PP in 2021.</p> <p>The data is found transparent and correct hence acceptable.</p>
	SDG1 – No Poverty (b) LPG saved)	tonne	9,453.99	<p>This parameter was not monitored in the previous MP as the project was not transited at the time last verification to GS4GG requirements – During this monitoring period project completed the transition and ensure that relevant SDG indicators are identified and monitored. PP has demonstrated the method of monitoring against this SDG indicator and found satisfactory.</p> <p>The Data is found obtained from the project survey conducted by the PP in 2021.</p> <p>The data is found transparent and correct hence acceptable.</p>
	SDG1 – No Poverty (c) % of HH noted on money save)	%	88.56%	<p>This parameter was not monitored in the previous MP as the project was not transited at the time last verification to GS4GG requirements – During this monitoring period project completed the transition and ensure that relevant SDG indicators are identified and monitored. PP has demonstrated the method of monitoring against this SDG indicator and found satisfactory.</p> <p>The Data is found obtained from the project survey conducted by the PP in 2021.</p>



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	SDG1 – No Poverty (d) of % of HH noted on time save)	%	98.92%	<p>The data is found transparent and correct hence acceptable.</p> <p>This parameter was not monitored in the previous MP as the project was not transited at the time last verification to GS4GG requirements – During this monitoring period project completed the transition and ensure that relevant SDG indicators are identified and monitored. PP has demonstrated the method of monitoring against this SDG indicator and found satisfactory.</p> <p>The Data is found obtained from the project survey conducted by the PP in 2021.</p> <p>The data is found transparent and correct hence acceptable.</p>
SDG3	SDG3 – Good Health & Well being (# People noted less smoke)	People	310,419.00	<p>This parameter was not monitored in the previous MP as the project was not transited at the time last verification to GS4GG requirements – During this monitoring period project completed the transition and ensure that relevant SDG indicators are identified and monitored. PP has demonstrated the method of monitoring against this SDG indicator and found satisfactory.</p> <p>The Data is found obtained from the project survey conducted by the PP in 2021.</p> <p>The data is found transparent and correct hence acceptable.</p>
SDG5	SDG5 (Gender Equality (# of women and girl boiling water)	People	353,703.00	<p>This parameter was not monitored in the previous MP as the project was not transited at the time last verification to GS4GG requirements – During this monitoring period project completed the transition and ensure that relevant SDG indicators are identified and monitored. PP has demonstrated the method of monitoring against this SDG indicator and found satisfactory.</p> <p>The Data is found obtained from the project survey conducted by the PP in 2021.</p> <p>The data is found transparent and correct hence acceptable.</p>
SDG6	SDG6 – Clean Water & Sanitation (# People access to safe drinking water)	People	369,653.00	<p>This parameter was not monitored in the previous MP as the project was not transited at the time last verification to GS4GG requirements – During this monitoring period project completed the transition and ensure that relevant SDG indicators are identified and monitored. PP has demonstrated the method of monitoring against this SDG indicator and found satisfactory.</p> <p>The Data is found obtained from the project survey conducted by the PP in 2021.</p> <p>The data is found transparent and correct hence acceptable.</p>
SDG8	SDG8 – Decent Work & Economic Growth (# of people)	Staff	19	<p>This parameter was not monitored in the previous MP as the project was not transited at the time last verification to GS4GG requirements – During this monitoring period project completed the</p>





						<p>transition and ensure that relevant SDG indicators are identified and monitored. PP has demonstrated the method of monitoring against this SDG indicator and found satisfactory.</p> <p>The Data is found obtained from Employee data base and found that there is reduction in staff level due to Covid 19 Pandemic. During last verification it was seen that total number employee with Nazava were 23 and now reduced to 19. The primary record for monitoring this parameter is Staff Report, PP demonstrated and justified the recruitment of new staff through this and hence found satisfactory.</p> <p>The data is found transparent and correct hence acceptable.</p>
SDG13	SDG13 – Climate Action (Emission Reduction)	tCO <sub>2</sub> e	44,942			<p>This parameter was not monitored in the previous MP as the project was not transited at the time last verification to GS4GG requirements – During this monitoring period project completed the transition and ensure that relevant SDG indicators are identified and monitored. PP has demonstrated the method of monitoring against this SDG indicator and found satisfactory.</p> <p>The Data is found obtained from the project survey conducted by the PP in 2021.</p> <p>The data is found transparent and correct hence acceptable.</p>
SDG15	SDG15 – Life On Land (Area of forest save (Ha))	Hectare	78.23			<p>This parameter was not monitored in the previous MP as the project was not transited at the time last verification to GS4GG requirements – During this monitoring period project completed the transition and ensure that relevant SDG indicators are identified and monitored. PP has demonstrated the method of monitoring against this SDG indicator and found satisfactory.</p> <p>The Data is found obtained from the project survey conducted by the PP in 2021.</p> <p>The data is found transparent and correct hence acceptable.</p>

The PP has collected Project relevant data during this monitoring report using established Project Survey Sample Plan /Ref-40/. The Sampling Plan is the comprehensive document to ensure consistency in the sampling for various surveys and analyzing the data obtained through such surveys. As per the guidelines provided by UNFCCC and Gold Standard PP has established various stratified Sampling and survey approach to ensure that representation of data is correct and this provides consistent and accurate results to arrive at the Emission Reduction Calculations. The Sample plan established is based on the CDM Methodology Guidelines, EB 86 Report Annex 4 “Guidelines for sampling and surveys for CDM Project Activities and Programme of Activities, Version 4 /Ref-32/.

The Sampling Plan considers following surveys as an important representation

1. Project Sample Group – Representative Sample of all participating households in the target population. Stratified Random Sampling method is selected.



## VERIFICATION REPORT

2. Project Survey and Usage Survey - Representative of purchasers across geography and age group of filters disseminated during the monitoring period. As well as representative of users across geography and age groups
3. Water Quality Test Survey – Representative of users across geography and age group (Subsample of monitoring survey)

While reviewing the results of Surveys performed by PP during November 2018 it is confirmed that the Sampling plan established is followed correctly and results obtained during surveys are representative of the particular sample group and fulfills the objective of survey.

Corresponding to the paragraph 360 - 364 of CDM Validation and Verification Standard for Project Activities, Version 02.0 as well as relevant sections of Gold Standard Validation & Verification Manual and Gold Standard for the Global Goals (GS4GG), Bureau Veritas (India) Private Limited can confirm that:

- The monitoring has been carried out in accordance with the monitoring plan contained in the approved/submitted revised PDD.
- All parameters required by the monitoring plan have been sufficiently monitored and correctly listed. The monitored data for required parameters have been verified by checking the whole information flow.

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

There is no monitoring parameter in the monitoring plan where PP has to use a calibrated instrument or equipment to ensure that the result of monitoring is consistent and reliable and hence this section is not applicable for this project.



Corresponding to the paragraph 365 - 371 of CDM Validation and Verification Standard for Project Activities, Version 02.0 as well as relevant sections of Gold Standard Validation & Verification Manual and Gold Standard for the Global Goals (GS4GG), Bureau Veritas (India) Private Limited can confirm that:

- The calibration is conducted at the frequency as specified by the methodology and the monitoring plan contained in the approved/submitted revised PDD.

### 3.6. Assessment of data and calculation of emission reductions

A complete set of data for the specified monitoring period is available.

The critical parameter used for the determination of the Emission Reductions is the total number of units of CWF's sold and other parameters which are derived from the Surveys done during the monitoring period. Important surveys which are critical to arrive at the emission reductions are as listed below.

1. Project Survey Report /**Ref-30**/
2. Usage Survey Report (Previously done in 2018) /**Ref-23**/
3. Water Quality Test Record /**Ref-28 & 29**/

The data obtained through above survey and monitoring methods is maintained in the form of relevant records. All the data are in compliance with that stated in the Monitoring Report version 2.0.



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As per the methodology AMS-III.AV, version 04.0, Small-scale Methodology, "Low greenhouse gas emitting safe drinking water production systems" and the registered PDD, the emission reductions for the Project are calculated as the baseline emissions minus the project emissions and leakage. Hence the emission reduction is determined by the following formula:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

BE<sub>y</sub> Emissions for baseline scenario during the year y in tCO<sub>2</sub>e

PE<sub>y</sub> Emissions for project scenario during the year y in tCO<sub>2</sub>e

LE<sub>p,y</sub> Leakage emissions for project scenario during year y in tCO<sub>2</sub>e

**[Baseline emissions]**

In order to arrive at the Baseline emissions PP has utilized Equation 1 and Equation 2 from Approved Small Scale Methodology AMS-III.AV, version 04.0. Baseline calculation needs to establish QPW i.e. Quantity of purified water in year y (litres) and for this Equation 2 is provided by the Approved Methodology. PP has calculated Baseline emissions using following formula,

$$BE_y = QPW_y \times SEC \times f_{NRB,y} \times EF_{projected\_fossilfuel} \times 10^{-9} \quad \text{Equation 1}$$

Where:

Parameter	Description
BE <sub>y</sub>	Baseline Emission in year y
QPW <sub>y</sub>	Quantity of purified water in year y (litres)
SEC	Specific energy consumption required to boil one litre of water
f <sub>NRB,y</sub>	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable
EF <sub>projected_fossilfuel</sub>	Emission factor for the substitution of non-renewable woody biomass or the emission factor of the fossil fuel substituted by similar consumers

For Calculation of QPW following formula is used

$$QPW_y = \sum_i T_{y,i} * N_{y,i} * R_{y,i} * 365 * Water\ Quality * Operational\ Units * X_{boil} \quad \text{Equation 2}$$

Where:

Parameter	Description
QPW <sub>y</sub>	Quantity of purified water in year y (litres)
T <sub>y,i</sub>	Total distributed water purification units
N <sub>y,i</sub>	The average population serviced by water purification system
Water Quality	PP has applied Water Quality Pass Rate in %
R <sub>y,i</sub>	The average volume of drinking water per person per day
Operational Units	Usage rate of the sold units based on its age group
X <sub>boil</sub>	Fraction of the population serviced by the project activity for which the common practice of water purification is or would have been water boiling

The input to calculate baseline emissions are taken from the Surveys done during monitoring period i.e. Water consumption Field Test, Project Survey and Usage survey. The Values monitored and recorded during these surveys are summarized and compared against previous monitoring period. The values monitored during such surveys are transparently shown in the Monitoring Report Section 3.1 and 3.3. During Remote Verification team verified these values in detail using various supporting records and



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documents. The Baseline emission calculation is provided in the Emission reduction calculation spreadsheet in a transparent manner and the calculation found correct. There is no material error noted in the accounting and application of various data against monitored parameters.

The baseline emissions of the Project are calculated as:

$$BE_y = 47,309 \text{ tCO}_2\text{e}$$

**[Project emissions]**

Based on the proposed methodology and the registered PDD. There is no project emission.

The Project Emissions calculated and presented in monitoring report is 00,000 tCO<sub>2</sub>e.

**[Leakage emissions]**

Leakage related to the non-renewable woody biomass saved by the project activity: The use/diversion of non-renewable woody biomass saved under the project activity by non-project households/users that previously used renewable energy sources. To account for leakages associated to non-renewable woody biomass a fixed adjustment factor of 0.95 was applied according to the AMS I.E version 6.0.

The conditions set in the registered PDD Section B.6.1 under Leakage were verified during this verification to confirm that there is no change. The conditions set at the time of registration are still found valid and hence it is acceptable that the Leakage calculation presented by PP during this monitoring period in monitoring report section E.3 is accurate and in line with the Registered PDD.

The Formula for calculation of Leakage emission is provided in the monitoring report is as given below.

$$\begin{aligned} \text{Leakage emissions} &= BE_y \cdot (1 - 0.95) \\ &= 47,309 \cdot (1 - 0.95) \\ &= \mathbf{2,367 \text{ tCO}_2\text{e}} \end{aligned}$$

**[Emission reductions]**

The emission reductions during the monitoring period from 19/12/2018 to 18/12/2020 are calculated as:

$$ER_y = BE_y - PE_y - LE_y$$

The result of ER calculation is presented in the below table

Vintage (including both start and end date)	Baseline GHG emissions or baseline net GHG removals BE <sub>y</sub> (t CO <sub>2</sub> e)	Project GHG emissions or actual net GHG removals PE <sub>y</sub> (t CO <sub>2</sub> e)	Leakage GHG emissions LE (t CO <sub>2</sub> e)	GHG emission reductions or net anthropogenic GHG removals ER <sub>y</sub> (t CO <sub>2</sub> e)
From 19/12/2018 to 31/12/2018	589	0	30	559
From 01/01/2019 to 31/12/2019	22,645	0	1133	21,512
From 01/01/2020 to 18/12/2020	24,075	0	1204	22,871
Total	47,309	0	2,367	44,942

The ER Calculated in the ER spread sheet i.e. 44,942 tCO<sub>2</sub>e is done using correct formulae and presented in a transparent manner and hence the Verification team accepted that ER Calculation method presented in ER spreadsheet as per the PDD.

**[Comparison of ERs]**

The annual estimated emission reductions are 22,735 tCO<sub>2</sub>e as per the registered PDD. The actual operation days of the Project in the monitoring period are 730 days. The corresponding estimate during 2<sup>nd</sup> monitoring period i.e. from 19/12/2018 to 18/12/2020 are 45,470 tCO<sub>2</sub>e [22,735+22,735] tCO<sub>2</sub>e. However the Actual emission reductions calculated by the PP for 2<sup>nd</sup> monitoring period are 44,942 tCO<sub>2</sub>e which is found to be 1.2% lower than that of estimated emissions as per the PDD.



This decrease in the Emission reduction is attributed to the low sales and decreasing usage rate over a period of 5 years. Average usage rate applied for this monitoring period is. 63.91% which is obtained through Project Survey performed by the PP during year 202. Based on this comparison it is concluded that the Emission Reductions calculated and presented by PP in the form of Monitoring report and emission reduction calculation spreadsheet found to be conservative and no over estimation noted.



Corresponding to the paragraph 372 - 374 of CDM Validation and Verification Standard for Project Activities, Version 02.0, as well as relevant sections of Gold Standard Validation & Verification Manual and Gold Standard for the Global Goals (GS4GG), Bureau Veritas (India) Private Limited can confirm that:

- Data used for the determination of the emission reductions are available and monitored in accordance with the monitoring plan contained in the approved/submitted revised PDD.
- Information and data provided in the monitoring report have been cross-checked with other sources such as plant logbooks, inventories, purchase records, laboratory analysis.
- Appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed.
- Assumptions, emission factors and default values that were applied in the calculations have been justified.

#### 4. VERIFICATION OPINION

Bureau Veritas (India) Private Limited has performed the 2nd periodic verification of Nazava Water Filter Project, GS Registration Reference Number GS4290, which is located in Jalan Kolonel Masturi 345. Kav 1, KM 1.4 RW 22, RT 01 Kel. Cipageran Kec. Cimahi Utara, 40511 Cimahi Indonesia, and applying the methodology AMS-III.AV, version 04.0, Small-scale Methodology, "Low greenhouse gas emitting safe drinking water production systems". The verification was performed based on the requirements set by the CDM / GS and relevant guidance provided by CMP and the CDM Executive Board & GS Secretariat.

The verification consisted of the following three phases: i) desk review of the project design, the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

The management of PT Holland For Water is responsible for the preparation of the GHG emissions data and the reported GHG emission reductions of the project on the basis set out within the monitoring plan contained in the approved/submitted revised PDD. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project, is the responsibility of the management of the project.

Bureau Veritas (India) Private Limited has verified the project Monitoring Report version 4.0 dated 12/08/2021 for the reporting period as indicated below. Bureau Veritas (India) Private Limited confirms that the project is implemented as described in the validated and approved/submitted revised project design documents. Installed equipment's being essential for generating emission reductions run reliably and are calibrated appropriately. The monitoring system is in place and the Project is generating GHG emission reductions as a GS project.

Bureau Veritas (India) Private Limited can confirm that the GHG emission reductions are calculated without material misstatements. Our opinion relates to the projects' GHG emissions and resulting GHG emission reductions reported and related to the validated and registered project baseline, approved/submitted revised monitoring plan and its associated documents. Based on the evidence and information that are considered necessary to guarantee that GHG emission reductions are appropriately calculated, Bureau Veritas (India) Private Limited confirms the following statement:

Reporting period:	19/12/2018 to 18/12/2020
Baseline emissions:	47,309 t CO <sub>2</sub> equivalents
Project emissions:	00,000 t CO <sub>2</sub> equivalents
Leakage emissions:	2,367 t CO <sub>2</sub> equivalents
Emission Reductions:	44,942 t CO <sub>2</sub> equivalents



Mr. Hong Linh Nguyen  
Internal Technical Reviewer  
Date : 14/08/2021



Mr. Ram M. Desai  
Team Leader  
Date: 14/08/2021



## 5. REFERENCES

### Documents reviewed:

- /1/ Registered PDD version 3.0 dated 13/04/2016, GS ref no.GS4290
- /2/ Gold Standard Validation & Verification Manual and Gold Standard for the Global Goals (GS4GG)
- /3/ Previous Validation Report
- /4/ GS Transition Annex – Nazava Water Filter.
- /5/ Monitoring Report version 1.0, dated 14/04/2021
- /6/ Monitoring Report version 4.0, dated 12/08/2021
- /7/ ER Calculation Spreadsheet version 3.0, dated 12/08/2021
- /8/ AMS-III.AV, version 04.0, Small-scale Methodology, “Low greenhouse gas emitting safe drinking water production systems”
- /9/ Validation and Verification Standard Version 09.0
- /10/ Gold Standard website: GS registration number: GS4290  
[https://mer.markit.com/br-reg/public/project.jsp?project\\_id=103000000009787](https://mer.markit.com/br-reg/public/project.jsp?project_id=103000000009787)
- /11/ PT Holland for Water MP2 (2020)\_Sales Data base
- /12/ PT Holland for Water MP2 (2020) Direct Sales Invoice
- /13/ PT Holland for Water MP2(2020) NGO Sales Invoice
- /14/ PT Holland for Water MP1 (2020) NGO Sales Receipt
- /15/ NAZAVA\_MP2(2020)\_Project\_Survey\_Questionnaire(EN\_Final)
- /16/ PT Holland for Water MP2 (2020) Retail Sales Invoice
- /17/ PT Holland for Water MP2 (2020) Retail Sales Receipt
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- /20/ “Domestic Water Quantity, Service Level and Health”, World Health Organization 2003; URL:  
[http://www.who.int/water\\_sanitation\\_health/diseases/WSH03.02.pdf](http://www.who.int/water_sanitation_health/diseases/WSH03.02.pdf)
- /21/ NAZAVAP Customer Database All MP2 Sales
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- /23/ NAZAVA\_MP1(2018)\_UsageSurvey\_Report\_20180905
- /24/ GS4290\_6W\_registration\_review
- /25/ fNRB Value Calculation Sheet: NAZAVA19\_fNRB\_updated 20150808
- /26/ UNFCCC Information note: Default values of fraction of non-renewable biomass for least developed countries and small island developing States v01.0; EB 67 dated 11 May 2012
- /27/ NAZAVA\_MP1(2020)\_WaterQualitySurvey\_Report\_20181102
- /28/ NAZAVA\_MP2 (2020)\_WQT.xls
- /29/ Nazava\_MP1(2018)WaterQualityTest\_20181212
- /30/ PT Holland for Water MP2 (2020) PROJECT SURVEY REPORT
- /31/ PT Holland for Water MP2 (2020) Employment Record
- /32/ CDM-EB- 77 - Meeting report: CDM Executive Board seventy-seventh meeting.  
EB 86, Annex 4, Version 4.0 “Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities”
- /33/ Training Record for PT Holland for Water Staff for carrying out and reporting Project Survey, Usage Survey and Water Consumption Field Test.
- /34/ Sample size Calculation Spreadsheet for MP2.
- /35/ Nazava\_MP2(2021)\_Project SurveyData
- /36/ Nazava\_MP2(2021)\_SDW\_MonitoringReport
- /37/ Guidance on Application of ISO /IEC Guide 62:1996 for determining the sample size for data to be sampled for the 2nd monitoring period.
- /38/ NAZAVA\_MP2(2020)\_Emp &Inc Record - Employment Data Base and Payroll data base.
- /39/ Gold Standard Toolkit – Ver 2.1 and 2.2





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- /40/ PTH\_MP 2 Nazava\_SamplePlan
- /41/ Baseline Water Boiling Test Report
- /42/ GS4290\_6W\_registration\_review\_Final
- /43/ Independent assessments on effectiveness of Nazava Filter in removal of bacteria by Thunderbird School of Management: [http://knowledgenetwork.thunderbird.edu/tem-indonesia-kopernik-7\\_11/2011/08/01/how-can-a-water-filter-make-a-difference/](http://knowledgenetwork.thunderbird.edu/tem-indonesia-kopernik-7_11/2011/08/01/how-can-a-water-filter-make-a-difference/)
- /44/ Information on Safe water supply situation in Indonesia by the MOH agency. (<https://www.alodokter.com/belum-cukup-hanya-dengan-merebus-air#:~:text=melebihi%20ambang%20batas,-.Air%20dari%20perusahaan%20penyedia%20air%20minum,tanah%20umumnya%20direbus%20terlebih%20dulu.&text=Namun%20merebus%20air%20PAM%20dan,serta%20merta%20aman%20untuk%20dikonsumsi>)
- /45/ MPI\_US&PS\_Deviation – Email Communication with GS TAC
- /46/ Summary of responses for GS4290\_MP1 deviation request\_12042018
- /47/ [Economics of CWF v/s Boiling of water for drinking purpose- .](http://kopernik.info/sites/default/files/instructions/Nazava%20more%20info_0_0.pdf)  
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- /48/ [Nazava Filter Specifications - http://www.nazava.com/english/nazava\\_filter\\_solution.php](http://www.nazava.com/english/nazava_filter_solution.php)
- /49/ [Summary of testing reports from Basic Water Needs ceramic water filters -](http://www.basicwaterneeds.com/wpcontent/uploads/qaqc/Netherlands/Netherlands/Netherlands%20Waterlab%20Noord%20Analysis.pdf)  
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- /50/ Mobile testing kit: Compact dry Compact Dry E. coli/Coliform Count (EC) {<https://www.ncbi.nlm.nih.gov/pubmed/16512235>.}
- /51/ Demographic Survey Results Published by IPB(Agricultural Institute in Bogor)
- /52/ Approved Small Scale Methodology AMS.I.E, Version 6 “Switch from non-renewable biomass for thermal applications by the user”
- /53/ Gold Standard for the Global Goals Transition Annex
- /54/ Performance evaluation reports of PADM's - file names: 336736991-Kinerja-PDAM-2015; 336738216-Kinerja-PDAM-2015-Wilayah-3, 367640923-KINERJA-PDAM-2017-pdf,Kinerja\_PDAM-2018.pdf, Kinerja\_PDAM\_2019.pdf
- /55/ Monitoring Report 3.0, dated 15/07/2021
- /56/ ER Calculation Spreadsheet version 2.0, dated 15/07/2021

**Persons interviewed:****PT Holland For Water**

Mr. Guido van Hofwegen - Co Founder & Director of PT Holland for Water	
Mr. Lieselotte Jantine Heederik	Marketing Director
Mr. Syahri Abdillah	Country Manager
Ms. Gita Nurul Fajriani	Admin Office Assistant
Mr. Suherman	Logistic & Production
Mr. Asep Supendi	Logistic & Production

**Nexus, Carbon for Development**

Mr. Chanvibol Meng	Carbon Project Manager
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Sr. No.	Interviewee Name	Address (village, District, Regency)	Province	Telephone number (PN)
1	Atik	Babakan Sadeng village, Leuwisadeng district, Bogor regency	West Java	81519843421
2	Siti Mulyanah	Cipendawa village, Pacet district, Cianjur	West Java	85624656984
3	Nani Suryani	Ciherang village, Pacet district, Cianjur	West Java	89684819656
4	Bu Sunarsih	Gedong Wetan, Turen, Malang Regency	East Java	82142157577
5	Kristin	Horinara village, Kelubagolit, East Flores	East Nusa Tenggara	82266486703
6	Masitah Masud	Horinara village, Kelubagolit, East Flores	East Nusa Tenggara	82146153525
7	I Wayan Budiarta	Tangkup village, Sidemen, Karangasem Regency	Bali	81337848900
8	Ulan	Sadeng Kolot village, Leuwisadeng, Bogor Regency	West Java	85710573100
9	Umi Zahro	Sanankerto Village, Turen, Malang Regency	East Java	82336156607
10	Daniel Ruben	Teriwu Village, Sabu Barat, Sabu Raijua	East Nusa Tenggara	81246523599
11	Tutik	Kendalpayak Village, Pakisaji, Malang Regency	West Java	81358612630
12	Rustanti	Gunung Bunder Village, Pamijahan, Bogor Regency	West Java	85892905260
13	Cucun Sumarni	Barusari Village, Pasirwangi, Bogor Regency	West Java	82117928032
14	Ida Widiawati	Margajaya Village, Ngamprah, Bogor Regency	West Java	82216347602
15	Reniawati	Karacak Village, Leuwiliang, Bogor Regency	West Java	82116201306
16	Yenih	Gunung Bunder Village, Pamijahan, Bogor Regency	West Java	85780813465
17	Pipih Napisah	Mulyasari Village, Tamansari, Tasikmalaya Regency	West Java	87861511154
18	Triana	Petulu Village, Ubud, Gianyar Regency	Bali	81805320569
19	Philda Thea	Batu Bulan Village, Ubud, Gianyar Regency	Bali	81214573423
20	A.A. Putra	Padang Tegal Tengah, Ubud, Gianyar Regency	Bali	85857444900
21	Hermawan Tanjung	Ubud Village, Ubud District, Gianyar Regency	Bali	85857444900
22	Komang Ayu Ade sugihari	Tangkup village, Sidemen, Karangasem Regency	Bali	87863070090
23	Wika Setia Budi (from Monkey Forest Sanctuary)	Padang Tegal Village, Ubud, Gianyar	Bali	81338301838
24	Iyah Supardi	Karacak Village, Leuwiliang, Bogor Regency	West Java	83806189297
25	Erti Sunarti	Karacak Village, Leuwiliang, Bogor Regency	West Java	87834448975



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Sr. No.	Interviewee Name	Address (village, District, Regency)	Province	Telephone number (PN)
26	Endah Kaban	Sukawati Village, Sukawati District, Gianyar	Bali	82145387606
27	Daryati	Setiawargi Village, Tamansari, Tasikmalaya	West Java	82321185327
28	Asmawati Muhidin	Horinara village, Kelubagolit, East Flores	NTT	85342410475
29	Suryani Muhidin	Horinara village, Kelubagolit, East Flores	NTT	81266476615
30	Orias Djo	Teriwu Village, Sabu Barat, Sabu Raijua	NTT	82144644544
31	Tita Rosita	Sirnajaya Village, Pasirwangi, Bogor Regency	west Java	89503912868
32	Ari Sahri	Gunung Bunder 2 Village, Pamijahan, Bogor Regency	west Java	85716132118
33	Made Garsi	Sayan Village, Ubud, Gianyar Regency	Bali	81337612666
34	Euis Supartini	Gunung Bunder 2 Village, Pamijahan, Bogor Regency	West Java	85773478243
35	Nur	Padaasih Village, Pasirwangi, Bogor Regency	West Java	82118142010
36	Kentin	Sadeng Kolot village, Leuwisadeng, Bogor Regency	West Java	81510859538
37	Haleluya Giri Rahmasih	Bentuyung Village, Ubud, Gianyar	Bali	8164275398
38	Leli	Sukanagalih Village, Pacet, Cianjur Regency	West Java	81904996348
39	Asih	Sadeng Kolot village, Leuwisadeng, Bogor Regency	West Java	85779480400
40	Rinawati	Cibodas Village, Pacet, Cianjur Regency	West Java	85722749880
41	Alit Juniasa (Shoulshine Villas)	Mas Village, Ubud, Gianyar Regency	Bali	87862791450
42	Nengsih	Cijujung Village, Cibungbulang, Bogor Regency	West Java	85718759860
43	Yati Haryati	Ciherang village, Pacet district, Cianjur	West Java	85862336931
44	Emis	Sadeng Kolot village, Leuwisadeng, Bogor Regency	West Java	85772548237
45	Indah Andriani	Peliatan Village, Ubud, Gianyar Regency	Bali	87884566306
46	Fatona	Kendalpayak Village, Pakisaji, Malang Regency	East Java	83142540599
47	Albert Rohi	Teriwu Village, Sabu Barat, Sabu Raijua	NTT	81246187049
48	Yosefina Nahak	Besikama Village, Malaka Tengah, Malaka Regency	NTT	81238000934
49	Rini	Pisang Candi Village, Sukun, Malang Regency	East Java	82131715734
50	Nurul Hayati	Kendalpayak Village, Pakisaji, Malang Regency	East Java	81233932395

## 6. CURRICULA VITAE OF THE VVB'S VERIFICATION TEAM MEMBERS

Mr. Ram M. Desai	Bureau Veritas Certification, Brunei	<p><b>Team Leader, Climate Change Lead Verifier,</b>  <i>Environmental Engineer with over all 13 years of experience in various industries related to Water &amp; Waste water engineering design, installation &amp; Commissioning, Integrated Facility Management for Environmental Services operations in various industries i.e Automotive, Pharmaceutical , IT &amp; Electronics (With Clean Room).</i></p> <p><i>Management System Implementation and Maintenance, Green Building concept implementation, Lean Management Implementation, Water &amp; Waste Water engineering Design &amp; project Management, Project Environmental Compliance etc for a construction company.</i></p> <p><i>He is the lead auditor for Environment management system, Quality management system and Occupational health and safety management system and his auditing experience spans for 3 year with BVCI &amp; BVCS. He has undergone intensive training on Clean Development Mechanism and was trained as Lead Verifier for CDM in the year 2005 and working as a lead Verifier for validation and verification of CDM/VCS projects</i></p>
Mr. Murugappan Palanisamy	Bureau Veritas Certification, Singapore	<p><b>Technical Specialist (ITR)</b>  <i>He is Bachelor of Engineering in Electrical and Electronics. He is working with Bureau Veritas Marine as Electrical Engineer. He is working in Electrical engineering field since last 09 years and is having reach hands on experience in designing, installation, commissioning of electrical systems for various applications in marine and oil and gas sector.</i></p> <p><i>He is also having experience in carrying out inspections of various marine equipment including electrical panels, rotating equipments, HVAC equipment's and operations of such equipment's.</i></p>
Mr. Hong Linh Nguyen	Bureau Veritas Vietnam	<p><b>Technical Reviewer, Climate change Lead Verifier:</b>  <i>He has graduated in Environmental Studies and had a Master Degree of Quality Management. He has undergone intensive training on Clean Development Mechanism. His working experience includes more than 7 years of auditing works in the field of Quality Management System and Environmental Management System. He has been involved in the validation / verification / technical review work of more than 30 GHG projects</i></p>

**Table 1 Verification requirements based on the Gold Standard Validation and Verification Manual**

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
<b>Project implementation in accordance with the registered project document</b>			
Are all physical features of the proposed GS project proposed in the registered PD in place?	Yes, The Compliance to the registered PDD verified during this verification period exclusively and found satisfactory.	OK	OK
Have the project participants operated the proposed GS project as per the registered PD?	Yes – all requirements of PDD has been implemented and found satisfactorily meeting during 2nd monitoring period.	OK	OK
Was an on-site visit conducted?	No – Justification is provided in the validation report.	OK	OK
If not, justify the rationale of the decision.	Not applicable	NA	NA
VVBs the implementation or operation of GS project conform with the description contained in the registered PD?	Yes.	OK	OK
If not, which are the potential impacts due to these changes?	Since there is no change to the PDD during this monitoring period, there is no potential impact noted on the Project Design, Project Additionality as well as Emission reduction calculations.	OK	OK
<b>Compliance of the monitoring plan with the monitoring methodology</b>			
Is the validated monitoring plan in accordance with the approved methodology applied by the proposed GS project?	Yes- there are few deviations found reported during this monitoring period. PP has requested the deviation on the Water Quality monitoring method, earlier at the time of registration monitoring plan mentions that the water quality shall be monitored using 3 <sup>rd</sup> party laboratory for detecting the microbial presence in the treated water, however during this monitoring period PP proposed to change this method to the use of mobile test kit, which is found accepted by the GS and PP has provided relevant evidences to support the approval on the deviation request.	OK	OK
Are there any monitoring aspects of the project that are not specified in the methodology (e.g. additional monitoring parameters, monitoring frequency and calibration frequency)?	No – The information provided in PDD is exactly suiting the requirement of project.	OK	OK
<b>Compliance of monitoring with the monitoring plan</b>			
Have the monitoring plan and the applied methodology been properly implemented and followed by the project participants?	Yes – there is no deviation observed during this varification	OK	OK
Have all parameters stated in the monitoring plan, the applied methodology been sufficiently monitored and updated as applicable, including:	Yes.	OK	OK
Project emission parameters?	Yes – Parameters which determines project emissions are monitored and presented transparently in the emission reduction spread sheet – calculation	OK	OK



## VERIFICATION REPORT

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
Baseline emission parameters?	is found correct and there is not material error noted during data verification. Yes – Parameters which determines Baseline emissions are monitored and presented transparently in the emission reduction spread sheet – calculation is found correct and there is not material error noted during data verification.	OK	OK
Leakage parameters?	Yes, Leakage is considered and PD applied value of 95% as leakage factor and this is found in accordance with the methodological requirement- hence acceptable.	OK	OK
Management and operational system: the responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan?	Yes – Management and operational system is followed meticulously and found comprehensive – personnel and aware of their roles and responsibilities and are contributing effectively in ensuring accuracy and authenticity of data collection and monitoring – PP has provided series of training to all relevant staff.	OK	OK
Are equipment controlled and calibrated in accordance with the monitoring plan?	Yes – Calibration of measuring equipment is seen – which is an internal cross check mechanism and PP has developed a suitable protocol for calibration of equipments.	OK	OK
Are monitoring results consistently recorded as per approved frequency?	Yes – The Data and parameters monitored and measure are transparently recorded either in the survey sheets, Daily records and other records. – Found satisfactory – The Traceability of such raw data captured during day to day operations and Survey is found good to the ER data presented during Remote verification	OK	OK
Have quality assurance and quality control procedures been applied in accordance with the monitoring plan?	Yes – comprehensive set up of the quality control and assurance is in place and this was demonstrated by the PP transparently during remote verification	OK	OK
<b>Assessment of data and calculation of greenhouse gas emission reductions</b>			
Is a complete set of data for the specified monitoring period available? (If no, i.e., only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, the validator shall make the most conservative assumption theoretically possible in finalizing the verification report).	Yes – Complete set of data is available for the verification of 2nd monitoring period. Monitoring Report section provides monitoring information on Quantitative – Employment and income Generation. For this monitoring period PP has given total Employee count, however, year wise data is not provided for the current monitoring period – Please provide data to establish compliance towards this monitoring parameter for the current monitoring period.	OK	OK
Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?	Yes – Various back up records were seen during this verification site visit i.e. Factory log books for production and quality control – Survey records, Sales Records, Invoices and interview with house hold using CWF's in the remote villages (selected villages in three different provinces)	OK	OK
Have calculations of baseline emissions, proposed project emissions	Yes – There is no deviation noted during this Verification, 1CL reported	OK	OK

## VERIFICATION REPORT

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
and leakage, as appropriate, been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document?	during this verification.		
Have any assumptions used in emission calculations been justified?	Yes – PP has used several inputs from Surveys, default values and these are justified adequately. Also this is found in accordance with the registered PD.	OK	OK
Have appropriate emission factors, IPCC default values and other reference values been correctly applied?	Yes – All emission factors used by PP are found valid and are validated in the Validation report Section 3.4	OK	OK



## VERIFICATION REPORT

GOLD STANDARD PROJECT VERIFICATION Protocol  
Table 2 – CAR & CL List

Draft report clarifications and corrective action requests by validation team	Summary of project owner response	Validation team conclusion
<b><u>CLARIFICATIONS (CL)</u></b>		

## VERIFICATION REPORT

<p>CL 1</p> <p>In Section D.1 of the Monitoring Report it is observed that X Boil factor is described as the fixed ex Ante parameter and it is taken from the registered PDD however PP has changed it from 70.1% to 88.26% which is impacting the baseline significantly. There is no clarity how this increase is justified? During Last Verification it was mentioned that 88.26% is applied as Xboil value based on the result of the Project survey which is found in accordance with para 11 of applied Methodology, against the PDD value of 70.1% and PP had proved a justification during last verification. However during this Verification it is observed that the Xboil value is monitored during project survey is 64.37% but instead of applying this monitored value PP applied 88.26% for this monitoring period – Please explain how this is accordance with Methodological requirement as well as how this is conservative. - CL</p>	<p>PP has added the justification on the applied Xboil factor value of 88.26% in section B.2.2 <i>'The value of Xboil factor is changed from 70.1% of the approved PDD to 88.26% which was proposed by PP during the 1st verification period and was accepted. This value is fixed for the whole crediting period in accordance with the applied methodology (AMS III.AV, version 4, paragraph 19)'.</i></p> <p>Furthermore, PP has also added the justification in section D1 <i>" According to the applied methodology, the project falls to Case 2. Therefore, the following adjustment is required: For Case 2, total project population needs to be adjusted for the fraction of the population serviced by the project equipment at households/buildings for which it can be demonstrated through documentation or survey that the practice of water purification would have been water boiling" - AMS III.AV, version 4, paragraph 11. Furthermore, in paragraph 19 for case 2, the Xboil factor should be defined by an ex-ante survey.</i></p> <p><i>During the validation stage, due to no available survey with the project filter users (or «the population serviced by the project equipment»), PP applied the Xboil factor of 70.1% based on the Indonesian Demographic and health survey 2012 report for ex-ante ER calculation. This survey was a general survey and was not targeted the specific project user group of having CWF.</i></p> <p><i>Therefore, during the first verification period, the PP conducted the monitoring survey in accordance with the methodology requirement including target user group, number of sampling and sampling methodology. Thus, the result of Xboil factor (88.26%) from this survey is well reflecting the baseline situation of the project targeted households. This value is then applied as a fixed value of Xboil factor for the whole crediting period as stated in section B.2.2 corrections.</i></p> <p><i>Besides in this monitoring period PP has monitored Xboil factor and its value is slightly higher than the previous one being 90.71%* but PP opts to use 88.26% to comply with the registered methodology and to be conservative.</i></p>	<p>The clarification provided by PD is verified and found satisfactory and it is confirmed that the value applied by PD towards Xboil factor is found conservated and transperent based on the monitoring survey completed in year 2018. The value applied is 88.26% against the Xboil factor value obtained during this monitoring period i.e. 90.71%. The value appied is also found to be in accordance with the paragraph 11 of approved methdology AMS III.AV.</p> <p>Based on the verification of the response it is concluded that the CL is closed.</p>
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\* Nazava\_MP2(2020)\_SurveyData\_Analysis\_V2.0\_final, tab Project\_Analysis Cell C8.





## VERIFICATION REPORT

<p>CL 2 Section D.1 Data Parameters Fixed Ex ante or at renewal of crediting period provides information on the parameter “ Case 1 or Case 2” – and it is observed that URL provided in this section is not working please provide correct link for the URL to access the same effectively</p>	<p>The URL link is now updated in order to provide accessibility to the relevant information which supports the monitoring parameter.</p>	<p>Monitoring report is now provided with the correct link and it is found accessible, hence the CL is closed.</p>
<p>CL 3 Sales database provided by the PD is verified and found satisfactory and found generally demonstrating accuracy and traceability to the identified samples, however please explain how the Quality control and quality assurance activities are performed to ensure that there is no duplication of data.</p>	<p>Nazava field officers check the daily sales and provides relevant data base to the office on daily basis and, office staff does the check on the sales inputs and add the same to the sales data base in the Excel sheet which is checked using function Duplicate in excel spreadsheet.</p> <p>Further NEXUS also verifies the data base using Duplicate function as well as by sampling sales records including invoices and payment records. For both sales i.e. individual sales and bulk sales.</p> <p>This QA/ QC practice is in place and this avoids the erroneous inclusion of any CWF including duplicates sales to calculate the emission reduction.</p>	<p>The QA/QC arrangement described in the response towards CL is found satisfactory and hence concluded that the CL is closed</p>



## VERIFICATION REPORT

<p>CL 4 How PD confirms that house purchased more than one CWF is accounted in the transparent manner in order to avoid double accounting as PD accounts emission reduction based on the CWF sold.</p>	<p>PD included question in the monitoring survey 'how many CWF do you have, now?, if more than one is used, please described each filter used for? Based on the survey data analysis, among 743 households, 12 households have more than one CWF. However, only 3 households that use two CWFs in their households, the others use only one in their house and other CWFs are used in their shop, co-working space, cafe, school or boken as seen in project survey data analysis (tab Project_Analysis, row 140-146). Thus, the rate of this double counting is very minimal being 0.4% (3/743) which is considered as non materialized impact to the overall emission reduction.</p>	<p>Based on the response PP has provided to the clarification and verification of the ER spreadsheet (Tab Project_Analysis) it is confirmed that feed back received during project survey against question No.4 found to be analysed and the rate of double accounting due to multiple fitlers in use in one HH is cacluated as 0.4% which is neglegible with no material impact to the emission reduction.</p> <p>The appraoch adopted by the PP is found to be correct and transparent and hence the clarification provided by PP is accepted and the CL is closed.</p>
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