Gold Standard for the Global Goals

TEMPLATE

KEY PROJECT INFORMATION & VPA DESIGN DOCUMENT (PDD)

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VERSION **v. 1.1**

RELATED SUPPORT

– **TEMPLATE GUIDE Key Project Information & VPA Design Document v.1.1**

This document contains the following Sections

Key Project Information

KEY PROJECT INFORMATION

GS ID of Project	GS11135
Title of Project	GS10959 VPA04 Safe Water Project in Rwanda IV
Time of First Submission Date	23/03/2021
Date of Design Certification	To be decided
Version number of the VPA-DD	02
Completion date of version	30/04/2021
Coordinating/managing entity	Guangzhou Iceberg Environmental Consulting Services Co., Ltd.
VPA Implementer (s)	Guangzhou Iceberg Environmental Consulting Services Co., Ltd.
Project Participants and any communities involved	Guangzhou Iceberg Environmental Consulting Services Co., Ltd.
Host Country (ies)	Rwanda
GS ID and Title of applicable Design Certified VPA	N/A
GS ID and Title of applicable Performance Certified VPA	N/A
Activity Requirements applied	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Scale of the project activity	☐ Micro scale ☒ Small Scale ☐ Large Scale
Other Requirements applied	N/A
Methodology (ies) applied and version number	Technologies and Practices to Displace Decentralized Thermal Energy Consumption (Version 3.1)
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label

	☐ N/A
Project Cycle:	☒ Regular ☐ Retroactive

Table 1 – Estimated Sustainable Development Contributions

Sustainable Development Goals Targeted	SDG Impact (defined in 错误!未找到引用源。)	Estimated Annual Average	Units or Products
SDG 13 Climate Action (mandatory)	Reduce emission from water boiling by non renewable biomass	57,522	VERs
SDG 3 – Good Health and Well-Being	Reduce the incidence of waterborne illness within the project area	30%	Percentage
SDG 5 – Gender Equality	Reduce the time spent to fetch and purify water by women and girls	50%	Percentage
SDG 6 – Clean Water and Sanitation	Provide safe water to local residents	14,250	Number of persons

SECTION A. DESCRIPTION OF PROJECT

A.1. Purpose and general description of project

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Many people in rural area of Rwanda rely on boreholes to provide clean water. Unfortunately, a lot of boreholes have fallen into disrepair because maintenance has been poorly managed due to lack of capacity, organization or fund. The VPA, which is the VPA 04 for PoA GS 10959 "Safe Water Programme in Africa and Asia " (hereinafter referred to as "the PoA"), consists of the maintenance of 15-20 boreholes in Kamonyi District, Southern Province of Rwanda. The CME will cooperate with local NGO, Association Rwandaise pour le Développement Endogène (Hereinafter referred to as "ARDE"), to implement the VPA for providing safe water to local communities and ensure the water quality to meet the related requirements of Rwanda and Gold Standard for the Global Goals. Chemical disinfection will be applied in case that water quality cannot meet the requirements after borehole maintenance. The project boundary is the boundary of communities that use the boreholes maintained by the project activity.

Before the implementation of the VPA, local communities in the project location use fossil fuel and/or non-renewable biomass (Hereinafter referred to as NRB) to boil water for purification. Therefore, the baseline scenario is that fossil fuel and/or NRB is used to boil water as means of water purification in the absence of the project activity. As a result, water purification through boiling with wood makes local people vulnerable to the negative effects of poor indoor air quality. In Rwanda indoor air pollution contributed to 12,500 annual deaths and another 16,700 were caused by diarrheal diseases each year[1]. Boiling water with wood also results in significant greenhouse gas emissions through the use of non-renewable biomass, causing deforestation and threatening biodiversity. In addition, usually in local communities it is women and girls that take the unpaid work of fetching and purifying water, which minimizes their time for rest and study, and even their opportunities to have paid jobs.

[1] WHO: Country Profile of Environmental Burden of Disease 2009: Rwanda

The VPA provides a solution to mitigate the above problems. The fund from sale of carbon credits generated by the VPA will make it sustainable and extendable.

A.1.1. Eligibility of the project under approved PoA

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No.	Eligibility Criterion	Description/ Required condition	Means of Verification/Supporting evidence for inclusion
1	Geographical boundaries of VPAs consistent with the geographical boundary of the PoA	The geographical boundary of the VPA should be consistent with the geographical boundary described in the PoA. Each VPA should be located in one host country.	Locations of boreholes in the database (including geographical coordinates) have been checked to confirm that all the boreholes are located in Kamonyi District.
2	Conditions to avoid double accounting of GHG emission reductions or net anthropogenic GHG removals	1. The VPA should exclusively belong to the PoA. It should be neither a single GS project activity nor a VPA under another PoA. 2. A unique identification system for boreholes should be applied and identification numbers should be recorded in related VPA databases. 3. The names and addresses of end users should be recorded in the related VPA databases 4. The clause in which the end users agree to give	1. GS registry has been checked to confirm that the VPA exclusively belongs to the PoA 2. VPA databases, maintenance records, donation and carbon transfer agreements have been checked and field investigation has been conducted to confirm that there is no double accounting for GHG emission reductions. 3. Declaration of no double counting check issued by CME has been provided to the DOE

		the ownership of the emission reductions to the CME should be included in the agreement accepted by both sides.	
3	Conditions to confirm that VPAs are neither registered as project activities with other offset schemes, included in other registered PoAs, nor the project activities that have been deregistered	It should be confirmed that the VPA is neither registered as project activity with other offset scheme, included in another registered PoA, nor the project activity that has been deregistered.	1. GS, CDM and VCS registries have been checked to confirm that the VPA is neither registered as project activity with other offset scheme, included in another registered PoA, nor the project activity that has been deregistered. 2. Declaration of independence from existing GS project/PoA has been provided by the CME
4	Specification of the technology/measure	The applied water purification technology should be borehole. Chemical disinfection will be used if water quality cannot meet the requirements after borehole maintenance	Specification of hand pump used in the VPA has been provided. Specifications of water disinfectants which may be used in the future have also been provided. Field investigation has been conducted to confirm related information.
5	Conditions to check the start dates through documentary evidence	1. The start date of VPA should be defined according to Principles and Requirements (Version	The date of the implementation of the first unit under the VPA will be checked to confirm the

		1.2) 2. The start date of the VPA should not be before that of the PoA (15/02/2021).	start date.
6	Conditions to ensure compliance with the applicability of the applied methodologies, the applied standardized baselines and the other applied methodological regulatory documents	Please Refer to Section B.2.	Please Refer to Section B.2.
7	Conditions to ensure that VPAs meet the requirements for demonstration of additionality	According to Paragraph 4.1.9(b) of Community Service Activity Requirements (Version 1.2), community service projects located in LDS, SIDS and LLDC are considered as additional and therefore are not required to prove financial additionality at the time of design certification.	The VPA is additional because it is a community service project and located in a least developed country-Rwanda[2]
8	Conditions to ensure no diversion of official development of assistance	The implementation of the VPA should not result in the diversion of official development assistance from Annex I Parities.	Declaration about no diversion of official development assistance from Annex I Parities to the PoA by the CME has

[2] https://unctad.org/topic/vulnerable-economies/least-developed-countries/list

			been provided.
9	Target group, and where applicable, distribution mechanism	The target group should be communities using boreholes maintained by the project activities	Maintenance records and agreements have been provided to prove that the target group is communities using boreholes maintained by the project activities
10	Conditions related to sampling requirements for the PoA	The sampling plan of the VPA should meet the requirements of Standard for "Sampling and surveys for CDM project activities and programme of activities" (Version 08.0) and "Guideline for Sampling and surveys for CDM project activities and programmes of activities" (Version 04.0) as well as the applied methodology.	The sampling plan of the VPA-DD has been checked to confirm that it meets requirements of Standard for "Sampling and surveys for CDM project activities and programme of activities" (Version 08.0) and "Guideline for Sampling and surveys for CDM project activities and programmes of activities" (Version 04.0) as well as the applied methodology.
11	Conditions to ensure that VPAs that will be included meet the small-scale or microscale thresholds and remain within those thresholds throughout the crediting period	As per Glossary: CDM Terms version 10.0, for small-scale project activity the emission reductions generated by the VPA should be no more than 60kt CO_2e annually. All VPAs included should meet the above small-scale threshold.	The VPA-DD and emission reductions calculation sheet have been check to confirm that the emission reductions generated by the VPA are fewer than 60kt CO_2e annually.
12	Conditions to confirm that technologies in the VPAs	The technologies should be maintenance of boreholes	It has been confirmed through field investigation

	are eligible	using hand pumps. Chemical disinfection may be applied in case that water quality cannot meet the requirements after borehole maintenance.	that all the borehole maintained by the project activities are using hand pumps. Chemical disinfection will be applied if the project implementer finds that water quality cannot meet the requirements in the future.
13	Conditions to be met by each VPA regarding SDG outcomes assessment	The VPAs should meet the requirements for SDG outcomes assessment in "Principle and Requirements (Version 1.2)" and "Programme of Activity Requirements (Version 1.2)".	The VPA-DD has been checked to confirm that the requirements for SDG outcomes assessment in "Principle and Requirements (Version 1.2)" and "Programme of Activity Requirements" are met.
14	Conditions to be met by each VPA regarding safeguarding principles	Each VPA should meet the requirements for safeguarding principles in "Principle and Requirements (Version 1.2)", "Programme of Activity Requirements (Version 1.2)" and "Safeguarding Principles and Requirements (Version 1.2)".	The VPA-DD has been checked to confirm that the requirements for safeguarding principles in "Principle and Requirements (Version 1.2)", "Programme of Activity Requirements (Version 1.2)" and "Safeguarding Principles and Requirements (Version 1.2)" are met.
15	Conditions to be met for retroactive VPAs	Not applicable as a regular VPA	Not applicable as a regular VPA
16	Conditions to be met for CER labeling	Not applicable	Not applicable

17	Conditions to be met in multi-country PoAs	The CME should provide a VPA-DD for each country considered at the time of PoA registration.	The CME has provided a VPA-DD for each country considered at the time of PoA registration.

A.1.2. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

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Donation and carbon transfer agreements will be signed between CME and the representatives of the villages where the VPA is located in. So the CME has full rights over the Products generated from GS Certification. No legal rights concerning changes in use of resources or legal land title/tenure are required to implement the VPA.

A.2. Location of project

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The VPA is located in Kamonyi District, Southern Province of Rwanda. The geographic coordinates of Kamonyi District are shown as follows:

Table 1. Geographic coordinates of Kamonyi District

Name of district	Eastmost	Southmost	Westmost	Northmost
Kamonyi District	2°6’42”S 30°1’14”E	2°12’9”S 29°58’33”E	1°54’46”S 29°47’4”E	1°51’14”S 30°49’4”E

The location of Kamonyi District is shown in the following map:

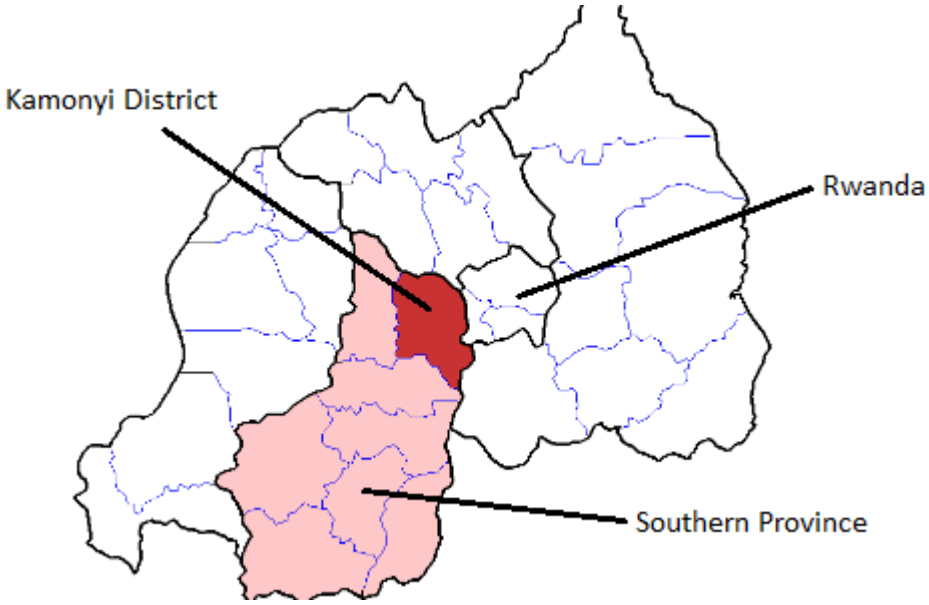

Figure 1. Kamonyi District in Southern Province of Rwanda

A.3. Technologies and/or measures

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India Mark II Hand Pump is the most representative type of hand pump used in the VPA. It is a conventional lever action hand pump and subject to Indian Standard IS 9301. This pump has a pump head, pump stand and a handle of galvanised steel. The down hole components exist of a brass lined cast iron cylinder with a foot valve and a plunger of brass. The material and technical data are shown as follows[3]:

Table 2. Material of India Mark II Hand Pump

Component	Material
Pump head	Galvanised steel
Handle	Galvanised steel
Pump stand	Galvanised steel
Pump rods	Galvanised steel
Rising main	Galvanised GI pipe
Pump cylinder	Cast iron / brass
Plunger/foot valve	Brass

[3] https://www.rural-water-supply.net/en/implementation/public-domain-handpumps/india-mark-ii

Table 3. Technical data of India Mark II Hand Pump

Cylinder diameter (mm):	63.5
Maximum Stroke (mm):	125
Approximate discharge at about 75 watt input (m^3/h):	at 10 m head 1.8
	at 15 m head 1.3
	at 20 m head 1.0
	at 25 m head 0.9
	at 30 m head 0.8
Pumping lift (m):	10 – 50
Population served (nos.):	300
Households (nos.):	30
Water consumption (lpcd):	15 – 20
Type of well:	borehole

Table 4. Lifespans of Components[4]

Component	Lifespan
Chain	4 years
Valve	4 years
Piston seals	5 years
Handle bearings	5 years
Pump rod	10 years
Riser pipes	12 years

[4] https://www.engineeringforchange.org/solutions/product/india-mark-ii-handpump/

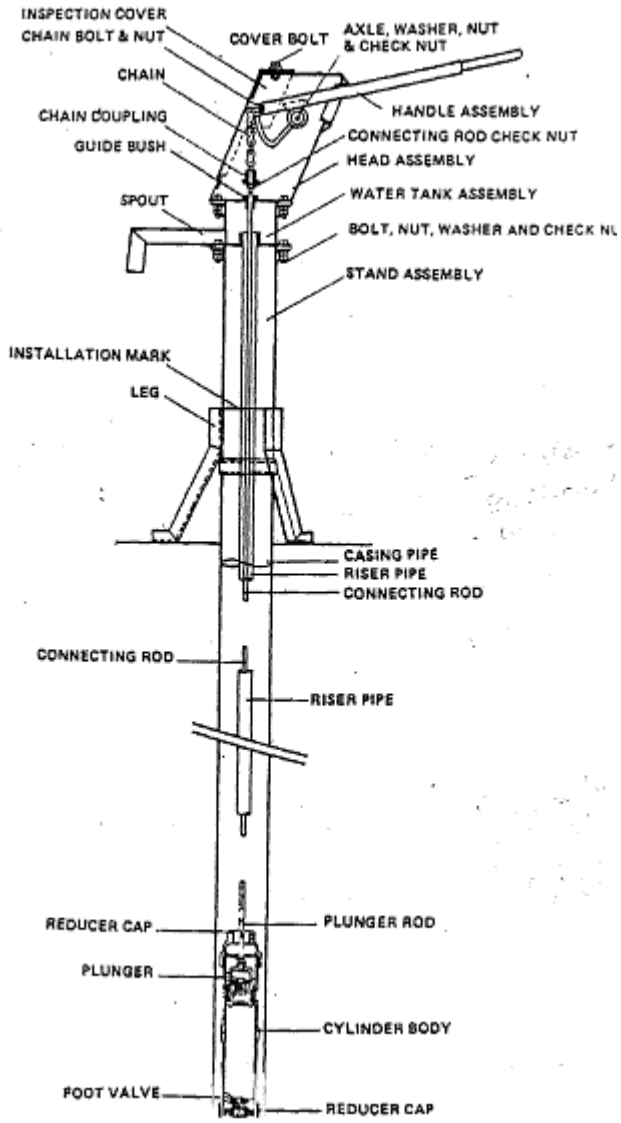

Figure.3 Structure of India Mark II Hand Pump

If water quality cannot meet the requirements after borehole maintenance, chemical disinfection will be used in the VPA. Chemical disinfection is an effective and low-cost way for water purification. It does not need electricity, which makes it more feasible in the LDCs as the power supply is not stable or even available in many areas. Therefore, the purification process has no greenhouse gas emission. Chlorine disinfectants are applied in the VPA, which kills bacteria, viruses and parasites in water. The lifespan of the water disinfectant dispenser is 5 years.

Figure.4 Chemical disinfection

A.4. Scale of the project

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The annual emission reductions of the VPA are 57,522 tCO_2e, which is less than 60,000 tCO_2e. As a result, the CPA is a type III small-scale project activity, which results in emission reductions of fewer than or equal to 60 kt CO_2e annually.

A.5. Funding sources of project

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There is no public funding for the VPA. A signed ODA declaration has been provided.

SECTION B. APPLICATION OF APPROVED GOLD STANDARD METHODOLOGY (IES) AND/OR DEMONSTRATION OF SDG CONTRIBUTIONS

B.1. Reference of approved methodology (ies)

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Technologies and Practices to Displace Decentralized Thermal Energy Consumption (Version 3.1)

B.2. Applicability of methodology (ies)

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Methodology requirement	Demonstration
The project boundary needs to be clearly identified, and the technologies counted in the project are not included in any other voluntary market or CDM project activity (i.e. no double counting takes place). In some cases there maybe another similar activity within the same target area. Project proponents must therefore have a survey mechanism in place together with appropriate mitigation measures so as to prevent any possibility of double counting.	The VPA is located in Kamonyi District, Southern Province of Rwanda. The project boundary is the boundary of communities that use the boreholes maintained by the project activity. Each borehole consisted in the VPA will have a unique serial number to ensure that double counting will not occur. The registries of Gold Standard, VCS and CDM have been check to confirm that the VPA is not included in any other voluntary market or CDM project activity as well as the project area does not overlaps with that of another Gold Standard and other voluntary or compliance standard programme of a similar nature.
The technologies have a continuous useful energy output of less than 150kW per unit (defined as total energy delivered usefully from start to end of	The VPA is to provide safe water through boreholes. The baseline scenario is that fossil fuel and/or NRB is used to boil water as means of

operation of a unit divided by time of operation). For technologies or practices that do not deliver thermal energy in the project scenario but only displace thermal energy supplied in the baseline scenario, the 150kW threshold applies to the displaced baseline technology.	water purification in the absence of the project activity.Therefore, the project technology just displaces thermal energy supplied in the baseline scenario rather than delivers thermal energy. According to the baseline water boiling test, 0.9Kg of wood is used for boiling 1L of water in 10 minutes. The NCV of wood is 15,600 KJ/Kg[5]. The total energy output is 0.9Kg × 15,600 KJ/Kg ÷ 600s = 23.4KW, which is less than 150KW.
The use of the baseline technology as a backup or auxiliary technology in parallel with the improved technology introduced by the project activity is permitted as long as a mechanism is put into place to encourage the removal of the old technology and the definitive discontinuity of its use. The project documentation must provide a clear description of the approach chosen and the monitoring plan must allow for a good understanding of the extent to which the baseline technology is still in use after the introduction of the improved technology.	The use of baseline technology, using fossil fuel and/or NRB to boil water as means of water purification will be monitored in the monitoring plan. The emissions generated will be accounted for project emissions. More details are provided in Section B.6 and B.7.
The project proponent must clearly communicate to all project participants	A full explanation was given to the representatives of the villages where

[5] IPCC (2006) "IPCC Guidelines for National Greenhouse Gas Inventories", Volume 2, Energy, Chapter 1, Introduction, Page 1.19, Table 1.2

the entity that is claiming ownership rights of and selling the emission reductions resulting from the project activity. For technology producers and the retailers of the improved technology or the renewable fuel in use, this must be communicated by contract or clear written assertions in the transaction paperwork. If the claimants are not the project technology end users, the end users will need to be informed and notified that they cannot claim for emission reductions from the project.	the VPA is located. Since the CME will undertake the cost for borehole maintenance, the ownership of the emission reductions generated from the VPA will be transferred to the CME. Donation and carbon transfer agreements were signed between the CME and the representatives of the villages.
Project activities making use of a new biomass feedstock in the project situation (e.g. shift from non-renewable to green charcoal, plant oil or renewable biomass briquettes) must comply with relevant Gold Standard specific requirements for biomass related project activities, as defined in the latest version of the Gold Standard rules.	Not applicable as the VPA reduces the usage of biomass for water boiling rather than uses a new biomass feedback.
Adequate evidence is supplied to demonstrate that indoor air pollution (IAP) levels are not worsened compared to the baseline, and greenhouse gases emitted by the project fuel/stove combination are estimated with adequate precision. The project fuel/stove combination may include instances in which the project stove is a baseline stove.	The VPA provides safe water through boreholes thus it reduces water boiling for households and improves indoor air quality.
Records of renewable fuel sales may not be used as sole parameters for emission	The emission reduction calculation will be based on the number of persons

reduction calculation, but may be used as data informing the equations in section 2.0 of this methodology. These records need to be correlated to data on distribution and results of field tests and surveys confirming (a) actual use of the renewable fuel and usage patterns (such as average fraction of non-renewable fuels used in mixed combustion or seasonal variation of fuel types), (b) GHG emissions, (c) evidence of CO levels not deteriorating (d) any further factors effecting emission reductions significantly.	using the project technology, amount of fuel used to boil water and the amount of safe water consumed. Therefore, there is no renewable fuel sold in the VPA.
The Methodology is for project technologies and practices that introduce a new zero emission technology for safe water, instead of boiling water as a purification technique. Technologies include gravity household water filters, borehole pumps and their repair/maintenance/operation, ultraviolet radiation treatment, chlorine tablets, etc..	The VPA maintains hand pump-drive boreholes to provide safe water. Chemical disinfection will be applied in case that water quality cannot meet the requirements after borehole maintenance. Both of the above technologies are zero emission technologies for safe water.
Special attention is required to as to the level of GHG emissions arsing from production, transport, installation and delivery of the clean water supply or	Materials used in the VPA will be transported from Kigali. The distance is 30km. The diesel consumption for heavy truck is 0.41L/km[6] and the

[6] Heavy Vehicles and Characteristics Archived 2012-07-23 at the Wayback Machine Table 5.4

treatment options. This is applicable to all technologies encompassed within this methodology. Whenever such emissions are expected to be material (5% or more of the overall emissions), these must be accounted for in the project situation as part of the project emissions. In the baseline situation, the project proponent has the option to take them into account, or to neglect them altogether.	density of diesel is 0.85Kg/L [7]while the emission factor of diesel is 74.1t CO_2e/TJ[8] and the net calorific value is 0.043TJ/t[9]. So the emission is 0.033t CO_2e (0.41L/km × 30km × 0.85Kg/L ÷ 1000Kg/t × 0.043TJ/t ×74.1t CO_2e), which is negligible.
The water in its improved form should be available within 1km walking/pedaling distance from the households. There is a two-year grace period (from date of registration) for any households falling outside of the distance. However, once this period is over these households would not be in the emission reduction calculation.	After grace period, no emission reductions will be taken into account for households outside of 1km walking distance of the boreholes maintained by the VPA.
Only end-users boiling water or currently using unsafe water are eligible for crediting.	Only end-users boiling water or current using unsafe water will be account for number of persons consuming safe water supplied by the VPA. Related questions are raised in the questionnaire.

B.3. Project boundary

[7] https://www.sciencedirect.com/topics/engineering/diesel-fuel#:~:text=The%20density%20of%20petroleum%20diesel,0.70%E2%80%930.75%20kg%2Fl.
8 IPCC 2006 Guidelines for National Greenhouse gas Inventories Chapter 2: Stationary Combustion Page 2.23 Table 2.4
[9] IPCC 2006 Guidelines for National Greenhouse gas Inventories Chapter 1: Introduction Page 1.18 Table 1.2

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The project boundary is the boundary of communities that use the boreholes maintained by the project activity in Kamonyi District, Southern Province of Rwanda as shown in the following figure:

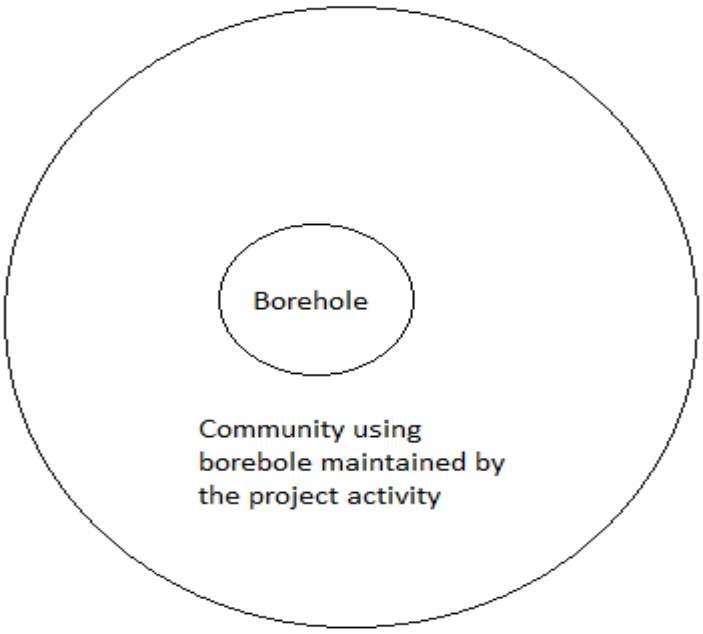

Figure 5. Diagram of Project Boundary

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Emissions from combustion of fossil fuels or non-renewable biomass for boiling water in the absence of the project activity	CO_2	Yes	Important emission source during complete combustion of biomass and fossil fuels
		CH_4	Yes	Important emission source during incomplete combustion of biomass and fossil fuels
		N_2O	Yes	Important emission source during incomplete combustion of biomass and fossil fuels
Project scenario	Emissions from combustion of fossil fuels or non-renewable biomass for the operation of the project activity	CO_2	Yes	Important emission source during complete combustion of biomass and fossil fuels
		CH_4	Yes	Important emission source

		during incomplete combustion of biomass and fossil fuels
N_2O	Yes	Important emission source during incomplete combustion of biomass and fossil fuels

B.4. Establishment and description of baseline scenario

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According to the applied methodology, the baseline scenario is that fossil fuel and/or NRB is used to boil water as means of water purification in the absence of the project activity. Baseline survey and water boiling test are applied to calculate baseline emissions. Since local residents do not have enough budget to buy firewood for water boiling, suppressed demand is applied in the small scale VPA when establishing the baseline scenario as per the applied methodology. More details are shown in Section B.6.1. and B.7.2..

B.5. Demonstration of additionality

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Specify the methodology, activity requirement or product requirement that establishes deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).	According to Paragraph 4.1.9(b) of Community Service Activity Requirements (Version 1.2), community service projects located in LDS, SIDS and LLDC are considered as additional and therefore are not required to prove financial additionality at the time of design certification.
Describe how the proposed project meets the criteria for deemed additionality.	The VPA is additional because it is a community service project and located in a least developed country-Rwanda[10].

[10] https://unctad.org/topic/vulnerable-economies/least-developed-countries/list

B.5.1. Prior Consideration

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Not applicable as a regular project.

B.5.2. Ongoing Financial Need

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Not applicable because the VPA is not required to demonstrate financial additionality.

B.6. Sustainable Development Goals (SDG) outcomes

Relevant Target/Indicator for each of the three SDGs

Sustainable Development Goals Targeted	Most relevant SDG Target	SDG Impact Indicator (Proposed or SDG Indicator)
13 Climate Action (mandatory)	13.b: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing states, including focusing on women, youth and local and marginalized communities	Reduce emission from water boiling by non renewable biomass in a LDC country - Rwanda

3 Ensure healthy lives and promote well-being for all at all ages	3.3: By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases	Reduce the incidence of waterborne illness within the project area
5 Achieve gender equality and empower all women and girls	5.4: Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate	Reduce the time spent to fetch and purify water by women and girls
6 Ensure availability and sustainable management of water and sanitation for all	6.b: Support and strengthen the participation of local communities in improving water and sanitation management	Provide safe water to local residents

B.6.1. Explanation of methodological choices/approaches for estimating the SDG Impact

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(1) SDG 13:

Baseline Scenario Fuel Consumption Calculation

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

Where:

$B_{b,y}$ Quantity of fuel consumed in baseline scenario b during the year in tons (L/p/d)

X_{boil} Percentage of premises that in the absence of the project activity would have used non-GHG emitting technologies like chlorine treatment techniques (if available) in the project boundary

C_j Percentage of users of project safe water supply who were already in baseline using a non boiling safe water supply

$N_{p,y}$ Number of person.days consuming water supplied by project scenario p through year y

$W_{b,y}$ Quantity of fuel in tons required to treat 1 litre of water using technologies representative of baseline scenario b in year y as per Baseline Water Boiling Test.

$Q_{p,y}$ Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day.

$Q_{p,\ rawboil,y}$ Quantity of raw water boiled in the project scenario p per person per day

X_{boil}, C_j and $N_{p,y}$ are determined by baseline survey; $W_{b,y}$ is determined by baseline water boiling test; $Q_{p,y}$ and $Q_{p,\ rawboil,y}$ are determined by water consumption field test.

Project Scenario Fuel Consumption Calculation

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

Where:
$B_{p,y}$ Quantity of fuel consumed in project scenario p during the year y in tons

C_j Percentage of users of project safe water supply who were already in baseline using a non boiling safe water supply

$N_{p,y}$ Number of person.days consuming water supplied by project scenario p through year y

$W_{p,y}$ Quantity of fuel in tons required to treat 1 litre of water using technologies representative of baseline scenario b in year y as per Baseline Water Boiling Test.

$Q_{p,rawboil,y}$ Quantity of raw water boiled in the project scenario p per person per day

$Q_{p,cleanboil,y}$ Quantity of safe water boiled in the project scenario p per person per day in year y

C_j and $N_{p,y}$ are determined by baseline survey; $W_{p,y}$ is equal to $W_{b,y}$ since the same water boiling technology is applied in the baseline and project scenarios as per the baseline and project surveys; $Q_{p,rawboil,y}$ and $Q_{p,cleanboil,y}$ are determined by project water consumption field test.

Emission Reductions

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

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

$$ER_y = (\Sigma BE_{fuel,b,y} - \Sigma PE_{fuel,p,y}) * U_{p,y} - \Sigma LE_{p,y}$$

Where:

$BE_{b,y}$	Baseline emissions during year y
$PE_{p,y}$	Project emissions during year y
$B_{b,y}$	Quantity of fuel consumed in baseline scenario b during the year in tons
$B_{p,y}$	Quantity of fuel consumed in project scenario p during the year y in tons
$f_{NRB,b,y}$	Fraction of biomass used that can be established as non-renewable biomass in baseline scenario b during year y
$f_{NRB,p,y}$	Fraction of biomass used that can be established as non-renewable biomass in project scenario p during year y
$EF_{b,fuel,CO2}$	CO_2 emission factor of fuels used in the baseline scenario
$EF_{b,fuel,non-CO2}$	Non-CO_2 emission factor of fuels used in the baseline scenario
$EF_{p,fuel,CO2}$	CO_2 emission factor of fuels used in the project scenario
$EF_{p,fuel,non-CO2}$	Non-CO_2 emission factor of fuels used in the project scenario
$NCV_{b,fuel}$	Net calorific value of fuels used in the baseline scenario
$NCV_{p,fuel}$	Net calorific value of fuels used in the project scenario
ER_y	Overall emission reductions achieved by the project activity during year y
$U_{p,y}$	Cumulative usage rate for technologies in project scenario p during year y, based on cumulative installation rate and drop off rate
$LE_{p,y}$	Leakage from project scenario p during year y

f_{NRB}, $EF_{b,fuel,CO2}$, $EF_{b,fuel,non-CO2}$, $EF_{p,fuel,CO2}$, $EF_{p,fuel,non-CO2}$, $NCV_{b,fue}$ and $NCV_{p,fuel}$ are determined by literature; $U_{p,y}$ is determined by project survey; $LE_{p,y}$ is determined by baseline and project surveys.

(2) SDG 3

The outcome of SDG 3 is quantified as the reduction of waterborne illness incidence compared to baseline scenario, which is calculated as follows:

$I_{r,y} = I_b - I_{p,y}$

Where:

$I_{r,y}$ Reduction of waterborne illness incidence in year y

I_b Waterborne illness incidence in the baseline scenario

$I_{p,y}$ Waterborne illness incidence in the project scenario during year y

I_b is determined by baseline survey while I_y is determined by project survey.

(3) SDG 5

The outcome of SDG 5 is quantified as percentage reduction of time spent to fetch and purify water by women and girls, which is calculated as follows:

$T_{r,y} = (T_b - T_{p,y})/T_b$

Where:

$T_{r,y}$ Percentage reduction of time spent to fetch and purify water by women and girls in year y

T_b Time spent to fetch and purify water by women and girls per person in the baseline scenario

$T_{p,y}$ Time spent to fetch and purify water by women and girls per person in the project scenario during year y

T_b is determined by baseline survey while $T_{p,y}$ is determined by project survey.

(4) SDG 6

The outcome of SDG 6 is quantified as number of persons consuming safe water supplied by the project activity, which is calculated as follows:

$P_y = P_{p,y} * (1-C_j) * U_{p,y}$

Where

P_y Number of persons consuming safe water supplied by the project activity during year y

C_j Percentage of users of project safe water supply who were already in baseline scenario using a non boiling safe water supply

$P_{p,y}$ Number of persons consuming water within the project area during year y

$U_{p,y}$ Cumulative usage rate for technologies in project scenario p during year y

Cj is determined by baseline survey while $P_{p,y}$ and $U_{p,y}$ are determined by project survey.

B.6.2. Data and parameters fixed ex ante

SDG13

Data/parameter	C_j
Unit	Percentage
Description	Percentage of users of project safe water supply who were already in baseline using a non-boiling safe water supply
Source of data	Baseline survey
Value(s) applied	0.05
Choice of data or Measurement methods	The data is obtained through sampling survey as per the applied methodology as well as "Standard: Sampling and

and procedures	surveys for CDM project activities and programmes of activities (Version 08.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" .
Purpose of data	Calculation of baseline and project emissions (SDG 13) as well as number of persons consuming safe water supplied by the project activity (SDG 6)
Additional comment	Also used for SDG 6

Data/parameter	X_{boil}
Unit	Percentage
Description	Percentage of premises that in the absence of the project activity would have used non-GHG emitting technologies like chlorine treatment techniques (if available) in the project boundary.
Source of data	Baseline survey
Value(s) applied	0.05
Choice of data or Measurement methods and procedures	The data is obtained through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 08.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" .
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	$W_{b,y}$
Unit	t/L
Description	Quantity of wood fuel or fossil fuel required to boil 1 litre of water using technologies representatives of baseline scenario b during year y

Source of data	Baseline water boiling test
Value(s) applied	0.0009
Choice of data or Measurement methods and procedures	The data is obtained through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 08.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" .
Purpose of data	Calculation of baseline emissions
Additional comment	Should be updated if ongoing monitoring surveys show that baseline water boiling technologies change over time.

Data/parameter	$W_{p,y}$
Unit	t/L
Description	Quantity of wood fuel or fossil fuel required to boil 1 litre of water using technologies representatives of project scenario p during year y
Source of data	Project water boiling test
Value(s) applied	0.0009
Choice of data or Measurement methods and procedures	According to the baseline and project survey, the same water boiling technology is applied in the baseline and project scenarios. So $W_{b,y}$ and $W_{p,y}$ are equal
Purpose of data	Calculation of project emissions
Additional comment	Should be updated if ongoing monitoring surveys show that baseline water boiling technologies change over time.

Data/parameter	$f_{NRB,b,y}$
Unit	Percentage
Description	Fraction of biomass used that can be established as non –

	renewable biomass in the baseline scenario b during year y
Source of data	Default value for Rwanda[11]
Value(s) applied	0.98
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of baseline emissions
Additional comment	If this value is updated by CDM EB, the updated value will be applied.

Data/parameter	$EF_{b,fuel,co2}$
Unit	tCO_2/TJ
Description	CO_2 emission factor of fuels used in the baseline scenario
Source of data	IPCC default value for Wood: IPCC 2006 Guidelines for National Greenhouse gas Inventories Chapter 2: Stationary Combustion Page 2.23 Table 2.5
Value(s) applied	112
Choice of data or Measurement methods and procedures	According to the baseline survey, wood is the only fuel used in the baseline scenario.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	$EF_{b,fuel,non\ co2}$

[11] https://cdm.unfccc.int/Panels/ssc_wg/meetings/035/ssc_035_an20.pdf

Unit	tCO_2/TJ
Description	Non CO_2 emission factor of fuels used in the baseline scenario
Source of data	IPCC default value for Wood: IPCC 2006 Guidelines for National Greenhouse gas Inventories Chapter 2: Stationary Combustion Page 2.23 Table 2.5 IPCC Fourth Assessment Report: Climate Change 2007 Page 212 Table 2.14[12]
Value(s) applied	8.692
Choice of data or Measurement methods and procedures	According to the baseline survey, wood is the only fuel used in the baseline scenario. As per IPCC 2006 Guidelines for National Greenhouse gas Inventories, the default emission factor of CH_4 and N_2O for stationary combustion is 0.3t/TJ and 0.004t/TJ, respectively. As per IPCC Fourth Assessment Report: Climate Change 2007, the global warming potential for CH_4 and N_2O is 25 and 298, respectively. So $EF_{b,non\ co2} = 0.3\times25+0.004\times298 = 8.692$.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	$NCV_{b,fuel}$
Unit	TJ/ton
Description	Net calorific value of the fuels used in the baseline
Source of data	IPCC default value for wood IPCC (2006) "IPCC Guidelines for National Greenhouse Gas Inventories", Volume 2, Energy, Chapter 1, Introduction, Page 1.19, Table 1.2
Value(s) applied	0.0156
Choice of data or Measurement methods	According to the baseline survey, wood is the only fuel used in the baseline scenario.

[12] https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg1-chapter2-1.pdf

and procedures	
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	$f_{NRB,p,y}$
Unit	Percentage
Description	Fraction of biomass used that can be established as non – renewable biomass in the project scenario p during year y
Source of data	Default value for Rwanda[13]
Value(s) applied	0.98
Choice of data or Measurement methods and procedures	-
Purpose of data	Calculation of project emissions
Additional comment	If this value is updated by CDM EB, the updated value will be applied.

Data/parameter	$EF_{p,fuel,co2}$
Unit	tCO_2/TJ
Description	CO_2 emission factor of fuels used in the project scenario
Source of data	IPCC default value for Wood: IPCC 2006 Guidelines for National Greenhouse gas Inventories Chapter 2: Stationary Combustion Page 2.23 Table 2.5

[13] https://cdm.unfccc.int/Panels/ssc_wg/meetings/035/ssc_035_an20.pdf

Value(s) applied	112
Choice of data or Measurement methods and procedures	According to the project survey, wood is the only fuel used in the project scenario.
Purpose of data	Calculation of project emissions
Additional comment	-

Data/parameter	$EF_{p,fuel,non\ co2}$
Unit	tCO_2/TJ
Description	Non CO_2 emission factor of fuels used in the project scenario
Source of data	IPCC default value for Wood: IPCC 2006 Guidelines for National Greenhouse gas Inventories Chapter 2: Stationary Combustion Page 2.23 Table 2.5 IPCC Fourth Assessment Report: Climate Change 2007[14] Page 212 Table 2.14
Value(s) applied	8.692
Choice of data or Measurement methods and procedures	According to the project survey, wood is the only fuel used in the project scenario. As per IPCC 2006 Guidelines for National Greenhouse gas Inventories, the default emission factor of CH_4 and N_2O for stationary combustion is 0.3t/TJ and 0.004t/TJ, respectively. As per IPCC Fourth Assessment Report: Climate Change 2007, the global warming potential for CH_4 and N_2O is 25 and 298, respectively. So $EF_{b,non\ co2} = 0.3\times25+0.004\times298 = 8.692$.
Purpose of data	Calculation of project emissions
Additional comment	-

[14] https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg1-chapter2-1.pdf

Data/parameter	$NCV_{p,fuel}$
Unit	TJ/ton
Description	Net calorific value of the fuels used in the project scenario
Source of data	IPCC default value for wood IPCC (2006) "IPCC Guidelines for National Greenhouse Gas Inventories", Volume 2, Energy, Chapter 1, Introduction, Page 1.19, Table 1.2
Value(s) applied	0.0156
Choice of data or Measurement methods and procedures	According to the project survey, wood is the only fuel used in the project scenario.
Purpose of data	Calculation of project emissions
Additional comment	-

SDG 3

Data/parameter	I_b
Unit	Percentage
Description	Waterborne illness incidence in the baseline scenario
Source of data	Baseline survey
Value(s) applied	60%
Choice of data or Measurement methods and procedures	The data is obtained through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 08.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" .
Purpose of data	Calculation of reduction of waterborne illness incidence
Additional comment	-

SDG 5

Data/parameter	T_b
Unit	Hour
Description	Time spent to fetch and purify water by women and girls per person in the baseline scenario
Source of data	Baseline survey
Value(s) applied	2
Choice of data or Measurement methods and procedures	The data is obtained through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 08.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" .
Purpose of data	Calculation of percentage reduction of time spent to fetch and purify water by women and girls
Additional comment	-

B.6.3. Ex ante estimation of SDG Impact

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(1) SDG 13:

Baseline Scenario Fuel Consumption Calculation

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

Where:

$B_{b,y}$ Quantity of fuel consumed in baseline scenario b during the year in tons

X_{boil} Percentage of premises that in the absence of the project activity would have used non-GHG emitting technologies like chlorine treatment techniques (if available) in the project boundary; the applied value is 0.05 as per section B.6.2.

C_j Percentage of users of project safe water supply who were already in baseline scenario using a non boiling safe water supply; the applied value is 0.05 as per section B.6.2.

$N_{p,y}$ Number of person.days consuming water supplied by project scenario p through year y; the applied value is 5,475,000 as per Section B.7.1.

$W_{b,y}$ Quantity of fuel in tons required to treat 1 litre of water using technologies representative of baseline scenario b in year y as per baseline water boiling Test; the applied value is 0.0009 as per Section B.7.1.

$Q_{p,y}$ Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day; the applied value is 7 as per Section B.6.2.

$Q_{p,\ rawboil,y}$ Quantity of raw water boiled in the project scenario p per person per day; ; the applied value is 0 as per Section B.6.2.

As a result, $B_{b,y}$ = 31,129.48t

Project Scenario Fuel Consumption Calculation

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

Where:

$B_{p,y}$ Quantity of fuel f consumed in project scenario p during the year y in tons

C_j Percentage of users of project safe water supply who were already in baseline scenario using a non boiling safe water supply; the applied value is 0.05 as per section B.6.2.

$N_{p,y}$ Number of person.days consuming water supplied by project scenario p through year y; the applied value is 5,475,000 as per Section B.7.1

$W_{p,y}$ Quantity of fuel in tons required to treat 1 litre of water using technologies representative of baseline scenario b in year y as per baseline water boiling Test; the applied value is 0.0009 as per Section B.7.1.

$Q_{p,rawboil,y}$ Quantity of raw water boiled in the project scenario p per person per day; the applied value is 0 as per Section B.7.1.

$Q_{p,cleanboil,y}$ Quantity of safe water boiled in the project scenario p per person per day in year y; the applied value is 0 as per Section B.7.1.

As a result, $B_{p,y}$ = 0

Emission Reductions

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

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

$ER_y = (\Sigma BE_{fuel,b,y} - \Sigma PE_{fuel,p,y}) * U_{p,y} - \Sigma LE_{p,y}$

Where:

$BE_{b,y}$ Baseline emissions during year y

$PE_{p,y}$ Project emissions during year y

$B_{b,y}$ Quantity of fuel consumed in baseline scenario b during the year in tons; the applied value is 31,129.48 as per calculation in this section above;

$B_{p,y}$ Quantity of fuel consumed in project scenario p during the year y in tons; the applied value is 0 as per calculation in this section above;

$f_{NRB,b,y}$ Fraction of biomass used that can be established as non-renewable biomass in baseline scenario b during year y; the applied value is 0.98 as per section B.6.2.

$f_{NRB,p,y}$ Fraction of biomass used that can be established as non-renewable biomass in project scenario p during year y; the applied value is 0.98 as per section B.6.2.

$EF_{b,fuel,CO2}$ CO_2 emission factor of fuels used in the baseline scenario; the applied value is 112 as per section B.6.2.

$EF_{b,fuel,non\text{-}CO2}$ Non-CO_2 emission factor of fuels used in the baseline scenario; the applied value is 8.692 as per section B.6.2.

$EF_{p,fuel,CO2}$ CO_2 emission factor of fuels used in the project scenario; the applied value is 112 as per section B.6.2.

$EF_{p,fuel,non\text{-}CO2}$ Non-CO_2 emission factor of fuels used in the project scenario; the applied value is 8.692 as per section B.6.2.

$NCV_{b,fuel}$ Net calorific value of fuels used in the baseline scenario; the applied value is 0.0156 as per section B.6.2.

$NCV_{p,fuel}$ Net calorific value of fuels used in the project scenario; the applied value is 0.0156 as per section B.6.2.

ER_y Overall emission reductions achieved by the project activity during year y

$U_{p,y}$ Cumulative usage rate for technologies in project scenario p during year y, based on cumulative installation rate and drop off rate; the applied value is 100% as per section B.7.1.

$LE_{p,y}$ Leakage from project scenario p during year y; the applied value 0 as per section B.7.1.

As per the applied methodology, $LE_{p,y}$ is estimated as follows:

Potential Influence Factor	Interpretation
The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or in a manner suggesting more usage than would have occurred in the absence of the project.	The displaced baseline technology is three stones. It will not be reused outside the project boundary because it will still be used for cooking after the implementation of the VPA.
Non-project users who previously used lower emitting energy sources use the non-renewable biomass or fossil fuels saved under the project activity.	The costs of low emitting water purification technologies, such as filtration and chlorination, are much higher than boiling with wood fuel. Users of these technologies are not price sensitive. Therefore, the implementation of the VPA will not lead these users to boil water with wood fuel, even if the price of wood fuel becomes cheaper because of the reduction of demand caused by the VPA.
The project significantly impacts the NRB fraction within an area where other CDM or VER project activities account for NRB fraction in their baseline scenario.	Considering that the VPA only saves 31,129.48tons ($B_{b,y}$) of biomass annually while the total amount of above-ground biomass of Rwanda is 75 million tons[15], the VPA will not affect NRB fraction.
The project population compensates for loss of the space heating effect of inefficient technology by adopting some other form of heating or by retaining some use of inefficient technology.	The space heating effect of boiling water is negligible. Therefore it is highly unlikely that some other form of heating will be adopted for compensating the space heating effect of boiling water.
By virtue of promotion and marketing of new technology with high efficiency, the project stimulates substitution within households who commonly used a technology with relatively lower emissions, in cases where such a trend is not eligible as an evolving baseline.	The VPA will not promote any new technology with high efficiency. It will not stimulate people to boil water.

In conclusion, $LE_{p,y} = 0$

[15] Table 18, Global Forest Resources Assessment 2015

As a result, $BE_{b,y}$ = 57,522 tCO_2e; $PE_{p,y}$ = 0; ER_y = 57,522 tCO_2e

(2) SDG 3

The outcome of SDG 3 is quantified as the reduction of waterborne illness incidence compared to baseline scenario, which is calculated as follows:

$I_{r,y} = I_b - I_{p,y}$

Where:

$I_{r,y}$ Reduction of waterborne illness incidence in year y

I_b Waterborne illness incidence in the baseline scenario; the applied value is 60% as per section B.6.2.

$I_{p,y}$ Waterborne illness incidence in the project scenario during year y; the applied value is 30% as per section B.7.1.

As a result, $I_{r,y}$ = 30%

(3) SDG 5

The outcome of SDG 5 is quantified as percentage reduction of time spent to fetch and purify water by women and girls, which is calculated as follows:

$T_{r,y} = (T_b - T_{p,y})/T_b$

Where:

$T_{r,y}$ Percentage reduction of time spent to fetch and purify water by women and girls in year y

T_b Time spent to fetch and purify water by women and girls per person in the baseline scenario; the applied value is 2 as per section B.6.2.

$T_{p,y}$ Time spent to fetch and purify water by women and girls per person in the project scenario during year y; the applied value is 1 as per section B.7.1.

As a result, $T_{r,y}$ = 50%

(4) SDG 6

The outcome of SDG 6 is quantified as number of persons consuming safe water supplied by the project activity, which is calculated as follows:

$P_y = P_{p,y} * (1-C_j) * U_{p,y}$

Where

P_y Number of persons consuming safe water supplied by the project activity during year y

$P_{p,y}$ Number of persons consuming water within the project area during year y; the applied value is 15,000 as per section B.7.1.

C_j Percentage of users of project safe water supply who were already in baseline scenario using a non boiling safe water supply; the applied value is 0.05 as per section B.6.2.

$U_{p,y}$ Cumulative usage rate for technologies in project scenario p during year y; the applied value is 100% as per section B.7.1.

As a result, P_y = 14,250

B.6.4. Summary of ex ante estimates of each SDG outcome

Year	Baseline estimate (tCO_2e)	Project estimate (tCO_2e)	Net benefit (tCO_2e)
Year 1	57,522	0	57,522
Year 2	57,522	0	57,522
Year 2	57,522	0	57,522
Year 4	57,522	0	57,522
Year 5	57,522	0	57,522
Total	**287,610**	**0**	**287,610**
Total number of crediting years			

Annual average over the crediting period	57,522	0	57,522

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

SDG 13

Data/parameter	$Q_{p,y}$
Unit	L
Description	Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day
Source of data	Project water consumption field test
Value(s) applied	7
Measurement methods and procedures	The data is obtained through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 08.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" . According to the applied methodology, the cap value for full-day premises is 7. So we choose the cap value for conservativeness.
Monitoring frequency	At least biennially
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	$Q_{p,rawboil,y}$
Unit	Litres per person per day
Description	Quantity of raw or unsafe water that is still boiled after installation of the water treatment technology.

Source of data	Project water consumption field test
Value(s) applied	0
Measurement methods and procedures	The data is obtained through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 08.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" .
Monitoring frequency	At least biennially
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of baseline and project emissions
Additional comment	

Data / Parameter	$Q_{p,cleanboil,y}$
Unit	Litres per person per day
Description	Quantity of safe (treated, or from safe supply) water boiled in the project scenario p, after installation of project technology
Source of data	Project water consumption field test
Value(s) applied	0
Measurement methods and procedures	The data is obtained through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 08.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" .
Monitoring frequency	At least biennially
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of project emissions
Additional comment	

Data / Parameter	Quality of the treated water

Unit	Percentage
Description	Performance of the treatment technology – less than 1 Colony Forming Unit (CFU) of E.Coli / 100 ml of safe water – in unqualified rate
Source of data	Water quality test
Value(s) applied	0
Measurement methods and procedures	As per the local laboratories' methods and procedures
Monitoring frequency	Quarterly
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of emission reductions
Additional comment	-

Data / Parameter	$U_{p,y}$
Unit	Percentage
Description	Usage rate in project scenario p during year y
Source of data	Annual usage survey
Value(s) applied	100
Measurement methods and procedures	The data is obtained through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 08.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" .
Monitoring frequency	Annually
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of emission reductions (SDG 13) and number of persons consuming safe water supplied by the project activity (SDG 6)
Additional comment	A single usage parameter is weighted to be representative of the quantity of project technologies of each age being credited in a given project scenario as per Section 3.1 of the applied methodology. Also used for SDG 6.

Data / Parameter	$N_{p,y}$
Unit	Persons.days
Description	Number of person.days consuming water supplied by project scenario p through year y
Source of data	Project water consumption field test
Value(s) applied	5,475,000
Measurement methods and procedures	Sum of the total number of people using boreholes in the VPA (15,000) multiplied by the number of days in year y (365)
Monitoring frequency	At least biennially
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of baseline emissions and project emissions
Additional comment	-

Data / Parameter	$LE_{p,y}$
Unit	tCO_2e per year
Description	Leakage in project scenario p during year y
Source of data	Baseline and monitoring surveys
Value(s) applied	0
Measurement methods and procedures	. The result is 0 and the details are shown in Section B.6.3.
Monitoring frequency	Biennially
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of emission reductions
Additional comment	-

SDG 3

Data / Parameter	$I_{p,y}$
Unit	Percentage

Description	Waterborne illness incidence in the project scenario during year y
Source of data	Project survey
Value(s) applied	30%
Measurement methods and procedures	The data is obtained through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 08.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" .
Monitoring frequency	At least biennially
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of reduction of waterborne illness incidence
Additional comment	

SDG 5

Data / Parameter	$T_{p,y}$
Unit	Hour
Description	Time spent to fetch and purify water by women and girls per person in the project scenario during year y
Source of data	Project survey
Value(s) applied	1
Measurement methods and procedures	The data is obtained through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 08.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" .
Monitoring frequency	At least biennially
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of percentage reduction of time spent to fetch and purify water by women and girls
Additional comment	

SDG 6

Data / Parameter	$P_{p,y}$
Unit	Number
Description	Number of persons consuming water within the project area during year y
Source of data	Project survey
Value(s) applied	15,000
Measurement methods and procedures	Head of village district officer
Monitoring frequency	At least biennially
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of percentage reduction of time spent to fetch and purify water by women and girls
Additional comment	

Data / Parameter	Hygiene campaigns
Unit	-
Description	Hygiene campaigns carried out among project technology users.
Source of data	Annual hygiene campaigns results
Value(s) applied	-
Measurement methods and procedures	-
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	Assessment of achievement of SDG 6
Additional comment	-

B.7.2. Sampling plan

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(1) Target population

The target population are boreholes maintained by the VPA and households consuming safe water provided by the VPA.

(2) Sampling method and size

Since VPA01-06 of PoA GS 10959 are in the same district, using same technologies and sharing same baseline scenario, cross VPA sampling will be applied in these VPAs.

Simple random sampling is applied for determining water quality. As per the applied methodology, since there are 100 boreholes, the sampling size should be 30 or more. For meeting 90/10 requirement, the sample size is calculated as follows:

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

Where:

n	=	Sample size
N	=	Population size, which is 100
P	=	Expected proportion, which is 0.95
1.645	=	Represents the 90% confidence interval
0.1	=	Represents the 10% relative precision

So n⩾13.

As a result, we choose the sample size to be 40.

Multi-stage sampling is applied for determine other parameters. For proportional parameter of interest (C_j, X_{boil}, I_b, $U_{p,y}$, $I_{p,y}$), sample size is calculated according to the following equation[16]:

[16] Equation 16 in Page 34 of "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)"

$$c \geq \frac{\frac{SD_B^2}{\overline{p}^2} \times \frac{M}{M-1} + \frac{1}{\overline{u}} \times \frac{SD_w^2}{\overline{p}^2} \times \frac{(\overline{N}-\overline{u})}{(\overline{N}-1)}}{\frac{0.3^2}{1.645^2} + \frac{1}{M-1}\frac{SD_B^2}{\overline{p}^2}}$$

Where:

c	=	Number of clusters to be sampled
M	=	Total number of clusters in the population
$\overline{u}$	=	Number of units to be sampled within each cluster
$\overline{N}$	=	Average units per cluster
SD_B^2	=	Unit Variance
SD_w^2	=	Average of the cluster variances
$\overline{p}$	=	Overall proportion
1.645	=	Represents the 90% confidence interval
0.3	=	Represents the 30% relative precision

For mean value parameter of interest ($W_{b,y}$, $W_{p,y}$, T_b, $Q_{p,y}$, $Q_{p,rawboil,y}$, , $Q_{p,cleanboil,y}$, $T_{p,y}$) sample size is calculated according to the following equation[17]:

$$c \geq \frac{\left(\frac{SD_B}{Clustermean}\right)^2 \times \left(\frac{M}{M-1}\right) + \left(\frac{1}{u}\right) \times \left(\frac{SD_w}{Overallmean}\right)^2 \left(\frac{\overline{N}-u}{\overline{N}-1}\right)}{\left(\frac{0.3}{1.645}\right)^2 + \frac{1}{M-1}\left(\frac{SD_B}{Clustermean}\right)^2}$$

Where:

c	=	Number of clusters to be sampled
M	=	Total number of clusters in the population
u	=	Number of units to be sampled within each cluster

[17] Equation 33 in Page 44 of "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)"

$\bar{N}$ = Average units per cluster

SD_B^2 = Unit Variance

SD_w^2 = Average of the cluster variances

1.645 = Represents the 90% confidence interval

0.3 = Represents the 30% relative precision

(3) Data to be collected

The following parameters may be determined by sampling:

Parameter	Description	Confidence/ Precision	Frequency
C_j	Percentage of users of project safe water supply who were already in baseline using a non-boiling safe water supply	90/±30	One-time measurement ex-ante
X_{boil}	Percentage of premises that in the absence of the project activity would have used non-GHG emitting technologies like chlorine treatment techniques (if available) in the project boundary.	90/±30	One-time measurement ex-ante
$W_{b,y}$	Quantity of wood fuel or fossil fuel required to boil 1 litre of water using technologies representatives of baseline scenario b during year y activity for which the common practice of water purification is or would have been water boiling	90/±30	One-time measurement ex-ante
$W_{p,y}$	Quantity of wood fuel or fossil	90/±30	One-time

	fuel required to boil 1 litre of water using technologies representatives of project scenario p during year y		measurement ex-ante
I_b	Waterborne illness incidence in the baseline scenario	90/±30	One-time measurement ex-ante
T_b	Time spent to fetch and purify water by women and girls per person in the baseline scenario	90/±30	One-time measurement ex-ante
$Q_{p,y}$	Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day	90/±30	At least biennially
$Q_{p,rawboil,y}$	Quantity of raw or unsafe water that is still boiled after installation of the water treatment technology	90/±30	At least biennially
$Q_{p,cleanboil,y}$	Quantity of safe (treated, or from safe supply) water boiled in the project scenario p, after installation of project technology	90/±30	At least biennially
$U_{p,y}$	Usage rate in project scenario p during year y	90/±30	Annually
$I_{p,y}$	Waterborne illness incidence in the project scenario during year y	90/±30	Annually
$T_{p,y}$	Time spent to fetch and purify water by women and girls per person in the project scenario during year y	90/±30	Annually

Water Quality	Performance of the treatment technology – less than 1 Colony Forming Unit (CFU) of E.Coli / 100 ml of safe water – in unqualified rate	90/±10	Quarterly

Besides the above parameters, the following data need to be collected as per the applied methodology:

- Address or location and telephone number (mobile or landline where possible)
- The number of people served by the baseline technology and typical usage patterns and tasks (e.g. commercial, institutional, domestic, etc.)
- Types of baseline technologies used and estimated frequency
- Types of fuels used and estimated quantities
- Seasonal variations in baseline technology and fuel use
- Sources of fuels (purchased or hand-collected, etc.) and prices paid or effort made (e.g. walking distances, persons collecting, opportunity costs)

(4) Implementation plan

The main survey methods applied in the sampling plan include hardcopy questionnaires, face to face interview and telephone interview. The potential of refusals and other means of non-responses will be taken into account for calculation of sample size. Meanwhile, in order to minimize the rates of non-response and answer bias, the questionnaires will be designed by professional team and widely tested before use. In addition, baseline water boiling test as well as baseline and project water consumption field test has been conducted as per the applied methodology.

B.7.3. Other elements of monitoring plan

>>

ARDE is in charge of the implementation of the monitoring plan and reporting to the CME. The executive director of ARDE is responsible for supervising the whole monitoring procedure. The water and environment department is responsible for conducting baseline and project surveys as well as reporting to the executive director.

The CME is in charge of designing the monitoring plan and completing the monitoring report.

Training about monitoring plan will be provided to ARDE, including survey method, data record and analysis. The monitoring plan will be carried out by qualified personnel trained for quality assurance and quality control. The CME will inspect ARDE to confirm that the personnel are qualified and the monitoring plan has been properly implemented.

SECTION C. DURATION AND CREDITING PERIOD

C.1. Duration of project

C.1.1. Start date of project

>>

To be decided, which is the date of the implementation of the first unit under the VPA

C.1.2. Expected operational lifetime of project

>>

15 years 0 month

C.2. Crediting period of project

C.2.1. Start date of crediting period

>>

03/05/2021

C.2.2. Total length of crediting period

>>

5 years, twice renewable to a total of 15 years

SECTION D. SUMMARY OF SAFEGUARDING PRINCIPLES AND GENDER SENSITIVE ASSESSMENT

D.1. Safeguarding Principles that will be monitored

A completed Safeguarding Principles Assessment is in Appendix 1, ongoing monitoring is summarised below.

Principles	Mitigation Measures added to the Monitoring Plan
Principle 9.5 Hazardous and Non-hazardous Waste	Water disinfectants used in the VPA should obtain international or domestic certificate, such as CE certificate, US FDA certificate or Rwanda Standard Board certificate.

D.2. Assessment that project complies with GS4GG Gender Sensitive requirements

Question 1 - Explain how the project reflects the key issues and requirements of Gender Sensitive design and implementation as outlined in the Gender Policy?	The VPA aims to be gender sensitive in design without excluding marginalised members of society. The VPA seeks to promote gender equality at all levels. The implemented activities including the stakeholder consultation as well as the future implementation of the project activities take into the account gender roles and the abilities of women and men to participate in the decision/designs of the project activities. For the majority of households in Rwanda, water fetching, fuel collection and purification activities are handled by women. In fact, the availability of clean water in a reasonable distance is foreseen to reduce women's work load related to water purification, collection of fuel needed for boiling water and caring activities as the risk for water borne diseases. It can be further expected that sexual harassment and violence happening during fuel collection and water fetching activities may be reduced. Hence, largely women will benefit from the project activity.	
Question 2 - Explain how the project aligns with existing country policies, strategies and best practices	Project activities are in line with the goals of Rwanda national policies. Rwanda has ratified an Equal Rights Amendment into their respective constitution, which guarantees equal	

	gender rights.[18] The project activities take into the account national policies, in fact the aim is to improve the conditions of the local women and girls by providing access to clean and safe water.	
Question 3 - Is an Expert required for the Gender Safeguarding Principles & Requirements?	National Council of Women committee members were invited to attend the stakeholder consultation including discussion on Safeguarding Principles & Requirements. No other expert is required for the Safeguarding Principles & Requirements.	
Question 4 - Is an Expert required to assist with Gender issues at the Stakeholder Consultation?	National Council of Women committee members were invited to attend the stakeholder consultation. No other expert is required to assist with Gender issues at the Stakeholder Consultation.	

SECTION E. SUMMARY OF LOCAL STAKEHOLDER CONSULTATION

The below is a summary of the 2 step GS4GG Consultation for monitoring purposes. Please refer to the separate Stakeholder Consultation Report for a complete report on the initial consultation and stakeholder feedback round.

E.1. Summary of stakeholder mitigation measures

>>

The stakeholder consultation meeting was postponed due to COVID-19

E.2. Final continuous input / grievance mechanism

[18] https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/64236/90478/F238686952/RWA64236.pdf

Method	Include all details of Chosen Method (s) so that they may be understood and, where relevant, used by readers.
Continuous Input / Grievance Expression Process Book (mandatory)	
GS Contact (mandatory)	help@goldstandard.org
Other	

APPENDIX 1 - SAFEGUARDING PRINCIPLES ASSESSMENT

Complete the Assessment below and copy all Mitigation Measures for each Principle into SECTION D above. Please refer to the instructions in the Guide to Completing this Form below.

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
Principle 1. Human Rights			
1. The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights	1.No	1. Rwanda has ratified many UN Human Rights Conventions.[19] The CME and the VPA will respect related laws of Republic of Rwanda and will not lead to violations of human rights or discrimination of any kind.	1.N/A
2. The Project shall not discriminate with regards	2.No	2. The VPA is set up to include people of all genders, races,	2.N/A

[19] http://www.claiminghumanrights.org/rwanda.html?&L=0

to participation and inclusion		religions, educational backgrounds or any other aspects. The VPA will not discriminate with regards to participation and inclusion as the safe water supply is free to be used for everybody.	
Principle 2. Gender Equality			
1. The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women (a) Sexual harassment and/or any forms of violence against women – address the multiple risks of gender-based violence, including sexual exploitation or human trafficking. (b) Slavery, imprisonment, physical and	1.No	1.(a) The VPA will not directly or indirectly lead or contribute to adverse impacts on gender equality or the situation of women. In fact, the access to clean and safe water are foreseen to improve the general conditions of women and not to lead to any risk of contributing issues like sexual harassment, sexual exploitation, violence, human trafficking 1.(b) The VPA will not directly or indirectly lead to/contribute to slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls. In contrast,	1.N/A

	mental drudgery, punishment or coercion of women and girls. (c) Restriction of women's rights or access to resources (natural or economic). (d) Recognise women's ownership rights regardless of marital status – adopt project measures where possible to support to women's access to inherit and own land, homes, and other assets or natural resources.	2.No	the VPA will contribute to health and well-being of women and girls. 1.(c) Boreholes are usually located in the public place of villages for everyone to use. No one can restrict women to access or control the natural resources. The VPA will benefit to local community regardless of gender. All inhabitants of Rwanda may turn to Economic and Social Council of the United Nations for women's rights violations.[20] 1.(d) The VPA will not have any impact on women's ownership rights to inherit and own land, homes and other assets. Rwanda's progressive land ownership policy will be	2.N/A

[20] http://www.claiminghumanrights.org/rwanda.html?&L=0

2. Projects shall apply the principles of nondiscrimination, equal treatment, and equal pay for equal work (a) Where appropriate for the implementation of a Project, paid, volunteer work or community contributions will be organised to provide the conditions for equitable participation of men and women in the identified tasks/activities. (b) Introduce conditions that		applied to everybody irrespective of gender.[21] 2.(a) For maintenance work and any other eventual paid or volunteer work in the VPA, the principle of the equal pay for equal work will be applied and organized in way to provide the conditions for equitable participation of men and women. 2.(b) The VPA applies the principles of nondiscrimination and equal treatment. Pregnancy or marital status does not affect the ability of a person to engage in the VPA. 2.(c) Equal participation of women and men in the VPA activities, like using the clean	

[21] http://rema.gov.rw/rema_doc/Policies/National_land_policy_english_version_.pdf

ensure the participation of women or men in Project activities and benefits based on pregnancy, maternity/paternity leave, or marital status. (c) Ensure that these conditions do not limit the access of women or men, as the case may be, to Project participation and benefits. 3. The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in	3.No	and safe water and participating in the annual hygiene campaigns, is guaranteed. 3. Rwanda has ratified an Equal Rights into their respective constitution (FUNDAMENTAL HUMAN RIGHTS), which guarantees equal gender rights.[22] The VPA will abide by the national gender strategy. So the VPA does not involve and is not complicit in any form of discrimination based on gender difference. 4. Not applicable as no opinion	3.N/A

[22] https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/64236/90478/F238686952/RWA64236.pdf

assessing gender risks 4. (where required) Summary of opinions and recommendations of an Expert Stakeholder(s)	4.No	or recommendation is received from expert stakeholder.	4. N/A
Principle 3. Community Health, Safety and Working Conditions			
1. The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community	No	The project activities do not pose risks to the health of the community. In fact, the VPA will reduce the risk of water borne illness for local communities and indoor air pollution caused by boiling water for purification. Local communities will benefit from clean and safe water.	N/A
Principle 4.1 Sites of Cultural and Historical Heritage			
Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture?	No	There are no sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture in the Project Area.	N/A
>>			
Principle 4.2 Forced Eviction and Displacement			
Does the Project require or cause the physical or economic	No	The project activity consists of introducing clean and safe	N/A

relocation of peoples (temporary or permanent, full or partial)? >>		water and therefore no physical or economic relocation of people is involved.	
Principle 4.3 Land Tenure and Other Rights			
Does the Project require any change, or have any uncertainties related to land tenure arrangements and/or access rights, usage rights or land ownership? >>	No	The VPA rehabilitates existing boreholes that have been in place for many years. No changes to land tenure arrangements and/or rights are required.	N/A
Principle 4.4 Indigenous Peoples			
Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples? >>	No	There are no indigenous people present within the area of influence of the VPA. The VPA is not located on territory claimed by indigenous people.	N/A
Principle 5. Corruption			
1. The Project shall not involve, be complicit in or inadvertently contribute to or reinforce	No	The VPA does not involve or inadvertently contribute to or reinforce or is not complicit in any corruption. Rwanda has	N/A

corruption or corrupt Projects		ratified the UN Convention against Corruption[23] which the VPA will obey.	
Principle 6.1 Labour Rights			
1. The Project Developer shall ensure that all employment is in compliance with national labour occupational health and safety laws and with the principles and standards embodied in the ILO fundamental conventions	1.No	1. The CME follows the labour laws and policies of Rwanda. Rwanda has ratified many ILO Conventions, including convention 87 (Freedom of Association and Protection of the Right to Organise Convention), convention 98 (Right to Organise and Collective Bargaining	1.N/A
2. Workers shall be able to establish and join labour organisations	2.No	Convention), convention 29 (Forced Labour Convention) and 105 (Abolition of Forced	2.N/A
3. Working agreements with all individual workers shall be documented and implemented and	3.No	Labour Convention).[24] 2. The CME does not restrict workers to be able to establish	3.N/A

[23] https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XVIII-14&chapter=18&clang=_en

[24] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:11200:0::NO::P11200_COUNTRY_ID:103460

include: a) Working hours (must not exceed 48 hours per week on a regular basis), AND b) Duties and tasks, AND c) Remuneration (must include provision for payment of overtime), AND d) Modalities on health insurance, AND e) Modalities on termination of the contract with provision for voluntary resignation by employee, AND f) Provision for annual leave of not less than 10 days per year, not including sick and casual leave. 4. No child labour is allowed	4.No	or join Labour organisations. 3. The CME does not hire local employees. The CME will supervise local partners to follow the labour laws of Rwanda about the employees' working hours, remuneration, annual leave and so on. All employees of the CME's local partners will work voluntarily and attend trainings on health & safety. The employment model related to the VPA will be also locally and culturally appropriate. 4. The age of all the staffs hired by local partners of the CME will be checked through ID cards to make sure that no one is below 18. Rwanda has	4.N/A

	(Exceptions for children working on their families' property requires an Expert Stakeholder opinion)		ratified ILO Conventions 138 (Minimum Age Convention) and 182 (Worst Forms of Child Labour Convention)[25] which the CME and all its local partners will obey.	
5.	The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures	5. No	5. All the work will be done by appropriate equipment with properly trained workers. Emergency preparedness and response measures have been set up and all the accidents and incidents will be recorded and reported.	5. N/A
Principle 6.2 Negative Economic Consequences				
1.	Does the project cause negative economic consequences during and after project implementation?	No	1.a) At the beginning, the CME will provide fund to cover the operation cost of the VPA including expenditures beyond the project certification cycle,	N/A

[25] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:11200:0::NO::P11200_COUNTRY_ID:103460

>>		e.g. maintenance of boreholes, hygiene campaigns and monitoring. After the successful sale of carbon credits generated from the VPA, the carbon market will provide financial sustainability of the VPA. 1.b) The VPA provides clean and safe water free for everybody and therefore the VPA benefits local communities.The VPA has positive economic benefit due to less expenditure on firewood for water boiling and more job opportunities for borehole maintenance.	
Principle 7.1 Emissions			
Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	GHG emissions will be reduced through replacing water purification using firewood with access to safe water.	N/A
>>			
Principle 7.2 Energy Supply			
Will the Project use energy	No	The VPA will reduce	N/A

from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?		consumption of biomass through the reduced need to boil water. Safe water will be supplied by boreholes with hand pumps thus the VPA will not use energy from a local grid or power supply.	
>>			
Principle 8.1 Impact on Natural Water Patterns/Flows			
Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	No	The VPA does not impact natural water patterns and flows. It uses existing aquifers and does not affect the volume of water consumed by villagers.	N/A
>>			
Principle 8.2 Erosion and/or Water Body Instability			
Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion?	No	The water is taken from existing boreholes that are rehabilitated mainly for domestic use. The VPA will not cause additional erosion and/or water body instability or disrupt the natural pattern of erosion.	N/A
>>			

Principle 9.1 Landscape Modification and Soil			
Does the Project involve the use of land and soil for production of crops or other products?	No	The VPA provides safe and clean water and does not involve use of land and soil for production or crops or other products.	N/A
>>			
Principle 9.2 Vulnerability to Natural Disaster			
Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?	No	This VPA does not have any impacts that may affect vulnerability to these natural disasters.	N/A
>>			
Principle 9.3 Genetic Resources			
Could the Project be negatively impacted by or involve genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development, or take place in facilities or farms that include GMOs in their processes and production)?	No	The VPA is not relevant to the use of genetically modified organisms or GMOs since it is a borehole maintenance project.	N/A

>>			
Principle 9.4 Release of pollutants			
Could the Project potentially result in the release of pollutants to the environment? >>	No	The purpose of the VPA is to provide clean water for community residents through boreholes. The VPA is not potentially resulting in release of pollutants to the environment.	N/A
Principle 9.5 Hazardous and Non-hazardous Waste			
Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials? >>	Potential	If water quality cannot meet the requirements after borehole maintenance, chemical disinfection will be applied. So water disinfectants containing chlorine may be used in the VPA.	Water disinfectants used in the VPA should obtain international or domestic certificate, such as CE certificate, US FDA certificate or Rwanda Standard Board certificate.
Principle 9.6 Pesticides & Fertilisers			
Will the Project involve the application of pesticides and/or fertilisers? >>	No	No pesticides and/or fertilisers will be used in the VPA.	N/A
Principle 9.7 Harvesting of Forests			
Will the Project involve the harvesting of forests?	No	The VPA reduces the consumption of firewood,	N/A

>>		therefore having a positive impact on forest conservation.	
Principle 9.8 Food			
Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	No	The VPA does not have any expected effects on modification of the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives.	N/A
>>			
Principle 9.9 Animal husbandry			
Will the Project involve animal husbandry?	No	The VPA does not involve animal husbandry.	N/A
>>			
Principle 9.10 High Conservation Value Areas and Critical Habitats			
Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	No	The VPA will not cause any risk to HCV ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified. In fact, the VPA benefits biodiversity of forest by reducing the use of firewood for water boiling.	N/A
>>			
Principle 9.11 Endangered Species			

Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)? AND/OR Does the Project potentially impact other areas where endangered species may be present through transboundary affects?	No	There are no endangered species identified as potentially being present within the project boundary. The VPA is not expected to potentially impact other areas where endangered species may be present through transboundary affects.	N/A
>>			

APPENDIX 2- CONTACT INFORMATION OF VPA IMPLEMENTER

Organization name	Guangzhou Iceberg Environmental Consulting Services Co., Ltd.	
Registration number with relevant authority	91440101MA5D7TPW6A	
Street/P.O. Box	No.106 Fengze East Road, Nansha District	
Building		
City	Guangzhou	
State/Region		
Postcode	511458	
Country	The People's Republic of China	
Telephone	+86-13560420840	
E-mail	baoji@icebergchina.com	
Website	www.icebergchina.com	
Contact person	Ji BAO	
Title	General Manager	
Salutation	Mr.	
Last name	BAO	
Middle name		
First name	Ji	
Department		
Mobile	+86-13560420840	
Direct tel.		
Personal e-mail	baoji@icebergchina.com	

APPENDIX 3-SUMMARY OF APPROVED DESIGN CHANGES

Please refer to Annex A of Principles and Requirements for more information on procedures governing Design Changes

Revision History

Version	Date	Remarks
1.1	7 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Inclusion criteria table added Gender sensitive requirements added Prior consideration (1 yr rule) and Ongoing Financial Need added Safeguard Principles Assessment as annex and a new section to include applicable safeguards for clarity Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on Stakeholder Consultation information required Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption