Gold Standard for the Global Goals

Climate Security & Sustainable Development

TEMPLATE

MONITORING REPORT

PUBLICATION DATE **14.10.2020**

VERSION **v. 1.1**

RELATED SUPPORT – **TEMPLATE GUIDE Monitoring Report v. 1.1**

This document contains the following Sections

KEY PROJECT INFORMATION

Programme of Activity Information – (delete below table if N/A)

GS ID of Programme	GS1247
Title of Programme	GS1247 Improved Kitchen Regimes Multi-Country POA
Version of POA-DD applicable to this monitoring report	GS1247 IKR Micro PoA-DD CP2 v14
Name and GS ID of fully Validated CPA/VPAs (i.e. non compliance check)	GS1247 VPA 142-147 Manicaland Safe Water (GS6518 – GS6523)

Key Project Information

GS ID (s) of Project (s)	GS6518 – GS6523
Title of the project (s) covered by monitoring report	GS1247 VPA 142 Manicaland Safe Water (GS6518) GS1247 VPA 143 Manicaland Safe Water (GS6519) GS1247 VPA 144 Manicaland Safe Water (GS6520) GS1247 VPA 145 Manicaland Safe Water (GS6521) GS1247 VPA 146 Manicaland Safe Water (GS6522) GS1247 VPA 147 Manicaland Safe Water (GS6523)
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	4
Version number of the monitoring report	6
Completion date of the monitoring report	10/10/2023
Date of project design certification	23/10/2018
Date of Last Annual Report	16/12/2022
Monitoring period number	4th
Duration of this monitoring period	01/09/2021 – 31/08/2022 (All VPAs, inclusive)
Project Representative	George Syder – CO2balance
Host Country	Zimbabwe

Activity Requirements applied	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Methodology (ies) applied and version number	Technologies and Practices to displace decentralized thermal energy consumption (TPDDTEC) v1
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

Table 1 - Sustainable Development Contributions Achieved

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SDG 13 Climate Action	Emissions Reductions[1]	GS6518: 2,581 (3,580) GS6519: 2,686 (3,724) GS6520: 2,805 (3,890) GS6521: 3,309 (4,588) GS6522: 5,409 (7,500) GS6523: 3,681 (5,104) Total: 20,471 (28,386)	tCO_2e
SDG 3 Good Health and Wellbeing	Reduction in incidences of stomach related illnesses or water-borne diseases	100% (all VPAs)	IR_y
SDG 5 Gender Equality	Reduction in time spent collecting water	47.5%(all VPAs)	TR_y
SDG 6 Clean Water and Sanitation	Additional people gaining access to safe water	GS6518: 1,217 GS6519: 1,167 GS6520: 1,202 GS6521: 1,251 GS6522: 1,474 GS6523: 1,370 Total: 7,681	P_{access}

[1] Values in Brackets represent Uncapped Values and are not being claimed

Table 2 – Product Vintages

		Amount Achieved
Start Dates	**End Dates**	**tCO_2e[2]**
01/09/2021	31/12/2021	GS6518: 864 (1,194) GS6519: 900 (1,243) GS6520: 940 (1,298) GS6521: 1,113 (1,537) GS6522: 1,824 (2,519) GS6523: 1,234 (1,704) Total: 6,875 (9,495)
01/01/2022	31/08/2022	GS6518: 1,717 (2,386) GS6519: 1,786(2,481) GS6520: 1,865 (2,592) GS6521: 2,196 (3,051) GS6522: 3,585(4,981) GS6523: 2,447 (3,400) Total: 13,596 (18,891)

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

>>

CO2balance is implementing 6 micro-scale VPAs in Manicaland Province, Zimbabwe, under the Gold Standard methodology *Technologies and Practices to Displace Decentralized Thermal Energy Consumption v1*. The project activity involves rehabilitating non-functioning boreholes to provide villages with a source of safe water. This displaces the baseline method of water treatment, which involves boiling water using solid fuel. The project activity removes the need of households to rely on firewood and coal to boil water and therefore reduces CO2 emissions.

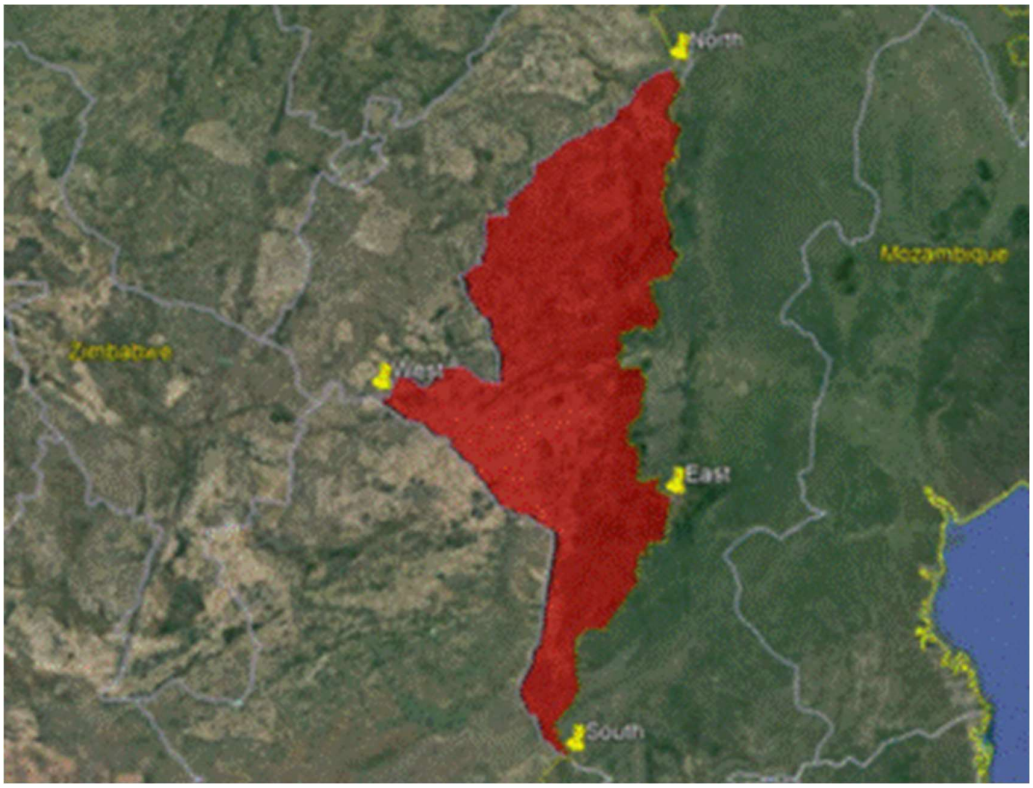
[2] Values in brackets represent Uncapped Values and are not being claimed

The 30 boreholes were rehabilitated between the 7th June 2018 and 20th July 2018. The crediting periods for each VPA are given in section A.4 and have a lifetime is 5 years, renewable. This monitoring period covers 01/09/2021 - 31/08/2022 for all boreholes, and as part of the requirements, all boreholes were checked on a quarterly basis during the period for functionality and water quality. All boreholes can be confirmed as operational with only a few problems, that needed maintenance and or repairs. Common problems were low water discharge, disconnected cylinders and leaking pipes, all which could be repaired without detriment to the water supply. A number of boreholes experienced turbidity across the monitoring period, which required flushing to amend. Three boreholes were recorded as non-functional, whilst a total 26 boreholes underwent maintenance at some point during the monitoring period, for a total of 49.1 non-functional days. Full details can be seen in section B.1.

A.2. Location of project

>>

This project is located in Manicaland Province, the easternmost province of Zimbabwe. Below is the geographic reference to allow unique identification of the project boundary. The target area and the fuel collection area are defined as being contained within project boundary, with the outer limits of the project boundary being clearly defined below. As the majority of beneficiaries collect their wood fuel locally in close proximity to their homesteads, the wood fuel collection area and target area are considered the same.


North
Mozambique
Zimbabwe
East
South

Project Area Coordinates		
	Latitude	Longitude
North	17°14'47.24"S	32°59'39.30"E
South	21°19'41.42"S	32°28'47.67"E
East	19°47'49.71"S	33° 3'15.79"E
West	19°14'8.05"S	31°12'55.35"E

A.3. Reference of applied methodology

>>

The applied methodology is Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1.0 (TPDDTEC).

A.4. Crediting period of project

>>

GS6518: 21/06/2018 – 20/06/2023

GS6519: 10/06/2018 – 09/06/2023

GS6520: 09/06/2018 – 08/06/2023

GS6521: 29/06/2018 – 28/06/2023

GS6522: 08/06/2018 – 07/06/2023

GS6523: 21/06/2018 – 20/06/2023

Each crediting period has a length of 5 years, as approved under the VPA-PDD.

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

>>

In partnership with Diocese of Mutare Community Care Programme (DOMCCP), CO2balance UK Ltd is implementing a number of Micro-Scale Voluntary Project Activities under PoA 1247 in Manicaland Province which are eligible under the Gold Standard methodology *Technologies and Practices to Displace Decentralized Thermal Energy Consumption version 1*. Local people typically use wood fuel on inefficient three stone fires for cooking and water purification, which results in the release of greenhouse gas emissions from the combustion of wood. This can be avoided if a technology that does not require fuel (wood or fossil) supplies clean water desired by households.

Manicaland is a largely rural province in which local people typically use wood fuel on inefficient three-stone fires to purify their drinking, cleaning and washing water. This process results in the release of greenhouse gas emissions from the combustion of wood. This can be avoided if a technology that does not require fuel (wood or fossil), supplies the clean water desired by households. Many existing boreholes are owned by community groups and have fallen into disrepair because maintenance programmes have been poorly managed or proven too expensive. In this project CO2balance UK Ltd, work with community groups and a local NGO partner, DOMCCP in this province, to identify broken down boreholes and renovate them so that they deliver clean, safe water and breakdowns are fixed rapidly.

The date of rehabilitation was confirmed by a Repair Confirmation Form, which was signed by the mechanic employed by the local NGO partner, carrying out the repair along with an elected representative of the community group owners of the borehole. The date of rehabilitation was used as the start date of operation and crediting for each borehole; we have conservatively assumed that the first day of crediting is not counted (see table below).

Borehole ID	BH Name	Rehab Date	Crediting Start Date
GS6518 - VPA 142			
CHI006	Mujeke	20/06/2018	21/06/2018
CHI008	Gezahle	07/07/2018	08/07/2018

CHI012	Kubiri 3	19/07/2018	20/07/2018
CHI009	Zambangoma	08/07/2018	09/07/2018
MUT006	Mukuni South Primary School	27/06/2018	28/07/2018
GS6519 - VPA 143			
CHI004	Moodies Rest / Jopa	09/06/2018	10/06/2018
CHI003	Hanganyi	09/06/2018	10/06/2018
CHI007	Ngatitonge 3	20/06/2018	21/06/2018
MUT005	Mutepfa	26/06/2018	27/06/2018
MUT015	Gurumidzo	09/07/2018	10/07/2018
GS6520 - VPA 144			
CHI002	Singizi	08/06/2018	09/08/2018
CHI005	Zamchiya	19/06/2018	20/06/2018
MUT004	Chinyamagona	22/06/2018	23/06/2018
MUT008	Mbabvu	28/06/2018	29/06/2018
MUT003	Chinyudze	21/06/2018	21/06/2018
GS6521 - VPA 145			
CHI010	Mutii	10/07/2018	11/07/2018
CHI011	Gogodo / Botani	17/07/2018	18/07/2018
MUT012	Kwaedza Mahihii	06/07/2018	07/07/2018
MUT011	Muroti Junction	05/07/2018	06/07/2018
MUT009	Musara Diptank	28/06/2018	29/06/2018
GS6522 - VPA 146			
MUT013	Warehouse Mahihii	06/06/2018	07/06/2018
CHI001	Mbire Borehole Chikwanda	07/06/2018	08/06/2018
MUT016	Mutandati	18/07/2018	19/07/2018
MUT007	Mukuni South Secondary School	27/06/2018	28/06/2018
MUT002	Masinga	21/06/2018	22/06/2018
GS6523 - VPA 147			
MUT010	Zvebocha	05/07/2018	06/07/2018
CHI014	Rukangare 1	20/07/2018	21/07/2018
CHI013	Matosi	19/07/2018	20/07/2018
MUT014	Mudzere	09/07/2018	10/07/2018
MUT001	Chitora	20/06/2018	21/06/2018

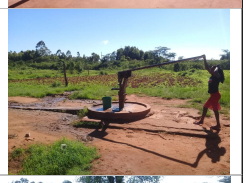
The boreholes included under the project are entirely human operated and fitted with hand pump B-Type Bush Pump model. The depth of the boreholes are limited to 100m or less.

	B-Type Bush Pump
Cylinder diameter (mm):	75 (3-25m depth) 63.5 (20-45m depth) 50 (40-80m depth)
Maximum Stroke (mm):	200-250
Approx. discharge (75 watt input):	at 10 m head: 1.4 m³/hour,

	at 15 m head: 1.1 m^3/hour,
	at 25 m head: 0.8 m^3/hour,
	At 30 m head: 0.7 m^3/hour
Pumping lift (m):	5-80
Water consumption (lpcd):	15-20
Max number of Users	~300

The number of days each borehole credited for in this monitoring period was multiplied by the number of people using the borehole to give the total number of project technology days for that borehole. The individual project technology days for each borehole were totaled to give the total number of project technology days for this monitoring period. The 30 boreholes were rehabilitated between the 7th June 2018 to the 20th July 2018, which began crediting for this report on 1st September 2021. The following table details pertinent information for each borehole in the project and groups them by VPA:

Borehole ID	BH Name	Ward	District	Latitude	Longitude	Pump model	Photo
GS6518 - VPA 142							
CHI006	Mujeke	23	Chipinge	-20.4359	32.29455	B-Type Bush Pump	
CHI008	Gezahle	23	Chipinge	-20.3669	32.7633	B-Type Bush Pump	
CHI012	Kubiri 3	23	Chipinge	-20.50943	32.24554	B-Type Bush Pump	
CHI009	Zambangoma	23	Chipinge	-20.34121	32.27131	B-Type Bush Pump	

MUT006	Mukuni South Primary School	8	Mutare	-19.26193	32.10097	B-Type Bush Pump	
GS6519 - VPA 143							
CHI004	Moodies Rest / Jopa	6	Chipinge	-20.05571	32.38597	B-Type Bush Pump	
CHI003	Hanganyi	6	Chipinge	-20.08009	32.37225	B-Type Bush Pump	
CHI007	Ngatitonge 3	25	Chipinge	-20.45566	32.25372	B-Type Bush Pump	
MUT005	Mutepfa	8	Mutare	-19.32916	32.09962	B-Type Bush Pump	
MUT015	Gurumidzo	16	Mutare	-19.34893	32.20642	B-Type Bush Pump	
GS6520 - VPA 144							
CHI002	Singizi	6	Chipinge	-20.09505	32.40301	B-Type Bush Pump	
CHI005	Zamchiya	23	Chipinge	-20.42095	32.28346	B-Type Bush Pump	
MUT004	Chinyamagona	16	Mutare	-19.34987	32.13127	B-Type Bush Pump	

MUT008	Mbabvu	8	Mutare	-19.2618	32.11263	B-Type Bush Pump	
MUT003	Chinyudze	8	Mutare	-19.4387	32.1614	B-Type Bush Pump	
GS6521 - VPA 145							
CHI010	Mutii	25	Chipinge	-20.39429	32.25229	B-Type Bush Pump	
CHI011	Gogodo / Botani	25	Chipinge	-20.47646	32.25409	B-Type Bush Pump	
MUT012	Kwaedza Mahihii	16	Mutare	-19.40851	32.14078	B-Type Bush Pump	
MUT011	Muroti Junction	16	Mutare	-19.26213	32.10997	B-Type Bush Pump	
MUT009	Musara Diptank	8	Mutare	-19.26953	32.05493	B-Type Bush Pump	
GS6522 - VPA 146							
MUT013	Warehouse Mahihii	16	Mutare	-19.4117	32.1443	B-Type Bush Pump	
CHI001	Mbire Borehole Chikwanda	6	Chipinge	-20.1113	32.3382	B-Type Bush Pump	

MUT016	Mutandati	16	Mutare	-19.36048	32.21465	B-Type Bush Pump	
MUT007	Mukuni South Secondary School	8	Mutare	-19.29666	32.10882	B-Type Bush Pump	
MUT002	Masinga	16	Mutare	-19.43871	32.16143	B-Type Bush Pump	
GS6523 - VPA 147							
MUT010	Zvebocha	16	Mutare	-19.2639	32.07301	B-Type Bush Pump	
CHI014	Rukangare 1	25	Chipinge	-20.47181	32.23446	B-Type Bush Pump	
CHI013	Matosi	25	Chipinge	-20.51349	32.25815	B-Type Bush Pump	
MUT014	Mudzere	16	Mutare	-19.40369	32.13617	B-Type Bush Pump	
MUT001	Chitora	16	Mutare	-19.4493	32.16885	B-Type Bush Pump	

The project is monitored quarterly by trained field staff from DOMCCP, in coordination with CO2balance. The field staff record whether a borehole is functional or non-functional, the date of breakdown including the reason for the breakdown.

Subsequently, when any non-functional boreholes are repaired, a repair confirmation form is completed detailing the repair carried out and the date of repair. These breakdowns and issues are reported using the KoboCollect app, and also allow field staff to indicate whether an issue has caused a complete breakdown, or whether there is a reduction in capacity of the borehole. A summary of failure days is shown in the table below. Additionally, a further cap on Project Technology Days of 95% recorded has been imposed to account for any error. A summary of failure days is shown in the table below:

Borehole ID	GS ID	BH Name	First day non-functional	Last day non-functional	Details	Total Days Not Crediting in MP4
MUT013	GS6522	Warehouse Mahihii	18/03/2022	27/03/2022	Replacement of Leaking Pipes	10 (100% Capacity Reduction)
MUT012	GS6521	Kwaedza Mahihii	01/08/2022	18/08/2022	Replace Cylinder	6.1 (30% Capacity Reduction + 1 day for repair)
MUT016	GS6522	Mutandati	12/08/2022	18/08/2022	Fixing loosened Pipes	7

In addition, repairs and services have also been conservatively assumed as one non-crediting day each. This has been summarized below:

Borehole ID	GS ID	BH Name	Maintenance Conducted	Date
CHI006	GS6518	Mujeke	Signage Installed	08/07/2022
CHI008	GS6518	Gezahle	Signage Installed	09/07/2022
CHI012	GS6518	Kubiri 3	Signage Installed	08/07/2022
CHI004	GS6519	Moodies Rest / Jopa	Signage Installed	07/07/2022
CHI003	GS6519	Hanganyi	Signage Installed	07/07/2022
CHI007	GS6519	Ngatitonge 3	Signage and Wall Installation	09/07/2022
MUT005	GS6519	Mutepfa	Signage Installed	18/08/2022

MUT015	GS6519	Gurumidzo	Signage Installed	17/08/2022
CHI002	GS6520	Singizi	Pipe and Rod Replaced	25/08/2022
MUT004	GS6520	Chinyamagona	Signage Installed	19/08/2022
MUT008	GS6520	Mbabvu	Signage Installed	19/08/2022
MUT003	GS6520	Chinyudze	Signage Installed	19/08/2022
CHI010	GS6521	Mutii	Signage Installed	09/07/2022
CHI011	GS6521	Gogodo / Botani	Signage Installed	09/07/2022
MUT011	GS6521	Muroti Junction	Signage Installed	17/08/2022
MUT009	GS6521	Musara Diptank	Signage Installed	19/08/2022
MUT013	GS6522	Warehouse Mahihii	Signage Installation	18/08/2022
CHI001	GS6522	Mbire Borehole Chikwanda	Signage Installed	07/07/2022
MUT002	GS6522	Masinga	Signage Installed	19/08/2022
MUT010	GS6523	Zvebocha	Signage Installed	17/08/2022
CHI014	GS6523	Rukangare 1	Signage Installed	09/07/2022
CHI013	GS6523	Matosi	Signage Installed	09/07/2022
MUT014	GS6523	Mudzere	Signage Installed	17/08/2022
MUT001	GS6523	Chitora	Apron Construction	03/04/2022
MUT001	GS6523	Chitora	Signage Installed	19/08/2022

Furthermore, a summary of maintenance activities is included in the latest version of the Emissions Reductions Calculation spreadsheet ('Zimbabwe_MP4_ER_calcs' - tab 'Maintenance').

B.1.1. Forward Action Requests

>> The below table highlights the Forward Action Requests received:

Project Phase	GS Review	Date	FAR
1	Verification 2	Jan-21	#1: The PP must monitor the number of users as required by the methodology.
			#2: PD to provide full transparency on maintenance programme roles and responsibilities. This should include: the process of recording and reporting all faults/breakdowns and when a borehole starts working again. It should also include a summary of all planned annual maintenance tasks and the downtime expected for these tasks. Future monitoring reports must have % total borehole downtime (and days) recorded transparently in Project Technology Days parameter box.
			#3: PD to update their usage survey format to capture seasonality and supply a copy for SustainCERT approval prior to conducting the study.

Each FAR has been addressed as summarized below:

FAR #1: Household List recollection has been scheduled within the monitoring programme and collected annually.

FAR #2: Section B.1 has been updated to include a description of the maintenance programme, including data collection procedures, including all faults recorded throughout the monitoring period.
FAR #3: A new usage survey has been implemented in this project, with confirmation of seasonality from SustainCert provided to the VVB.

B.2. Post-Design Certification changes

>>

B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

>>
No temporary deviations have been made during this monitoring period.

B.2.2. Corrections

>> Under the ongoing SWS Grievance review between GS and CO2balance, a temporary cap has been implemented to fixed ex-ante parameters (Wb,y), as well as to parameters monitored throughout the crediting period. The temporary caps are as follows:

- Wb,y - 0.0004T/L
- Wp,y - 0.0004T/L
- Project usage rate, Up,y – 90%
- Project user numbers - 300 users.

PP applied these caps to the ER calculations and MR as the means of presentation agreed between GS and the PP for the duration of the BAMG review.

B.2.3. Changes to start date of crediting period

>> No changes have been made to the start date of the crediting period for this monitoring period.

B.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

>> No permanent changes have been made for this monitoring period.

B.2.5. Changes to project design of approved project

>> No changes to the project design have been made for this monitoring period.

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

>> The Project monitors the contribution towards 4 SDG indicators:

SDG 3: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

SDG 5: 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.

SDG 6: By 2030, achieve universal and equitable access to safe and affordable drinking water for all.

SDG 13: 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

All surveys are administered by trained CO2balance staff and partner NGOs that are local to the area and conversant in the local dialects to ensure that the responses are consistent and not biased by any regional language barriers. Each participant is provided with a briefing on the purpose of the survey and is assured that no individual names are used in the analysis.

The results of the surveys are collated in Excel spreadsheets and stored on a central server in an electronic format then is sent to the UK head office for data analysis. The documentation procedure devised ensures a minimum chance of original data being lost – all original copies of our project documentation are retained in the Mutare office and are available scanned upon request of the UK team.

In accordance with the Gold Standard methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1, the survey samples are randomly selected from the borehole user record. Each borehole user is assigned a unique random number which is then sorted in order from lowest to highest; the first

nth HHs are selected for the survey. The size of the RSG is dependent on the methodological requirements and variance of the parameter being monitored to ensure the parameters measured satisfy 90/30 precision (90% confidence interval and 30% margin of error). The RSG is reselected for every monitoring period to ensure the selection remains random.

Below is a summary of the key information that has been collected and monitored as part of this project:

Borehole database

The borehole installation/rehabilitation record includes the following information:

- Date of installation/rehabilitation
- GPS location of the borehole
- Model of the borehole
- Quantity of boreholes installed
- The total number of people obtaining their water from each borehole
- Mode of use: commercial/domestic

The total number of households using each borehole has been determined through the lists supplied by the community group and district officials. DOMCCP further conducts studies to screen and determine the exact number of people the rehabilitated boreholes. Using this method, the total number of people using each borehole has been fixed and hence a figure for person days can be calculated.

Ongoing Monitoring Studies

The following ongoing monitoring studies were conducted; the results are given in the parameter boxes tables in Section 6.

- **Water consumption field test** (Equation parameters Qp,y and Qp,rawboil,y) – The WCFT was conducted during April 2021 and sampled 40 households. As the WCFT is conducted biennially, the next survey is not due to take place until 2023 (MP5).

- **Quality of the treated water** - Water quality tests were conducted on all boreholes in the project area following rehabilitation and all were within levels considered acceptable for domestic human consumption as per the WHO guidelines. Testing took place quarterly for boreholes in the Mutare and Chipinge Districts.

- **Usage Survey** – This survey was conducted during March/April 2022, with additional surveys carried out in August 2022 and sampled the minimum number of 100 households.

- **Project Survey** – This survey was conducted during March/April 2022, with additional surveys carried out in August 2022 and sampled the minimum number of 100 households.

- **Leakage assessment -** Sources of leakage detailed within the methodology relevant to this project have been reviewed.

Individual participants were selected from the borehole user data base using the random sampling process outlined in the monitoring plan. Sample sizes are in line with the Gold Standard requirements.

Leakage Assessment

In line with the monitoring requirements, a leakage assessment is conducted biennially and has therefore been included in this report. The potential sources of leakage listed in the methodology have been investigated, and addressed below:

a) 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.

In all cases the baseline technologies displaced are three stones; these have no market value and are not a product as such. There is nothing limiting the use of three stone cooking across the country (the technology is lowest rung on the energy ladder and the price is zero), which is why this cooking method is so widespread. In any case the primary purpose of these three rocks is for cooking so they will not be replaced/displaced in their entirety as a result of this project - which means they will not be reused outside the project boundary. This leakage source can therefore be discounted.

b) The non-renewable biomass or fossil fuels saved under the project activity are used by non-project users who previously used lower emitting energy sources.

There is no evidence to suggest significant (if any) use of renewable energy for purifying water in the project region as found in the Baseline Water Surveys.

Renewable energy used for purifying water would likely be animal dung or crop residues which will be used due to ease of availability/proximity to the home rather than due to a shortage of wood fuel, therefore it is an independent factor. This leakage source can therefore be discounted.

c) 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.

As most participants collect wood from within the project boundary, it is not expected that the NRB in other areas will be affected. There are currently no other CDM or VER projects in the project area.

d) 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 for purification purposes will be minimal, as the predominant use of baseline technology is for cooking. Therefore, it is highly unlikely that another technology will be used for heating when users no longer boil water.

e) 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.

This project is not marketing efficient technology; it is eliminating the need for a fuel-based technology to deliver pure water. Lower emission technology substitution within households is therefore not possible and this leakage source can therefore be discounted.

SECTION D. DATA AND PARAMETERS

D.1. Data and parameters fixed ex ante or at renewal of crediting period

>>

Data/parameter	EF_{fuel}
Unit	tCO2/TJ
Description	CO2 emission factor arising from use of wood-fuel in baseline scenario (includes production, transport and use)
Source of data	Calculated from IPCC defaults
Value(s) applied	112
Choice of data or Measurement methods and procedures	IPCC defaults IPC 2006 Guidelines, Volume 2, Chapter 2, Table 2.2 – Wood/Wood Waste https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf
Purpose of data	EFfuel was used in accordance with the methodology as a methodology default value
Additional comment	

Data/parameter	EF_{fuel} (non-CO_2)
Unit	tCO_2/TJ
Description	Non-CO_2 emission factor arising from use of wood-fuel in baseline scenario (includes production, transport and use)
Source of data	Calculated from IPCC defaults http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html#table-2-14
Value(s) applied	9.46
Choice of data or Measurement methods and procedures	IPCC defaults

Purpose of data	EF_{fuel} was used in accordance with the methodology as a methodology default value. For project activities starting from 01/01/2013, the most update figure of 8.692 is used for this parameter as per guidance from the GS TAC and GS Guidance. For all vintages 2021 onwards, an updated value of 9.46 is used based on updated Global Warming Potential published in the IPCC AR5 report.
Additional comment	

Data/parameter	NCV_{fuel}
Unit	TJ/ton
Description	Net calorific value of the fuels used in the baseline.
Source of data	IPCC defaults https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf Page 1.18 Table 1.2
Value(s) applied	0.0156
Choice of data or Measurement methods and procedures	IPCC defaults
Purpose of data	NCV_{fuel} was used in accordance with the methodology as a methodology default value.
Additional comment	

Data/parameter	fNRB
Unit	Non-Renewability Fraction
Description	Non-renewability status of woody biomass fuel in scenario i during year y
Source of data	The NRB assessment has been carried out by an independent consultant in accordance with the methodology.

Value(s) applied	0.97
Choice of data or Measurement methods and procedures	CDM Default National Figure
Purpose of data	Default NRB value was used in accordance with the methodology. NRB is fixed for the project unless reassessed in future as per PP requirements.
Additional comment	

Data/parameter	Wb,y
Unit	T/L
Description	Quantity of fuel that is used to treat 1 litre of water in the baseline scenario b during year y
Source of data	GS
Value(s) applied	0.0004 CAPPED
Choice of data or Measurement methods and procedures	Capped value from GS grievance review
Purpose of data	Calculate ERs
Additional comment	

Data/parameter	Wp,y
Unit	T/L
Description	Quantity of fuel that is used to treat 1 litre of water in the project scenario p during year y
Source of data	GS
Value(s) applied	0.0004 CAPPED

Choice of data or Measurement methods and procedures	Capped value from GS grievance review
Purpose of data	Calculate ERs
Additional comment	

Data/parameter	Xboil Non Suppressed Demand
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 study conducted in February and March 2018. Credible literature, studies, survey, reports, relevant to the project target area
Value(s) applied	0
Choice of data or Measurement methods and procedures	Suppressed demand will be determined through a set of questions in the project survey that establish the method households use to purify their water, if any, and how they would choose to purify if they were not subject to monetary and access barriers. This is in line with the Gold Standard principles of suppressed demand outline in annex 2. A fixed suppressed demand baseline has been opted for, however, in the event the project surveys show a substantial change in fuel use characteristics, a new baseline shall be conducted.
Purpose of data	To establish the number of households who, if they had access to a means of purifying water, would purify using a non-GHG emitting method (such as chlorination tablets) and thus calculate an accurate suppressed demand figure.
Additional comment	

Data/parameter	C_j

Unit	Percentage
Description	Portion of users of project safe water supply who were already in baseline using a non-boiling safe water supply
Source of data	Baseline Study conducted in February and March 2018. Credible literature, studies, survey, reports, relevant to the project target area
Value(s) applied	1.76%
Choice of data or Measurement methods and procedures	Established through questions in the baseline on a representative sample of the end users
Purpose of data	To calculate the additional number of persons having access to safe water in the project activity compared to the baseline scenario
Additional comment	

Data / Parameter	$T_{b,y}$
Unit	Minutes
Description	Time spent collecting water and fuel per household per day before project activity
Source of data	Baseline Survey conducted in February and March 2018.
Value(s) applied	72
Measurement methods and procedures	Calculated from question 15 of the baseline survey
Monitoring frequency	Annually
QA/QC procedures	Guidance is always provided to all members of the projects team by senior project staff on the procedure and importance of collecting accurate monitoring information. Quality of data uploaded is assured by cross-checking against scans of the survey sheets by another member of the projects team to ensure no data entry errors have occurred.

Purpose of data	To calculate TR_y and quantify whether the project has contributed to a reduction in the amount of time spent collecting water and fuel compared to the pre-project scenario.
Additional comment	

D.2. Data and parameters monitored

>>

Data / Parameter	Np,y
Unit	Project Technology Days
Description	Number of persons consuming water supplied by project scenario p through year y
Source of data	Borehole Project Database
Value(s) applied	GS6518: 451,422 (515,112) GS6519: 432,432 (535,808) GS6520: 445,536 (559,787) GS6521: 461,842 (660,181.8) GS6522: 541,500 (1,079,133) GS6523: 507,585 (734,357) Total: 2,840,317 (4,084,388.8) Number of Failure Days (% of MP) GS6518: 3 (<1%) GS6519: 5 (<1%) GS6520: 5 (<1%) GS6521: 10.1 (1%) GS6522: 20 (1%) GS6523: 6 (<1%) Total : 49.1 (<1%)
Measurement methods and procedures	Borehole users * Total crediting days
Monitoring frequency	Annual
QA/QC procedures	Guidance is always provided to all members of the projects team by senior project staff on the procedure and importance of collecting accurate monitoring information. Quality of data uploaded is assured by cross-checking against scans of the survey sheets by

	another member of the projects team to ensure no data entry errors have occurred.
Purpose of data	Calculate ERs
Additional comment	CAPPED at 95%

Data / Parameter	$U_{p,y}$
Unit	Percentage
Description	Usage rate in project scenario p through year y
Source of data	Annual Usage Survey
Value(s) applied	92.37%
Measurement methods and procedures	$U_{p,y}$ = Number of users of the borehole / Total number of households surveyed
Monitoring frequency	Annual
QA/QC procedures	Guidance is always provided to all members of the projects team by senior project staff on the procedure and importance of collecting accurate monitoring information. Quality of data uploaded is assured by cross-checking against scans of the survey sheets by another member of the projects team to ensure no data entry errors have occurred. The usage survey has been carried out by staff from in-country partner DOMCCP to meet the specific requirements of the methodology. All data presented in Excel is subject to checking and cross referencing of a sample of the raw data by the project developers.
Purpose of data	Calculate ERs
Additional comment	

Data / Parameter	Tp,y
Unit	Minutes
Description	Time spent collecting water per household per day in project

Source of data	Project Survey
Value(s) applied	37.8 (all VPAs)
Measurement methods and procedures	Project Survey Question 18 & 19
Monitoring frequency	Annual
QA/QC procedures	Guidance is always provided to all members of the projects team by senior project staff on the procedure and importance of collecting accurate monitoring information.
Purpose of data	Calculate SDG 5
Additional comment	

Data / Parameter	TR_y
Unit	Percentage
Description	Total reduction time spent collecting water for project activity in year y (%)
Source of data	Annual Project Survey
Value(s) applied	47.5% (All VPAs)
Measurement methods and procedures	-
Monitoring frequency	Annual
QA/QC procedures	
Purpose of data	To quantify whether the project has contributed to a reduction in the amount of time spent collecting water compared to the pre-project scenario
Additional comment	

Data / Parameter	Usage of time saved on water collection
Unit	Percentage
Description	Uses of time saved which was previously spent on water collection

Source of data	Annual Project Survey
Value(s) applied	1. (Unpaid) Domestic work (includes cooking and caring for family members): 97% 2. Income generating activities: 20% 3. Religious activities: 1% 4. Social and leisure activities: 0% 5. Voluntary activities: 0% 6. Education and training: 0% 7. Other (Specify): 0%
Measurement methods and procedures	Measured; Ask users how time saved on water collection in the project scenario, as opposed to the baseline scenario, is now being used.
Monitoring frequency	Annual
QA/QC procedures	
Purpose of data	To quantify how time which was previously spent on water collection is now being used
Additional comment	

Data / Parameter	Ip,y
Unit	%
Description	Percentage of the population experiencing water-related illnesses in the project scenario
Source of data	Project Survey
Value(s) applied	0 (All VPAs)
Measurement methods and procedures	Project Survey Question 16
Monitoring frequency	Annual
QA/QC procedures	Guidance is always provided to all members of the projects team by senior project staff on the procedure and importance of collecting accurate monitoring information.
Purpose of data	Calculate SDG 3
Additional comment	

Data / Parameter	P_y
Unit	Number
Description	Number of persons consuming safe water
Source of data	Household Lists
Value(s) applied	GS6518: 1,239 (1,414) GS6519: 1,188 (1,472) GS6520: 1,224 (1,538) GS6521: 1,273 (1,821) GS6522: 1,500 (2,983) GS6523: 1,395 (2,018)
Measurement methods and procedures	Sum of the total number of people using each borehole in the project. The total number of households using each borehole will be established through lists supplied by the water resource committee and/or community group and/or district officer responsible for that borehole. Using this method, the total number of people using each borehole will be known.
Monitoring frequency	Annual
QA/QC procedures	
Purpose of data	Determination of number of persons using safe water.
Additional comment	

Data / Parameter	P_{access}
Unit	Number
Description	Number of additional persons having access to safe water in the project activity compared to the baseline scenario.
Source of data	Household Lists; Usage Survey
Value(s) applied	GS6518: 1,217 GS6519: 1,167 GS6520: 1,202

	GS6521: 1,251 GS6522: 1,474 GS6523: 1,370
Measurement methods and procedures	Borehole users * Usage rate
Monitoring frequency	Annual
QA/QC procedures	
Purpose of data	To calculate the additional number of persons having access to safe water in the project activity compared to the baseline scenario
Additional comment	

Data / Parameter	Qp,y
Unit	Litres per household per day
Description	Quantity of safe water supplied in the project scenario p during the year y using the zero or low emissions clean water supply technology
Source of data	Water Consumption Field Test (WCFT)
Value(s) applied	7.5 CAPPED (11.37 ACTUAL; all VPAs)
Measurement methods and procedures	Method used similar to Kitchen Performance Test in which the volume of water consumed in each household is averaged over 3 days. The WCFT is carried out by staff trained by CO2balance and local in- country partner DOMCCP to meet the specific requirements of the methodology. All data presented in Excel is subject to checking and cross referencing of a sample of the raw data by the project developers.
Monitoring frequency	Biennial (Last conducted April 2021)
QA/QC procedures	
Purpose of data	To calculate the additional number of persons having access to safe water in the project activity compared to the baseline scenario
Additional comment	Value Capped at 7.5

Data / Parameter	Qp,cleanboil,y
Unit	Litres per household per day
Description	Quantity of safe water boiled in the project scenario p during the year y using the zero or low emissions clean water supply technology
Source of data	Water Consumption Field Test (WCFT)
Value(s) applied	0 (all VPAs)
Measurement methods and procedures	Method used similar to Kitchen Performance Test in which the volume of water consumed in each household is averaged over 3 days. The WCFT has been carried out by staff trained by CO2balance and local in-country partner DOMCPP to meet the specific requirements of the methodology. All data presented in excel is subject to checking and cross referencing of a sample of the raw data by project developers.
Monitoring frequency	Biennial (Last conducted April 2021)
QA/QC procedures	
Purpose of data	Calculate ERs
Additional comment	

Data / Parameter	Qp,rawboil,y
Unit	Litres per household per day
Description	The raw of unsafe water that is still boiled after installation of the water treatment technology
Source of data	Water Consumption Field Test (WCFT)
Value(s) applied	0 (all VPAs)
Measurement methods and procedures	Method used similar to Kitchen Performance Test in which the volume of water consumed in each household is averaged over 3 days. The WCFT has been carried out by staff trained by CO2balance and local in-country partner DOMCPP to meet the specific requirements of the methodology. All data presented in excel is subject

	to checking and cross referencing of a sample of the raw data by project developers.
Monitoring frequency	Biennial (Last conducted April 2021)
QA/QC procedures	
Purpose of data	Calculate ERs
Additional comment	

Data / Parameter	LEp,y
Unit	tCO2e per year
Description	Leakage in project scenario p during year y
Source of data	Baseline and monitoring surveys
Value(s) applied	0 (all VPAs)
Measurement methods and procedures	Measured
Monitoring frequency	Annual
QA/QC procedures	
Purpose of data	Calculate ERs
Additional comment	

D.3. Comparison of monitored parameters with last monitoring period

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
Ip,y	0%	0%
Tp,y	37.8 (All VPAs)	40.2 (All VPAs)
TRy	47.5% (All VPAs)	44.2% (All VPAs)
Usage of time saved on water collection	1. (Unpaid) Domestic work (includes cooking and caring for family members): 97% 2. Income generating activities: 20% 3. Religious activities: 1%	1. (Unpaid) Domestic work (includes cooking and caring for family members): 97% 2. Income generating activities: 20% 3. Religious activities: 1%

	4. Social and leisure activities: 0% 5. Voluntary activities: 0% 6. Education and training: 0% 7. Other (Specify): 0% (All VPAs)	4. Social and leisure activities: 0% 5. Voluntary activities: 2% 6. Education and training: 0% 7. Other (Specify): 0% (All VPAs)
Py	GS6518: 1,239 GS6519: 1,188 GS6520: 1,224 GS6521: 1,273 GS6522: 1,500 GS6523: 1,395	GS6518: 1,239 GS6519: 1,188 GS6520: 1,224 GS6521: 1,273 GS6522: 1,500 GS6523: 1,395
P_{access}	GS6518: 1,217 GS6519: 1,167 GS6520: 1,202 GS6521: 1,251 GS6522: 1,474 GS6523: 1,370	GS6518: 1,217 GS6519: 1,167 GS6520: 1,202 GS6521: 1,251 GS6522: 1,474 GS6523: 1,370
Quality of Treated Water	Pass (All VPAs)	Pass (All VPAs)
Np,y	GS6518: 451,422 GS6519: 432,432 GS6520: 445,536 GS6521: 461,842 GS6522: 541,500 GS6523: 507,585	GS6518: 438,590 GS6519: 418,114 GS6520: 437,115 GS6521: 462,615 GS6522: 531,600 GS6523: 455,775
Up,y	92.37% (All VPAs)	84.65% (All VPAs)
Qp,y	7.5 CAPPED (11.37 ACTUAL; All VPAs)	7.5 CAPPED (11.37 ACTUAL; All VPAs)
Qp,cleanboil,y	0 (All VPAs)	0 (All VPAs)
Qp,rawboil,y	0 (All VPAs)	0 (All VPAs)
LEp,y	0 (All VPAs)	0 (All VPAs)
Failure Days,y	49.1 (Combined All VPAs)	425 (Combined All VPAs)

D.4. Implementation of sampling plan

>>

The project proponent has elected to cross-sample technologies across all its homogenous borehole VPAs located within Mutare and Chipinge districts. The samples for the surveys analysed below are randomly selected from the borehole information databases using the RSG procedure previously explained in line with the minimum sample size requirements as defined by the methodology, and cover VPA, borehole and household levels. The random sampling procedure is as follows. Following 90/30 precision, achieved using Raosoft Sample Size Calculator, it was found that 7 of the 30 homogenous boreholes to be selected for inclusion in the surveys. These 7 boreholes were selected by generating a random list of numbers on the Research Randomizer online resource. An aggregate list was then generated of the borehole users in the 7 randomly selected boreholes, and these were ordered according to a new random list of numbers, again generated using Research Randomizer. The aggregate list was then reordered according to random number and the first 120 users selected for the Project Survey and Usage Survey (a selection of 100, with an extra 20 as buffer). The usage survey was conducted between 27/07/2022 and 03/04/2022, with additional surveys carried out between 17/08/2022 and 27/08/2022. The project survey was conducted between 27/07/2022 and 03/04/2022, with additional surveys carried out between 17/08/2022 and 27/08/2022. The WCFT was conducted in April 2021 and is conducted biennially, as such was not conducted during this monitoring period.

The surveys have been conducted to ensure that they are within the end date of the respective monitoring periods for the VPAs.

SECTION E. CALCULATION OF SDG IMPACTS

E.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

>>

SDG 3 - Good Health and Wellbeing

$I_{b,y}$	Percentage of incidences of stomach related illnesses or water-borne diseases prior to project activity (%)

To establish $I_{b,y}$, the Baseline Survey asks the following:

17	Do you or your family ever suffer from stomach related illnesses/water-borne diseases and how often does this occur?	1. Never
		2. Once every few months
		3. Once per month
		4. Several times per month
		5. Weekly
		6. Everyday

$I_{b,y}$ for All VPAs = 88%

SDG 5 - Gender Equality

By ensuring that there is a safe water source at the centre of communities, the projects reduce the *time poverty* of women, because the time burden of collecting water, which falls disproportionately on women, is reduced. As the safe water sources are located centrally within communities, closer to public institutions and villages, the distance travelled to collect water is reduced, reducing the time per trip spent collecting water. In addition, as the water sources is maintained, they provide a reliable water supply, ensuring that water needs for cooking, drinking, and food preparation can be met by one central water source, so the time spent collecting water is minimised. The average % decrease per household in time spent collecting water is taken as a proxy contribution towards the SDG target.

$T_{b,y}$ Time spent collecting water per household per day prior to project (minutes)

$T_{b,y}$ for GS6518 (and all other VPAs) = 72.0 minutes

Reference: See the latest version of the ER calculation spreadsheet 'Zimbabwe_MP4_ER_calcs' - tab 'SDG Impacts', cell D11.

SDG 6 - Clean Water and Sanitation

The outcome for SDG 6 is quantified as the additional number of persons having access to safe water in the project activity compared to the baseline scenario (P_{access}). The number of persons using each borehole is determined in the sensitization process during the rehabilitation. The percentage of users who were already consuming safe water in the baseline without boiling it (C_j) is determined through the baseline survey.

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

C_j for GS6518 (and all other VPAs) = 1.76%

Reference: See the latest version of the ER calculation spreadsheet 'Zimbabwe_MP4_ER_calcs' - tab 'SDG Impacts', cell D17.

SDG 13 - Climate Action

CO2 emission reductions are the indicator to demonstrate that the project has raised capacity for effective climate change-related planning and management. This outcome is measured using the emission reduction calculations.

Baseline Emissions ($BE_{b,y}$)

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

Where:

$B_{b,y}$ = Quantity fuel consumed in the baseline scenario.

fNRB = Country-specific default value for the fraction of non-renewable biomass.

$EF_{b,fuel,CO2}$ = Emissions factor of fuel consumed in the baseline scenario (CO2).

$EF_{b,fuel,nonCO2}$ = Emissions factor of fuel consumed in the baseline scenario (non-CO2).

$NCV_{b,fuel}$ = Net calorific value of fuel consumed in the baseline scenario.

$BE_{b,y}$ for GS6518 = 1,518*((0.97*112)+9.42)*0.0156 = 2,796

Reference: See the latest version of the ER Calculations 'Zimbabwe_MP4_ER_calcs' - tab 'All VPAs', cell E27.

E.2. Calculation of project value or estimation of project situation of each SDG Impact

>>

SDG 3 - Good Health and Wellbeing

$I_{p,y}$ Percentage of incidences of stomach related illnesses or water-borne diseases during project activity (%)

The project survey asks the following questions in order to establish $I_{p,y}$:

24	Do you or your family ever suffer from stomach related illnesses/water-borne diseases and how often does this occur?	1. Never
		2. Once every few months
		3. Once per month
		4. Several times per month
		5. Weekly
		6. Everyday

$I_{p,y}$ for GS6518 (and all other VPAs) = 0%

Reference: See the latest version of the ER calculation spreadsheet 'Zimbabwe_MP4_ER_calcs_v2' - tab 'SDG Impacts', cell D7.

SDG 5 - Gender Equality

$T_{p,y}$ Time spent collecting water per household per day in project (minutes)

The project survey asks the following questions in order to establish $T_{p,y}$ and to show what use is made of the time used.

37	Who usually goes to this source to collect water for your household?	**1.** Male Adult	**2.** Female Adult
		3. Male Child	**4.** Female Child
38	How much time does a trip to and from the borehole take?	*Please specify*	
39	How many trips are made per day to the borehole?	*Please specify*	
40	Has the borehole project saved you time?	1. Yes	2. No (skip to question 44)
41	In which of these activities has the borehole project saved you the most time?	1. Less distance to walk to the water source	2. Less time waiting at the water source

		3. Less time spent boiling/purifying water	4. Less time spent collecting wood to boil water
		5. Other (Specify)	
42	How much time do you think the borehole project has saved you on average per day?	1. 0-30min	2. 31-60min
		3. 1-2hrs	4. 2-3hrs
		5. 3-4hrs	6. >4hrs
43	What do you do with the time saved from the project? *Select all that apply*	1. (Unpaid) Domestic work (*includes cooking and caring for family members*)	2. Income generating activities
		3. Religious activities	4. Social and leisure activities
		5. Voluntary activities	6. Education and training
		7. Other (Specify)	

$T_{p,y}$ for GS6518 (and all other VPAs)= 37.8 minutes

Reference: See the latest version of the ER calculation spreadsheet 'Zimbabwe_MP4_ER_calcs' - tab 'SDG Impacts', cell D12.

SDG 6 - Clean Water and Sanitation

P_y	Number of persons having access to safe water in the project activity.
X_{boil}	Percentage of premises that would have used other non-GHG emitting technologies like chlorine treatment techniques, if available, in the absence of the project activity.

P_y for GS6518 = 1,239

X_{boil} for GS6518 (and all other VPAs) = 0%

Reference: See the latest version of the ER calculation spreadsheet 'Zimbabwe_MP4_ER_calcs' - tab 'SDG Impacts', cell D16-18.

SDG 13 - Climate Action

Project Emissions ($PE_{p,y}$)

$PE_{p,y} = B_{p,y} * ((fNRB * EF_{p,fuel,co2}) + EF_{p,fuel,nonco2}) * NCV_{p,fuel}$

Where:

$B_{p,y}$ = Quantity fuel consumed in project scenario.

fNRB = Country-specific default value for the fraction of non-renewable biomass.

$EF_{p,fuel,co2}$ = Emissions factor of fuel used in the project scenario (CO2).

$EF_{p,fuel,nonco2}$ = Emissions factor of fuel used in the project scenario (non- CO2).

$NCV_{p,fuel}$ = Net calorific value of fuel used in the project scenario.

$PE_{p,y}$ for GS6518 = 0 * ((0.97 * 112) + 9.46) * 0.0156 = 0

Reference: See the latest version of the ER Calculations 'Zimbabwe_MP4_ER_calcs' - tab 'All VPAs', cell E28.

E.3. Calculation of leakage

>> In line with the monitoring requirements, a leakage assessment is conducted biennially and has therefore been included in this report. The potential sources of leakage listed in the methodology have been investigated, and addressed below:

a) 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.

In all cases the baseline technologies displaced are three stones; these have no market value and are not a product as such. There is nothing limiting the use of three stone cooking across the country (the technology is lowest rung on the energy ladder and the price is zero), which is why this cooking method is so widespread. In any case the

primary purpose of these three rocks is for cooking so they will not be replaced/displaced in their entirety as a result of this project - which means they will not be reused outside the project boundary. This leakage source can therefore be discounted.

b) The non-renewable biomass or fossil fuels saved under the project activity are used by non-project users who previously used lower emitting energy sources.

There is no evidence to suggest significant (if any) use of renewable energy for purifying water in the project region as found in the Baseline Water Surveys. Renewable energy used for purifying water would likely be animal dung or crop residues which will be used due to ease of availability/proximity to the home rather than due to a shortage of wood fuel, therefore it is an independent factor. This leakage source can therefore be discounted.

c) 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.

As most participants collect wood from within the project boundary, it is not expected that the NRB in other areas will be affected. There are currently no other relevant CDM or VER projects in the project area, according to the CDM Project search and Verra Registry.

d) 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 for purification purposes will be minimal, as the predominant use of baseline technology is for cooking. Therefore, it is highly unlikely that another technology will be used for heating when users no longer boil water.

e) 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.

This project is not marketing efficient technology; it is eliminating the need for a fuel-based technology to deliver pure water. Lower emission technology substitution within households is therefore not possible and this leakage source can therefore be discounted.

E.4. Calculation of net benefits or direct calculation for each SDG Impact

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Emissions Reductions	Baseline emission estimate for each VPA (BEb,y): GS6518: 2,796 tCO_2e GS6519: 2,908 tCO_2e GS6520: 3,039 tCO_2e GS6521: 3,583 tCO_2e GS6522: 5,857 tCO_2e GS6523: 3,986 tCO_2e **Total: 22,169 tCO_2e**	Project emission estimate for each VPA (PEp,y): GS6518: 0 tCO_2e GS6519: 0 tCO_2e GS6520: 0 tCO_2e GS6521: 0 tCO_2e GS6522: 0 tCO_2e GS6523: 0 tCO_2e **Total: 0 tCO_2e**	Emission reduction (ERy) for each VPA (includes usage rate and leakage reductions): GS6518: 2,581 tCO_2e GS6519: 2,686 tCO_2e GS6520: 2,805 tCO_2e GS6521: 3,309 tCO_2e GS6522: 5,409 tCO_2e GS6523: 3,681 tCO_2e **Total: 20,471 tCO_2e**
3	Reduction in incidences of stomach related illnesses or water-borne diseases	**88%** of households who suffer from stomach related or water-borne illnesses at least once every few months	**0%** of households who suffer from stomach related or water-borne illnesses at least once every few months	**100%** reduction in the percentage of households who suffer from stomach related or water-borne illnesses at least once every few months
5	Reduction in time spent collecting water	**72.0** minutes spent collecting water per household per day in the baseline for all VPAs	**37.8** minutes spent collecting water per household per day in the baseline for all VPAs	**47.5%** reduction in time spent collecting water and firewood per household per day for all VPAs
6	Additional people gaining access to safe water	People consuming safe water prior to project: GS6518: 22 GS6519: 21 GS6520: 22 GS6521: 22 GS6522: 26 GS6518: 25	People consuming safe water during project: GS6518: 1,239 GS6519: 1,188 GS6520: 1,224 GS6521: 1,273 GS6522: 1,500 GS6518: 1,395	Additional people consuming safe water (P_{access}): GS6518: 1,217 GS6519: 1,167 GS6520: 1,202 GS6521: 1,251 GS6522: 1,474 GS6518: 1,370

	Total: 138	**Total: 7,819**	**Total: 7,681**

SDG 3 - Good Health and Wellbeing

$IR_y = (I_{b,y} - I_{p,y})/ I_{b,y}*100$

Where:

IR_y	Total reduction in incidences of stomach related illnesses or water-borne diseases in the project activity compared to the baseline scenario in year y (%)
$I_{p,y}$	Persons who suffer from stomach related illnesses/water-borne diseases in project (%)
$I_{b,y}$	Persons who suffer from stomach related illnesses/water-borne diseases prior to project (%)

IR_y for GS6518 (and all other VPAs) = (0.88-0.00)/0.88*100 = 100%

Reference: See the latest version of the ER calculation spreadsheet 'Zimbabwe_MP4_ER_calcs' - tab 'SDG Impacts', cell D8.

SDG 5 - Gender Equality

$TR_y = (T_{b,y} - T_{p,y})/ T_{b,y} * 100$

Where:

TR_y	Total reduction time spent collecting water for project activity in year y (%)
$T_{b,y}$	Time spent collecting water per household per day prior to project (minutes)
$T_{p,y}$	Time spent collecting water per household per day in project (minutes)

TR_y for GS6518 (and all other VPAs) **=** (72.0-37.8)/72.0 * 100 = 47.5%

Reference: See the latest version of the ER calculation spreadsheet 'Zimbabwe_MP4_ER_calcs' - tab 'SDG Impacts', cell D13.

The project has saved households 27.2 minutes per day and for all households has reduced the distance needed to the water source (100%).

The 63.1% reduction in time spent collecting and treating water is used in the following ways:

1. (Unpaid) Domestic work (includes cooking and caring for family members): 97%
2. Income generating activities: 20%
3. Religious activities: 1%
4. Social and leisure activities: 0%
5. Voluntary activities: 0%
6. Education and training: 0%
7. Other (Specify): 0%

SDG 6 - Clean Water and Sanitation

$$P_{access} = Py * (1 - Cj) * (1 - Xboil)$$

Where:

P_{access}	Number of additional persons having access to safe water in the project activity compared to the baseline scenario.
P_y	Number of persons having access to safe water in the project activity.
C_j	Expressed as a percentage, the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it.
Xboil	Percentage of premises that would have used other non-GHG emitting technologies like chlorine treatment techniques, if available, in the absence of the project activity.

P_{access} for GS6518 = 1,239 * (1 – 0.0176) * (1 – 0) = 1,217

Reference: See the latest version of the ER calculation spreadsheet 'Zimbabwe_MP4_ER_calcs' - tab 'SDG Impacts', cell D19.

SDG 13 - Climate Action

Emissions Reductions (ER_y)

$ER_y = (((BE_{b,y} - PE_{p,y}) * U_{p,y}) - LE_{p,y}) * (1 - X_{boil})$

Where:

$BE_{b,y}$ = Baseline Emissions

$PE_{p,y}$ = Project Emissions

$U_{p,y}$ = Usage Rate

$LE_{p,y}$ = Leakage in year y

X_{boil} = Percentage of premises that would have used other non-GHG emitting technologies like chlorine treatment techniques, if available, in the absence of the project activity.

ER_y for GS6518 = (((2,801 – 0) * 0.9237) – 0) * (1-0) = 2,587.68 (2,586 ERs claimed)

Reference: See the latest version of the ER Calculations 'Zimbabwe_MP4_ER_calcs' - tab 'All VPAs', cells E31-32.

E.5. Comparison of actual SDG Impacts with estimates in approved PDD

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values[3] achieved during this monitoring period
13	Ex ante emission reduction (ER_y) for each VPA: GS6518: 10,000 GS6519: 10,000 GS6520: 10,000 GS6521: 10,000 GS6522: 10,000 GS6523: 10,000 **Total: 60,000**	Emission reduction (ER_y) for each VPA: GS6518: 2,581 (3,580) GS6519: 2,686 (3,724) GS6520: 2,805 (3,890) GS6521: 3,309 (4,588) GS6522: 5,409 (7,500) GS6523: 3,681 (5,101) Total: 20,471 (28,386)

[3] Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

3	From PDD, all VPAs expected to reduce the percentage of households suffering from stomach related or water-borne illness by **50%**	**100%** reduction in the percentage of households suffering from stomach related or water-borne illnesses more frequently than once every few months
5	From PDD, all VPAs expected to reduce the time required to collect water by **40%**	**47.5%** reduction in the time spent collecting water
6	From PDD, the number of people expected to gain access to safe water due to the project is **13,260**. Based on an additional 2,210 per VPA.	Actual additional people with access to safe water (P_{access}): GS6518: 1,217 GS6519: 1,167 GS6520: 1,202 GS6521: 1,251 GS6522: 1,474 GS6523: 1,370 **Total: 7,681**

E.5.1. Explanation of calculation of value estimated ex ante calculation of approved PDD for this monitoring period

>> Explanation of estimated ex ante calculations were originally provided in the PDD and are described below:

SDG 3 - Good Health and Wellbeing

The impacts of the project towards SDG 3 is measured through the project survey. A percentage figure is calculated from the difference between the baseline and the project survey, which asks how often do you or your family suffer from stomach related illnesses, and which illnesses have they suffered from in the last year: Typhoid; Bilharzia; Cholera; or other?

It is estimated that the project will reduce waterborne illness by at least 50% per year (all VPAs)

SDG 5 - Gender Equality

$$\text{TRy} = (T_{b,y} - T_{p,y}) / T_{b,y}$$

Where:

TR_y Total reduction time spent collecting water for project activity in year y (%)
$T_{p,y}$ Time spent collecting water per household per day in project (hours)
$T_{b,y}$ Time spent collecting water per household per day prior to project (hours)

It is estimated that the project will save roughly 0.5 hours per household per day. The project survey will monitor how this time is spent and the impact it has towards Gender Equality.

$$\text{TRy for GS6518 (and all other VPAs)} = \frac{(1.2-0.72)}{1.2} = 40\%$$

SDG 6 - Clean Water and Sanitation

$$P_{access} = P_y * (1 - C_j) * (1 - X_{boil})$$

Where:
P_{access} Number of additional persons having access to safe water in the project activity compared to the baseline scenario.
P_y Number of persons having access to safe water in the project activity.
C_j Expressed as a percentage, the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it.
X_{boil} Percentage of premises that would have used other non-GHG emitting technologies like chlorine treatment techniques, if available, in the absence of the project activity.

P*access* for GS6518 (and all other VPAs) = 2,250 * (1 – 0.0176) * (1 – 0) = 2,210

It is estimated that the project will provide access to safe water to an additional 2,210 people.

SDG 13 - Climate Action

CO2 emission reductions are the indicator to demonstrate that the project has raised capacity for effective climate change-related planning and management. These are calculated according to the description in Section B of the VPA-DD.

Baseline Emissions

$$BE_{b,y} = B_{b,y} * \left(\left(fNRB_y * EF_{b,fuel,co2} \right) + EF_{b,fuel,nonco2} \right) * NCV_{b,fuel}$$

$BE_{b,y}$ = 10,747.7 * ((0.97 * 112) + 8.692) * 0.0156 = 19,672 per VPA

Project emissions

$$PE_{p,y} = B_{p,y} * \left(\left(fNRB_y * EF_{p,fuel,co} \right) + EF_{p,fuel,nonco2} \right) * NCV_{p,fuel}$$

$PE_{p,y}$ = 0 * ((0.97 * 112) + 8.692) * 0.0156 = 0 per VPA

$$PE_{p,y} = B_{p,y} * \left(\left(fNRB_y * EF_{p,fuel,co} \right) + EF_{p,fuel,nonco2} \right) * NCV_{p,fuel}$$

Where:

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

$B_{p,y}$ = (1 – 0.028) * 1,084,050 * 0.00136000 * (0 + 0) = 0

$$ER_y = \left(\left((\Sigma BE_{b,y} - \Sigma PE_{p,y}) * Up,y \right) - LEp,y \right) * (1 - XBoil)$$

ER_y = (((19,672 – 0) * 0.8) – 0) * (1 – 0) = 15,738 per VPA

As the ERs are over 10,000 tCO2e, the cap of 10,000 tCO2e per year will be applied.

E.6. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD

>> The following are remarks on the differences achieved for the SDG impacts compared to the estimates provided in the PDD:

SDG 3

The estimated value was under half that of the actual value achieved during the monitoring period. The greater reduction in stomach related and water-borne illness represent a positive outcome of the project.

SDG 5

The estimated reduction in time spent collecting water for ex-ante calculations was based on similar projects in other countries. The actual figure of 47.5% is slightly higher than estimated. The greater reduction in time spent collecting water represent a positive outcome of the project.

SDG 6

The number of people accessing safe water shows a decreae on the values estimated per VPA in the PDD. The number of people accessing safe water is lower than the estimated value due to the cap of 300 users per borehole placed by the Gold Standard during a previous SWS grievance review.

SDG 13

All VPAs have fallen significantly short of the expected 10,000 ERs. This is due to the cap of 0.0004T/L for the Wb,y/Wp,y value placed by the Gold Standard during a previous SWS grievance review.

SECTION F. SAFEGUARDS REPORTING

>> As according to the most recent PDDs for the VPAs under review, no safeguarding principles were identified as relevant to these projects. Nonetheless, the project continues to emphasize during all trainings that project beneficiaries should support vulnerable or less mobile community members to access water, to reduce the risk of marginalization. The project area does not include sites or structures of historic and cultural value, does not negatively impact the physical or economic condition of the beneficiaries, does not impact land tenure arrangements, nor occur on government-owned land, and does not encourage corruption, or break with labour laws.

SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

G.1. List all Inputs and Grievances which have been received via the Continuous Input and Grievance Mechanism together with their respective responses/mitigations.

>>

No inputs or grievances were received during the monitoring period.

G.2. Report on any stakeholder mitigations that were agreed to be monitored.

>>

No inputs or grievances were received during the previous monitoring period.

G.3. Provide details of any legal contest that has arisen with the project during the monitoring period

>>

No legal contests or disputes arose during the monitoring period.

Revision History

Version	Date	Remarks
1.1	14 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Section for POA monitoring Forward action request section Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on safeguard reporting Clarity on design changes Leakage section added for VER/CER projects Addition of Comparison of monitored parameters with last monitoring period Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption