TEMPLATE

DEVIATION REQUEST FORM

PUBLICATION DATE **11.04.2021**
Version **5.0**

A. To be completed by Gold Standard

1| Decision

1.1 | Date – 23/01/2023

1.2 | Decision

The deviation request is approved with following considerations. The project developer shall ensure that:

1. The requirements of the applied methodology Methodology for Emission Reductions from Safe Drinking Water Supply (latest version) are met in entirety along with the proposed applicability scope of increasing the run-time and not just rehabilitating the existing technology from non-functional to functional.

2. Seasonality shall be considered while establishing the baseline for the pumps. Since the baseline is set as at least 2 months prior to the start of crediting period of the pump, there are chances of seasonality not being captured due to the limited time period. For example - during rainy season, when rainwater or other (perceived) clean surface water is available, presumably the water points would be used less than during dry season when water is less available and water points more frequently used. If the 2-month baseline period is not capturing most critical season– there is a risk that the baseline is not representative for entire period. In case, the data is not representative for all seasons for a given location, the developer may refer to other locations with similar climatic conditions to account seasonality for representative baseline setting.

3. The project developer shall through baseline surveys confirm the sources of water during the downtime in baseline situation. This is to ensure that end users are indeed source water unsafe sources during downtime.

4. The project developer shall clearly outline in the PDD if all boreholes are connected with DMRV system or sample based monitoring will be conducted. The project developer shall use minimum sample size requirements for different sampling approach outlined in Guidelines for sampling and surveys for CDM project activities and programmes of activities.

The project developer shall document the deviation request and GS' decision in the appropriate section of the GS PDD.

The validating VVB shall, through appropriate means at its disposal, evaluate the project's compliance with the above-mentioned condition(s) and provides its opinion in the Verification Report.

SustainCert shall review both the project developer's response and the VVB's assessment/opinion of the same and take appropriate steps.

1.3 | Is this decision applicable to other project activities under similar circumstances?

No

B. To be completed by the Project Developer/Coordinating and Managing Entity and/or VVB requesting deviation

2| Background information

Drought-driven humanitarian emergencies can be prevented if groundwater is reliably made available at strategic locations during cycles of water stress. DRIP - The Drought Resilience Impact Platform - integrates technology with water service providers and carbon finance to ensure improved, reliable water access during times of drought.

DRIP links satellite-connected in-situ sensors deployed in northern Kenya monitoring electrical groundwater boreholes with local water service providers who are notified when a borehole is likely broken, to ensure timely repairs and improved water security. Water service providers are compensated for repair activities through revenue generated by carbon finance.

The Drought Resilience Impact Platform (DRIP) combines early detection with proactive groundwater management to ensure water availability with various stakeholders and decision support tools. The project includes localized monitoring from sensor-equipped pumps enabling local service providers to increase functionality rates and pump uptime improvement, especially ahead of drought periods.

The project **operationalizes** DRIP's borehole water services through carbon credit enabled pay-for-performance contracting, ensuring that all institutions and partners are incentivized to ensure water asset management and year round safe water supplies. DRIP includes:

- Systems analysis to understand the actors and factors that support increased water and food security;
- Groundwater quality, sustainability and asset monitoring;
- Online integration of in-situ and remote sensing data with localized groundwater demand forecasts
- **Decision-response tools** to identify water service gaps and forecast water demand;
- Translation of service gaps and resource shortages into **performance based water security actions**, led by local organizations.

Please see this list of relevant publications -

The Drought Resilience Impact Platform - DRIP
https://virridy.com/applications/drip/

A Steady DRIP with NASA Satellites
https://www.nasa.gov/feature/a-steady-drip-with-nasa-satellites

"Using Feedback to Improve Accountability in Global Environmental Health and Engineering"
https://pubs.acs.org/doi/abs/10.1021/acs.est.0c04115

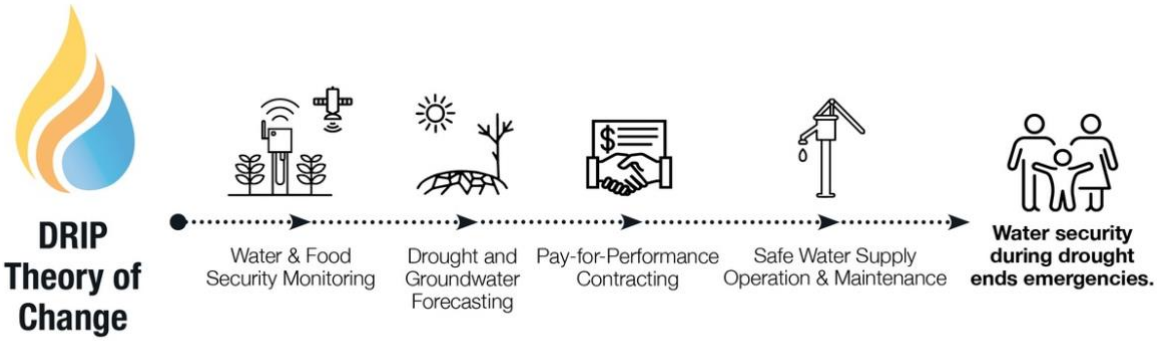
"Reducing drought emergencies in the Horn of Africa"
https://www.sciencedirect.com/science/article/abs/pii/S0048969720322890

"The Drought Resilience Impact Platform (DRIP): Improving Water Security Through Actionable Water Management Insights"
https://www.frontiersin.org/articles/10.3389/fclim.2020.00006/full

"Estimating groundwater use and demand in arid Kenya through assimilation of satellite data and in-situ sensors with machine learning toward drought early action"
https://www.sciencedirect.com/science/article/pii/S0048969722015467

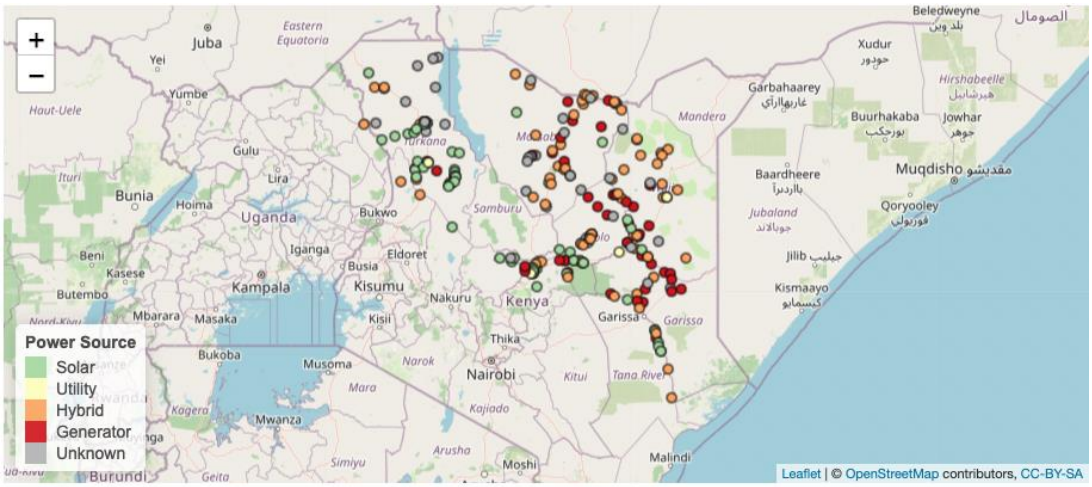
"A contribution to drought resilience in East Africa through groundwater pump monitoring informed by in-situ instrumentation, remote sensing and ensemble machine learning"
https://www.sciencedirect.com/science/article/pii/S0048969721015540

Project Theory of Change:

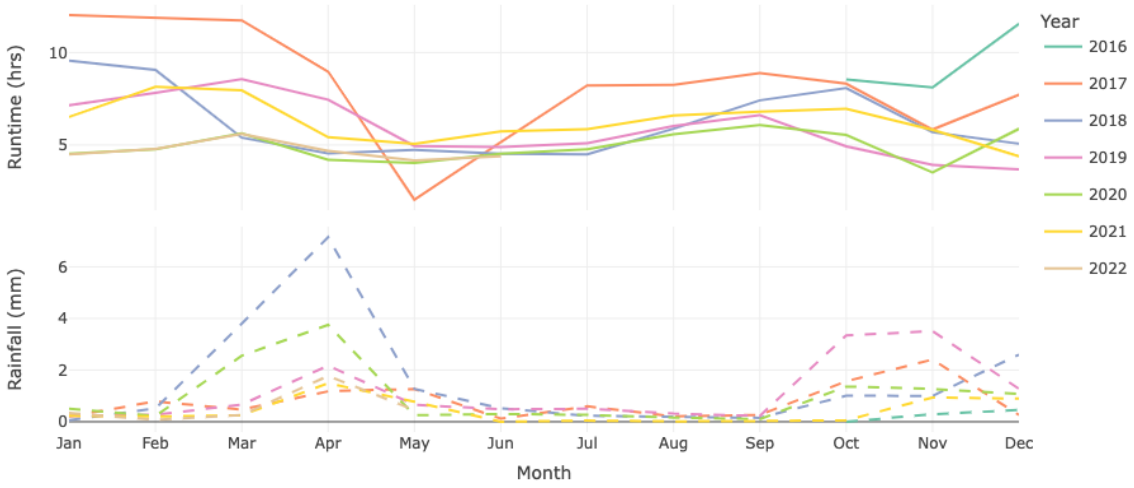


Images of example solar powered water pumps, water collection points, and satellite connected sensors:

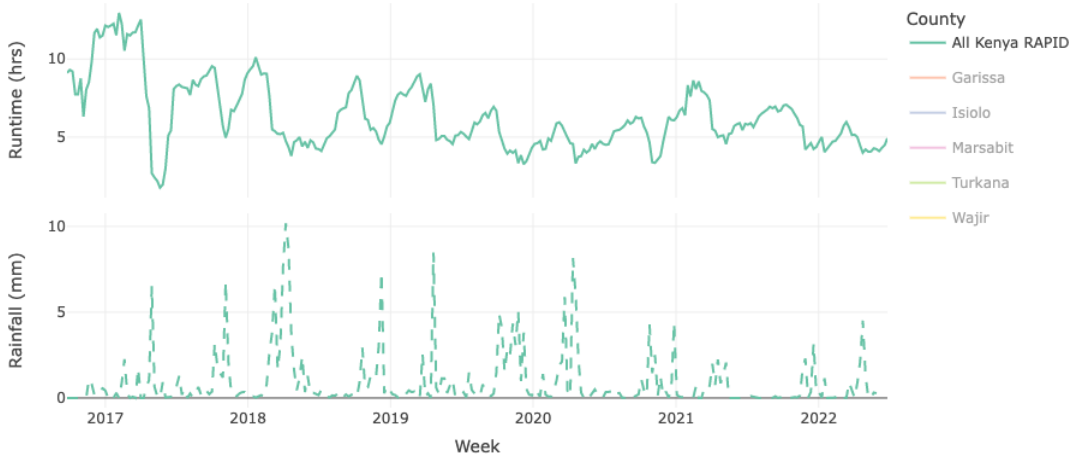
Map of initial project and non-project water pumps monitored with sensors.



Average monthly rainfall and water pump runtime per year since 2016.



Average borehole runtime and local rainfall per week.



Deviation Reference Number	DEV_314

Date of decision	23/01/2023	
Precedent (YES/NO)	No	
Precedent details	N/A	
Date of submission	27/07/2022	
Project/PoA/VPA	Project	NA
	☒ PoA	ID – GS11803
	☒ VPA	ID – GS11804, GS11805, GS11806
Project/PoA/VPA title	Virridy and Millennium Water Alliance Clean Drinking Water Supply Program	
Date of listing	Not listed yet	
GS Standard version applicable	GS4GG	
Date of transition to GS4GG (if applicable)	NA	
Date of transition to Gold Standard from another standard (e.g. CDM) (if applicable)	NA	
Date of design certification/inclusion (if applicable)	NA	
Location of project/PoA/VPA	Kenya, Democratic Republic of Congo, Ethiopia	
Scale of the project/PoA/VPA	☐ Microscale ☐ Small scale ☒ Large scale	
Gold Standard Impact Registry link of the project/PoA/VPA	Not available yet.	
Status of the project/PoA/VPA	☒ New ☐ Listed ☐ Certified design ☐ Certified project	
Title/subject of deviation	Runtime deviation for Virridy and Millennium Water Alliance Clean Drinking Water Supply Program	
Specify applicable rule/requirements/methodology, with exact paragraph reference and version number	GG Methodology For Emission Reductions From Safe Drinking Water Supply, V1.0 Section 1 |Definition b. Community water supply technologies (CWS) - Technologies that generate a supply of water for a	

	community. If the supplied water is safe water, then users may retrieve water from the supply point. If the supplied water is not safe, then the Community water supply technology is combined with HWT, IWT or CWT. *Example where supply is of safe water from the supply point*: New borehole, and users retrieve water in jerry cans from the borehole pump. 2| Scope, Applicability, and entry into force 2.1 Scope 2.1.1 | This methodology is applicable to project activities that introduce a new, or **rehabilitate an existing**, zero-emission or low-emission technology to supply safe drinking water 2.2 |Applicability 2.2.1 | The methodology is applicable under the following conditions: b. Eligible community water supply technologies (CWS) include new installation of new borehole hand-pumps, borehole hand-pumps rehabilitation, solar powered drinking water pumps, etc. Water pumps powered by fossil-fuel engines are not eligible, with the exception of back-up fossil–fuel engines that are used for no more than 10% of operating hours (parameter SWDS 33). d. Where the project involves the rehabilitation of an existing technology, **the project developer shall provide evidence that the existing technology is non-operational and that there is no planned maintenance or repair for at least 3 months after the date it became non-operational** (parameter SWDS 2). f. In cases where the safe water is retrieved at the CWT or CWS location, **the water in its improved form shall be available within a distance of 1 km or less from the end-users**, as demonstrated by satellite imaging or GPS coordinates of each CWT or CWS location. Alternatively, as a proxy, a total collection time of

	30 minutes or less for a round trip, including queuing, using the travel modes of walking or pedaling may be demonstrated (parameter SDWS 1). **3| Baseline Methodology** **3.12| Data and parameters not monitored** Parameter ID SDWS 2 Description: **Rehabilitated technologies:** In case the project technology (CWT and CWS) is a rehabilitation, the following is also required as part of technology description: - Evidence of Non-operational time prior to proposed rehabilitation (at minimum with evidence letter from local representative or government, etc.); - Evidence of lack of an existing maintenance or repair plan (at minimum with evidence letter from local representative or government, etc.); - Original installation date/month (approximate month/year); and - Information/evidence to confirm the details of rehabilitation activity (e.g. parts replaced, specifications followed, personnel conducting the repairs and date of retrofitting). Source of data: Rehabilitated technologies: - Sources mentioned for CWT and CWS above and - Technical reports from a qualified entity that undertakes the rehabilitation - Professional opinion or expert opinion is not accepted as a source for this parameter.
Specify the monitoring period for which the request is valid (if applicable)	Start date 01/01/2023 End date 31/12/2028
Submitted by	Contact person name: Evan Thomas Email ID: evan.thomas@virridy.com
	Organisation: SweetSense Inc, doing business as Virridy

	Project participant: Yes ☒ No ☐
Validation and Verification body (VVB opinion shall be included, where required by the applicable rules/requirements or request is submitted by the VVB).	Yes ☐ No ☐ NA If yes; VVB name: NA VVB Staff name(s): NA
Any previous deviations approved for the same project activity/PoA/VPA(s)?	Yes ☐ No ☒

3| Deviation detail

3.1 | Description of the deviation:

**Guidance* Use the space below to describe the deviation and substantiate the reason for requesting deviation from applicable rules/requirements. Please include all relevant information in support of the request. You are requested to follow the principles for requesting deviations, given in the Deviation Approval Procedure/ Design Change Requirements.*

3.1.1 | Deviation detail (to be completed by Project developer):

We seek deviation request. The table below provides further details of the clarifications and the deviation sought.

2| Scope, Applicability, and entry into force 2.1 Scope 2.1.1 |	This methodology is applicable to project activities that introduce a new, or **rehabilitate an existing**, zero-emission or low-emission technology to supply safe drinking water.	This project incentivizes improved water access through repair and rehabilitation of water pumps. The project uses satellite-connected sensors installed on water pumps. These sensors measure the run-time of the pumps per day in hours. A local flow-rate test is conducted at each pump to create a calibration constant thereby estimating total water volume produced per day. At every pump, we will have between 2 months and 4 years of historic, baseline runtime data. DRIP focuses on under-utilized and poorly maintained

		groundwater electrical pumps. The project activity uses instrumented monitoring to trigger repair activities, and pays for those activities with the revenue from carbon finance. The additionality of the program is the difference between the poorly maintained baseline operation and the improved operation and water services delivered through the addition of carbon-financed and sensor-enabled repairs. The lack of sufficient funding to provide required levels of water service at these pumps is well documented in the literature. These pumps are poorly maintained but not abandoned. The program provides carbon finance generated budget to improve water service delivery. **1) Deviation Requested:** **We propose substituting the requirement to demonstrate non-functionality of water pumps and no planned repair activities for three months with electronic sensor collected runtime data on a per-pump basis.** **We propose crediting only the difference between the average runtime during the baseline period and the anticipated improved runtime achieved during the crediting period.** **We will provide a baseline period runtime for each pump for at least 2 months prior to the start of the crediting period for that pump.**

MONITORING REQUIREMENTS FOR PARAMETER SWDS 2

The table below summarize the deviation to be sought for demonstration monitoring for parameter: Project Technology Description

3| Baseline Methodology
3.12| Data and parameters not monitored

Parameter ID SDWS 2

Parameter ID	**SDWS 2**
Data/Parameter:	Project technology description
Data unit:	NA
Description:	**Rehabilitated technologies:** In case the project technology (CWT and CWS) is a rehabilitation, the following is also required as part of technology description: - Evidence of Non-operational time prior to proposed rehabilitation (at minimum with evidence letter from local representative or government, etc.); - Evidence of lack of an existing maintenance or repair plan (at minimum with evidence letter from local representative or government, etc.); - Original installation date/month (approximate month/year); and - Information/evidence to confirm the details of rehabilitation activity (e.g. parts replaced, specifications followed, personnel conducting the repairs and date of retrofitting).
Source of data:	Rehabilitated technologies: - Sources mentioned for CWT and CWS above and - Technical reports from a qualified entity that undertakes the rehabilitation Professional opinion or expert opinion is not accepted as a source for this parameter.
Deviation Request	**We propose substituting the requirement to demonstrate non-functionality of water pumps and no planned repair activities for three months with electronic sensor collected runtime data on a per-pump basis.** **We propose crediting only the difference between the average runtime during the baseline period and the anticipated improved runtime achieved during the crediting period.** **We will provide a baseline period runtime for each pump for at least 2 months prior to the start of the crediting period for that pump.**

3.1.2 | VVB opinion (to be completed by VVB, if applicable):

NA

3.2 | Assessment of the deviation:

3.2.1 | Deviation assessment (to be completed by Project developer):

Requirements' accomplishment
The deviation sought to demonstrate the state of water pumps and planned repair activities includes actual monitored sensing data which is more accurate than conventional minimum evidence e.g. letter from local representative or government. The methodology complies with the equipment of the methodology to demonstrate functionality status and runtime of the pumps.

We consider that the use of actual monitoring sensing data meets the requirement to define functionality of the supply water points.

The proposal to include as part of applicability scope the increasing runtime and not only rehabilitation from non-functional to functional includes the same spirit of the methodology to increase availability of water supply to end-users. Therefore, it meets the methodology requirements.

Accuracy

The use of actual monitoring remote sensing data and in-situ instrumentation provides enough accuracy level for the baseline definition and project performance. The data obtained includes start-time stamp, end-time stamp, and the pump on-time percentage, including some sensors with satellite connectivity and can be physically accessed to download data as a special file format that allows for reviewing the data at various intervals from one to 60 minutes, as well as at a daily interval. The technology used provides enough accuracy to make data and results traceable and trustworthy.

Completeness
The deviation request does not involve omission of data or evidence, but to add data valid sources from technology application for the baseline set-up and project performance.

Conservativeness
As mentioned above, We propose crediting only the difference between the average runtime during the baseline period and the anticipated improved runtime achieved during the crediting period; this a conservative approach.

3.2.2 | VVB opinion (to be completed by VVB, if applicable):

NA

3.3 | Impact of the deviation:

**Guidance* Use the space below to describe the impact of the deviation on project design, safeguarding principles assessment, SDG assessment, emissions reductions, monitoring frequency, data quality, potential risk or any other relevant aspect of the*

project. Please substantiate the impact assessment with relevant and verifiable data/information.

3.3.1 | Impact assessment (to be completed by Project developer):

Project Design
The PoA and the VPAs proposed are new applicants and have an estimated starting date of 01/01/2023. The PoA and the project activity design are being defined. The deviation sought looks to confirm the applicability of the methodology and the validity of the data source proposed. The deviation request will not involve any design change.

Safeguarding Principles

The table below includes a brief explanation on how the deviation proposed relates to each Safeguarding Principle.

Safeguarding Principle	Impact identify
Human Rights	The user of sensing data and in-situ instrumentation to increase the running time of pumps does not harm human rights. By increasing availability of safe water and making wise use of the resources for maintenance, the impact on poverty alleviation inclusion and equality is in general positive. No specific risk identified.
Gender Equality and Women's Rights	There is no direct or indirectly reinforce of gender-based discrimination. Increasing availability of safe water can benefit women and children. No specific risk identified.
Community Health, Safety and Working Conditions	The technology applied will not create adverse impacts on the health and safety of affected communities. The CME will ensure to provide workers with safe and healthy working conditions and to prevent accidents, injuries, and disease. No specific risk identified.
Cultural Heritage, Indigenous Peoples, Displacement and Resettlement	The deviation sought does not have an impact on cultural heritage. Actually, one of the clarifications sought includes the recognition of nomadic people. Including pastoralist people as consumers of water access points is a way to respect and preserve this way of life. No specific risk identified.
Corruption	The user of sensing data and in-situ instrumentation to increase the running time of pumps does not contribute or reinforce corruption of any kind. Contrary, the data to be used enhance transparency and traceability. No specific risk identified.

Economic Impact	The use of technology for sensing data provides a chance for economic growth. The involvement of local partners contributes to local employment and procurement. No specific risk identified.
Climate and Energy	The deviation proposed does not imply an increase of GHG, not availability of Energy. The project technology includes PV equipment (zero emission). No specific risk identified.
Water	DRIP links satellite-connected in-situ sensors deployed to monitoring electrical groundwater boreholes can improve maintenance management and to provide reliable water access during times of drought. No specific risk identified.
Environment, Ecology and Land Use	The deviation proposed does not involve activity that affects soil or will increase erosion. The project can help to better manage the availability of water (natural resource). No specific risk identified.

The full assessment of the Safeguarding Principles will be proved as part of the PoA-DD and VPA-DD, as well, it will be a topic to be discussed with the stakeholders as part of the local consultation meetings.

SDGs assessment
Beside the contribution to SDG 13, the project activity anticipates a positive contribution to the following SDGs:

SDG 3 Good Health and well-being
SDG 6 Clean Water and sanitation
SDG 7 Affordable and clean energy

It is not identified an adverse effect to above mentioned (or any other) SDG because of the use of sensing data to increase runtime of water pumps.

ERs
As mentioned above, We propose crediting only the difference between the average runtime during the baseline period and the anticipated improved runtime achieved during the crediting period. The approach suggested is actually conservative and can follow the same principles stated in the methodology to determine the ERs. The proposed deviation actually provides a more accurate method to quantify the water supply, therefore the ERs.

Monitoring Frequency
The monitoring of SDWS 2 Parameter to define the rehabilitated technologies is not affected. Actually, the use of sensing data provides actual monitored data. The proposal is to provide a baseline period runtime for each pump for at least 2 months prior to the start of the crediting period for that pump.

Potential risk or any other relevant aspect of the project

There is no potential risk identified for the proposed deviation. Actually, the use of the technology is perceived as an improvement of the methods to define the functionality of rehabilitated technology and impact quantification.

3.3.2 | VVB opinion (to be completed by VVB, if applicable):
NA

3.4 | Documents:

Please see this list of relevant publications -

The Drought Resilience Impact Platform - DRIP
https://virridy.com/applications/drip/

A Steady DRIP with NASA Satellites
https://www.nasa.gov/feature/a-steady-drip-with-nasa-satellites

"Using Feedback to Improve Accountability in Global Environmental Health and Engineering"
https://pubs.acs.org/doi/abs/10.1021/acs.est.0c04115

"Reducing drought emergencies in the Horn of Africa"
https://www.sciencedirect.com/science/article/abs/pii/S0048969720322890

"The Drought Resilience Impact Platform (DRIP): Improving Water Security Through Actionable Water Management Insights"
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"Estimating groundwater use and demand in arid Kenya through assimilation of satellite data and in-situ sensors with machine learning toward drought early action"
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"A contribution to drought resilience in East Africa through groundwater pump monitoring informed by in-situ instrumentation, remote sensing and ensemble machine learning"
https://www.sciencedirect.com/science/article/pii/S0048969721015540

Version number	Release date	Description
5	11.04.2022	Additional information added: - date of listing, design certification, transition - standard version

		- specific reference to a requirement deviated from - any previous deviations/design changes approved Guidance on VVB opinion
4	14.01.2021	
3	16.07.2020	
2	03.05.2018	
1	01.07.2017	Initial adoption