Safe Water Optimization Tool

Getting started guide

hello@safeh2o.app

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The Safe Water Optimization Tool (SWOT) helps water supply teams set site specific, evidence-based chlorination targets that ensure that water is safe and protected against recontamination, right up to the last cup.

The SWOT uses advanced analytics to predict the decay of chlorine occuring between the tapstand and home, accounting for collection, transport and storage before drinking. It uses information from routine water quality monitoring to provide a recommendation about the level of chlorination required to ensure protection over this period.

This quick start guide gives an overview of the steps, from planning considerations to monitoring, uploading data and running your first analysis. More information is available at safeh2o.app or by contacting the SWOT team at hello@safeh2o.app

Where can it be used?

The SWOT is designed for situations where there is a significant amount of time between collecting water from a chlorinated source and consuming it. This is common where there is no piped water in people's homes, or when supplies are broken or unreliable. For example:

- Centralised, batch chlorination in piped networks with communal tapstands
- Chlorine dosing at handpumps
- Water trucking to communal waterpoints

The SWOT is most useful in warm climates where chlorine decay is likely to be more rapid. In cooler areas, you'll still get accurate recommendations, but these may be more similar to existing guidance.

How much data do we need to collect?

The analytics tool requires at least 100 paired samples in order to generate an accurate recommendation. Each paired sample consists of a timed FRC measurement made at the waterpoint, and another at the household after a set delay. By testing the same water at the point of collection and the point of use, a paired sample shows how FRC levels have decayed over time.

What equipment do we need?

To use the SWOT some basic water testing and data collection equipment is needed. If you are already monitoring FRC levels it is likely that this equipment is already available at the field site. The main equipment needed is:

FRC
Ideally a digital photometer, but pool testers can be used as an alternative or to supplement. Either method will require a supply of reagents.

Temperature & Conductivity [Optional]
Digital multi-parameter meters are cheap and widely available. The accuracy of the SWOT is improved when water temperature and conductivity measurements are provided.

Mobile data collection [Optional]
A way for enumerators to collect and record water quality data, either manually or using a mobile data collection tool such as Kobo, ODK or Mobenzi. Mobile data collection will require a set of mobile phones or tablets configured with the appropriate app and survey tool. But the SWOT can be used with the monitoring system you already use.

How many staff do we need?

We recommend teams of two to collect FRC measurements, with 2 teams covering a population of up to 50,000. How many teams you need depends on how quickly you would like to complete the first analysis, the distribution of water points and households, and the logistics of moving between them.

Each team should be able to collect 5 paired samples per day, so with one team you'll have your first data set ready in 3-4 weeks. Since the actual collection of FRC measurements takes only a few hours per day, it is likely that you will be able to use the SWOT without increasing the size of your team.

What do we need to know?

Before setting out your monitoring plan it is important to have a basic understanding about how people collect, store and use water. This will be useful when it comes to planning your data collection and is also needed for setting up your analysis.

The monitoring team will need to be confident taking FRC, temperature and conductivity measurements using the equipment available, as well as using the kobo collect app, or other data collection tool. It is also useful to ensure that the monitoring team are comfortable talking with water users, explaining the purpose of taking household samples, obtaining consent and providing appropriate channels for feedback and complaints.

How does this fit with our M&E plan?

There are several ways to integrate SWOT analysis into water routine quality monitoring, for example:

Firstly, you could start collecting additional household level monitoring as part of your routine tapstand monitoring. You could expect to collect enough data to see an updated FRC recommendation every few weeks. This would give you a useful overview of the seasonal changes in FRC decay rates and help your teams maintain consistent household FRC levels over time.

Another approach would be to focus on collecting SWOT data as part of a larger assessment or other household survey. It may be more efficient to collect paired samples when enumerators are already visiting households, and this may help to reduce assessment fatigue among the affected population. In this approach you could get an updated FRC target after 1-2 weeks of data collection, repeated every 3-6 months.

Every context is unique, we are here to help you find an approach that fits your needs.

Ready?

Go to live.safeh2o.app and sign up for an account. You'll find detailed instructions for data collection, a template for data input and everything you need to get started.

Getting started checklist

- ☐ **Consider your context**
  The SWOT is designed for chlorinated water supplies with household storage. Contact us and we'll help you decide if it's right for your context.
- ☐ **Check your equipment**
  You'll need some basic tools for taking and recording water quality measurements.
- ☐ **Adapt your monitoring plan**
  The data collection schedule should be based on typical storage times in your context. You'll find detailed guidance at safeh2o.app
- ☐ **Brief your staff**
  Review how to take accurate water quality measurements. Make sure your team is confident with household sampling, including getting consent and how to respond to concerns.
- ☐ **Collect and record**
  You'll need to collect 100-150 paired samples to get your first recommendation. If you are not using a mobile survey, you'll need to make sure the data is formatted correctly before uploading.
- ☐ **Upload and analyse**
  Visit live.safeh2o.app to upload and analyse your first set of samples. You'll receive a report showing the the FRC level required at the tapstand to achieve water that is safe to the last cup.

Questions? Get in touch.

We have a dedicated team available to talk you through any stage of the process, from understanding how the SWOT could be applied in your context, getting set up with the tool, or helping your team interpret analysis results. hello@safeh2o.app

Equipment checklist

FRC Measurement

Digital chlorometers are preferred for accuracy, consistency and precision of measurements. Basic pooltesters are cheaper and more commonly available. Each method requires specific reagents.

Digital photometer + reagents
Example:
Est. cost: $250 + $20 per 250 DPD1 tablets

Pooltester + reagents
Example:
Est. cost: $10 + $10 per 250 DPD1 tablets

Temperature & conductivity

Including water temperature and conductivity readings from the tapstand improves the accuracy of SWOT recommendations.

Multi-parameter meter
Example: or
Est. cost: $180

Mobile data collection

SWOT survey templates are available for KoboToolbox, contact us for other options.

Mobile / Tablet with app
Example:
Est. Cost: Varies