



Field-Level Water Quality Monitoring Kit

Water quality monitoring in rural settings

Sustainable access to safe water is critical for human health and development, and regular monitoring is required to ensure the safety of water supplies. However, in too many rural settings in low and middle-income countries, water quality monitoring is performed infrequently, if at all. In some cases, water quality is tested when rural water sources are first constructed, but never again. In many cases, the low frequency of post-implementation water quality monitoring is related to the costs and logistical challenges associated with transporting samples by road over the long distances from rural water points to the nearest suitable laboratory for analysis.

Field-level monitoring solutions

Low-cost field-level water quality monitoring solutions can help address this challenge in settings where transportation costs and challenges are major barriers to effective monitoring. Several excellent field-level water quality test kits have long been commercially available, including the Del Agua kit, Wagtech Potalab, and others. These methods typically use membrane filtration to measure microbiological water quality, and a variety of other methods to measure key chemical parameters. However, membrane filtration can be challenging to perform in outdoor field settings, and requires users to prepare media regularly. The Compartment Bag Test, developed at UNC, allows users with minimal training to measure microbiological water quality in demanding field settings without the need to prepare media.

WaSH MEL field kit

The WaSH MEL project required monitoring solutions that were small and portable enough to fit in a backpack, avoided the need to prepare media, and allowed teams on motorbikes to carry enough supplies to analyze dozens of samples for a few critical parameters without refilling. To meet these needs, the WaSH MEL team modified the compartment bag test to be more compact, allowing up to 50 tests to be carried in each backpack. (The modified kit is now available from Aquagenx, LLC as the CBT II kit). The team combined these modified CBTs with validated third-party tests for a small number of critical parameters: arsenic, fluoride, free chlorine, turbidity, pH, and total dissolved solids/electrical conductivity in a backpack-sized field kit. The kit also included collapsible containers for measuring flow rates, mobile phones for rapid data collection, field chargers to avoid running out of power, and barcoded asset tags to link samples, sources, and surveys using mobile barcode scanner apps. With the ability to test up to 50 samples before refilling, these backpack kits are well suited to extended monitoring sorties. The WaSH MEL team and its partners have piloted these kits in hundreds of rural communities in Ghana, Ethiopia, and Burkina Faso with promising results. Of particular interest, these kits have enabled household water quality testing in these contexts at a scale rarely achieved by previous monitoring activities.

Contents

Quantity	Item	Description	Manufacturer	Part #
1	Backpack	Super-sturdy ballistic nylon backpack	Ful	
50	CBT	Compartment Bag with Test Bud	Aquagenx, LLC	
20	Clip	Plastic clip for Compartment Bag Test	Aquagenx, LLC	

50	Whirlpak Bags	Sterile 100 mL Whirlpak bag with sodium thiosulfate	Nasco	Bo1040WA
1	Plastic asset tags	Adhesive plastic asset tags for sample tracking (pack of 100 tags)	Intelli-scanner®	ISTAGS-S100
1	Arsenic Test Kit	Econo-Quick II Arsenic Test Kit (100 tests)	ITS, Inc	481304
1	Fluoride Meter	Digital fluoride meter	Extech Instruments	FL700
1	Fluoride Reagents	TISAB tablets (tube of 100)	Extech Instruments	FL704
1	Chlorine Meter	Digital Residual Chlorine Meter	Extech Instruments	FL200
1	Chlorine Reagents	DPD tablets (pack of 100)	Extech Instruments	FL204
1	pH/Conductivity meter	Digital pH/conductivity/TDS meter	Hanna Instruments	HI 98129
2	Stopwatch	Digital sports stopwatch	Champion Sports	910
1	Collapsible bucket	20L collapsible bucket	Sea to Summit	
1	Turbidimeter	Portable Turbidimeter (Optional)	Hanna Instruments	HI9803
1	Mobile phone	Mobile phone suitable for data collection	Various Mfrs.	
1	Power bank	Mobile power bank (>10,000 mAh)	Various Mfrs.	

Where can I learn more?

For more information on field-level water quality testing, as well as on WaSH monitoring, evaluation, and learning, visit the WaSH MEL project Virtual Learning Center www.washmel.org , or contact Kaida Liang (kliang@email.unc.edu)

