

# ARSENIC TESTING

Arsenic is an important drinking-water contaminant. Drinking water rich in arsenic over a long period leads to arsenic poisoning or arsenicosis. This results in various health effects including skin problems (such as colour changes on the skin, and hard patches on the palms and soles of the feet), skin cancer, cancers of the bladder, kidney and lung, and diseases of the blood vessels of the legs and feet, and possibly also diabetes, high blood pressure and reproductive disorders. The most effective preventive measure is supply of drinking water low in arsenic concentration.

Arsenic exists naturally in the groundwater throughout Asia above levels considered safe for human consumption. The exact impact of arsenic on the rural populations is still unclear. So far, dangerous levels of arsenic have been found in Pakistan, India (West Bengal), Bangladesh, Nepal, Vietnam, Cambodia, Laos, and Myanmar. There may be many other countries affected, but only through accurate testing will the magnitude of the problem be uncovered.

The worst affected countries are Bangladesh and West Bengal, India. It is estimated that there are upwards of 9 million tube-wells supplying households daily drinking water throughout rural Bangladesh. It is also estimated that as many as 25 million people are affected and the problem is so wide-spread that many do not have alternative safe water sources. Clearly there are 100 million people affected in the arsenic prone areas throughout the region.

There are currently over 40,000 diagnosed cases of Arsenicosis in Bangladesh alone and it is thought that less than 10% of Arsenicosis patients demonstrate external symptoms of the disease. Without safe water options for the affected households, it is agreed that these numbers could grow dramatically over the coming years.

It is therefore clear that testing for arsenic throughout the region is key to identifying where the problem exists and more importantly, identifying safe sources which are acceptable to those living in arsenic prone areas.

Wagtech International has been engaged in supplying accurate and easy to use arsenic testing equipment to the region for the past several years. Its digital Arsenator system is now recognised as the most reliable and accurate option for field based testing and is in widespread use by organisations such as UNICEF and the WHO. Large scale arsenic testing using Wagtech products is actively helping to identify the contaminated sources.



# ARSENATOR®

## DIGITAL ARSENIC TESTING IN THE FIELD

- **Combines laboratory accuracy with field portability, accurate down to ppb levels and in the critical range of 2 to 100ppb mg/l.**
- **Immediate results in the field (20 minutes).**
- **Features a unique tri-filter arsenic trap system, which removes both excess arsine gas as well as Hydrogen Sulphide by-products.**
- **Reduces reliance on costly, lab-based analytical techniques.**
- **Simple & easy to operate, environmentally friendly.**
- **Supplied with reagents for 420 tests.**
- **Stable, long shelf-life reagents, available locally as refill packs.**

At the top-end of Wagtech's unique family of Arsenic testing products, the Arsenator is the worlds first digital field instrument capable of measuring arsenic in water down to ppb levels.

With a host of innovative design features the Arsenator was developed in conjunction with Professor Walter Kosmos and laboratory tested by Imperial College, London. The chemistry behind the product is based on the Gutzeit colorimetric method.

Now an established product the Arsenator is in widespread use all over the world by UNICEF, WHO and a whole host of other organisations.

It has been proven to be reliable, accurate and easy to use. It is now widely accepted as the most effective way of measuring Arsenic in the field.

### **Wag-WE10500 Wagtech Digital Arsenator -**

Fully complete and supplied with reagents and consumables to carry out 420 tests. Housed in a robust carrying case for easy handling and storage.



# ARSENIC



## VISUAL COLOUR DETECTION KIT (VCDK)

- **Low Cost Visual Arsenic testing system**
- **Fully portable, allows visual analysis of arsenic in drinking water from 10µg/ml (ppb) up to 500µg/l (ppb)**
- **Ideal for mass screening**
- **Uses all the same reagents and consumables as the arsenator**
- **Housed in a robust, custom built case**
- **System is compatible with the Arsenator results obtained using the VCDK can be verified digitally using the Arsenator**

Wag-WE10600 Visual Colour Detection Kit - Fully complete and supplied with reagents and consumables to carry out 200 tests.



## ARSENIC MULTI-PACK

- **Kit comprises 5 complete sets of Arsenic generators**
- **Allows up to five tests to be conducted simultaneously**

Wag-WE10540 Multi-Pack Accessory - Fully complete - contains five additional Arsenic Workstations for multiple testing.

Wag-WE10560 Arsenic Refill Pack- Contains sufficient filter holders & reagents for 200 tests.

## AsK SERIES- ARSENIC SAFETY KITS

- **Low Cost, Visual Detection Kits for Field Arsenic Testing**
- **Produced locally in Bangladesh for regional market only**
- **Available in other parts of the world in the event of large quantity order**
- **Allows, visual analysis of arsenic in drinking water**
- **Results can be verified using the Digital Arsenator®**

Wag-WB10640 AsK 100 Kit - Sufficient tablets, powders and filters to perform 100 tests.

Wag-WB10650 AsK 50 Kit - Sufficient tablets, powders and filters to perform 50 tests.

Accessories

Wag-WE10660 - AsK Series Refill Pack - enough for 50 arsenic tests.



# TESTING



**Arsenicosis Victim – [Halima, Bangladesh] BEFORE**



**Arsenicosis Victim – [Halima, Bangladesh] AFTER**

Following on from the success of the established range of arsenic testing products Wagtech has produced a simple, low-cost, portable arsenic visual detection kit.

Keen to promote sustainable development and adopt a community led approach, the AsK 50 & 100 Test Kits are produced in Bangladesh and sold through Wagtech's dealer network in all the affected countries of the region. This aim was to allow governments and development organisations to buy locally at a lower cost and conduct testing programs throughout the region.

These low-cost kits use the same innovative technology as the standard products and are fully compatible with the Digital Arsenator. The kits are put together by a team of local employees based at the Wagtech Regional Training & Research Centre in Dhaka.

Considerable investment has been made to ensure there are significant levels of stock of these kits at all times.

With an estimated 11 million tube wells in the country, the sheer scale of assessing the Arsenic contamination issue in Bangladesh cannot be emphasised enough. At Wagtech, our aim is to provide accurate, low cost arsenic testing to an increased percentage of the affected local population.

Our aim is to create a regional Arsenic Centre of Excellence. A local resource that can be used by anyone with an interest in Arsenic testing technologies. However, we realise that once an arsenic problem has been identified, the problem then has to be rectified.

In our eyes, testing and mitigation go hand in hand. Due to our position at the forefront of field based Arsenic testing technology it was felt we were ideally placed to promote sustainable local mitigation solutions. In partnership with IACD, a not-for-profit development organisation based in Dhaka, Bangladesh, our mission is to improve the social, economic and environmental conditions of Bangladesh's poorest people by identifying, developing, testing and finally, promoting a private sector marketing approach in the delivery of these affordable technologies.

In this context, these deliverable technologies must be produced locally and sold to the poor at a fair market price through a private sector supply chain. IACD's work is specifically focused on Water and Sanitation issues and in this proposed project, our aim is to address and aid those people in the project area who currently are faced with serious arsenic contamination of their groundwater and have no alternative clean water source.