



Homeland Security
Technologies

ON GUARD

THE LATEST WATER SECURITY NEWS FROM THE MAKERS OF THE
GUARDIANBLUE® EARLY WARNING SYSTEM



GUARDIANBLUE IS CERTIFIED AND DESIGNATED BY THE DEPARTMENT OF HOMELAND SECURITY

PROTECTING OLYMPIANS IN BEIJING

GuardianBlue provides gold medal quality water security for 2008 Olympic Games.

While world records were being made and broken at the Beijing 2008 Olympics, strategically placed Hach GuardianBlue Early Warning Systems were quietly and carefully analyzing the drinking water to guard against contamination.



Everyone enjoyed watching the recent Olympics as the finest athletes of the world competed for the gold. China spent some \$6.5 billion on security for the games to protect the 10,000 athletes, 30,000 journalists, 80 heads of state and others gathering in and around the National Stadium (the "Bird's Nest"), the Olympic Village and surrounding hotels. The Hach GuardianBlue Early warning system was included in the state-of-the-art security measures to quickly alert officials in the event contaminants were introduced into water supplies.

China's Beijing Health Ministry chose the GuardianBlue Early Warning System several months before the games after reviewing recommendations on how to guard against intentional contamination of water supplies.

GuardianBlue is proven to be the best option for continuous and accurate screening for water quality anomalies that would characterize an intentional contamination of the water supply. Hach technicians were also contracted to provide expertise in site selections and installation of the early warning systems.



Continuous monitoring.

The GuardianBlue EWS is the first and only early warning system for drinking water certified and designated by the U.S. Department of Homeland Security as an approved product for security. Once every minute the system measures and analyzes sensor data from five state of the art water quality sensors and calculates a trigger signal, which indicates a deviation from the water quality baseline. If significant deviations occur, the trigger signal alerts security officials in real-time.

Story continues on back page.

EPA'S WATER SECURITY INITIATIVE MOVING FORWARD

The Water Security (WS) initiative is a U.S. Environmental Protection Agency (EPA) program that addresses the risk of intentional contamination of drinking water distribution systems.

EPA established this initiative in response to Homeland Security Presidential Directive 9, under which the Agency must "develop robust, comprehensive, and fully coordinated surveillance and monitoring systems, including international information, for...water quality that provides early detection and awareness of disease, pest, or poisonous agents."

EPA is implementing the WS initiative in three phases: (Phase I) develop the conceptual design of a system for timely detection and appropriate response to drinking water contamination incidents to mitigate public health and economic impacts; (Phase II) test and demonstrate contamination warning systems through pilots at drinking water utilities and municipalities and make refinements to the design as needed based upon pilot results; and (Phase III) develop practical guidance and outreach to promote voluntary national adoption of effective and sustainable drinking water contamination warning systems.

The San Francisco Public Utilities Commission and New York city are two of the four cities to receive grant money. Hach Homeland Security Technologies is taking part in this initiative and offering instrumentation and expertise.

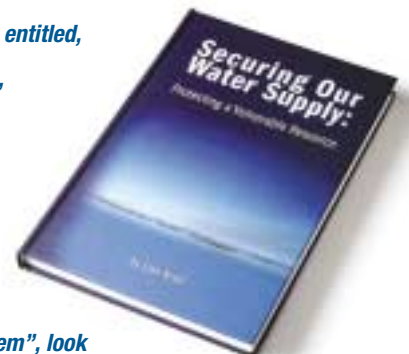
To view the video from the City of San Francisco, please visit: www.hachhst.com and go to **water security videos**.

Meet The Author!

Meet Dan Kroll, author of the book entitled, "Securing Our Water Supply; Protecting a Vulnerable Resource." (Available on amazon.com.)

To view a video of Dan explaining why we should monitor our distribution system, please go to: www.hachhst.com and click on the blue bar on top of the screen entitled:

"GuardianBlue Early Warning System", look toward the bottom of that page for the video links.



HOW HARD WOULD IT BE TO PERFORM A BACKFLOW ATTACK ON OUR NATION'S WATER DISTRIBUTION SYSTEM?

Easier than you think. A university recently performed a study on the effects of an intentional water poisoning event. In this simulation, the selected town has a population of 100,000 people. If a belligerent individual within a community rents a house in this small city and purchases a pump from a hardware store and has access to some chemicals—this individual has all the tools they need to have disastrous effects. The individual makes a dilute solution of VX (an odorless and

tasteless nerve agent that is considered a weapon of mass destruction by the United Nations) or Sodium Fluoracetate (a white crystalline odorless compound used as a rodenticide) and stores it in a 55 gallon drum in the basement of this rented house.

The pump is then connected to the influent pipe and pressure is applied to override the distribution pressure which creates a backflow attack.

Effects of an Intentional Water Poisoning Event

AGENT	TOWN SIZE	TIME INTERVAL TO AFFECT 100% OF POPULATION	% OF POPULATION DEAD AFTER 48 HOURS	NUMBER DEAD AFTER 48 HOURS
VX	100,000	12 hours	22%	22,000
Sodium Fluoracetate	100,000	12 hours	12%	12,000

As seen from the results of this simulation, significant death can occur without much investment using the water supply as a delivery device. GuardianBlue is the first and only Early Warning System certified and designated by the Department of Homeland Security as an approved anti-terrorist product.

Several accidental/non-malicious back flows have been documented as well. KDKA TV recently did a two month investigative report and the results are shocking. Tap water found in local hospitals and school were being contaminated with anything from morgue fluids to cleaning supplies. To watch the full video, please visit: www.hachhst.com and go to: **water security videos**.

GUARDIANBLUE®

EARLY WARNING SYSTEM



1 & 2

1 THE EVENT MONITOR TRIGGER SYSTEM

The unique, patented system integrates sensor data to calculate any water quality deviations from baseline. All sensor data and alarms are easily networked to your SCADA system for simplified system surveillance. (Prod. No. 6960600)

2 THE AGENT LIBRARY

The Agent Library software is housed within the Event Monitor, so when an event is detected, it can be matched to one of the threat agent fingerprints. (Prod. No. 6960000)



3

3 THE WATER PANEL (WDMP or WDMP sc)

Continuously measures pH, chlorine, turbidity, conductivity, temperature, and pressure with USEPA methods. (Prod. No. 6960400)

4 THE TOC ANALYZER (astroTOC UV analyzer)

Continuously measures total organic carbon, using EPA method 415.1. (Prod. No. 6960300)



4



5

5 THE AUTOMATIC SAMPLER (optional)

Instantly captures water samples for future forensic analysis. (Prod. No. 007184)

IS THE WATER BEING DELIVERED TO YOUR SOCIAL, ECONOMIC, AND POLITICAL ICONS SAFE TO DRINK?



This system diagram illustrates how Hach's GuardianBlue Early Warning System detects and alerts operators to deviations in water quality parameters within a city's drinking water system.

1. GuardianBlue systems are strategically located at key points throughout a city's water distribution system, such as pump stations, water treatment facilities and storage tanks.
2. If a contaminant is introduced into a water distribution system via a backflow attack, deviations occur in one or more of the measured water quality parameters.
3. Every 60 seconds, GuardianBlue analyzes the city's drinking water for deviations from baseline. The deviation caused by a contaminant, triggers a system alarm.
4. Operators at the water distribution monitoring facility are alerted to the problem in real-time and track the contamination movement in order to contain the affected water.

PROACTIVE SOURCE WATER MONITORING

When source water travels over a long distance before reaching a treatment plant, having the right instrumentation in the right place can provide plant operators with a head start on the treatment process.

Monitoring the source water not only gives an early indication of potential problems, but also provides information to optimize treatment plant performance—which can save in chemical or energy costs.

The Hach system is designed to take up less space and be the most accurate suite of probes available in source water applications.



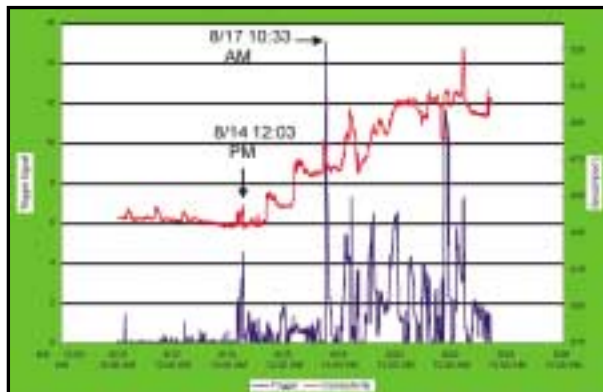
DETECT CHANGES BEFORE YOUR CUSTOMERS DO.

- Detect cross connection in real time
- Detect contamination events—intentional or accidental
- Stay alert to quality degradation due to water age
- Identify degradation in water quality due to biofouling or other events
- Monitor dead ends and low flow areas of the system
- Detect deviations caused by corrosion by-products, improve corrosion control
- Detect nitrification problems and ammonia overfeeds

Pipeburst Event

This graph depicts a 36-inch main break. GuardianBlue was 2 miles upstream and started to see significant deviations in water quality almost 3 full days before the catastrophic pipe break occurred.

The EPA estimates a pipebreak can cost on average about \$29 million in repairs and revenue loss. Wouldn't some early warning be helpful?



SPOTLIGHT ON: WATER QUALITY IN THE DISTRIBUTION SYSTEM

Fluoride overfeed caught in real-time.

The water distribution system can be vulnerable to accidental exposure to unwanted water quality events. In this scenario, the water utility was forced to revert to the utilization of a different water treatment plant while maintenance was being done to the new plant. A pump responsible for dosing fluoride into the treated water malfunctioned causing the dose to increase over time.

When the overdose occurred, the GuardianBlue Early Warning System not only alarmed but also classified the likely cause of the problem to be a fluoride overfeed. This allowed a rapid response before consumers of water were exposed to potentially dangerous levels of fluoride.

Fluoride, while toxic at moderate to high doses, is generally considered beneficial for dental health at low doses. The most commonly recommended dosage of fluoride for humans is 1 mg per day.

GUARDIANBLUE THE FIRST EARLY WARNING SYSTEM TO RECEIVE SAFETY ACT DESIGNATION & CERTIFICATION



GuardianBlue is the first and only Early Warning System for drinking water to earn SAFETY Act designation and certification from the U.S. Department of Homeland Security. "Designation" means the product has qualified as an anti-terrorist technology, while "certification" means the product is approved for homeland security.



GuardianBlue's Event Monitor, Water Panel and TOC Analyzer have undergone Environmental Technology Verification from the EPA for continuous multi-parameter water monitoring in distribution systems. Hach's GuardianBlue Early Warning System alarmed on 100% of all contaminants injected into the system during ETV verification. For a full report, go to www.hachhst.com and download the ETV summary.

PROTECTING OLYMPIANS IN BEIJING Continued from front page.



No deviations were reported during the games. If there had been, the monitor would have not only notified security personnel immediately, it would have also instantly signaled automatic samplers to capture real-time water samples at designated monitoring locations. In the event of a contamination, The system uses the GuardianBlue Agent Library to classify the deviation. The library contains fingerprints for a wide variety of threat contaminants, ranging from VX and ricin to arsenic and herbicides.

The success of the summer Olympic games is a point of immense national pride for China, and deservedly so. Unprecedented security measures were taken to deal with potential threats—one measure being the development of a highly strategic early warning system to alert officials of intentional contamination in the water supply. By continuously monitoring drinking water at key locations at the games,

the GuardianBlue EWS helped to provide a sense of confidence for security officials that water quality was being guarded effectively.

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