DO YOU KNOW WHAT'S IN YOUR SOURCE WATER?

HOW CONTINUOUS MONITORING CAN MAKE THE DIFFERENCE

68%

The percentage of all US drinking water facilities that pull their water from surface sources - both naturally occurring bodies of water and human-made reservoirs.

● = 1 Olympic pool

59 million gallons

The average volume of source water pumped per day by US treatment plants. That's **90 Olympic swimming** pools per plant, per day!

160 to 320

is the estimate of large dams built every year. Human-made reservoirs can create surface water sources with unique micro-climates. These climates are often not well understood, raising the potential for water quality events.

CONTAMINATION

Unlike groundwater, which is naturally filtered over time, surface water sources are much more prone to the risks of contamination due to natural exposure to the elements. Hazardous substances can be accidentally discharged into the watershed from industrial sources, old sewer systems or human activities such as agriculture (phosphorous pollution). There are many concentrated efforts surrounding watershed management, but accidents still occur and it is best to be prepared.

WHAT ARE YOU BRINGING INTO YOUR PLANT?

You already know what's coming into your facility with the process instruments that every plant will have. However, a monitoring program will give you insight into what's in your source water **before** it gets inside your plant, and provide you with an early warning! Generally speaking, the closer we look at our source water the more potential contaminants we find.

Though there are many hazards to be aware of, **Harmful Algae Blooms** (HAB's) have entered the public consciousness lately due to several high-profile cases that received media attention. While HAB's pose a serious threat to both humans and wildlife, they also pose a threat to keeping the machinery of treatment plant running smoothly.

$50 MILLION

The average cost per year to treat HAB's and HAB related problems.

>

$20 MILLION

The amount per year, of the $50 million, to address the impact on public health.

>

In 2014 there were 130 HAB events in 24 states.

What's the standard for monitoring HAB's?

The U.S. EPA recently released health advisories recommending values of microcystin to not exceed **1.6 micrograms** per liter.

1 ppb

But the World Heath Organization has said that as little as **1 part per billion** of microcystin is enough to merit remediation.

With such a small amount toxins being a potential source for so many problems we **MUST BE VIGILANT**

What are the impacts of unmonitored HAB's?

DO NOT DRINK

DO NOT SMELL

The impacts of unchecked algae toxins in source water are as serious as they are numerous. At low levels it can impart unpleasant colors, odor and tastes to drinking water. It can make recreational activities like swimming or fishing hazardous. At high concentrations it can cause nausea, vomiting & liver damage. In the example below, a worst case scenario, unmonitored HAB's can trigger an expensive total shut-down of the facility.

NAUSEA, VOMITING & LIVER DAMAGE

THE TOLEDO EXAMPLE

Due to a lack of standards, toxic algae blooms are becoming the "new normal". Global climate change combined with agricultural runoff are contributing to a trend of increasingly toxic blooms of microcystin. In 2014 the communities surrounding the Toledo area felt the effects first-hand.

Toledo pulls its source water directly from Lake Erie, which has seen record blooms of late. Due to limited visibility into cyanobacteria levels the problem went undetected until it was too late.

Chemical tests confirmed the presence of unsafe levels of the algal toxin in Toledo's drinking water plants **finished water**, at levels around **10 to 20 parts per billion** forcing a plant shutdown.

400,000 people without potable water for several days.

$200,000+

The estimated remediation costs for the Toledo event. Does not include impact on the local economy.

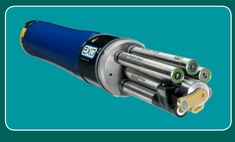
WHAT CAN YOU DO ABOUT HAB's?

Until a nation-wide standard is put in place for mitigating the causes of harmful algae blooms the best thing you can do to protect your treatment plant is maintain a robust monitoring program. Keeping a close eye on your source water and the machinery of your plant will help reduce costs in the long run and prevent frustrating shut downs.

At YSI, we offer a variety of solutions to help you manage the quality of your source water:

1 EXO SAMPLING KIT

Improve Efficiency



The first solution is to sample key locations for water quality indicators in source water including turbidity and algae. The **EXO platform** can complement a routine sampling program by allowing the field technician to sample more parameters in the same amount of time as traditional methods.

YSI.com/EXO2

2 REAL-TIME BUOY

Gain Peace of Mind

A more significant step is to deploy an autonomous water quality platform to provide real time data at your intake. This decision support tool can track changes in water quality day and night, and provide an early warning of events before they hit your pre-treatment filtering. This can give you minutes to hours of early indication as events occur.

EMM68 - Harbor Buoy

3 SYSTEMS & SERVICES

The Total Solution

The most powerful tool at your disposal is our **Integrated Systems & Services Division**. We can provide you with complete systems, site selection, installation and support for your source water monitoring needs. More importantly, they can help provide the data you need to have visibility into the quality of your source water.

YSIsystems.com

LEARN MORE ONLINE:

YSIsystems.com | **YSI.com/Sourcewater**

SOURCES
US EPA - *Drinking Water Treatment*
Martha C. White, NBC News - *Toledo Collapse Story*
Rod Dunn - *Overview of Columbus Water System*
City of Dayton Dept. of Water - *2015 Water Quality Report*
UW-Madison Center for Limnology - *Toxic Algae, Drinking Water & Why Madison Won't be Toledo*

A YSI Infographic Source Water Series

Interested in learning more about continuous monitoring?
Contact an applications specialist:

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