

# **UNDERWATER DETECTIVE: THE IMPORTANCE OF NEAR-REAL TIME RIVER WATER MONITORING**

Understanding the operational importance of a near real-time monitoring and notification network from a water system management perspective.



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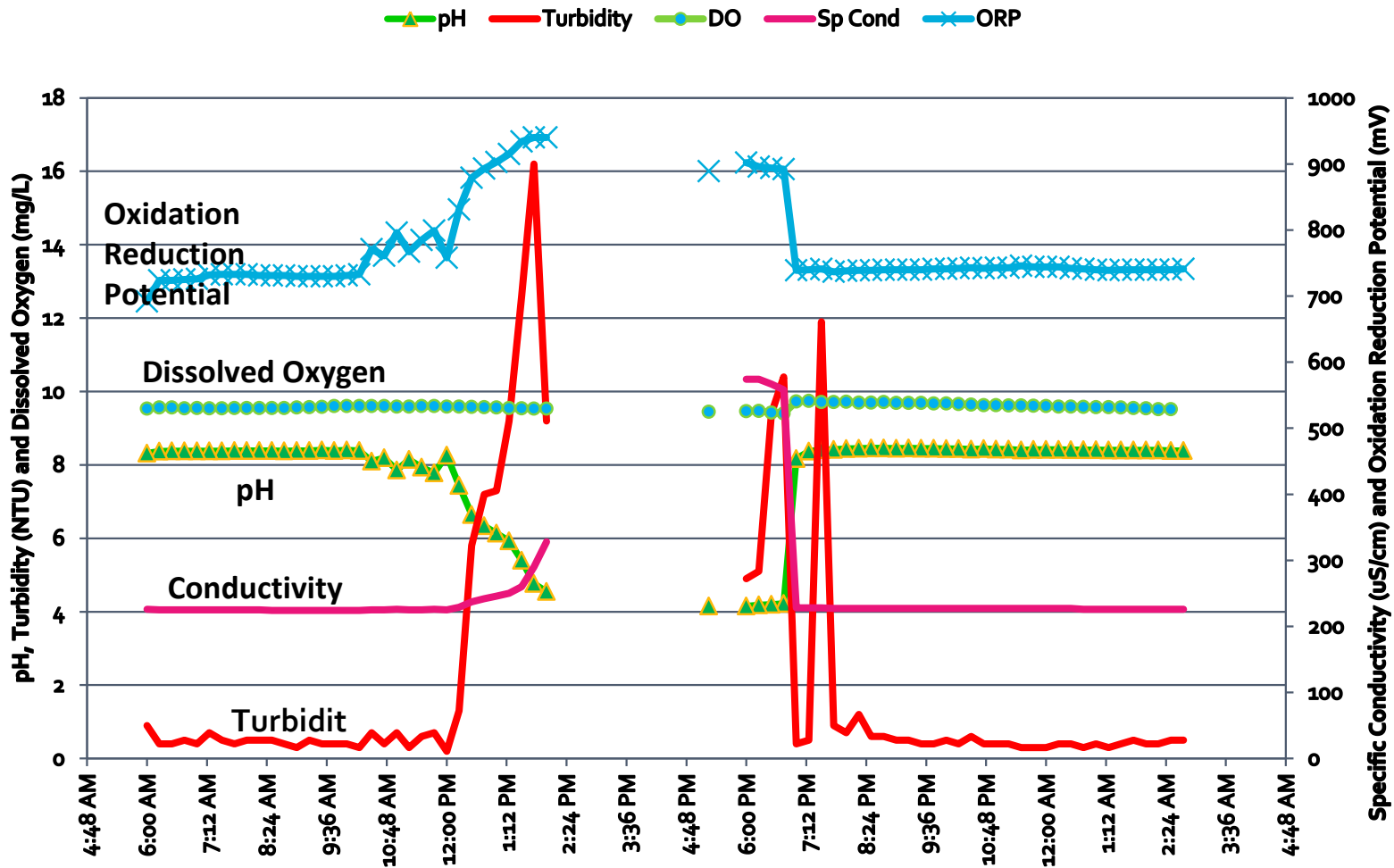
# Huron to Erie Drinking Water Monitoring Network

- Designed to provide detection and notification of a chemical spill in drinking water source water
- Alliance of municipalities from Lake Huron to Lake Erie with near-real time monitoring equipment on their water plant intakes
- Originally funded by federal, state, and county grants/funds
- Funding began in 2006 for 14 locations.
- Due to funding constraints, today there are only 9 locations left on the system
- Equipment consisted of three options:
  - Multi-parameter probe (pH, conductivity, ORP, D.O., chlorophyll, turbidity)
  - TOC analyzer and fluorometer (for petroleum based chemicals)
  - Gas chromatographic mass spectrophotometer (GCMS)
- Each location's sampling equipment was selected based on probability of being susceptible to a Canadian chemical release
- Detections can instantly alert all municipalities on the network

# Monitoring Locations




# July 15, 2011 Incident: Port Huron Intake





# July 15, 2011 Incident – Port Huron

- Port Huron Water Filtration Plant detected a drop in pH from 8.3 down to 4.2
  - Monitoring system alerted subscribed plants of the pH drop
  - Port Huron verified the pH with benchtop laboratory equipment
  - Port Huron shutdown plant and also contacted downstream plants via telephone
  - Maintained communication with MDEQ officials
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# July 15, 2011 Incident - Marysville

- Marysville was able to shut down before the spill reached our intake
- Distribution system pumping was reduced to a minimum
- Fire Department was notified of possible restricted usage
- Contact was made with MDEQ personnel for updates
- Marysville operated the plant in bypass mode and monitored for a pH change
- During bypass operation, a pH drop from 8.3 to 7.0 was detected
- Within one hour the pH returned to 8.3
- After notifying the MDEQ, the plant was brought back online and normal distribution pumping was resumed

*EARLY DETECTION IS CRITICAL*

# Benefits of a continuous monitoring and alert system

- If a spill is detected before it has entered the plant:
  - Shutdown intake facilities immediately
  - Operation of distribution pumps at minimal requirements
  - Notifying high volume users of potential supply shortage
  - Notifying residential customers regarding non-essential water usage
  - Possible isolation of storage facilities
  - Operation of inter-city connections
  - If pressure is lost, then a boil notice must be issued
- If a spill is detected after it has entered the plant:
  - Untreated water in plant may not be used – major loss of capacity
  - Untreated water in plant must be eliminated – major loss of treatment time during emptying, cleaning, and re-filling of tanks
  - Possible contamination of filter media and post-treatment facilities – days/weeks of cleaning and testing

# Benefits of a continuous monitoring and alert system

- If a spill is detected after it has passed through the plant:
  - Do not drink notification to the public
  - Testing, cleaning, and re-testing of all affected areas
    - Water mains
    - Elevated storage towers
    - Pumping stations
  - Possibly weeks of public water supply disruption
  - Public relations and consumer confidence fallout

*It is our opinion that the Huron to Erie Network is one of the best tools available to maintain safe drinking water*





# Where do we go from here?

- Streamlining notification channels between US and Canada agencies
- Understanding flow models of our waterways
  - Crossover potential of spills
  - Response time due to river velocity and spill location
- Possible real-time incident website
  - Spill location and information on GIS map
  - Scrolling chat forum based updates from Emergency Management
- Educating the public of the importance of the network
  - Ensure the public knows we are doing our best to prevent an issue
  - Water rates cover the funding for this network



# Questions?

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