

# Enhanced Online Water Quality Monitoring for Super Bowl XLVIII

Outcome and Lessons Learned  
(Not Just Another Giants' Game)

Next Generation Compliance  
George Washington University Law School  
March 26 – 27, 2015

Keith Cartnick, United Water  
John Dyksen, United Water



# Super Bowl Invades NY Area – Feb 2, 2014



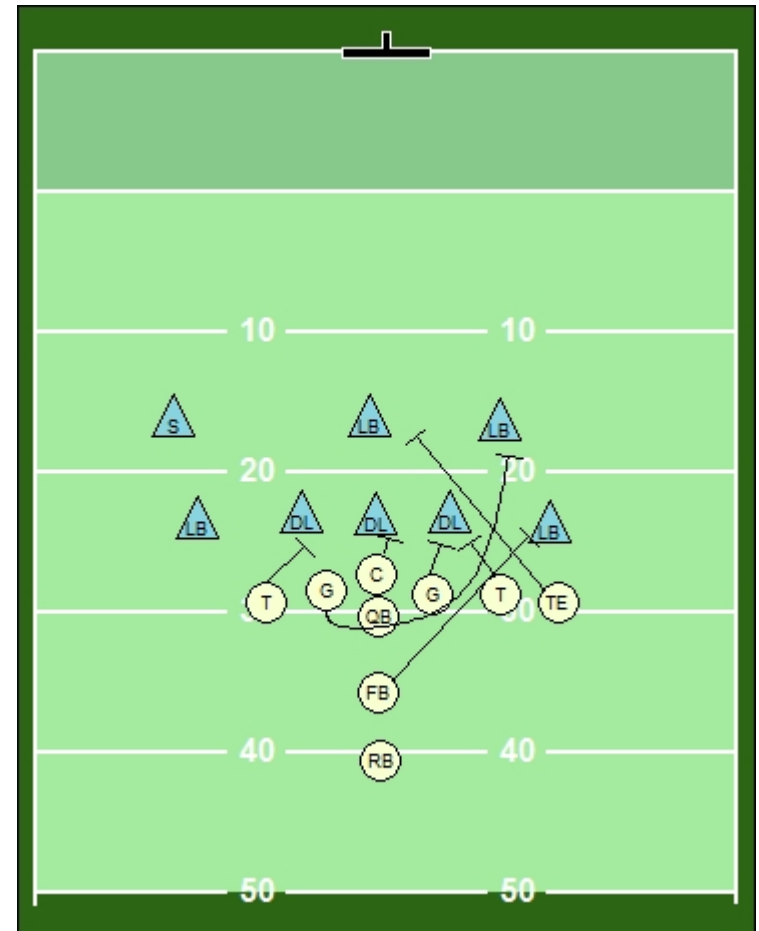
Seahawks:  
43  
  
Broncos:  
8



# Planning for the Big Game



- **Assure adequate and uninterrupted water quantity, pressure and quality the week leading up to the game and game day**
- **Be prepared to quickly isolate and repair main breaks**
  - Especially in Jersey City and other towns with Super Bowl events
- **Monitor water quality for any potential contamination event**
- **Be prepared to respond to a contamination incident**





# History of Special H<sub>2</sub>O Security



- Done at past Super Bowls – Cowboys Stadium, Arlington, TX
- Boston Marathon
- NCIS Los Angeles – 4/9/13
- Water Research Foundation
  - \$50,000 research grant



# United Water Super Bowl Planning Team

- **Transmission & Distribution**
- **Engineering**
- **Water quality**
- **Health & safety**
- **Communications**
- **Customer service**



# Planning Agencies Involved

- NJ State Police
- US Department of Homeland Security
- Bergen County Prosecutor's Office
- NJ Sports & Exposition Authority
- MetLife Stadium
- NJDEP
- NFL
- Hackensack Hospital Med. Center





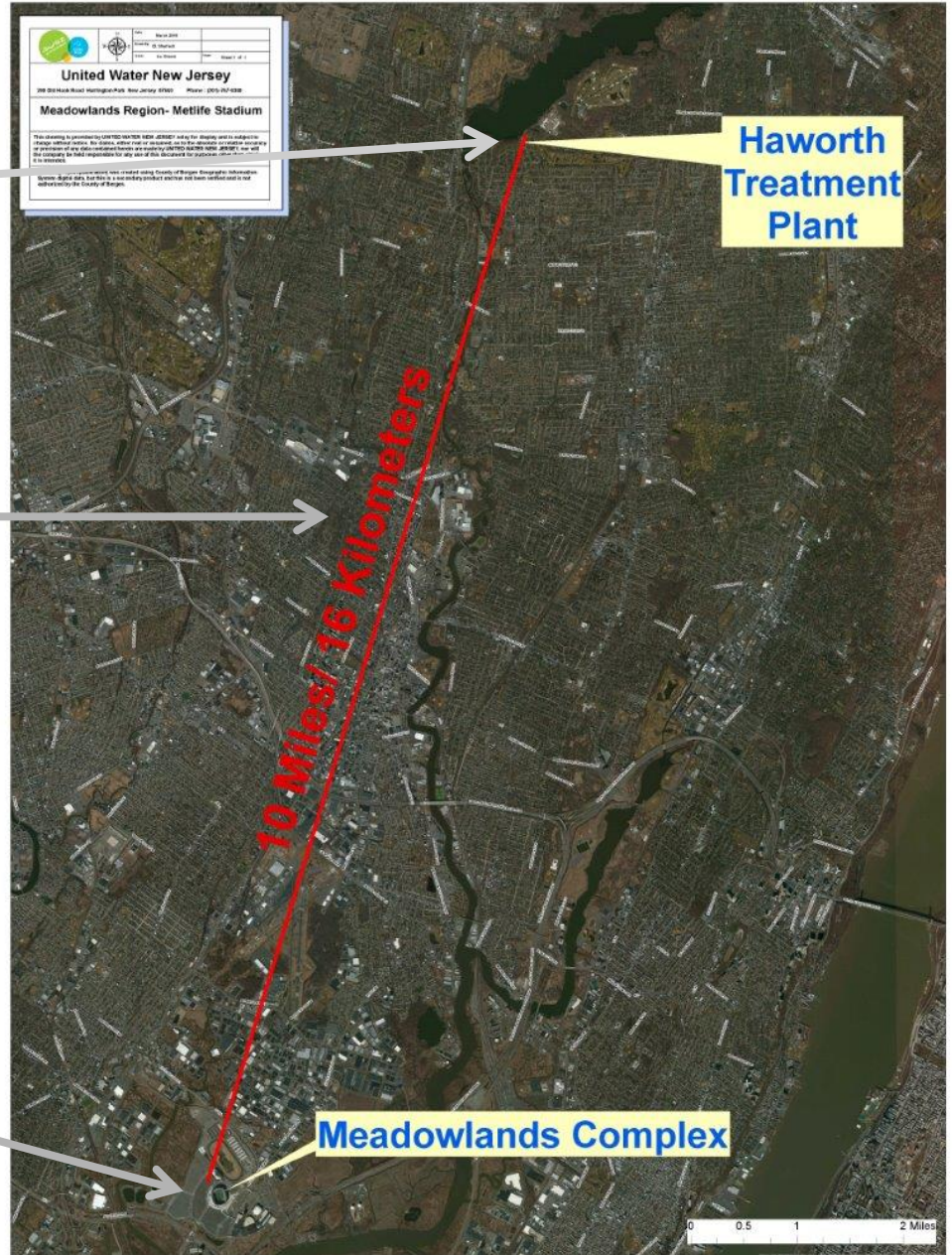
# UWNJ Distribution System



Haworth WTP

Transmission  
Mains

Meadowlands  
Sports  
Complex



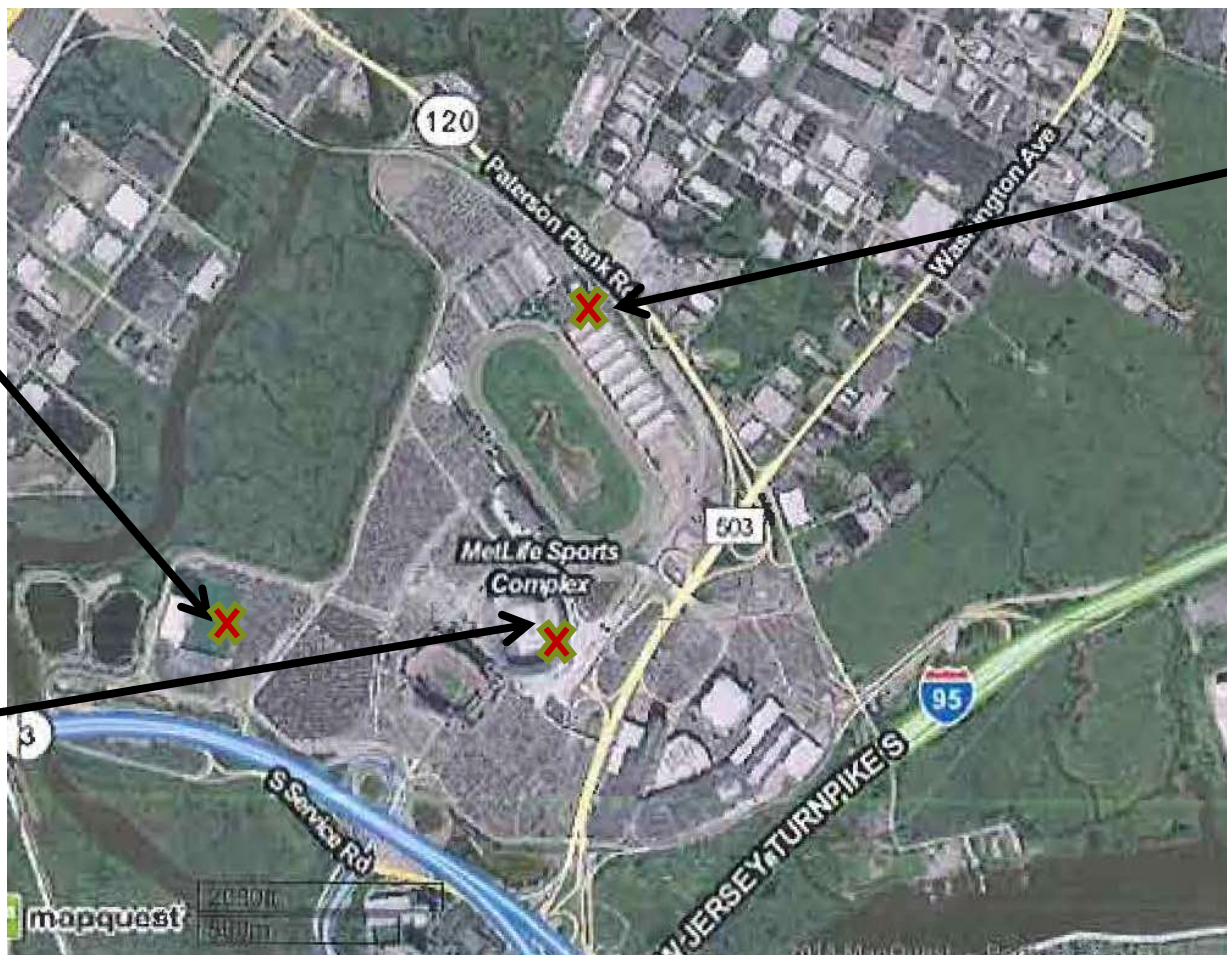
# Meadowlands Sports Complex

## Sampling Locations - X

Quest Training Center

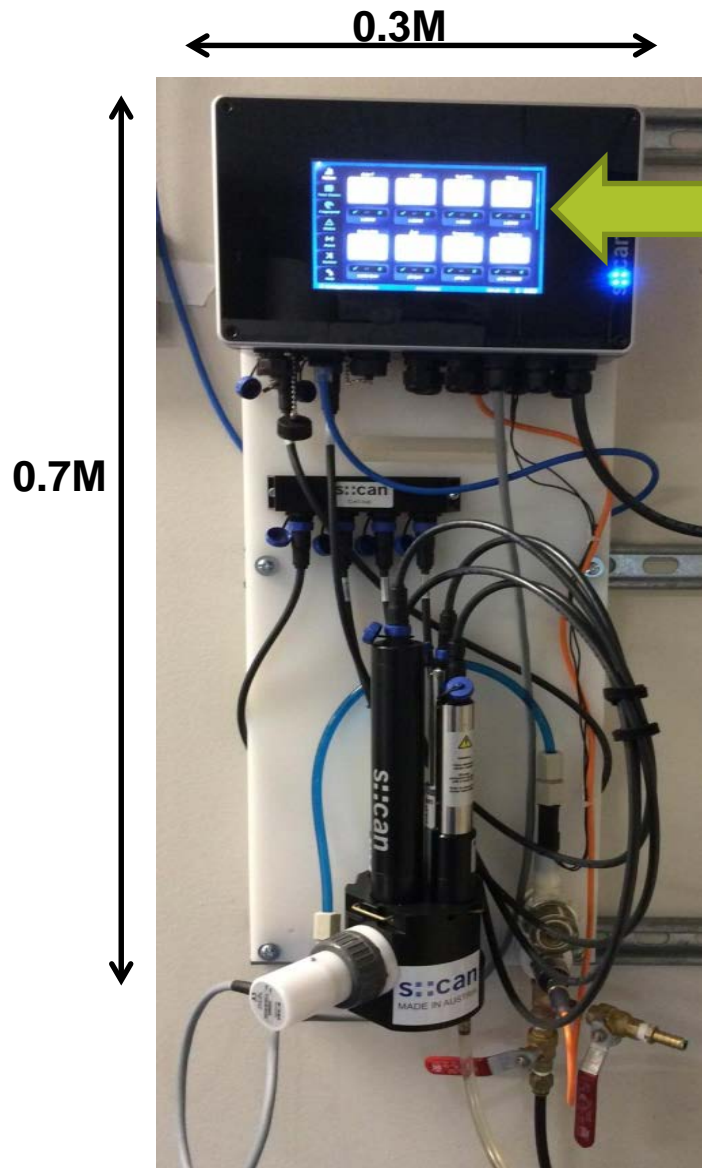
MetLife Stadium

Hotbox





# S::CAN Monitoring Device



i::scan manufactured by s::can Measuring Systems LLC, Cambridge, MA

- Parameters Measured:
- pH
  - Temperature
  - Total chlorine residual
  - Conductivity
  - Turbidity/Color
  - /TOC/UV254
  - Pressure

# Installation of Devices

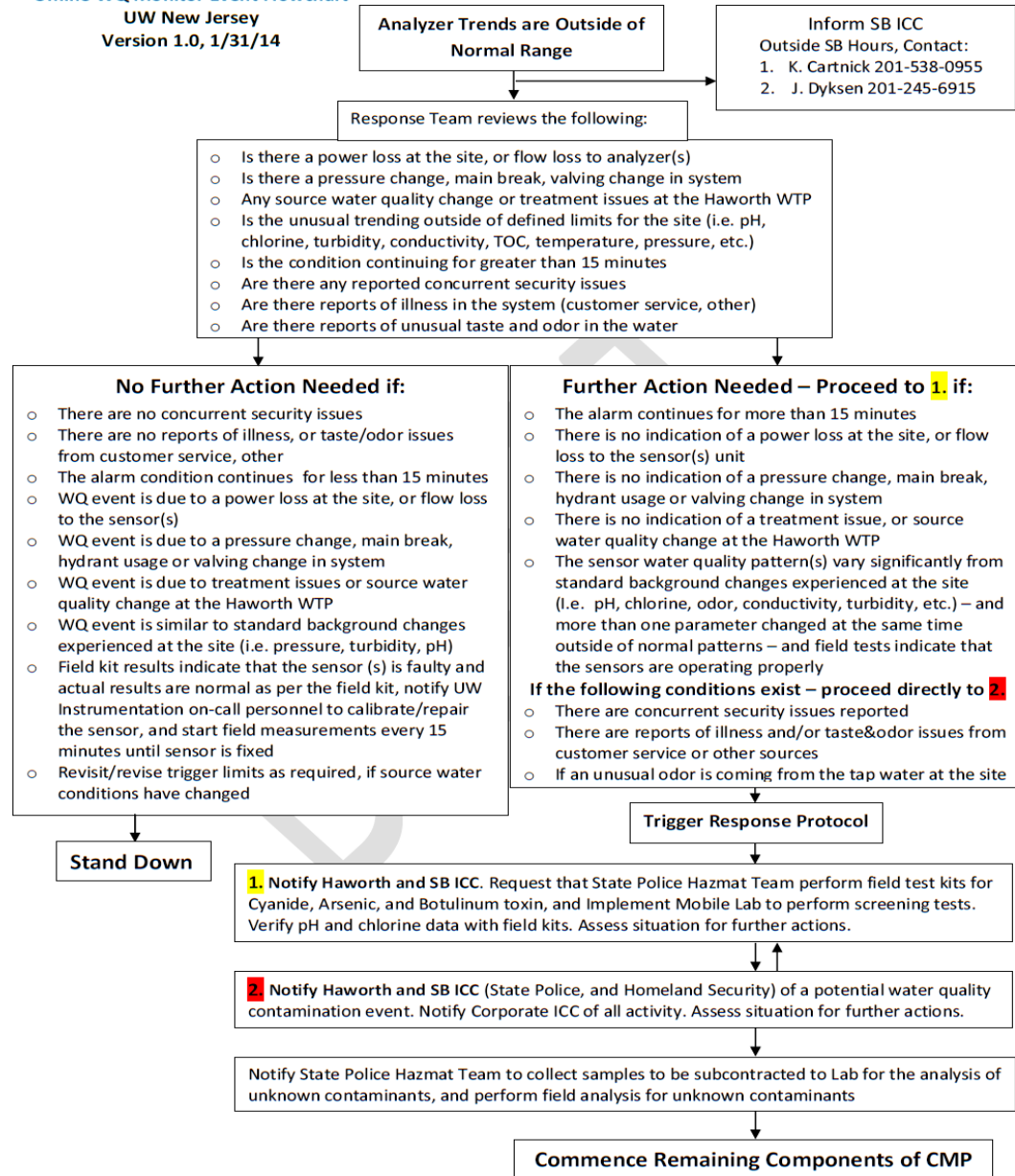


# Event Flowchart

What are the consequences of making the “wrong call”?



## Online WQ Monitor Event Flowchart UW New Jersey Version 1.0, 1/31/14



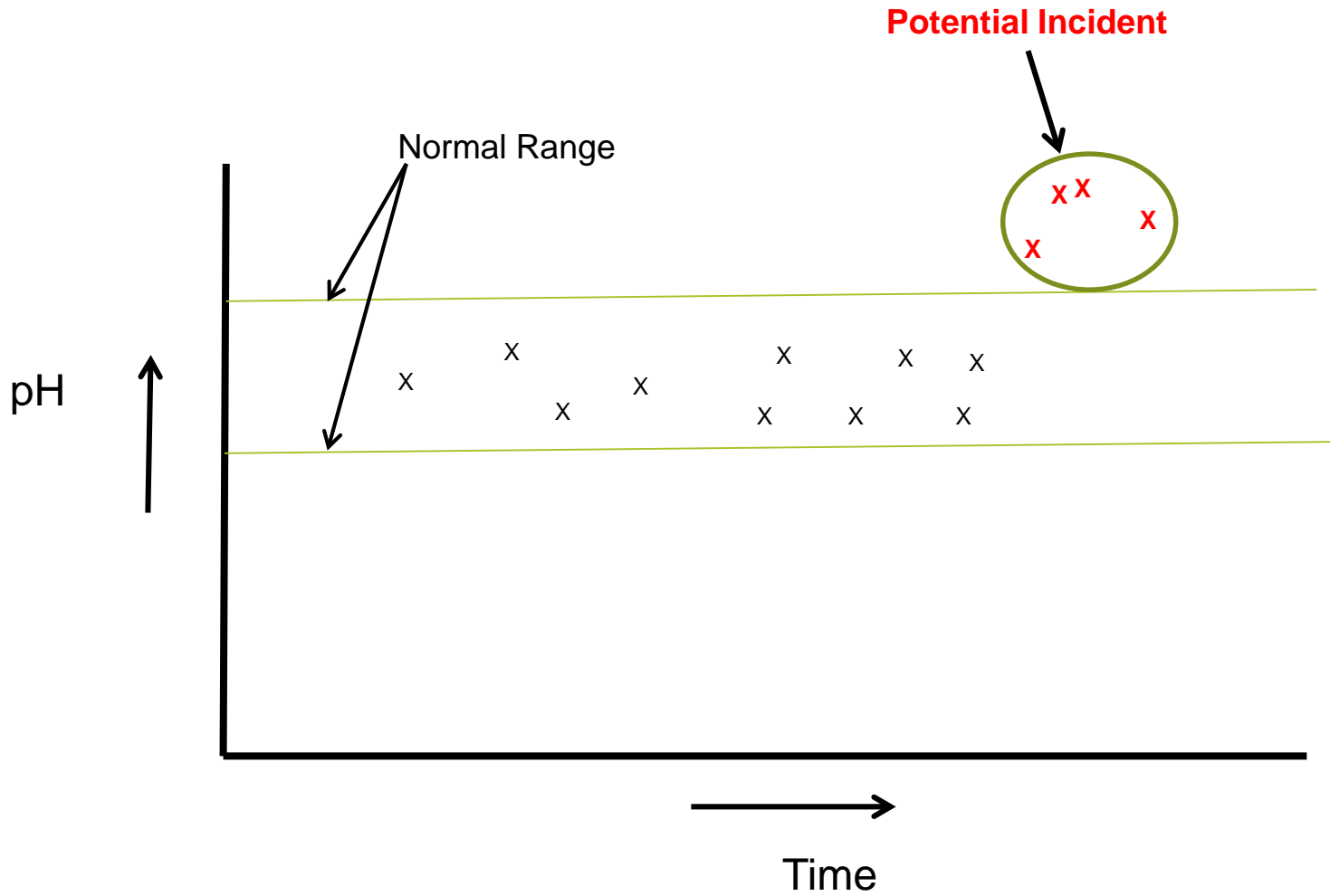


# Make it Simple for the Quarterback (Monitoring/ Response Procedures)

- Track water quality parameters
- If water quality within typical range, all is well
- If major deviation occurs
  - Check water quality at plant for any changes
  - Field check monitoring devices
  - Check system operations for possible main break, fire, change in operations
  - Check with Customer Service about complaints or threats
  - Immediately notify authorities about contamination possibility
  - Analyze water on-site using test kits for selected contaminants like cyanide
  - Notify authorities if on-site test is positive
- Isolate water system and investigate the source
- Initiate decontamination procedures

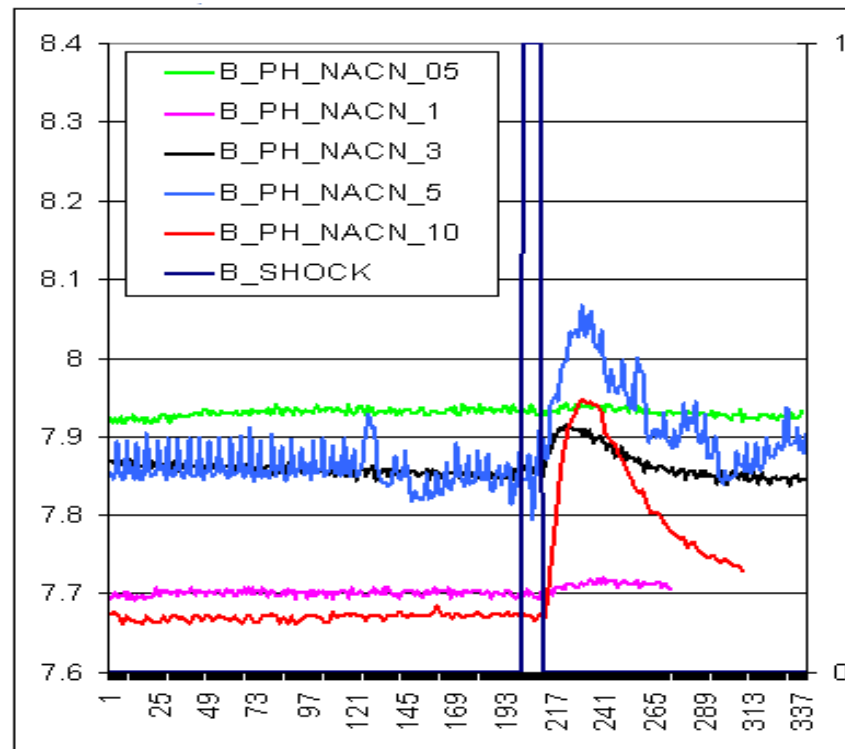
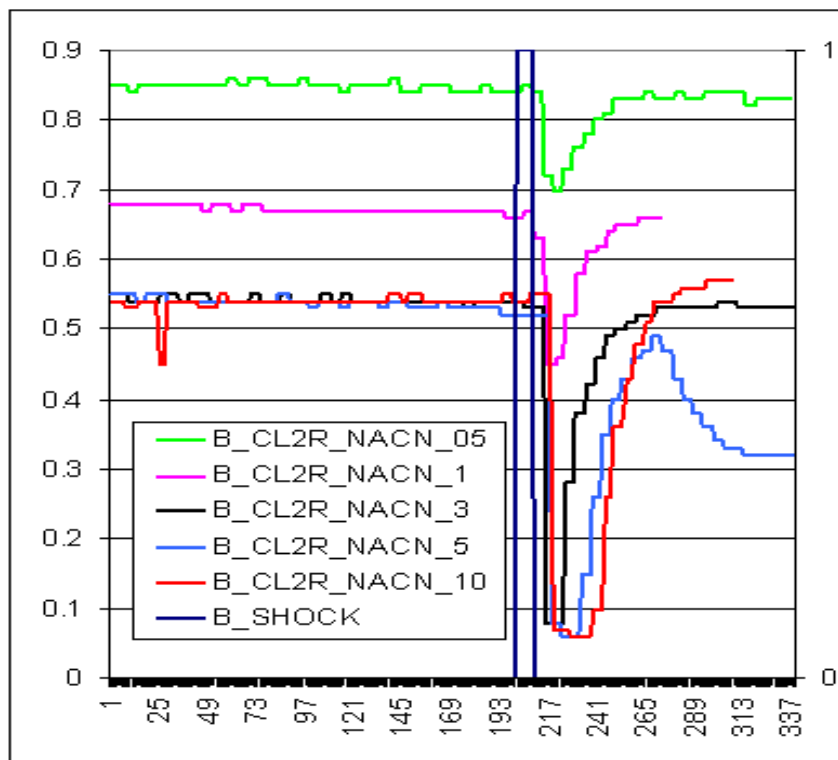


# Water Quality Monitoring



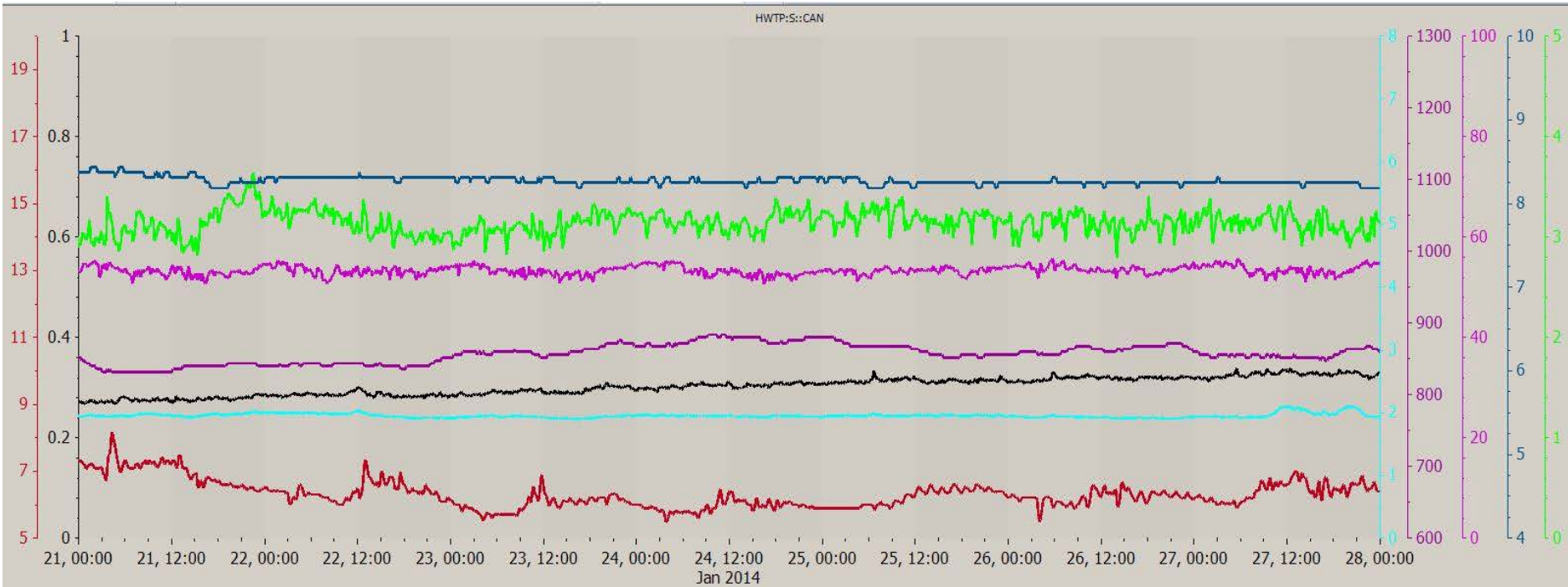
# Chlorine Residual and pH Response to Sodium Cyanide

...really need to understand multi-parameter responses to contaminants



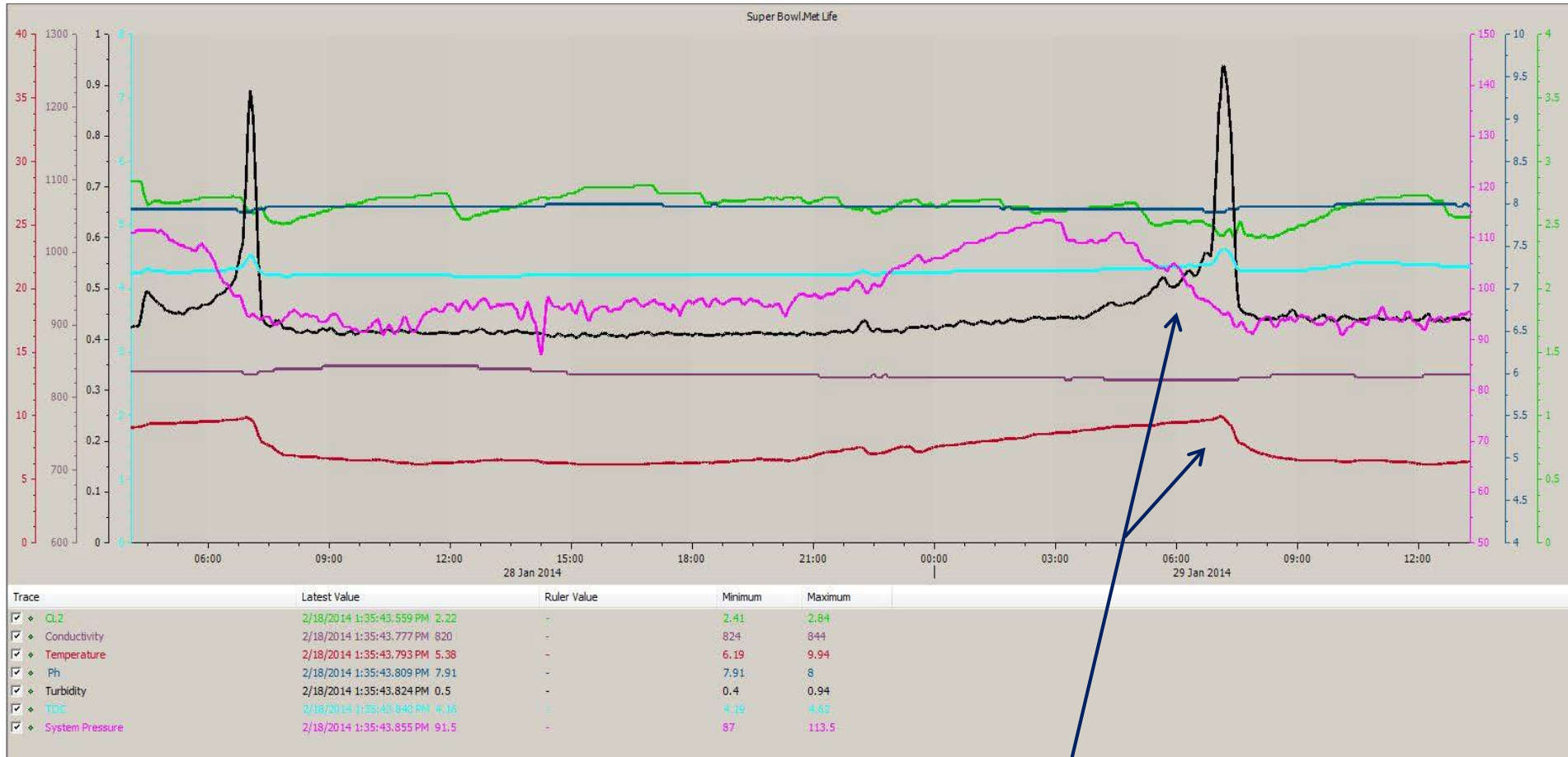


# Haworth WTP – Stable Water Quality



Trace	Latest Value	Ruler Value
Cl <sub>2</sub>	2/18/2014 1:26:39.608 PM 2.89	-
Temperature	2/18/2014 1:26:39.639 PM 5.97	-
PH	2/18/2014 1:26:39.671 PM 8.19	-
System Pressure	2/18/2014 1:26:39.717 PM 52.25	-
Conductivity	2/18/2014 1:26:39.749 PM 832	-
Turbidity	2/18/2014 1:26:39.780 PM 0.41	-
TSS	2/18/2014 1:26:39.811 PM 1.62	-

# Super Bowl Arena – Met Life Building – 2 Day View



It is important to understand normal, daily excursions due to site operations

# Super Bowl Arena – MetLife Stadium – Game Week



Game Day excursions similar, but slightly different due to more frequent operation of booster pumps at the Stadium to satisfy demand



# Postgame Wrap-up – and Application of Results

- Added security against potential contamination incidents
- Network monitoring in “sensitive” locations (hospitals, schools, etc.)
- Network operations to stabilize/ improve water quality
- Corrosion control optimization. Revised Lead and Copper Rule corrosion control monitoring (real-time pH, conductivity, po4)
- Research need:  
Impact of potential contaminants on typical water quality parameters



# Data Integrity – UW Liability

- **Monitoring initiative was not publicized – should it be?**
  - Deterrent
  - Stimulant
- **Quality Assurance calibration standards used to verify monitors**
  - However, no regulatory requirements and no “Certified” analytical methods
- **Data from online sensors is transmitted through “secure” pathway**
  - How secure is it?
  - How do we ensure that data is protected?
- **What are the consequences of making the “wrong call”?**
- **When does United Water step out of the way?**
  - State Police
  - Homeland Security
  - NJDEP
  - Met Life Stadium personnel
  - What is the liability if we don’t monitor the water at all?



# Resources

- **Water Contaminant Information Tool (WCIT) - EPA**
  - <http://water.epa.gov/scitech/datait/databases/wcit/index.cfm>
- **Distribution System Water Quality Monitoring: Sensor Technology Evaluation Methodology and Results - EPA 2012**
- **On-Line Water Quality Monitoring for Drinking Water Contamination - USEPA Cincinnati - 2012**
- **Data Set: Water Quality Parameter Response Data for 5 Different Finished Drinking Water from 4 Large Municipalities – EPA 2013**



# Our Team on Game Day!



## Team effort! – both internal and external “players”

- Engineering, Operations, Communications, Laboratory, Security
- Regulator (NJDEP), State Police, NFL Members

# Thank You!

