WQ Monitoring Workshop
Water Industry Point of View
Drinking Water

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Source Water Monitoring

Source water applications:

1) Direct supply reservoir monitoring

2) Inlet to reservoirs (flow weirs)

3) River Murray monitoring
Direct supply reservoir monitoring

- Thermister chains
  - high on maintenance, limited information (temperature profile) and have issues where taken out, can lose individual components

- Vertical profiling units – future direction
  - Myponga reservoir
  - More robust, greater number of WQ parameters measurable, get a depth profile
  - DO, chlorophyll, blue-green algae, temp, turbidity, conductivity
Reservoir vertical profiler system

- Telemetry linked sensors and weather station to provide real-time water quality data
- Web-based interface
Water quality sondes – sensors for 7 parameters

- Depth
- Conductivity
- Temperature

- Chlorophyll (optical)
- “Blue-green algae” (optical)
- Turbidity (optical)
- DO (optical)

Optical sensors employ LED technology
Myponga WQ profiler – auto downloads

Temperature

Depth (m)

Date

09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

0 5 10 15 20 25 30

Turbidity

Depth (m)

Date

09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

0 5 10 15 20 25 30

SpCond

Depth (m)

Date

09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

0 5 10 15 20 25 30

Chl

Depth (m)

Date

09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

0 5 10 15 20 25 30

DOxygen_sat

Depth (m)

Date

09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

0 5 10 15 20 25 30

BGA_PC_Conc

Depth (m)

Date

09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

0 2 4 6 8 10

0 10 100 1000 10000
Inlet to reservoirs (flow weirs)

- Profile online WQ of water coming into our direct supply reservoirs

- Allow decisions on diversion of flow (indirect supply reservoirs, environmental flows)

- Allows identification of key challenges (eg Cryptosporidium, pesticides) based on rainfall, flow and WQ data
River Murray Monitoring

- Used fixed depth profiler for prediction of algal blooms and general WQ data

- Sondes can evaluate blue-greens versus other algae
Cyanobacterial sensor - telemetry

- Further development of the water quality sonde deployment: cooperative trial installation at Lock 1 of sensor linked to telemetry to provide real-time data of cyanobacterial biomass at that location – enhanced monitoring
River Murray Monitoring

• Trialled unit for WQ monitoring and stormwater monitoring (S:CAN) at Mannum – prediction of hydrocarbon and nutrients loads (possibly algae as well) – limited sensitivity for some contamination events (eg hydrocarbons, nutrients)
Why install the S::CAN at Mannum?

Urbanised area

Upstream

Stormwater can contain very high levels of pathogens, organic and inorganic pollutants

MAPL offtake
Drinking Water Quality

• Looking at expanding traditional analysers

• Ammonia analysers for chloramination control

• UVabs for coagulant prediction – feed forward WTP control

• UVabs for prediction of chlorine demand and DBP’S
Ammonia Analysers

- Morgan
- Woolpunda
- Summit

Good results provided you calibrate and maintain (high maintenance requirements to ensure results meaningful)

Allow to track disinfection (chlorine and ammonia addition) and optimise monochloramine formation (minimise nitrification problems in the distribution system)
Feed Forward Coagulation Control

- Use S:CAN to predict alum dosing
- Feed forward control
- Have purchased S:CAN and installing
UV for Chlorine Demand and DBP Prediction

• Using S:CAN

• Difficulty in predicting water age at set point in system

• The 3 day chlorine demand parameter performs better as a surrogate for chlorine demand than a single wavelength 254nm

• Trials ongoing with desal water entering system
Conclusion

We already use a lot of online monitoring for WTP’s

A lot of promise for enhanced online systems, early warning and optimising drinking water treatment and distribution management

(Accurate and timely information)