

**SECURING A QUALITY WATER SUPPLY
WORKSHOP SUMMARY AND OUTCOMES**

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1 Water Quality Workshop

Panel

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2 Agenda

- The Australian Drinking Water Framework - Paul Byleveld
- What are the implications for water utilities?
 - Assessment of the System, Hazard Analysis and Risk Assessment
 - Existing Controls Adequate? Multiple barrier approach, Matching treatment to source water
 - Monitoring
- Indirect Potable Reuse
- Learning from Outbreaks World Wide
- What industry focussed strategies should be pursued by the association and Water directorate to assist council owned water utilities.

3 What are the implications for water utilities?

3.1 Assessment of the System - Hazard and Risk Assessment

- Assessment of schemes is a part of business planning.
- With a good understanding of the system it is possible to defer works eg WTP.
- Appendix of the Australian Drinking Water Guidelines gives good guidance.
- Major incidents can stretch the system – it is important to understand the problem areas. Operators' training is critical, incidents always happen on holidays.

3.2 Existing Controls Adequate? Multiple barrier approach, Matching treatment to source water

- Treatment requirements should be matched to the quality of the source water. Groundwater is obviously different to surface water.
- Need information over a significantly long period of time to understand the range. Water quality monitoring during the current period (drought) may miss the peak events (first flush).
- As the reliance in on-line monitoring increases there is a need to maintain instruments if you are relying on them to demonstrate/verify the system is safe.
- The reservoir roof is a critical barrier; swallows etc. in reservoirs can compromise the system. Test results need to be taken seriously. They can show the system is not as secure as operators think.
- Knowing the system and understanding how the system operates is critical.

Example: Coffs Harbour City Council experienced fuel (benzene) in river system of small village. This required that water be carted in until a treatment system could be constructed. This could also have serious implications for the system, where trunk main breaks occur adjacent to leaking petrol stations.

Example: Hastings Council turned off the water supply system for the small villages during period of high turbidity prior to the installation of membrane plants. If these periods were extended they had to cart water. They also looked in the catchment and found cows crossing the river. They worked out when this occurred and stopped extraction over this period.

They also have:

- A telemetry system with redox probes to indicate the chlorine residual.
- Security alarms on reservoirs that call out the local security company. Well-publicised prosecutions result in a reduced incident of break ins.

3.3 Monitoring

- There is a need to make sure that you can respond to operational monitoring. There is no point in monitoring things at the operational level if you don't know what you will do about it. Verification monitoring will check these areas.
- Operators need a good understanding of how their plant works, so they understand which points should be monitored as key areas (critical control points).
- It is better to monitor for thermotolerant coliforms or e-coli than total coliforms for bacterial contamination. However total coliforms are an indication of health of the system.
- It is essential to monitor for chlorine at a frequency that ensures the process is safe.
- It is important to undertake a mass balance regularly (eg daily), that is, a manual check of how much chemicals you are putting in for the amount of water you are treating

Example: North Coast Water, Power failures were problem - have installed automatic valves that shut the system down

- Pressure monitoring, so they know if there are regular backflows
- Some of their system have no chlorine residual
- pH, Turbidity and chlorine are monitored on-line

- They have used total plate count rather than total coliforms to indicate when to flush

Example: North Coast Water Power failure was a problem - have installed automatic valves that shut the system down

- Pressure monitoring so they know if there has been any backflow events;
- Some of their system has no chlorine residual, hence total coliform counts are monitored for irregularity rather than zero counts due to regrowth in system especially during summer;
- pH, turbidity have been monitored throughout the system weekly;
- Turbidity and chlorine also monitored on-line to avoid dirty water extractions from the river and ensure prompt reactions to treatment process that trigger chlorine alarms; and
- They have used total plate count rather than total coliforms to indicate when to flush.

Example: Coffs Harbour test regularly for cyanobacteria (blue green algae) in their storage reservoirs, despite the fact they have not had any cyanobacterial outbreaks as neighbouring councils have. They also have raw water source monitoring on line, monitoring for chlorine, weekly reservoir checks for chlorine and end of system checks to ensure the system are working.

Example: Riverina Water found that the cost of monitoring for algal monitoring for a small supply was more expensive than to provide drinking water to all households (40 households) and treat with PAC for water for all other sources.

Discussion – On-line Aluminium monitoring

- High doses of aluminium can be picked up through pH changes – on-line monitoring isn't really necessary. Current studies indicate that it is not a significant health risk.
- High dose of alum can cause an irritation effect due to impact in mucus membranes

Pesticide Monitoring

To get the best value from pesticides monitoring, have discussions with the local agricultures officers to determine what to test for.

Total Organic Carbon

Total organic carbon testing can tell you about the stability of the chlorine residual. This is available from DHL labs. TOC will be tested for in treated water as part of the regular Health testing. If you want testing for management of raw water, approach your local Public Health officer.

4 Indirect Potable Reuse

- CRCs position does not support indirect potable reuse. Their position is we should be minimising the amount of waste that enters the system.
- The Health Department does not rule out indirect potable reuse, however it would need to see a careful risk assessment.
- There will be new national recycled water guidelines, however they will not consider indirect potable reuse. This throws it back to the states to organise their own guidelines.
- As in industry we will be relying on recycled water more and more. We need to be careful as a failure in any system can shatter public confidence throughout the industry.

5 Learning from Outbreaks World Wide

- Knowledge Transfer – NSW Health - the decision tool from the NHMRC - will use the weekly circulation and Water Directorate's monthly newsletter to disseminate information
- Hold meetings regionally
- Lessons learn from outbreak

5.1 What industry focussed strategies should be pursued by the association and Water Directorate to assist council owned water utilities?

- Water Directorate are upgrading the Blue Green Algae Protocols and chart and providing a 20 page operators guide to the ADWG.
- Lobby for testing of Algal toxins in NSW Health Labs.
- Lobby for better spreading of the collection of information on algae, the information already collected by DNR.
- Difficulties in maintaining trained operators – Water Directorate and LGSA to investigate the issues associated with capacity (operators) and develop strategies to address this.
- Need for local training of operators.