WICA and Public Health
Guidelines and monitoring requirements

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NSW Health’s Role

- Protection of Public Health

- Why is the regulation of drinking water and recycled water important for the protection of public health?
  - Ensure access to adequate quantities of safe drinking water
  - Ensure recycled water is fit for purpose

- How is this done?
  - Ensuring technical competence
  - Enduring appropriate design and monitoring of schemes
  - Notification of incidents of public health concern
12 May: contamination (8-12 May heavy rain)

17 May: adverse micro results received by operator, but not reported

19 May: Operator lies to Health Unit – ‘water is OK’

21 May: Boil Water Advisory issued

22 May: first death

18 May: GI illness emerges in the community

Walkerton Epidemic Curve adapted from Steve Hrudey, University of Alberta, 2006
Milwaukee Outbreak 1993

“process monitoring”

Finished water turbidity

Phone complaints

GI Cases - the outbreak

adapted from Steve Hrudey, University of Alberta, 2006

- Defines safe, good quality drinking water
- Preventive management encompasses all steps in water production from catchment to consumer
- Helps assure drinking water quality and protects public health
Framework for Management of Drinking Water Quality

- Assessment of water supply and identification of hazards
- Emphasises prevention, operational procedures, process control
- Verification of quality, management of incidents

Simply - what is the hazard and the source?
- how do we manage the risk?
- how do we know the risk is managed?
ADWG- Guiding Principles

- Greatest risk is from pathogenic microorganisms. Protection of water sources and adequate treatment is essential.
- Robust multiple barriers appropriate to level of potential contamination must be continuously maintained.
- Sudden or extreme change in water quality, flow or environmental conditions (e.g. extreme rainfall or flooding) should arouse suspicion.
- Operators must respond quickly and effectively to adverse monitoring signals.
- Operators must have personal sense of responsibility to supply safe water, and never ignore a consumer complaint.
- A preventive risk management approach is required to ensure drinking water safety and quality. Testing is just one part of this process.
Recycled Water Incidents

- Cranbourne, Melbourne, 2007
  - Recycled water mistakenly piped to drinking water tap in an administration building at the Eastern Treatment Plant, Melbourne
  - Plumbing defect detected after 19 days
  - Approximately 12 people ill from 25 people exposed to Class C recycled Water

- Gold Coast, 2009-10
  - Recycled water of non-potable class mistakenly piped to drinking water system via reticulation system cross-connection
  - 630 properties affected
  - Defect detected, due to taste and odour complaints and rectified within 2 days
  - No illness likely due to high quality of the water
  - Public confidence is now a major issue
Guidelines for Recycled Water

- **Australian Guidelines for Water Recycling (Phase 1)**

- **Australian Guidelines for Water Recycling (Phase 2)**:
  3 modules
  - Augmentation of Drinking Water Supplies (May 08)
  - Stormwater Harvesting and Reuse (Aug 09)
  - Managed Aquifer Recharge (Aug 09)

- Biological and chemical contaminants are considered

- Designed using a similar framework to Drinking Water guidelines
How to Protect Public Health

Preventive Risk Management

- Holistic consideration of recycled water system NOT just the quality of the end product
- Use of multiple barriers within system to protect health and the environment
- Management plan to ensure system reliance for life
Recycled Water System

Source

- Low
  - Stormwater
  - Greywater
  - Sewage

High Contamination

Treatment

- Low

Uses

- High
  - Agriculture, Irrigation
  - Toilet flushing
  - Car washing

Higher water quality

NSW Government
Health
Monitoring

- Every recycled water scheme needs some monitoring
- The amount of monitoring required will depend on the size and complexity of the scheme
- QMRA provides information on log removal requirements
- Determination of barriers, critical control points and limits provides basis for monitoring programs including the final water quality objectives
Types of monitoring

- **Baseline**
  
  Initial monitoring carried out to provide data for the risk assessment or to refine the risk assessment

- **Validation** – “Will it work?”
  
  Make sure the treatment process does what it is designed to do

- **Verification** – “Did it work?”
  
  Assess compliance with water quality requirements and operational plan

- **Operational** – “Is it working now?”
  
  Ongoing monitoring of the system to ensure safe supply of recycled water for the life of the scheme

- **Revalidate the system when changes occur** (e.g. treatment update)