

IMPLEMENTING DRINKING WATER RISK MANAGEMENT IN NSW



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ABSTRACT

Even in developed countries like Australia, drinking water systems are vulnerable to contamination. Communities cannot rely simply on end-point water quality monitoring. There is strong international consensus that a preventive risk-management approach as set out in the Australian Drinking Water Guidelines (ADWG)¹ is the most reliable way to protect public health.

The drinking water provisions of the Public Health Act 2010 (NSW)² and the Public Health Regulation 2012 commenced on 1 September 2012. The Act requires drinking water suppliers to develop and adhere to a 'quality assurance program' (or drinking water management system) from 1 September 2014. This applies to water suppliers defined in the Act, including water utilities, private water suppliers and water carters.

A drinking water management system consists of documents, procedures and other supporting information for the safe supply of drinking water. The purpose of the management system is to identify and control risks. For water utilities, the management system must address the 12 elements of the Framework for Management of Drinking Water Quality in ADWG.

Over the last year, NSW Health, NSW Office of Water and specialist contractors have worked with more than 30 water utilities on the development of drinking water management systems. This exercise has helped utilities better understand their supplies and optimise and document operational procedures to ensure a safer water supply.

1.0 INTRODUCTION

In 2010 a new Public Health Act was approved by the NSW Government. This included the requirement for drinking water suppliers to develop and adhere to a 'quality assurance program' (or drinking water management system). The Public Health Regulation 2012 describes the management systems as needing to address the Framework for Management of Drinking Water Quality in ADWG and being relevant to the operations of the supplier. Drinking water suppliers need to have their management system in place by 1 September 2014.

In practice a management system consists of documents, procedures and other supporting information for the safe supply of drinking water. At the heart of the Framework are Critical Control Points (CCPs). A CCP is an activity, procedure or process that is critical to control a water quality hazard (for example chlorination and filtration/particle removal).

The steps to develop a management system include:

- identifying personnel to participate
- documenting current practices that fulfil ADWG requirements and identify any gaps
- holding a risk assessment workshop
- identifying CCPs

- developing operational procedures for CCPs, prioritising improvements and actions
- undertaking immediate improvements and actions
- submitting the management system document to Public Health Unit for review
- putting the management system into action
- reviewing and continuously improving the management system as it is used.

NSW Health recommends the use of an external facilitator for the risk assessment workshop. To assist water utilities, in the past two years NSW Health has paid for the contractors to help over 30 water utilities to develop a management system. Another ten will be offered this support this year.

As a minimum, these contractors review the current documentation at the water utility, review the water quality data from operational and drinking water monitoring, conduct risk assessment workshops, develop standard operating procedures for CCPs, and combine all this into a single practical document.

The NSW Guidelines for drinking water management systems (NSW Health/NSW Office of Water)³ provides practical guidance for water utilities. There are also separate Private Water Supply Guidelines (NSW Health) and NSW Guidelines for Water Carters (NSW Health/NSW Food Authority). Examples of drinking water management systems already produced for a range of supply systems are available from the NSW Health internet site at: http://www0.health.nsw.gov.au/PublicHealth/environment/water/drinkwater_nsw.asp

2.0 DISCUSSION

Some of the lessons learned and benefits observed from the development of drinking water management systems to date have been:

Workshops support the operators' perspective of their systems: Generally operators know their raw water source, treatment plant and distribution system very well. They are also keenly aware of the risks that their supply systems face. However, operators may encounter frustration in getting changes made to address these risks. The workshop process gives support to operators' concerns. Managers, administrators and councillors are often present at workshops and can hear support for the concerns of operators' being voiced by NSW Health and the NSW Office of Water.

Workshops can lead to rapid responses to risks: The risky nature of a small supply was described at one workshop. The General Manager agreed with the operators, engineer, NSW Health and the NSW Office of Water that the risks were so great that the supply should be declared non-potable as soon as agreement could be gained from the council.

Standard Operating Procedures: Through the implementation of the drinking water management systems and associated procedures, work flows are better documented and communication protocols and escalation procedures formalised. This is an important step in streamlining operations and providing the operators with more clarity regarding the appropriate course of action in adverse events.

Providing clear advice on managing under-resourced systems: A small unfiltered supply drawn from an infiltration well had an operating procedure written around the influence of turbidity on disinfection. In the long term this will help to match turbidity with river height and give better information for managing water quality around high flow events.

Improving monitoring ability: Several water utilities are looking into installing equipment for monitoring turbidity and chlorine concentration at different points in their supply systems following the review of their operations in developing management systems.

Staff learn about the supply system: The senior engineer at a large water utility came away from a workshop saying that he had learned a lot about his supply system.

Specialist engineering advice from contractors: In several instances the contract engineers involved in developing management systems have been able to provide detailed advice to improve the operation of treatment plant equipment. For example, improved mixing of flocculation chemicals at a conventional plant was achieved by changing the operation of the plant to larger volumes for shorter periods. This has produced a “magical” improvement in clarifier function.

Possible improvements to equipment: Water utility management staff in workshops have agreed to investigate how to protect the community against high risk hazards that have no control in the current supply system. Specific problems in treatment plants can also get rapid attention, such as the replacement of twelve-year-old membranes at one water filtration plant, which were costing the council a great deal in chemicals and operator effort.

Improving communication between linked water utilities: Workshops that include systems bulk-supplied by a neighbouring water utility include representatives from all relevant water utilities. This allows agreement from all parties on how the systems should be operated, identifies gaps for all parties (eg the absence of formal water quality agreements), and detailed communication protocols can be established with the participation of all water utilities.

Responding to taste and odour, as well as health concerns: A supply system with taste and odour complaints had a number of simple remedies identified during a workshop: replacing the common inlet/outlet point on the main reservoir with separate pipes, and removing a redundant reservoir from operation. Both actions should stop water standing too long in the reservoirs, losing chlorine and possibly growing taste and odour producing organisms.

3.0 CONCLUSION

The development of drinking water management systems by NSW water utilities (and other suppliers of drinking water) is required under the NSW Public Health Act 2010. Experience with the water utilities that have already undertaken this process shows that there are direct and immediate benefits for operators and other water utility staff. In the long term these management systems should provide clear guidance for making decisions in the operation of supply systems.

The information that will be collected around Critical Control Points will enable better understanding of the supply systems and allow better prediction of how the system will respond to changes in source water quality.

Along with the other benefits identified above, the development and application of drinking water management systems by NSW water utilities will provide greater protection to the health of communities.

4.0 ACKNOWLEDGEMENTS

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5.0 REFERENCES

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