Implementing drinking water risk management in NSW

Paul Byleveld, Sandy Leask, Leslie Jarvis, Katrina Wall, Wendy Lee, Kerry Spratt, Josh Tickell, Michelle Phoenix

Water Unit, NSW Health
A painting by J. Skinner Prout of the Tank Stream in the 1840s
Typhoid mortality in metropolitan NSW
We’ve spent three billion dollars to clean up Sydney’s water. Now we can’t drink it.

Entire city told to boil water

SYDNEY’S WATER CRISIS

3 MILLION NOW HIT

by TON

Australian Drinking Water Guidelines 6 2011

Version 3.1 Updated March 2015
Five-year Drinking Water Quality Management Plan 2010-2015

Sydney Catchment Authority
Water Quality Management Framework
2012 - 2017
Aborigines missing out on services

Harvey Bennet

With federal powers over all Aboriginal services, non-Aboriginal communities in NSW did not have access to clean drinking water or sewage systems. Bennet was the president of the Federal Council of Aboriginal and Torres Strait Islander Social Justice. He said, "The federal government had been working primarily on a single-stream approach for health and education. It was clear that more needs to be done."

The Water and Sewerage Minister in NSW, NCNA, said the NSW government was about to introduce new legislation that would provide Aborigines with access to clean drinking water and sewage systems. NCNA said, "We are committed to improving the lives of our people, and we believe that access to clean drinking water and sewage systems is a fundamental human right."
NSW Water and Sewerage Project Communities by ICC Regions

ICC: Indigenous Coordination Centres
NSW water supplies by population
<table>
<thead>
<tr>
<th>Barcode</th>
<th>Characteristic</th>
<th>Standard Value</th>
<th>Unit</th>
<th>Value</th>
<th>Sample Code</th>
<th>Lab Name</th>
<th>Date Collected</th>
<th>Date Received</th>
<th>Location</th>
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<tr>
<td>113000020273</td>
<td>E. coli</td>
<td>0.15 - 1.00</td>
<td>mL</td>
<td>&lt; 1</td>
<td></td>
<td>XPRL-DAL</td>
<td>14/01/2013</td>
<td>15/01/2013</td>
<td>65</td>
</tr>
<tr>
<td>113000020273</td>
<td>Free Chlorine</td>
<td>0.5 - 3.00</td>
<td>mL</td>
<td>0.3220</td>
<td>1</td>
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<td>14/01/2013</td>
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<tr>
<td></td>
<td>pH</td>
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<td>15/01/2013</td>
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<tr>
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<td>Total Chlorine</td>
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<tr>
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<td>mL</td>
<td>&lt; 1</td>
<td>1</td>
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<td>15/01/2013</td>
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<td>0.15 - 1.00</td>
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<td>&lt; 1</td>
<td>2</td>
<td>XPRL-DAL</td>
<td>14/01/2013</td>
<td>15/01/2013</td>
<td>38</td>
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<td>mL</td>
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<td>15/01/2013</td>
<td>38</td>
</tr>
</tbody>
</table>
Review – Drinking Water Monitoring Program

- 323 supplies, 110,274 microbiology samples
- *E. coli* detection associated with watercourses, inadequate disinfection, smaller systems and higher post-treatment turbidity
- 214,000 chemical samples
- Systems with higher turbidity and smaller populations were more likely to be non-compliant


Li et al. *Assessment of chemical quality of drinking water in regional New South Wales, Australia. 18th World IMACS Congress and MODSIM09 International Congress on Modelling and Simulation. 2009: pp. 4326-4332*
Boiled Water Alert

Current flooding in the Lachlan River and Goobang Creek is resulting in high levels of turbidity and organic matter affecting the quality of water for consumers in Condobolin. With ongoing flooding and high flows predicted to continue over the next few weeks this problem may persist, giving the water a dirty appearance.
Castlereagh River, 4 days later
Public Health Act 2010

Division 1  Safety Measures for Drinking Water

25  Quality assurance programs (cf 1991 Act, s 10M)

(1) A supplier of drinking water must establish, and adhere to, a quality assurance program that complies with the requirements prescribed by the regulations.

(2) The regulations may make provision for or with respect to any of the following:
   (a) the tests on water and other substances to be carried out by a supplier of drinking water pursuant to this Division,
   (b) the records to be maintained by a supplier.

(3) The Chief Health Officer may, by notice in writing, exempt a supplier of drinking water or class of suppliers from subsection (1) if the Chief Health Officer is satisfied that the supplier, or class of suppliers, is subject to other appropriate licensing or other regulatory requirements.
Part 5 Safety measures for drinking water

34 Quality assurance programs

(1) For the purposes of section 25 (1) of the Act, a quality assurance program must address the elements of the Framework for Management of Drinking Water Quality (as set out in the *Australian Drinking Water Guidelines* published by the National Health and Medical Research Council) that are relevant to the operations of the supplier of drinking water concerned.

(2) A supplier of drinking water must provide the Director-General with a copy of its most recent quality assurance program.

(3) The Director-General may arrange for the review of a quality assurance program of a supplier of drinking water at any time.
Public Health Act 2010

supplier of drinking water means any of the following:

(a) Sydney Water Corporation,
(b) Hunter Water Corporation,
(c) a water supply authority within the meaning of the Water Management Act 2000,
(d) a local council or a county council exercising water supply functions under Division 2 of Part 3 of Chapter 6 of the Local Government Act 1993,
(e) the Lord Howe Island Board,
(f) a licensed network operator or a licensed retail supplier within the meaning of the Water Industry Competition Act 2006,
(g) any person who treats or supplies water on behalf of a person referred to in any of the preceding paragraphs,
(h) any person who supplies drinking water in the course of a commercial undertaking (other than that of supplying bottled or packaged drinking water), being a person who has not received the water:
   (i) from a person referred to in any of the preceding paragraphs, or
   (ii) in the form of bottled or packaged water,
(i) any person who receives water from a person referred to in this definition and who supplies drinking water from a water carting vehicle in the course of a commercial undertaking.
15 **Drinking water must be fit for human consumption** (cf 1991 Act, s 10IA)

A person must not, by means of a reticulated water system, supply any other person with drinking water that is not fit for human consumption.

Maximum penalty:

(a) in the case of an individual—2,500 penalty units, or 12 months imprisonment, or both, or

(b) in the case of a corporation—10,000 penalty units.
NSW Health support - drinking water management systems
Critical control points....

Roof on a reservoir....

*E. coli* results from routine drinking water testing.
The risk from Cryptosporidium…

Photos – Sydney Catchment Authority
Tourists ill from water

By health writer, SADIA M. CHAMIC

THE Government has announced a ban on public drinking water after several health alerts from the Sydney area.

A study by the NSW Health Department has found that more than 90% of the water samples taken from the Sydney water supply have been contaminated with a bacterium known as Campylobacter. The study also found that the bacterium is present in water supplies in other parts of the state as well.

The NSW Health Department has been working closely with the NSW Food Authority to ensure that all water supplies are safe for consumption.

NSW PRIVATE WATER SUPPLY
Guidelines

Non-reticulated water in food businesses

Food businesses must ensure the water they use for activities conducted on their premises is safe. This applies to businesses that do not have access to a town water supply.

Non-reticulated water and food safety

Non-reticulated water is any water supply not piped into a business by a water utility or local council. It includes:

- rainwater
- groundwater (eg bore water)
- surface water

The hazards of non-reticulated water will depend on the source. Disease-causing microorganisms may be present, such as viruses, Cryptosporidium, and E. coli. It might also contain harmful chemicals.

Legal requirements on water supplies

Under the Food Standards Code, food businesses must use drinkable water for activities conducted on their premises. Where businesses do not have access to a potable water source, they must be able to demonstrate that the water they use is safe.

How to manage a private water supply

If you have a private water supply you should ensure:

- water is collected from a suitable source,
- there are no microbial or chemical contaminants in the surrounding environment (this might require a stooling test),
- water is treated, if necessary, to make it safe, eg remove solids and microorganisms,
- pools and fountains used to collect rainwater are kept free from leaves and bird droppings.

The NSW Health Department has also recommended that businesses undertake a risk assessment on the potential risks associated with the use of non-reticulated water.

About the NSW Food Authority

The NSW Food Authority is the government organisation that helps ensure NSW food is safe and correctly labelled.

More information

- Visit the NSW Food Authority's website at www.foodauthority.nsw.gov.au
- phone the helpline on 1300 562 406
- Other contacts:
  - Victorian Department of Human Services, Guidelines for the use of non-potable water in food business (visit www.health.vic.gov.au/companies/PublicHealth/environmental/Water/private_water_supply.pdf)

Your local council or public health unit may also be able to provide you with further advice.

Note:

This information is a general summary and cannot cover all situations. Food businesses are required to comply with all of the provisions of the Food Standards Code and the Food Act 2003 (NSW).
ATTENTION

BECAUSE OF THE RANTING BEAUBARATIC NUMBSKULLS IN THE HEALTH DEPARTMENT, BELIEF THAT RAINWATER IS UNSUITABLE FOR HUMAN CONSUMPTION.

YOU DRINK THIS BEAUTIFUL PURE RAINWATER AT YOUR "OWN RISK".

WATER QUALITY ADVICE

The drinking water here is not monitored or treated. Water quality may not meet health guidelines.
The following activities are undertaken by this business to ensure safe drinking water and to protect public health.


Tanker Vehicle Registration Number: ___________________________ Tanker Volume: ___________________________

Tanker Vehicle Registration Number: ___________________________ Tanker Volume: ___________________________

Tank is made of (insert material): ___________________________

Tank, hoses and fittings are made of material that will not contaminate drinking water (for example food grade material, or painted with A3/125400, A3/125401, 40/123456, 40/123457, 40/123458, or naphtha stove). Yes/No

The tanker/s is filled from a source: ___________________________

(Describe any activity that may be done to keep the water safe).

The tanker/s is flushed, cleaned and disinfected (when and how you use to do this): ___________________________

Chlorine is added to the water (at the source): Yes/No/Sometimes

Chlorine is stored safely (where and how it is stored): ___________________________

Chlorine levels in drinking water are tested and recorded (where, how, what you use to do this): ___________________________

The hoses and fittings are capped, stored and cleaned (when and how): ___________________________

Contacts for water quality problems and in case of issues or emergencies (what might happen, contact details you might need): __________________________

Records are kept for at least 6 months of (please the answer):

- The name of each supplier / get drinking water from supplier
- The place, date and time (if) drinking water from each supplier
- The name and address of each customer
- The place, date, time and volume of water for each customer delivery
- Details of any loads / substances other than drinking water put into the water tank/s
- The dates water tank/s are cleaned

Records are kept (where): __________________________

The NSW Food Authority has been notified of my water carters (food) business and the notification reference number is __________________________

To notify go to http://www.foodauthority.nsw.gov.au/register/index.html or phone 1300 886 010

Business contact person name: ___________________________ Signature: ___________________________

Mobile phone number: ___________________________

Business postal address: ___________________________

Business contact email address: ___________________________
Private Water Supplies

Ensuring safe drinking water with the Public Health Act 2010 and Public Health Regulation 2012

The Public Health Act 2010 and the Public Health Regulation 2012 require drinking water suppliers to develop and adhere to a quality assurance program (QAP) for drinking water management systems from 1 September 2014.

NSW Health's Private Water Supply Guidelines will assist private water supply operators in providing water that is safe to use. The Guidelines are for any business or facility that supplies drinking water from an independent water supply (i.e. not town water).

- NSW Private Water Supply Guidelines
- Connected Chlorine Fido Reorder Tables to insert into printed 2014 Guidelines
- 2011_090_Private Water Suppliers and Water Carters Information Bulletin

The NSW Food Authority provide information for food businesses using non-chlorinated water and fact sheets for specific industries such as home-based businesses, charities and catering.

Developing a Quality Assurance Program

Use the NSW Private Water Supply Guidelines and the quality assurance program (QAP) template below to create your own QAP. Refer to an example QAP that is similar to your supply as a guide. Your completed QAP should reflect your water supply so it will vary from the example.

- QAP template
- QAP template for unchlorinated rainwater

Larger, more complex, drinking water supplies should use the NSW guidelines for Drinking Water Management Systems for development of a QAP. Further information and examples can be found at Drinking Water in Rural and Regional NSW.

NSW Health recommends water supplies are regularly monitored. If a water supply is contaminated, or is not monitored or not treated then consumers should be warned. Example signs are available to print. For monitoring information please see Private Water Supply Testing Service FASS.

Page Updated: Monday, 20 November 2014
Page Owner: Environmental Health
### 3.1 Risk Assessment

<table>
<thead>
<tr>
<th>Step 1 Hazard</th>
<th>Step 2 Risk Rank</th>
<th>Step 3 Hazard Controlled?</th>
<th>Step 4 How is this control monitored?</th>
<th>Step 5 If no what could be done to improve safety?</th>
<th>Step 6 Timeframe for action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dirty river water after heavy rain</td>
<td>High</td>
<td>Yes</td>
<td>Pump switched off when more than 40 mm rain in 1 hour In-line filters Chlorination (target at least 0.5 mg/L free chlorine after 30 min, leaving treated water tank)</td>
<td>Rain gauge monitored hourly during rainfall, Visual check of river water colour Water pressure at taps indicates if filters are blocked Daily chlorine residual testing Routine monitoring of chlorination equipment</td>
<td>Immediate</td>
</tr>
<tr>
<td>Contaminants from upstream farms in river</td>
<td>High</td>
<td>Yes</td>
<td>In-line filters Chlorination (target at least 0.5 mg/L free chlorine after 30 min, leaving treated water tank)</td>
<td>Water pressure at taps indicates if filters are blocked Daily chlorine residual testing Monthly E. coli testing Routine monitoring of chlorination equipment</td>
<td>Have signage ready in case of E. coli detection or low chlorine concentration Source alternative water supply for drinking (bottled water) and/or carted water</td>
</tr>
</tbody>
</table>
## Water Supply Quality Assurance Program

This program has been prepared by: (name)

This program is for: (business name and address)

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<tr>
<td>Water Supply Quality Assurance Program</td>
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<tr>
<td>1. Basic Information</td>
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<td>1.1 Private water supplier’s details</td>
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<td>1.2 Water supply system monitoring and maintenance personnel details</td>
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<td>1.3 Description of the water supply system</td>
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<td>2. Diagram of the Water Supply System</td>
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<td>4. Management Actions and Record Keeping</td>
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<td>4.1 Planned water supply system inspection and maintenance program</td>
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<td>4.3 Equipment details</td>
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<td>4.5 Water quality monitoring program</td>
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<td>4.6 Water quality monitoring results</td>
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<td>4.7 Records of water purchase from a watercenter</td>
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<td>4.8 Chlorination records</td>
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<td>4.9 Incident records</td>
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<td>5. Contingency and Emergency Planning</td>
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<td>5.1 Contingency plan</td>
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<td>5.2 Emergency contacts</td>
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</table>

#### APPENDIX A
- Example water supply system diagram

#### APPENDIX B
- Common sources of contamination (hazards) and suggested control measures

#### APPENDIX C
- Identification of risk

#### APPENDIX D
- Possible water supply system inspections

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**Instructions on using this document**

(Include instructions on how to fill in the template)


- As you fill in each section of the template, you may need to involve other people (e.g., staff or suppliers) in discussions about how best to manage your water supply.

- You should amend the tables in this template to suit your water supply. The tables contain words in italics as examples.

- Additional sections, information, or records can be added to those suggested in this template.
Records to be kept by suppliers of drinking water

(1) A water carter must make, and keep for at least 6 months, a record of
the following:
(a) the name of each supplier of drinking water from whom the water
carter receives water and the place, date and time at which the
water is supplied to the water carter by that supplier,
(b) the name and address of each person to whom the water carter
supplies water, the place, date and time at which the water is
supplied to that person and the volume of water supplied to that
person,
(c) details of any substances other than drinking water transported in
any water tank used by the water carter,
(d) the dates on which any water tank used by the water carter is
cleaned.
Maximum penalty: 10 penalty units.

(2) A supplier of drinking water (other than a water carter) must make, and
keep for at least 6 months, a record of the name, address and telephone
number of each water carter to whom the supplier of drinking water
supplies water.
Maximum penalty: 10 penalty units.

(3) In this clause, water carter means a person referred to in paragraph (i)
of the definition of supplier of drinking water in section 5 (1) of the
Act.