

Water Supply

Quality Assurance Program

This program has been prepared by:

Insert name

This program is for:

Business Name

(rainwater tank)

Date: Insert Date

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Background

The *Public Health Act 2010* and *Public Health Regulation 2012* require that all suppliers of drinking water establish and adhere to a Quality Assurance Program (QAP). This QAP was developed by customising the template provided by *NSW Health Private Water Supply Guidelines* to ensure its relevance to the water supply system for the **Business Name**.

This QAP addresses the Framework for Management of Drinking Water Quality set out in the *Australian Drinking Water Guidelines* (ADWG 2011), in a way that is appropriate to the water supply to the **Business Name**.

The *NSW Health Private Water Supply Guidelines* were also used to develop this QAP

Water Supply Quality Assurance Program

A water supply system includes everything from the collection of the source water through to the point of use. When developing this QAP for the **Business Name** water supply system the following questions were addressed:

- What problems could occur between the water source and the point of use?
- How can they be prevented or fixed?
- How do you know that the problem has been prevented or fixed?

The answers to these questions helped to determine how to:

- assess and protect the quality of the source water
- make sure treatment processes are appropriate, maintained and working properly
- regularly test the water quality
- make the water supply safe if contamination has occurred
- make sure that water users are warned and/or provided with safe drinking water if the normal supply is found to be unsatisfactory or the quality cannot be guaranteed.

Keeping the water supply system safe involves:

- identifying who is responsible for the system and who will respond to issues
- understanding hazards to your water sources
- making sure the water is stored and distributed safely
- treating the water to remove or control any contamination
- monitoring the quality of the water and the integrity of the water supply system
- planning on how to respond to problems in the water supply system.

This QAP reflects the type of water supply system managed by the **Business Name**, especially the water source and its end uses. While NSW Health recommends that water supplies be monitored regularly, operators may choose not to monitor water quality.

What to do with the QAP

A copy of this completed QAP has been provided to the Public Health Unit for review.

This QAP should be a living document that is reviewed regularly. Any changes that occur to the water supply system or any new hazards that are identified from observations, equipment checks, incidents or monitoring should be added to the relevant section of the program.

This QAP should be kept in a central place that is easily accessible to staff and others who may need to view it, such as officers of NSW Food Authority, your local Council and NSW Health.

The activities in this QAP are undertaken by this business to ensure safe drinking water and to protect public health.

1 Basic Information

1.1 Private water supplier's details

Property/business name	
Owner/occupier name	
Owner /occupier contact details	
Business after-hours / emergency contact	

1.2 Water supply system monitoring and maintenance personnel details

	Roles and responsibilities
Name and phone number of main person responsible	
Name and phone number of any other people responsible	

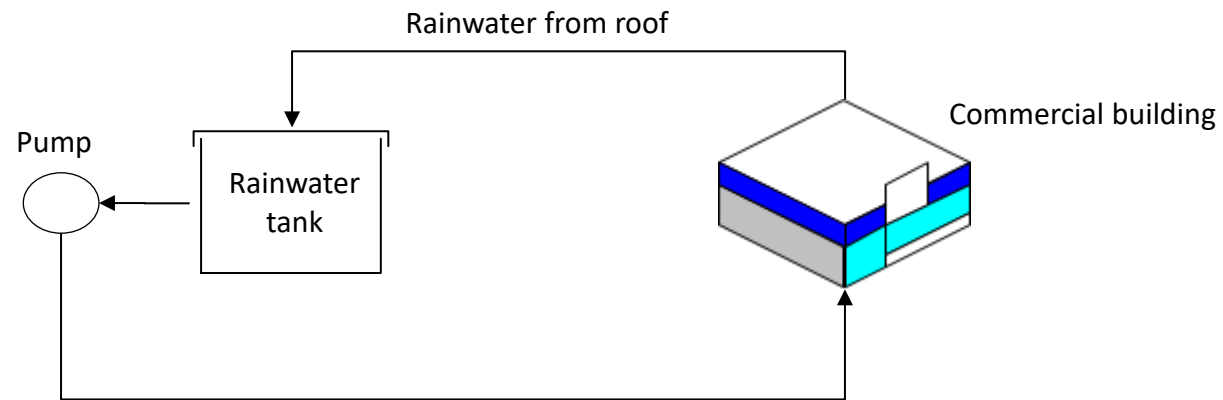
1.3 Description of the water supply system

Tick	Component	Description
Water sources		
✓	Rainwater (roof water)	Untreated rainwater from shed roofs
✓	Carted water	Available as a backup if required
Treatment		
✓	Other – strainer	At entrance of storage tank
Distribution		
✓	Storage/header tank	1 x storage tank; receiving water from roof Self-draining first flush device
✓	Pipes	PVC pipes
✓	Pumps	1 x distribution pump – pumping on demand as determined by water pressure
Uses		
✓	Drinking	Tank water used for drinking for XX people
✓	Food preparation (including washing of produce and cleaning of utensils and equipment)	Tank water used for food preparation, water supply to coffee machine, and for washing and cleaning of utensils and equipment.
✓	Personal hygiene (showers, toilets etc.)	Tank water used for toilets and hand washing.
✓	Clothes washing	Tank water used for washing of tea towels and cleaning cloths.
✓	Other	No irrigation Tank water used for general cleaning

2 Diagram of the Water Supply System

Uses of rainwater:

- Drinking water
- Hand washing
- Toilet flushing
- Food preparation



3 Risk Assessment of the Water Supply System

Step 1: Identify particular hazards in your water supply in the risk assessment template. The table in Appendix B gives some examples of some hazards and is provided to assist you to complete the “Hazard” column of the Risk Assessment.

Step 2: Assign risk rankings. Once you have listed all possible hazards, assign a risk ranking to each hazard as low, medium or high in the risk assessment template. Consider the likelihood of the hazard occurring and, if it does, the severity of the consequence. The table in Appendix C may assist in ranking risks.

Step 3: Identify controls. Decide whether the hazards identified in your system have controls in place and describe these controls in the risk assessment template. Controls are the ways that risks will be managed, for example excluding animals from dams used for human drinking water, regular inspection and maintenance programs or water treatment. The table in Appendix B gives some more examples of possible controls for various hazards.

Step 4: Monitoring of controls is important to ensure they are working effectively. Describe in the risk assessment template how, when and where monitoring will occur, who is responsible, how and where records will be kept and by whom. Consult the Private Water Supply Guidelines for information on monitoring.

Step 5: If any hazards are not controlled, identify what could be done to improve safety and reduce the risk of those hazards. List any shortcomings in your water supply system and its management and identify what improvements should be made. Document these improvements in your risk assessment template.

Step 6: Prioritise actions that need to be taken to protect the water supply and give them a priority number or time frame in the risk assessment template.

3.1 Risk Assessment

Step 1 Hazard	Step 2 Risk Rank	Step 3		Step 4 How is this control monitored?	Step 5 If not controlled what could be done to improve safety?	Step 6 Timeframe for action
		Hazard Controlled?	What is the control, if any?			
Organic matter and bird faecal contamination being washed into the tank from roof and gutters	High	Yes	Screen on tank inlet Self-draining first flush device	Cleaning of screen every 2 weeks	Undertake monthly <i>E. coli</i> testing Disinfect water (chlorination or UV) or provide bottle water or advise guests to boil water.	Within 1 month
Contaminants from neighbouring property and roads	High	Yes	Screen on tank inlet Self-draining first flush device	Cleaning of screen every 2 weeks	Undertake monthly <i>E. coli</i> testing	Within 1 month
Build-up of sludge in tank, dirt in inlet strainers and/or insect screens	Medium	No	Self-draining first flush device	Cleaning of screen every 2 weeks	Undertake monthly <i>E. coli</i> testing Disinfect water (chlorination or UV) or provide bottle water or advise guests to boil water.	
Roof materials (e.g. lead sheeting; peeling paint)	Medium	Yes		Roofing materials unknown	Yearly chemical testing	

Step 1 Hazard	Step 2 Risk Rank	Step 3		Step 4 How is this control monitored?	Step 5 If not controlled what could be done to improve safety?	Step 6 Timeframe for action
		Hazard Controlled?	What is the control, if any?			
Contamination from insects, birds and animals entering tank with rainwater from the roof	High	Yes	Screens on tank inlet	Routine cleaning	Undertake monthly <i>E. coli</i> testing	Within 1 month
Contamination from insects, birds and animals entering directly from the roof of the tank	Medium	Yes	Roof integrity	Routine check of tank	Undertake monthly <i>E. coli</i> testing Disinfect water (chlorination or UV) or provide bottle water or advise guests to boil water.	
Corrosion of metal plumbing fittings by soft water e.g. copper from pipes resulting in blue water	Low	Yes	Visual inspection of water colour Good water turnover	Run taps for a several minutes after they have been left standing	Yearly chemical testing	

4 Management Actions and Record Keeping

Document all activities required to manage the water supply including inspections, maintenance, signage, monitoring, and incident management.

Keep records of:

- system inspections
- all results of microbial and chemical testing, and chlorine levels (where applicable)
- maintenance to the water system such as tank cleaning, filter change, chlorination
- incidents and corrective actions e.g. dead animal in tank, storms, treatment breakdown
- deliveries of carted water, including date and name of supplier
- the placement of warning signs.

4.1 Planned water supply system inspection and maintenance program

Planned inspection and maintenance program

Item inspected / maintained	Frequency or dates	Who by	Equipment or procedures
Empty first flush device	After very rainfall event	Maintenance staff	
Strainer (mesh on corrugated iron tank) clear of debris	Every 2 weeks or after heavy rain	Maintenance staff	
Tank visual inspection (including hatches)	3 monthly	Maintenance staff	
Clean gutters	As required	Maintenance staff	
Check for potential contamination by birds on roof through overhanging branches	3 monthly	Maintenance staff	
Trim overhanging branches	As required	Maintenance staff	
Check presence of mosquito larvae in tank water	3 monthly	Maintenance staff	Visual inspection of water
Structural condition of tank	Annually	Maintenance staff	
Level of sludge and internal cleanliness	Every 2 years or as required	Maintenance staff	

Item inspected / maintained	Frequency or dates	Who by	Equipment or procedures
System (pump, piping) is fully operational and maintained	Annually	Maintenance staff	Equipment manuals

4.2 Water supply system inspection and maintenance records

Water supply system inspection and maintenance record (planned and additional)

Date	What was inspected	Notes	Actions to be taken	Person Responsible
	Empty first flush device			
	Strainer (mesh on corrugated iron tank) clear of debris			
	Tank visual inspection (including access hatches)			
	Clean gutters			
	Check presence of mosquito larvae in tank water			
	Check for potential contamination by birds on roof through overhanging branches			
	Trim overhanging branches			
	Structural condition of tank			
	Level of sludge and internal cleanliness			
	System (pump, piping) is fully operational and maintained			

4.3 Equipment details

Equipment records (procedures for operation and maintenance including history)

Part / Equipment	Manufacturer ¹	Supplier/Repairer Contact Details
Water pump		

Note 1: Manufacturer's instructions are held by Manager

4.4 Sign posting

All taps where untreated rainwater is supplied be identified as 'RAINWATER' with a label or the rainwater tap identified by a green coloured indicator. Rainwater warning signs should comply with Australian Standard AS 1319 *Safety Signs in an Occupational Environment*. Their location should be record as per the table below

Table 0-1 Example of a rainwater sign



Signs

Sign location	Sign wording	Permanent or Temporary	Inspection Date	Any action taken

4.5 Water quality monitoring program

Water quality monitoring

What is to be monitored	How often are tests to be taken (frequency or dates)	Location of tests	Who should perform the test	Equipment needed and procedures for performing the test
Water quality	Daily	Kitchen	Manager	Taste & odour Visual inspection
E. coli	Monthly	Kitchen	Manager	See sampling procedure from laboratory
Chemical	Annually	Kitchen	Manager	See sampling procedure from laboratory

4.6 Water quality monitoring results

Water testing results - visual inspection and taste

Date	Where test was taken from	Type of test taken	Observation	Any action taken	Person Responsible
		Water quality visual inspection			
		E. coli			

4.7 Records of water purchased from a water carter

Purchased water

Date	Name and details of Water Carter	Volume of water purchased

4.8 Incident records

Issue / Incident / Emergency Record (including customer complaints)

Date	Incident	Notes and corrective actions	Person(s) Responsible

Date	Incident	Notes and corrective actions	Person(s) Responsible

5 Contingency and Emergency Planning

Document what you plan to do:

- if there was a problem with an important part of the water supply system
- to ensure all people responsible for the water supply system have the knowledge and skills to run the system, e.g. training temporary managers
- in response to customer complaints regarding water quality
- any other issue.

5.1 Contingency plan

Issue	Likely actions that could be taken
Dirty or smelly water	<ul style="list-style-type: none">• Flush lines• Use bottled water for drinking, food preparation and cleaning teeth
Unpleasant taste to water	<ul style="list-style-type: none">• Flush lines• Use bottled water for drinking, food preparation and cleaning teeth
Positive <i>E. coli</i> test	<ul style="list-style-type: none">• Contact Public Health Unit for advice• Sign post all outlets that water supply is contaminated and not to be used for drinking, food preparation or consumed when cleaning teeth• Use bottled water for drinking, food preparation and cleaning teeth• Disinfect water• Re test water for <i>E. coli</i>

5.2 Emergency contacts

Contact	Name	Contact Details
Public Health Unit	Toni Cains	Telephone: 9382 8333 Mobile: 0411 458 814 Fax: 9381 8334
Local Authority	Lord Howe Island Board	Telephone: 6563 2066 Fax: 6563 2127
Pollution Incident Hotline	NSW Environment Protection Authority	131 555
Plumber		
Tank Cleaner		
Electrician		

APPENDIX A – Common sources of contamination (hazards) and suggested control measures

Component	Potential source of contamination	Control measures
Water Source	<i>Rain water Roof and gutters (e.g. build-up of leaves, dirt and animal droppings)</i>	<ul style="list-style-type: none"> • <i>First flush device</i> • <i>Regular cleaning of roof and gutters</i> • <i>Removal of overhanging branches</i> • <i>Regular inspections</i> • <i>Water treatment (disinfection)</i>
	<i>Rain water Roof material (e.g. lead-based paint, lead flashing, bitumen-containing products, treated timber, peeling paint)</i>	<ul style="list-style-type: none"> • <i>Water not collected from roofs coated or painted with substances that may leach hazardous materials</i> • <i>Remove or treat lead flashing</i> • <i>Seal any exposed treated timber</i>
	<i>Surface water (dams, creeks and rivers) Surrounding land use (e.g. farming, urban areas, industrial sites and sewage discharges)</i>	<ul style="list-style-type: none"> • <i>Protect surface water source against livestock, septic tanks/sewage overflows and chemical spills</i> • <i>Water treatment</i>
	<i>Surface water (dams, creeks and rivers) Animal and human activities</i>	<ul style="list-style-type: none"> • <i>Fence water storage or off-take area</i> • <i>Don't permit swimming or public access in off-take area</i> • <i>Water treatment</i>
	<i>Groundwater (bore, well, spring) Surface water seepage</i>	<ul style="list-style-type: none"> • <i>Raise bore heads above ground level and mound up ground around bore head</i> • <i>Ensure bore covers and casing are intact</i> • <i>Regular inspections</i>
	<i>Groundwater (bore, well, spring) Sub-surface contamination (e.g. from industry, farming, landfill, sewage)</i>	<ul style="list-style-type: none"> • <i>Extract groundwater from places where sub-surface contaminants are unlikely</i> • <i>Test the water for chemicals and treat if necessary</i> • <i>Groundwater source is at least 20 metres from any wastewater disposal systems</i>

Component	Potential source of contamination	Control measures
		<ul style="list-style-type: none"> • <i>Water treatment (disinfection)</i>
Water Storage	<i>Insect, birds and animals in system</i>	<p><i>Screen all inlets and outlets to the tank</i></p> <ul style="list-style-type: none"> • <i>Regular inspections of tank, roof and gutters</i>
	<i>Build-up of sludge in tank, dirt in inlet strainers or insect screens</i>	<i>Regular inspection, cleaning and maintenance program</i>
	<i>Tank materials (e.g. pH of water in concrete tanks, high metals from metallic tanks)</i>	<ul style="list-style-type: none"> • <i>Materials in contact with water comply with relevant Australian Standards (refer to Appendix 1)</i> • <i>Chemical adjustment of pH in new concrete tanks may be necessary</i>
	<i>Backflow water (e.g. from animal water troughs)</i>	<ul style="list-style-type: none"> • <i>Backflow prevention device</i>
Distribution system	<i>Pump and plumbing materials</i>	<ul style="list-style-type: none"> • <i>All materials in contact with water comply with AS/NZS 4020:2005</i>
	<i>Leaching from bore casings, pipes or plumbing materials</i>	<ul style="list-style-type: none"> • <i>All materials in contact with water comply with AS/NZS 4020:2005</i> <ul style="list-style-type: none"> • <i>Flush standing water at irregularly used fixtures</i>

APPENDIX B – Identification of risk

	Consequence		
Likelihood	Minor	Moderate	Major
Rare	Low Risk	Low Risk	Medium Risk
Possible	Low Risk	Medium Risk	High Risk
Likely	Low Risk	Medium Risk	High Risk

To identify a risk as low, medium or high, use the above matrix of likelihood and consequence. As an example: A hazard with rare likelihood but major consequence will be assigned a medium risk. Events that may cause sickness would be assigned a major consequence, for example bacterial contamination of a dam or rainwater tank, or an algal bloom in a dam.

Likelihood can be assessed as

- Rare: the hazard may only occur in exceptional circumstances, for example every 2 to 5 years
- Possible: the hazard might occur or should occur at some time, for example 2 to 4 times per year
- Likely: the hazard will probably occur in most circumstances, for example every month

Consequence can be assessed as

- Minor: causing a minor impact on a small number of people, some manageable operation disruption, or some increase in operating costs, for example consequences which can be managed by normal operations
- Moderate: causing a minor impact on more people, significant modification to normal operations but manageable, operation costs increased, or increased monitoring, for example consequences that may involve additional time and expense to manage
- Major: causing a major impact for any number of people, system significantly compromised, operation abnormal if operating at all, high level of monitoring required. Any consequence involving consumers falling ill should be considered major

APPENDIX C – Possible Water Supply System Inspections

A range of inspections may need to be conducted on various aspects of the water supply system. Possible inspections include:

Water source--river, creek, dam and bore water

- Check upstream for contamination (monthly or after heavy rains)
- Check upstream during warmer months for blue-green algae blooms (weekly)
- Check the intake area (monthly)
- Check the fenced livestock area (monthly)
- Check well head is secure and free from water (monthly or after heavy rains)
- Check maintenance and operation of pump (annually)

Tank

- Check inlet and outlet screens (3 monthly)
- Check access covers (3 monthly)
- Clear strainer for debris (3 monthly and after heavy rains)
- Check presence of mosquito larvae in tank water (3 monthly)
- Check structural condition (annually)
- Check sludge level and internal cleanliness (every 2 years or as required)
- Check roof condition and ensure no overhanging trees (3 monthly)

Distribution system

- Check plumbing/piping is fully operational and well-maintained (annually)
- Check treatment system is operating as per manufacturers advice
- Replace filters (as per manufacturer's advice or earlier if a decrease in water flow is noticed)
- Test chlorine level is at or above 0.5 mg/L (regularly as per Private Water Supply Guidelines)
- Check UV light is operating (daily)
- Check UV light is visually free from scum (as per manufacturer's advice)
- Replace UV light source (as per manufacturer's advice)
- Other treatment (as per manufacturers advice)