

Water Supply

Quality Assurance Program

This program has been prepared by:

John Smith

This program is for:

Conference Centre

100 Main Street, Anywhere, NSW

Manager

(Mixed Supply System)

Date: April 2014

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Background

The *Public Health Act 2010* and Public Health Regulation 2012 require that suppliers of drinking water establish and adhere to a Quality Assurance Program (QAP). This QAP was developed using the *NSW Private Water Supply Guidelines* and by adapting the template provided by NSW Health to be relevant to the water supply system for the Conference Centre. These were sourced from

<http://www.health.nsw.gov.au/environment/water/Pages/private-supplies.aspx>

This QAP also 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 General Store. The *Australian Drinking Water Guidelines* are available at <http://www.nhmrc.gov.au/guidelines/publications/eh52>

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 General Store 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 help 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 Conference Centre, especially the water source and its end uses.

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 will be added to the relevant section of the QAP.

This QAP will 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, local Council or Public Health Unit.

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 | Conference Centre |
| Owner/occupier name | John Smith |
| Owner /occupier contact details | John Smith Phone: (02) XXXX XXXX Email: john.smith@conferencecentre.com Address: 100 Main Street, NSW, 0000 |
| Business after-hours / emergency contact | John Smith Mobile: XXXX XXX XXX Email: john.smith@conferencecentre.com |

1.2 Water supply system monitoring and maintenance personnel details

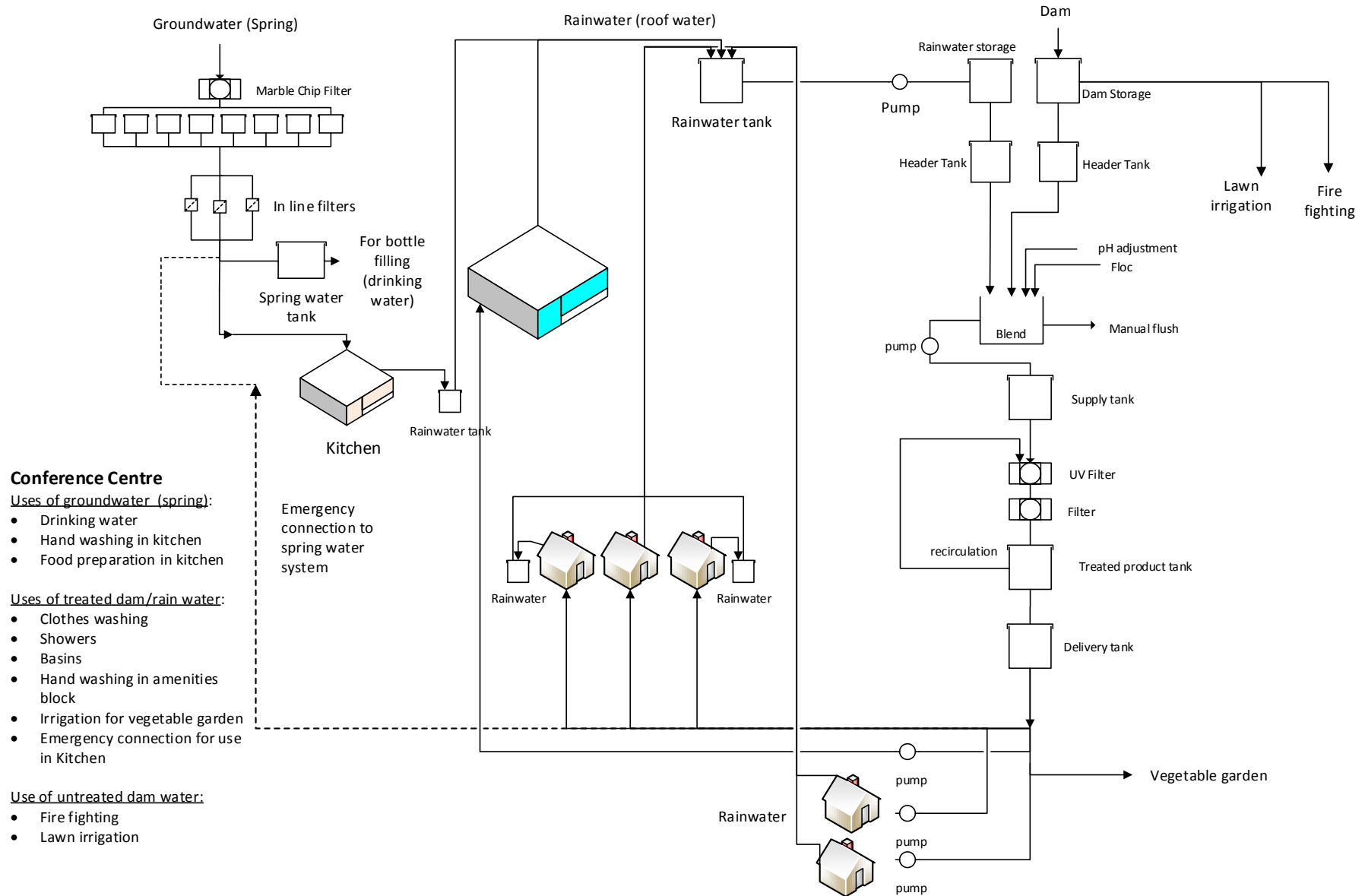
| | Roles and responsibilities |
|--|--|
| Name and phone number of main person responsible | John Smith Phone: (02) XXXX XXXX Email: john.smith@conferencecentre.com |
| Name and phone number of any other people responsible | Kate Jones Mobile: : XXXX XXX XXX Email: kate.jones@conferencecentre.com |

1.3 Description of the water supply system

| Tick | Component | Description |
|----------------------|--|--|
| Water sources | | |
| ✓ | Groundwater (spring) | Untreated 1 km away from property over a gully Gravity feed to header tanks (8 tanks approximately 80 kL capacity) |
| ✓ | Dam | Up and over the ridge surrounding property Used as a backup if insufficient rainfall. Water is coagulated, filtered and disinfected using UV. |
| ✓ | Rainwater (roof water) | Collected from roofs and stored in tanks with collective storage of approximately 250 kL Water is coagulated, filtered and disinfected using UV. Rainwater is mixed with dam water when levels are running low |
| Treatment | | |
| ✓ | Filtration | Marble chip and in line filter for spring water Media filters for rain and dam water |
| ✓ | UV disinfection | UV treatment plant for rain and dam water |
| ✓ | Coagulation and pH adjustment | Coagulation and pH adjustment for rain and dam water |
| Distribution | | |
| ✓ | Storage/header tank | Multiple storage tanks (approximately 250 kL capacity) 8 x header tanks for drinking water (spring) 1 x header tank for rain water 1 x header tank for dam water |
| ✓ | Pipes | Black poly pipes |
| ✓ | Pumps | Multiple pumps for rainwater systems |
| Uses | | |
| ✓ | Drinking | Spring water |
| ✓ | Food preparation (including washing of produce and cleaning of utensils and equipment) | Spring water |
| ✓ | Personal hygiene (showers, toilets etc.) | Rainwater and dam water |
| ✓ | Clothes washing | Rainwater and dam water |

| Tick | Component | Description |
|------|-------------------------------------|--|
| ✓ | Other: irrigation and fire fighting | Dam water for lawns Spring water for vegie garden |

2 Diagram of the Water Supply System



3 Risk Assessment of the Water Supply System

The hazards to my water supply were considered and rated using my best efforts and following the advice in the QAP template and the *Private Water Supplies Guidelines*. I have some controls in place to address some of the hazards, but I need to act upon a few areas to improve the ongoing protection of our water quality. I have used the following risk assessment process.

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

Step 2: Assign risk rankings. Once all possible hazards are listed, 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 the 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: Where hazards are identified, consider what could be done to improve safety and reduce the risk of those hazards. List any shortcomings in the water supply system and its management and identify what improvements should be made. Document these improvements in the risk assessment template.

Step 6: Prioritise actions that need to be taken to protect the water supply and give them a priority number and 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 What could be done to improve safety? | Step 6 Timeframe for action |
|---|---------------------|--------------------|---|--|---|--------------------------------|
| | | Hazard Controlled? | If Yes what is the control? | | | |
| <i>Contamination of the spring water with faecal material from animals by surface water seepage into the spring</i> | <i>Low</i> | <i>Yes</i> | <ul style="list-style-type: none"> • <i>Monthly Visual inspection for contamination</i> • <i>Spring is covered by a pipe to prevent access by animals and protect from contamination</i> | <ul style="list-style-type: none"> • <i>Spring site check sheet is completed at each inspection</i> • <i>Water is tested for microbiological quality monthly</i> | | |
| <i>Subsurface contamination of spring water</i> | <i>Low</i> | <i>Yes</i> | <ul style="list-style-type: none"> • <i>Monthly Visual inspection for contamination</i> • <i>Location makes subsurface contaminants unlikely</i> • <i>Source is not located near wastewater disposal systems</i> | <ul style="list-style-type: none"> • <i>Spring site check sheet is completed at each inspection</i> • <i>Water is tested for microbiological quality monthly</i> | | |
| <i>Build-up of sludge in tanks, dirt in inlet strainers and/or insect screens</i> | <i>Low</i> | <i>Yes</i> | <ul style="list-style-type: none"> • <i>Marble chip filter screens dirt</i> • <i>Spring water tank maintenance procedure is carried out monthly</i> • <i>Check for sludge in tanks every 6 months and clean if necessary</i> | <i>Spring water tank maintenance sheet is completed at each inspection</i> | <i>Install self draining first flush diverters to raintanks</i> | <i>ASAP</i> |

| Step 1 Hazard | Step 2 Risk Rank | Step 3 | | Step 4 How is this control monitored? | Step 5 What could be done to improve safety? | Step 6 Timeframe for action |
|---|---------------------|--------------------|---|--|--|--------------------------------|
| | | Hazard Controlled? | If Yes what is the control? | | | |
| <i>Contamination from frogs, birds and other animals from the roof and gutters, or entering the rain tanks directly</i> | <i>High</i> | <i>Yes</i> | <ul style="list-style-type: none"> • <i>Regular cleaning of roof & gutters</i> • <i>Removal of overhanging branches</i> • <i>Water treatment: UV treatment; coagulation; pH adjustment</i> • <i>Screens on tank inlets</i> • <i>Filters are serviced every 2 weeks or more frequently if needed</i> • <i>Visual inspection of all tanks carried out daily</i> • <i>Daily inspections of roofs, gutters and nearby trees</i> • | <ul style="list-style-type: none"> • <i>Service and maintenance sheets</i> • <i>Water treatment processes are checked</i> • <i>UV service sheet is completed whenever serviced (at least annually)</i> • <i>Water filter service sheet is completed whenever filters are serviced</i> | | |
| <i>Roof materials (e.g. lead sheeting; peeling paint)</i> | <i>Low</i> | <i>Unknown</i> | <i>Most roofs are tiled</i> | | <i>Chemical analysis of rain water quality, tested annually Program to repaint roofs as needed</i> | <i>Annually</i> |
| <i>Corrosion of metal plumbing fittings by soft water and or low pH e.g. copper from pipes resulting in blue water</i> | <i>Low</i> | <i>Yes</i> | <i>Visual inspection of water colour</i> | | <i>Chemical analysis of spring water quality annually, including pH.</i> | <i>Annually</i> |

| Step 1 Hazard | Step 2 Risk Rank | Step 3 | | Step 4 How is this control monitored? | Step 5 What could be done to improve safety? | Step 6 Timeframe for action |
|--|---------------------|--------------------|--|---|--|---|
| | | Hazard Controlled? | If Yes what is the control? | | | |
| <i>Contamination from frogs, birds and other animals entering spring tank</i> | <i>Medium</i> | <i>Yes</i> | <ul style="list-style-type: none"> • <i>Screens on tank vents</i> • <i>Spring water tank maintenance procedure is carried out monthly</i> • <i>Visual inspection of all tanks carried out daily</i> | <i>Spring water tank maintenance sheet is completed at each inspection</i> | <i>Consider UV treatment of spring water</i> | |
| <i>Pump and plumbing materials (e.g. piping, pump components)</i> | <i>Unknown</i> | <i>Unknown</i> | <i>Unsure if all materials comply with AS/NZ 4020:2005</i> | | <i>Undertake annual chemical testing.</i> <i>Ensure all future water supply equipment complies with AS/NZ 4020:2005</i> | <i>Annually</i> <i>Immediate</i> |
| <i>Animal and human activities (e.g. cattle, birds and /kangaroos; recreational use) impacting dam water quality</i> | <i>Low</i> | <i>Yes</i> | <i>Dam is difficult to access for humans and cattle</i> | <ul style="list-style-type: none"> • <i>Monthly inspection of dam and upstream area</i> • <i>Water treatment processes are checked</i> • <i>UV service sheet is completed whenever serviced (at least annually)</i> • <i>Water filter service sheet is completed whenever filters are serviced</i> • <i>Water is tested for microbiological quality monthly</i> | | |

| Step 1 Hazard | Step 2 Risk Rank | Step 3 | | Step 4 How is this control monitored? | Step 5 What could be done to improve safety? | Step 6 Timeframe for action |
|--|---------------------|-----------------------|--|--|--|-----------------------------------|
| | | Hazard Controlled? | If Yes what is the control? | | | |
| <i>Unintended cross connection e.g. between untreated dam water and spring water</i> | <i>Medium</i> | <i>Yes</i> | <ul style="list-style-type: none"> • <i>Manager over sight of plumbing works</i> • <i>Labelling of pipes and pumps</i> | <ul style="list-style-type: none"> • <i>Daily visual monitoring of water quality.</i> • <i>Water is tested for microbiological quality monthly</i> | | |
| <i>Algal bloom in dam</i> | <i>Low</i> | <i>No</i> | <ul style="list-style-type: none"> • <i>Monthly visual inspection of dam</i> • <i>Filtration</i> | <ul style="list-style-type: none"> • <i>Water treatment processes are checked</i> • <i>Water filter service sheet is completed whenever filters are serviced</i> • <i>Records kept of inspections</i> | | |

4. Management Actions and Record Keeping

An inspection and maintenance program and a water monitoring program are needed and are described in this section.

In the following tables, records will be kept for:

- all inspections, maintenance, carted water or incidents/emergencies.
- 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 and checking of warning signs.

4.1 Planned water supply system inspection and maintenance program

Regular inspection and maintenance are essential to maintaining a well-functioning and safe water supply. My inspection and maintenance program is as follows.

| Item inspected / maintained | Frequency or dates | Who by | Equipment or procedures |
|---|---|--------------------------------|---|
| <i>Inspection of water filters:</i> <ul style="list-style-type: none"> • Behind reception • Behind hut • Shed toilets • Behind cool room • Main filter • Dining room • Drinking tank | <i>2 weeks or as needed more frequently</i> | <i>Manager & residents</i> | <ol style="list-style-type: none"> 1. Shut off water supply to filter 2. Release pressure in filter (open tap) 3. Open up filter 4. Clean filter element & housing 5. Re-assemble units, be careful of sealing surfaces & O-rings 6. Close pressure relieving valve 7. Open shut off valve 8. Release air from system |
| <i>Inspection of spring site</i> | <i>Monthly</i> | <i>Manager</i> | <ol style="list-style-type: none"> 1. Check source of spring water 2. Clean out spring catchment hole 3. Clean out settling box 4. Note the flow (little/medium/ample) 5. Adjust T-piece as required 6. Follow the spring line and check for leaks 7. Check the flow at the tanks (testing valve) 8. Note the flow at the green tanks (little/medium/ample) |
| <i>Spring water tank maintenance</i> | <i>Monthly</i> | <i>Manager</i> | <ol style="list-style-type: none"> 1. Check flow of spring from testing valve 2. Check cleanliness of marble filter 3. Check for leaking joints in pipes 4. Clean tops of tanks 5. Check levels of tanks 6. Check build-up of sediments in tanks |
| <i>Dam water inspection</i> | <i>Monthly</i> | <i>Manager</i> | |
| <i>Replace marble filters</i> | <i>6 monthly</i> | <i>Manager</i> | |
| <i>UV & filter system maintenance</i> | <i>Annually</i> | <i>Contracted</i> | |

| Item inspected / maintained | Frequency or dates | Who by | Equipment or procedures |
|--|---------------------------|-------------------|--------------------------------|
| <i>Check that infrastructure (pump, piping etc.) is fully operational and maintained</i> | <i>As required</i> | <i>Contracted</i> | |
| <i>Presence of mosquito larvae in tank water</i> | <i>Weekly</i> | <i>Manager</i> | <i>Visual inspection</i> |
| <i>Rainwater tank roof condition and overhanging trees</i> | <i>3 monthly</i> | <i>Manager</i> | |
| <i>Clean gutters</i> | <i>3 monthly</i> | <i>Manager</i> | |
| <i>Check and trim overhanging branches</i> | <i>Annually</i> | <i>Manager</i> | |
| <i>Assess dam upstream catchment for new developments and other possible sources for contamination</i> | <i>Annually</i> | <i>Manager</i> | |

4.2 Water supply system inspection and maintenance records

Make a record every time a supply system item is inspected or maintained.

| Date | What was inspected | Notes | Actions to be taken | Person Responsible |
|-------------|--|--------------|----------------------------|---------------------------|
| | <i>Water filters</i> | | | |
| | <i>Inspection of spring site</i> | | | |
| | <i>Spring water tank maintenance</i> | | | |
| | <i>Dam water inspection</i> | | | |
| | <i>Replace marble filters</i> | | | |
| | <i>UV & filter system maintenance</i> | | | |
| | <i>Check that infrastructure (pump, piping etc.) is fully operational and maintained</i> | | | |

| Date | What was inspected | Notes | Actions to be taken | Person Responsible |
|------|--|-------|---------------------|--------------------|
| | <i>Presence of mosquito larvae in tank water</i> | | | |
| | <i>Rainwater tank roof condition and overhanging trees</i> | | | |
| | <i>Clean gutters</i> | | | |
| | <i>Check and trim overhanging branches</i> | | | |
| | <i>Assess dam upstream catchment for new developments and other possible sources for contamination</i> | | | |

4.3 Equipment details

The manufacturer's instructions are attached to the QAP.

| Part / Equipment | Manufacturer ¹ | Supplier/Repairer Contact Details |
|---------------------|---------------------------|--|
| <i>UV equipment</i> | <i>Brand A</i> | <i>Anywhere irrigation supplies XXXX XXX XXX</i> |
| <i>Water pumps</i> | <i>Brand B</i> | <i>Anywhere irrigation supplies XXXX XXX XXX</i> |
| <i>Filters</i> | <i>Brand C</i> | <i>Anywhere irrigation supplies XXXX XXX XXX</i> |

Note 1: *Manufacturer's instructions are held by the site manager*

4.4 Sign posting (Permanent or temporary signs to communicate warnings to consumers)

Signs must be checked to ensure they are present and able to be read.

| Sign location | Sign wording | Permanent or Temporary | Inspection Date | Any action taken |
|------------------------|---------------------|------------------------|-----------------|------------------|
| <i>Lawn hose point</i> | <i>Do not drink</i> | <i>Permanent</i> | | |

4.5 Water quality monitoring program

Water quality monitoring is important in ensuring controls are effective and in response to concerns.

| 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 |
|-------------------------|--|--|-----------------------------|---|
| <i>Water quality</i> | <i>Daily</i> | <i>Spring water tank Kitchen</i> | <i>Chef</i> | <i>Visual check Taste</i> |
| <i>E. coli</i> | <i>Monthly</i> | <i>Spring water tank Kitchen Amenities block</i> | <i>Manager</i> | <i>See sampling procedure from laboratory</i> |
| <i>Chemical</i> | <i>Annually</i> | <i>Spring water tank Kitchen Amenities block</i> | <i>Manager</i> | <i>See sampling procedure from laboratory</i> |

4.6 Water quality monitoring results

Make a record every time water is tested.

| Date | Where test was taken from | Type of test taken | Test Result | Any action taken | Person Responsible |
|------|---------------------------|----------------------|-------------|------------------|--------------------|
| | | <i>Water quality</i> | | | |
| | | <i>E. coli</i> | | | |
| | | <i>Chemical</i> | | | |

4.7 Incident records

This table records details of incidents, issues or emergencies that impact on water quality, and what was done to rectify the situation. Any customer complaints about water quality are included.

| Date | Incident | Notes and corrective actions | Person(s) Responsible |
|------|----------|------------------------------|-----------------------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

5. Contingency and Emergency Planning

This is what is planned:

- 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
- to respond to any other issue.

5.1 Contingency plan

| Issue | Likely actions that could be taken |
|---|---|
| <i>Dirty water in spring supply</i> | <ul style="list-style-type: none"> • <i>Change filters</i> • <i>Flush lines</i> • <i>Use bottled water for drinking, food preparation & cleaning teeth</i> |
| <i>Dirty water in rainwater/dam supply</i> | <ul style="list-style-type: none"> • <i>Check water quality in supply water tank</i> • <i>Check water quality in header tanks</i> • <i>Flush lines</i> • <i>Check filters, backwash, consider changing filter media</i> • <i>Check coagulation process, pumps working, enough chemicals, chemicals are in date</i> • <i>Provide an alternate supply</i> |
| <i>Unpleasant taste to water</i> | <ul style="list-style-type: none"> • <i>Change filters</i> • <i>Flush lines</i> • <i>Use bottled water for drinking, food preparation & cleaning teeth</i> |
| <i>Detection of E. coli in a water sample</i> | <ul style="list-style-type: none"> • <i>Contact Public Health Unit for advice</i> • <i>Undertake disinfection, e.g. chlorination</i> |

| Issue | Likely actions that could be taken |
|--------------------|--|
| | <ul style="list-style-type: none"> • Signpost all outlets that water supply is contaminated and not to be used for drinking, food preparation or consumed when cleaning teeth, bathing or showering (as appropriate) • Review control measures • Provide an alternative supply • Re test water for E. coli |
| Algal bloom in dam | <ul style="list-style-type: none"> • Contact Public Health Unit for advice • Signpost all outlets that water supply may be contaminated and not to be used for drinking or bathing (as appropriate) • Review control measures • Test water for toxins • Use an alternative supply |

5.2 Emergency contacts

| Contact | Name | Contact Details |
|----------------------------|--------------------------------------|---|
| Public Health Unit | Sourced from: | http://www.health.nsw.gov.au/Infectious/pages/phus.aspx |
| Local Council | Anywhere Council | (02) XXXX XXXX |
| Pollution Incident Hotline | NSW Environment Protection Authority | 131 555 |
| Plumber | Bill's Plumbing | XXXX XXX XXX |
| Electricians | Jo Sparks | XXXX XXX XXX |
| Plumbing Supplies | Anywhere irrigation supplies | XXXX XXX XXX |
| Gutter Cleaner | Bob's roof maintenance | XXXX XXX XXX |
| Bottled Water Supplier | Wet Water Bottled Water | XXXX XXX XXX |
| Water Carter | Wet Water Carted Water | XXXX XXX XXX |