

# Water Supply Management Plan

---

This plan has been prepared by: (name)

This plan is for (business name and address):

Date:

## Instructions on using this document

(Please delete this box when you have developed your WSMP)

Use the *NT Guidelines for private water supplies* to help you to fill in this template.

<https://nt.gov.au/environment/water/water-and-your-health/private-water-supply-management>

**If you are unsure about drafting a Water Supply Management Program then engage a hydraulic engineer or certifying plumber and drainer (design) who is experienced with the design and management of water supply infrastructure. A list of registered hydraulic engineers and certifying plumber and drainer (design) is available on the NT Building Practitioners Board website.**

<http://www.ntlis.nt.gov.au/building-practitioners/>

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

You may need to write or develop lists or procedures.

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 to make your WSMP complete.

Examples of WSMPs can be accessed at:

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

## Background

This template will help private water suppliers develop a water supply management plan (WSMP), and can be altered to ensure it is relevant to each water supply system.

A WSMP must address 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 each water supply. The *Australian Drinking Water Guidelines* are available at <http://www.nhmrc.gov.au/guidelines/publications/eh52>

The *NT Guidelines for private water supplies* will also help private water suppliers develop a WSMP and are available at <https://nt.gov.au/environment/water/water-and-your-health/private-water-supply-management>

Further information can be found by contacting the Department of Health – Environmental Health (DoH):

Department of Health – Environmental Health		
Policy	Top End Health Service	Central Australia Health Service
Ph. (08) 8922 7152	(08) 8922 7377	(08) 8955 6122
<a href="mailto:envirohealth@nt.gov.au">envirohealth@nt.gov.au</a>	<a href="mailto:envirohealthte@nt.gov.au">envirohealthte@nt.gov.au</a>	<a href="mailto:envirohealthca@nt.gov.au">envirohealthca@nt.gov.au</a>

## Water supply management plan

A water supply system includes everything from the collection of the source water through to the point of use. When developing a WSMP for a water supply system an operator should ask three questions:

- 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 will help 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.

Your WSMP should reflect the type of water supply system you manage, especially the water source and its end uses. While DoH recommends that water supplies be monitored regularly, operators may choose not to monitor water quality. If the water supply is not

monitored or treated, and is not required to be of drinking water quality (water used in food preparation must be drinking water quality), operators may choose to manage their risk by placing signs at outlets to warn consumers. See the *NT Guidelines for private water supplies* for information on signage. A WSMP must still be developed and should include details on all signage. If you use your water supply to prepare food, please visit the NTG webpage - Private water supplies in food businesses:

<https://nt.gov.au/industry/hospitality/private-water-supplies-in-food-businesses>

### **What to do with the WSMP**

You should provide a copy of the completed WSMP to DoH for review.

The WSMP 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.

Your WSMP 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 DoH.

**The activities in this WSMP are undertaken by this business/development 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	Phone Mobile Phone Email Address
Business after-hours / emergency contact	Name Phone Mobile Phone Email Address

### 1.2 Water supply system monitoring and maintenance personnel details (if different from above)

	Roles and responsibilities
<b>Name and phone number of main person responsible</b>	
<b>Name and phone number of any other people responsible</b>	

### 1.3 Description of the water supply system

Describe the details of your water system from source to use. (Delete any that are not relevant)

Tick	Component	Description
	<b>Water sources</b>	
	Groundwater (bore)	
	Dam	
	River / creek	
	Rainwater (roof water)	
	Carted water	
	<b>Treatment</b>	
	Filtration	
	UV disinfection	
	Chlorination	
	First flush diverter (rainwater tanks)	
	Other	
	<b>Distribution</b>	
	Storage/header tank	
	Pipes	
	Pumps	
	Other	
	<b>Uses</b>	
	Drinking	
	Food preparation (including washing of produce and cleaning of utensils and equipment)	
	Personal hygiene (showers, toilets etc.)	
	Clothes washing	
	Other	

## **2. Diagram of the water supply system**

Draw a simple diagram of your water supply system. Show the water source, pumps, storage, treatment, pipelines and uses. Include the location of wastewater systems (for example, septic tanks), any possible sources of contamination and the location of physical control measures such as fences, signs, etc. The diagram must reflect the details of the water supply system but does not need to be to scale. An example diagram is included in Appendix A.

### 3. Risk assessment of the water supply system

Understanding the risks to your water supply is a crucial step in ensuring its safety. Actions should be prioritised on the basis of level of risk.

The hazards to the water supply are considered and rated following the advice in the WSMP template and the *NT Guidelines for private water supplies*. Note all controls which are in place to address the hazards, and actions required to improve the ongoing protection of the water quality. Use the following risk assessment process.

Document your risk assessment in the next template table, using the following steps. Create as many pages as required. It is important to review your risk assessment regularly to ensure any new risks are identified.

**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 *NT Guidelines for private water supplies* 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 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.

### Risk assessment template

Step 1	Step 2	Step 3		Step 4	Step 5	Step 6
Hazard	Risk Rank	Is the Hazard Controlled?	If Yes what is the control?	How is this control monitored ?	What could be done to improve safety?	Timeframe for action
e.g. Surface water dam – access by farm animals (potential for microbiological contamination)	High	No			Fencing of dam  Installing chlorination system	12 months  6 months
e.g. River water dirty looking after heavy rain (probable bacterial contamination)	High	Yes	After >90mm of rain, pump is switched off and water carter called to top up main tank	Rain gauge monitored hourly during rainfall. Visual check of river water colour	Shut off as soon as rain begins.	Currently managed
e.g. Rodents/animals accessing roof (probably bacterial contamination)	Medium	Partly	Trees trimmed so not overhangin g roof	Visual inspection of trees annually		Currently managed
e.g. Taste and discoloration of water from leaves entering storage tank	Low	Yes	Overhangin g branches trimmed. Gutter guards installed and maintained	Inspection and maintenance records		



## 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. These records include 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 and checking of warning signs.

### 4.1 Planned water supply system inspection and maintenance program

An inspection regime should address all aspects of the water supply system. Examples of inspections are included in Appendix D.

Regular inspection and maintenance is essential to maintaining a well functioning and safe water supply.

What is to be inspected/maintained	How often it is to be inspected/maintained (frequency or dates)	Who should conduct the inspection/maintenance	Any equipment or procedures needed
Check catchment-roof and gutters	monthly	Manager	Ladder
Top up fuel for pump	weekly	Manager	Fuel tank, funnel, gloves, pump compound key
UV treatment Power supply operating UV lamp	daily 6 monthly	Manager Service company technician	Key to plantroom Supplied by technician

## 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
3.3.13	Roof & gutters	Gutter loose near NE cnr of house Down pipe at SW cnr beginning to rust	Reconnected loose gutter during inspection Check downpipe next month	John Smith
5.3.13	Pump motor	Topped up fuel, mowed grass	Clean air filter at next visit	John Smith

## 4.3 Equipment details

Record details of pumps, parts, treatment systems and chemicals. Include details of manufacturers, supplier and repairers.

The manufacturer's instructions are attached to the WSMP.

Part / Equipment	Manufacturer	Supplier/Repairer Contact Details
UV equipment		
Water pumps		

#### 4.4 Sign posting

Signs can be a useful way of communicating with customers. Signs may be permanent or temporary. Examples of warning signs can be found in the *NT Guidelines for private water supplies*.

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

#### 4.5 Water quality monitoring program

Water quality monitoring is important in ensuring controls are effective and in response to concerns. Refer to the *NT Guidelines for private water supplies* for information on developing a monitoring program which is suitable for your system.

This table describes the tests that will be made.

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
Onsite tests e.g pH, chlorine	Daily chlorine levels	At tank and at tap in laundry	Manager	Test kit Procedures are written on the lid of test kit.
Microbiological				
Chemical				

#### 4.6 Water quality monitoring results

Make a record every time water is tested, detailing what was tested, when, results and actions.

Date	Where test was taken from	Type of test taken	Test result	Any action taken	Person responsible

#### 4.7 Records of water purchased from a water carter

Make a record every time drinking water is purchased from a water carter and added into the water supply system.

Date	Name and details of water carter	Volume of water purchased

#### 4.8 Chlorination records

For guidance on the safe use of chlorine see Chapter 5 of the *NT Guidelines for private water supplies*

If chlorine is used, record the details in the table below.

Date	Volume of water treated (litres)	Amount of chlorine added	Free chlorine test result (mg/L)	Person responsible

mg/L = milligrams per litre, this is the same as ppm (parts per million)

#### 4.9 Incident records

If incidents, issues or emergencies occur that impact on the water quality, record what happened and what was done to rectify the situation. Include any customer complaints about water quality.

Date	Incident	Notes and corrective actions	Person responsible
12/5/19	e.g. Dirty water noticed coming out of taps after heavy rain	Heavy rains after dry spell washed dirt into rainwater tank and resuspended sludge as tank level was low. Potential for bacterial contamination. Tank has not been cleaned recently. Advised customer to boil water before use and supplied bottled water to rooms. Booked tank cleaner and water carter to refill tank. Checked roof and gutters. Checked first flush diverter.	Nicola Smith

## 5. Contingency and emergency planning

This is what is planned:

- if there was a problem with an important part of the water supply system
- in response to a failed water quality test
- 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
- in response to any other issue.

### 5.1 Contingency plan

Issue	Likely actions that could be taken
e.g. Algal bloom in dam	<ul style="list-style-type: none"> <li>• Contact DoH for advice</li> <li>• Signpost all outlets that water supply may be contaminated and not to be used for drinking or bathing</li> <li>• Review control measures</li> <li>• Test water for toxins</li> <li>• Provide an alternative supply</li> </ul>
e.g. detection of E. coli in a water sample	<ul style="list-style-type: none"> <li>• Contact DoH for advice</li> <li>• Undertake disinfection, e.g. chlorination</li> <li>• 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</li> <li>• Review control measures</li> <li>• Provide an alternative supply</li> <li>• Re test water for E. coli</li> </ul>

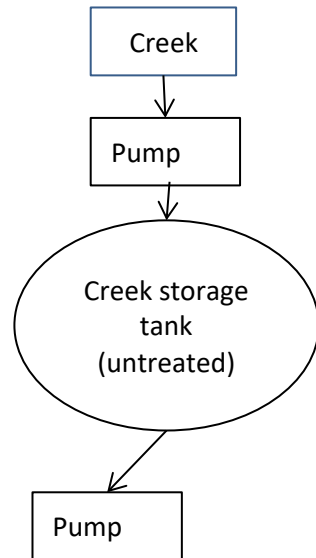
## 5.2 Emergency contacts

Keep details of who to contact in an emergency, who to call for advice and important local contractors. Keep these details in an easily accessible place.

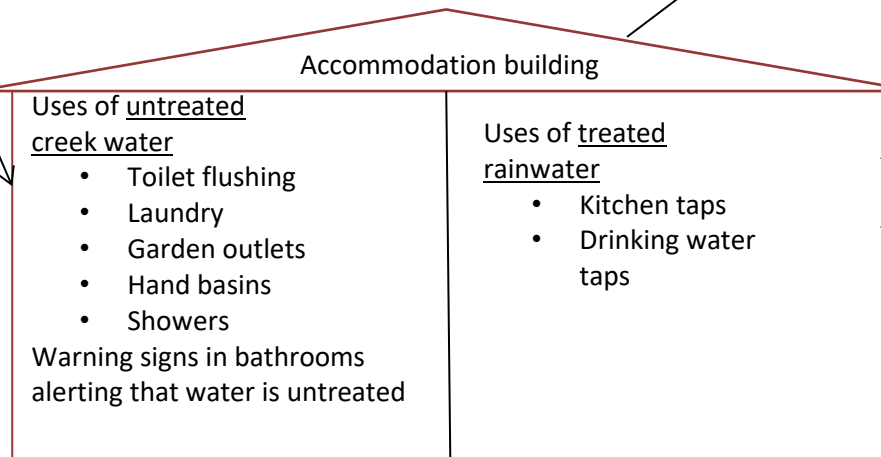
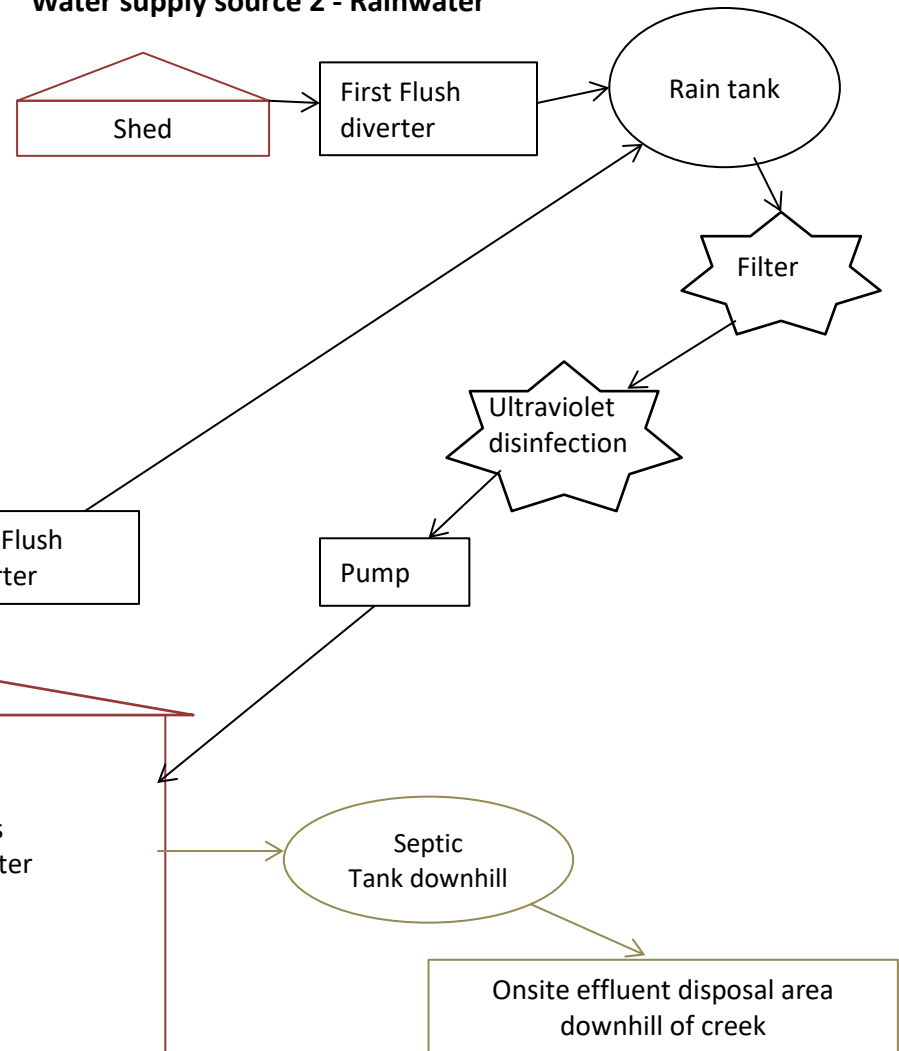
Contact	Name	Contact details
DoH	Environmental Health	
Pollution Incident Hotline	NT Environment Protection Authority	1800 064 567
Plumber		
Tank cleaner		
Water carter		
Chlorine supplier		
Electrician		
Hydraulic consultant		

## APPENDIX A: Example water supply system diagram

### Water supply source 1 – Creek water



### Water supply source 2 - Rainwater





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

Component	Potential source of contamination	Control measures
Water source	Rain water Roof and gutters (e.g. build-up of leaves, dirt and animal droppings)	<ul style="list-style-type: none"> <li>• First flush device</li> <li>• Regular cleaning of roof and gutters</li> <li>• Removal of overhanging branches</li> <li>• Regular inspections</li> <li>• Water treatment (disinfection)</li> </ul>
	Rain water Roof material (e.g. lead-based paint, lead flashing, bitumen-containing products, treated timber, peeling paint)	<ul style="list-style-type: none"> <li>• Water not collected from roofs coated or painted with substances that may leach hazardous materials</li> <li>• Remove or treat lead flashing</li> <li>• Seal any exposed treated timber</li> </ul>
	Surface water (dams, creeks and rivers) Surrounding land use (e.g. farming, urban areas, industrial sites and sewage discharges)	<ul style="list-style-type: none"> <li>• Protect surface water source against livestock, septic tanks/sewage overflows and chemical spills</li> <li>• Water treatment</li> </ul>
	Surface water (dams, creeks and rivers) Animal and human activities	<ul style="list-style-type: none"> <li>• Fence water storage or off-take area</li> <li>• Don't permit swimming or public access in off-take area</li> <li>• Water treatment</li> </ul>
	Groundwater (bore, well, spring) Surface water seepage	<ul style="list-style-type: none"> <li>• Raise bore heads above ground level and mound up ground around bore head</li> <li>• Ensure bore covers and casing are intact</li> <li>• Regular inspections</li> </ul>
	Groundwater (bore, well, spring) Sub-surface contamination (e.g. from industry, farming, landfill, sewage)	<ul style="list-style-type: none"> <li>• Extract groundwater from places where sub-surface contaminants are unlikely</li> <li>• Test the water for chemicals and treat if necessary</li> <li>• Groundwater source is at least 20 metres from any wastewater disposal systems</li> <li>• Water treatment (disinfection)</li> </ul>
Water Storage	Insect, birds and animals in system	<ul style="list-style-type: none"> <li>• Screen all inlets and outlets to the tank</li> <li>• Regular inspections of tank, roof and gutters</li> </ul>
	Build up of sludge in tank, dirt in inlet strainers or insect screens	<ul style="list-style-type: none"> <li>• Regular inspection, cleaning and maintenance program</li> </ul>
	Tank materials (e.g. pH of water in concrete tanks, high metals from metallic tanks)	<ul style="list-style-type: none"> <li>• Materials in contact with water comply with relevant Australian Standards (refer to Appendix 1)</li> <li>• Chemical adjustment of pH in new concrete tanks may be necessary</li> </ul>
	Backflow water (e.g. from animal water troughs)	<ul style="list-style-type: none"> <li>• Backflow prevention device</li> </ul>
Distribution system	Pump and plumbing materials	<ul style="list-style-type: none"> <li>• All materials in contact with water comply with AS/NZS 4020:2005</li> </ul>
	Leaching from bore casings, pipes or plumbing materials	<ul style="list-style-type: none"> <li>• All materials in contact with water comply with AS/NZS 4020:2005</li> <li>• Flush standing water at irregularly used fixtures</li> </ul>

## APPENDIX C: 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 D: 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 *NT Guidelines for private water supplies*)
- 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)