

Appendix A: Distribution System Hazards and Mitigation

HAZARD	ISSUE	RISK	MITIGATION MEASURE
Long pipe lengths	Poor turnover: Water remains dormant for long periods, allowing it to stagnate. Elevated metals concentrations: Where pipes are metal, long exposure of water to the pipes may result in dissolution of metals into the water	Objectionable taste odour or appearance bacterial growth. Exceedance of metals standards (e.g. lead, copper, nickel).	Regular flushing of twice the capacity of the pipe. Reduce pipe run when possible. Ensure the system is not unnecessarily convoluted or long.
Age, condition and material of pipes.	Potential for pipe material or component substances to dissolve (e.g. lead) or break off into the water (e.g. iron)	Cloudy water, water with particles, and possible objectionable taste and odour. Potential health effects depending on materials.	Replace or improve the pipes. Flushing in the short term may help, but it could make it potentially worse.
Inappropriate location of pipes, vessels and chambers	Pipes and storage tanks/reservoirs located by waste facilities (latrines, toilets etc) or storage of contaminants such as oil could inadvertently leak into the supply	Contaminants may enter the supply leading to illness and/or taste, odour and appearance issues	Relocate pipes/vessels to a less hazardous location. Ensure tanks, chambers and tanks are in robust condition with protective measures in place, such as bunding around oil storage and ensure pipes are lined or are run in a protective sleeve to prevent chemicals migrating through plastic.
Age, condition and material of storage vessels (tanks, reservoir, chambers)	Breakdown of materials into the water, potentially hazardous chemicals. Possible ingress points	Cloudy water, water with particles, objectionable taste and odour. Risk of decaying animals where they have gained access via holes, cracks etc.	Upgrade or replace the vessel.
Contamination via ingress points	Inappropriate covers on inspection chambers or storage reservoirs or tanks, including loft tanks, will	Ingress of land run off (pesticides, industrial pollutants), farm slurry or animal faeces from wildlife or grazing livestock	Inspection chambers, reservoir and tank roofs must have robust stock proof fencing. Ensure vents have a gauze covering, ensure chamber covers are adequately sealed and raised above the ground

	allow ingress of animals, including vermin and insects or encourage algal or bacterial growth		where possible.
Low or irregular usage/little throughput of water	Low usage can encourage microbial growth or slime on the pipe walls called biofilms	Taste, odour and appearance problems.	Ensure tanks and reservoirs are of a suitable size to ensure regular turnover, ensure the system is not unnecessarily convoluted or long
"Dead spots" in the system (areas of low or no flow such as redundant pipework or dead spots due to poor mixing).	As above. Water remains dormant for long periods, allowing it to stagnate, and this may get pulled back into the main flow of water.	Taste, odour and appearance problems	Remove dead legs and dead spots where possible.
Fittings on the system that are unapproved, in poor condition or inappropriate	Unapproved materials from fittings products or treatment chemicals can impart chemicals to the water or encourage microbial growth in the system.	Taste, odour and appearance problems. Potential health issues depending on the circumstances and product.	Products should be replaced with appropriate approved materials and products. See DWI website for further details.
Back flow risks	Contaminants get pushed or sucked into the system due to pressure changes due to absence of backflow prevention devices. Possible contamination of the public supply.	Taste, odour and appearance problems. Potential health issues depending on the circumstances and contaminants.	Ensure appropriate protection devices are installed. Consult local water company.
Uncontrolled operator access	Uncontrolled use of valve or hydrant operation	Inadvertent stirring up of sediment in the system leading to taste, odour or appearance issues. Connection of apparatus with inadequate backflow protection.	Restrict access to use of valves and hydrants. Document a procedure for their operation by approved personnel.