Guidelines for Water Quality Testing

= Optimum range for most fresh water systems

Variable	What is it?	Range	Definition of range
Water Temperature	All plant and animal life have preferred ranges of temperatures they like to live in. Above or below this range can impact the ecology of the creek. The external air temperature and the amount and temperature of rain water can influence the water temperature.	Variable depending on day.	Variable depending on species.
pH	pH (potential of hydrogen) is a numeric scale used to specify the acidity or basicity of a matrix (water, soil…). Drinking water typically has a pH around 7.	0 - 6.5	Acidic
		6.5 – 8.5	Normal
		8.5 - 14	Alkaline
Conductivity	The conductivity tells us how much the water can conduct electricity i.e. how many ions it has in it. Dissolved salts are high in ions.	0-200 µS/cm	Rain Water
		200 – 600 µS/cm	Mains Water
		600 – 1500 µS/cm	Freshwater ecosystems
		1500 – 33 000 µS/cm	Brackish / salty water
		33 000 – 80 000 µS/cm	Sea Water
		80 000 – 120 000 µS/cm	Salt Pans
Dissolved Oxygen	The dissolved oxygen tells us how much oxygen is in the water that can be used by aquatic life.	< 2.0 mg/L	Below ecosystem requirements
		2.0 – 5.0 mg/L	Blackish in colour/smelly
		5.0 – 8.5 mg/L	Normal
		> 8.5 mg/L	Influenced by algae
Turbidity	The turbidity tells us how clear the water is e.g. is it muddy? etc.	< 10 NTU (Nephelometric Turbidity Unit)	Normal for urban waterways
Ammonia N	Ammonia is found in trace quantities in nature. It is produced from nitrogenous animal and vegetable matter.	0.25 mg/L	Background
		> 1.0 mg/L	Could be influenced by sewage
		60 - 400 mg/L	Leachate (e.g. liquid coming from a landfill)
Total Nitrogen (N)	Nitrogen is essential for plant growth and animal nourishment and naturally occurs in waterways up to a concentration of around 0.5mg/L.	0 – 0.5 mg/L	Normal levels
		>0.5 mg/L	Potential for eutrophication and adverse effects
Total Phosphorus (P)	Phosphorus is essential for plant growth and animal nourishment and naturally occurs in waterways up to a concentration of around 0.05mg/L.	0 – 0.05 mg/L	Normal levels
		>0.05 mg/L	Potential for eutrophication and adverse effects

Source: Urban Utilities SE Qld, https://water.usgs.gov/edu/ph.html

Analysing the Results

Variable	Measurement impacts	Possible actions
Temperature	• **Low:** Prolonged low or high temperatures could detrimentally affect those animals and plants that cannot tolerate those temperatures. • **High:** Prolonged high temperatures could lead to low dissolved oxygen and possibly lead to an algal bloom detrimentally effecting the ecosystem.	✓ Plant trees to create shade and reduce temperature fluctuations and extremes.
pH	• **Low:** Low pH could be an indicator of acid present in the system e.g. runoff from acidic sulphate soils. • **High:** High pH could be an indicator of alkali present in the system (lime) e.g. industrial wastes. • Low or high pH can be an indicator of point source pollution (e.g. industrial waste), mining, acid rain or pine forests.	✓ Educate your community regarding storm water pollution e.g. washing cars on grass. ✓ Educate your community about not dumping waste into waterways.
Conductivity	• **High:** High conductivity could be an indicator of new concrete in the waterway. • **High:** High conductivity may lead to low dissolved oxygen and therefore limit plant and animal life. • **Low:** Low conductivity could be an indicator of high rainfall leading to fresher water.	✓ Plant trees to increase dissolved oxygen. ✓ Talk to your local council to see if they have plans to alter storm water drains, pathways etc near the creek and how you can work with the Council to reduce the impact of these works.
Dissolved Oxygen	• **Low:** Low dissolved oxygen can be caused by excess organic material in the water, the breakdown of organic matter, algal bloom, low flow or high BOD (biochemical oxygen demand). This can lead to the death of aquatic life. • **High:** High dissolved oxygen could be an indicator of too high a flow leading to the death of aquatic life.	✓ Plant trees to reduce organic debris falling into the creek at a high rate. ✓ Educate people about storm water pollution, disposing of their green waste appropriately.
Turbidity	• **High:** High turbidity (too many particles in the water) can affect plant growth by reducing the amount of sunlight they can use. High turbidity can impact fish and other aquatic animal's ability to breathe (clog fish gills).	✓ Plant trees, grasses and shrubs to prevent soil erosion. ✓ Educate people about storm water pollution, disposing of their green waste appropriately.
Ammonia N	• Ammonia even at dilute concentrations is highly toxic to aquatic animals. Experiments have shown that the lethal concentration for a variety of fish species ranges from 0.2 to 2.0 mg/L. Ammonia can be found in many fertilisers.	✓ Educate your community regarding storm water pollution, in particular fertiliser preparation and run off after rain.
Total Nitrogen (N) **Total Phosphorus (P)**	• **High:** High levels of Nitrogen and Phosphorus can impact the waterways adversely by overstimulating growth of plants such as algae which can then clog waterways and cause the reduction of light. It can be an indicator of fertiliser run off or sewage.	✓ Educate your community regarding storm water pollution, in particular fertiliser preparation and run off after rain. ✓ Educate your community about fixing broken sewerage pipes quickly. ✓ Plant trees to increase the absorption of the nutrients before they enter the waterways.

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