STILL CREEK CATCHMENT LANDCARE WATER TEST RESULTS 2009/2020 CONCLUSIONS

General conclusions	
Water tests have shown that the catchment is in good condition and that general water quality has being maintained over the last 12 years	
On exit from the catchment into Berowra Creek at Crosslands most results are good with the areas of bush and the dilution effect improving the water as it flows through the catchment	
Further upstream in the catchment, closer to residences, results are not as good, but are not a major problem	
Charltons Creek , high in the catchment, tends to be high in phosphorous, with quite notable surges after heavy rain	
Still Creek in mid-catchment at Mansfield Road is high in salts, as measured by electrical conductivity tests and shows a large variation, with a long flat tail	
E coli incidence is low but has increased significantly over the last 18 months	
Waterbug (Macroinvertebrates) observations have found Mayflies, Caddisflies at sometimes Stoneflies at both Charltons Ck and Still Ck Crosslands	

Conclusions about compliance with ANZECC water quality guidelines: % within guidelines	
Available Phosphate	Fairly good on exit from the catchment, although in recent years, this has decreased to 84%
	83% of mid-catchment tests were within guidelines, similar over the years
Salts: Electrical Conductivity	Only 29% on exit from the catchment likely due to the geology rather than human disturbance of the soil and not regarded as indicating a problem
	Only 9% of mid-catchment results were within guidelines due to geology rather than human disturbance of the soil and not regarded as indicating a problem
Dissolved oxygen	Good results with 96% within guidelines on catchment exit, 97% mid catchment 91% upstream at Charltons Ck
E coli	Previously good with over 90%, but in last 18 months has been 89% at catchment exit and 67% and 78% mid catchment
Turbidity	Very good: almost 100% within guidelines
pH	Very good:100% within guidelines

Conclusions from statistical analysis, time series and specific studies	
Available Phosphate	Negative impact sources: nutrients via run off from fertilisers, livestock/animal wastes, septic treatment of waster water
	Test results vary greatly, also the testing method for values of 0.06 and below can be read as the same value, which is still a good result
	Result means have not varied significantly during the period
	Catchment exit is 65% of the mid catchment Phosphate readings due to dilution plus biological clean-up within the 50% of catchment not populated
	The significant effect of rain within 24 hours, compared with nil for 7 days is 70% more at Charltons, 187% more at Still Mansfield and 45% at catchment exit
	For rain within 24 hours, heavy rain compered with light rain results in 130% higher readings at Catchment exit and mid catchment and even higher at Charltons Ck
	High flows result in 190%, 210% and 500% increased Phosphates at the three sites, compared with light flows
	Charltons Ck without flow is 5 times normal due to build up in waterholes without flushing from 2012 studies
	Water treatment (3 stage for grey and black household effluent) is 1700 times exit site despite using no-phos cleaners in a brief 2012 study
Salts (Electrical Conductivity)	Negative impact sources: human activity involving waste water, and run off
	Catchment exit is 65% of the mid catchment Phosphate readings due to dilution plus biological clean-up within the 50% of catchment not populated
	The effect of rain within 24 hours, compared with nil for 7 days is 8% less at Charltons, 15% less at Still Mansfield and 7% less at catchment exit
	For rain within 24 hours, heavy rain compered with light rain results in 60% to 70% lower readings throughout the catchment
	Charltons Ck without flow is 5 times normal due to build up in waterholes without flushing from 2012 studies
	High flows result in 25% to 45% decreased salts at the three sites, compared with light flows
	Charltons Creek and Mansfield had an unexplained period of higher than normal salts in mid 2018 but have since returned to more typical levels
	Charltons Ck without flow is 1.7 x normal due to build up in waterholes without flushing from 2012 studies
	Water treatment (3 stage for grey and black household effluent) is 2.2 times mid-catchment test results in a 2012 study
Dissolved Oxygen	Higher DO results in increased ability to sustain aquatic life
	Results are fairly consistent with the standard deviation being 23% of the means for all three sites
	All three sites showed an increase over the 12 years from about 8 to 10, this is unexplained and requires further investigation into this beneficial effect
	As results above 10 are unlikely with this test, future results will be capped at 10.0 until further notice
	Charltons Ck without flow is 60% of normal dissolved Oxygen due to reduced oxygenating movement in waterholes
	A brief diurnal trial on a flowing creek showed no significant variation during the day (single day trial of 3 readings)
E.coli	Sources: livestock and other animal faeces, septic treatment failures or poor maintenance
	Overall not often at very bad levels but has deteriorated in last 18 months at >99% confidence level, now 4 incidents per year, previously 1 incident per year
	High flows result in increased E. coli detection, 21%, compared with 10% for medium and low flows
	In the last 18 months 50% of high flows resulted in E. coli detection, previously it was 15%: this is unexplained
Turbidity	Sources: sediment from erosion, loss of topsoil and building sites: good and unchanged over the 12 years
pH	Acidity and alkalinity from human activities: good and unchanged over the 12 years
Waterbugs	Macroinvertebrate presence is an indicator of good conditions for life, in particular Stoneflies present in 50% of checks at Charltons Ck and 38% at catchment exit
	Mayflies and Caddisflies are also high level indicators and were present 77% and 85% at Charltons Ck and 100% and 92% at catchment exit