

STILL CREEK CATCHMENT LANDCARE WATER TEST RESULTS 2009/2021 CONCLUSIONS

General conclusions

Water tests have shown that the catchment is in good condition and that general water quality has been maintained over the last 13 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 10 times over the last 2.5 years, this unexplained. 2022 results are unknown because deliveries of petrifilm temporarily stopped
 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	Fairly good on exit from the catchment at 91%
Phosphate	83% of mid-catchment tests were within guidelines, similar over the years
Salts: Electrical Conductivity	Only 30% 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 8% 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, 95% mid catchment and 91% upstream at Charltons Ck
E. coli	Previously good with over 95%, but in last 2.5 years has been 73% at catchment exit, 79% mid-catchment and 69% higher up
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 waste water Test results vary greatly, the testing method for values of 0.06 and below care inaccurate 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 compared 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 Phos due to build up in waterholes without flushing based on studies in 2012 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 Still Ck at Mansfield Rd is consistently 50% above the other two sites, presumed due to local geology 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 compared 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: aim of minimum of 6.0 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 13 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 approximately 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 2.5 years at >99% confidence level, now 2.8 incidents per site-year, previously 0.28 This change is unexplained and has not been assessed in 2022 due to cessation of Petrifilm deliveries until May High flows result in increased E. coli detection, 20%, compared with 5% for medium and low flows
Turbidity	Sources: sediment from erosion, loss of topsoil and building sites: good and unchanged over the 13 years
pH	Acidity and alkalinity from human activities: good and unchanged over the 13 years
Waterbugs	Macroinvertebrate presence is an indicator of good conditions for life, in particular Stoneflies present in 50% of checks at Charltons Ck and 33% 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