

Site 012 – Hornsby Creek, Hornsby

Freshwater site

Cowan Creek Catchment

Monitoring Program Timelines

Program Name (site reference)	Sampling Period	Sampling Frequency
Long-term (012)	Oct 1994 – Jun 2016	Fortnightly
	Jul 2016 – Sept 2017	Monthly
Industrial (012)	Oct 2017 ongoing	Monthly

Key Findings and Recommendations

Condition	<p>Phys-chem: pH is elevated and consistently exceeds REHVs. EC is elevated but variable, exceeding REHVs around 70% of the time. DO consistently complies with REHVs following a long-term decrease with particular improvement from 2001 onwards.</p> <p>Clarity: Turbidity and TSS are decreasing through time and generally comply with REHVs.</p> <p>Nutrients: Nutrient levels are elevated, particularly NO_x-N, and consistently exceed REHVs.</p> <p>Bacteria: Bacteria levels elevated and consistently exceed REHVs.</p>
Issues	<ul style="list-style-type: none"> – Strongly influenced by industrial development in the catchment – Potential impacts from wastewater infrastructure – Difficult meeting REHVs in highly modified catchments
Recommendations	<ul style="list-style-type: none"> – Investigate sources of nutrients and bacteria in the catchment – Identify further opportunities for WSUD in the catchment – Ongoing collaboration with Sydney Water to improve the management of wastewater – Collaboration with State Government agencies (i.e. EPA) to improve the management of industrial developments – Engage with industry to identify opportunities to reduce sources of pollutants – Review water quality values and objectives relevant to industrial sites and continue monitoring until objectives are achieved – Maintain high sediment and erosion control standards

Site Photos



Hornsby Creek looking upstream during high flow



Hornsby Creek looking upstream during low flow

Results of Data Analysis

Table 1 Results of non-conformance calculations and *Kendall Tau* ($p < 0.05$) trend analysis for Site 012

012	REHV	Long-term				2012-2017			
		n	Median	%NCs	Trend	n	Median	%NCs	Trend
Temp (°C)	NA	508	16.83	NA	NS	104	15.80	NA	NS
pH	4.8-7	505	7.74	98	↓	102	7.72	98	↑
DO (%sat)	75-118	469	102.10	20	↓	104	96.65	1	NS
EC (mS/cm)	0.32	507	0.40	67	NS	104	0.38	74	NS
Turbidity (NTU)	8	508	6.0	42	↓	104	4.8	36	↑
TSS (mg/L)	7	519	3	26	↓	104	2	23	NS
TP (mg/L)	0.01	520	0.058	98	↓	104	0.050	100	↑
TN (mg/L)	0.32	520	1.020	100	↑	104	0.990	100	NS
NH ₃ -N (mg/L)	0.02	519	0.030	62	↑	104	0.040	76	NS
NO _x -N (mg/L)	0.05	520	0.650	100	NS	104	0.655	100	NS
F.Cols (CFU/100ml)	150	519	920	93	NS	104	850	97	NS

REHV – Regional Environmental Health Value

n - Number of sampling events

%NCs - percent non-conformance based on REHVs

NA - No associated REHV or benchmark value

NS - trend not significant based on Kendall Tau analysis at $p < 0.05$

↑ - significant increasing trend based on Kendall Tau at $p < 0.05$

↓ - significant decreasing trend based on Kendall Tau at $p < 0.05$

Median	%NCs
Within or below REHV	<25%
Equal to REHV	25% to 75%
Outside or above REHV	>75%
No associated REHV	Not Applicable

Table 2 Descriptive statistics for variables measured at Site 012 from January 1995 to September 2017

Variable	Valid n	Mean	Median	Minimum	Maximum	20 th Percentile	80 th Percentile	Std Dev
Temp (°C)	508	16.59	16.83	8.03	29.70	12.28	20.50	4.200
pH	505	7.81	7.74	6.50	10.00	7.53	8.04	0.410
DO (mg/L)	505	10.55	10.34	2.00	17.90	9.12	11.80	1.910
DO (%sat)	469	107.18	102.10	14.60	200.00	95.10	116.80	21.490
EC (mS/cm)	507	0.38	0.40	0.00	0.90	0.29	0.50	0.140
EC (µS/cm)	205	382.96	394.00	0.39	3850.00	277.50	451.50	268.660
Turbidity (NTU)	508	17.4	6.0	0.0	333.0	2.4	25.0	29.43
TSS (mg/L)	519	9	3	1	251	1	10	16.9
TP (mg/L)	520	0.090	0.058	0.003	1.500	0.033	0.100	0.1200
TN (mg/L)	520	1.490	1.020	0.410	26.500	0.770	1.510	1.9400
NH ₃ -N (mg/L)	519	0.120	0.030	0.005	7.000	0.010	0.090	0.4100
NO _x -N (mg/L)	520	0.700	0.650	0.060	2.100	0.410	0.965	0.3500
F.Cols (CFU/100ml)	519	11312	920	1	800000	340	7000	49826.1
E.Coli (CFU/100ml)	26	5050	865	130	36000	520	3300	9278.8
Enterococci (CFU/100ml)	48	3257	240	44	110000	82	1000	15880.1

Boxplots showing annual variability for each variable measured



