WATER CYCLE MANAGEMENT STUDY

Infinite Projects Fenwick Pty Ltd

17 Fenwick Crescent

Goulburn

27th October 2024

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1. Site Location

The site No. 17 Fenwick Crescent Goulburn is 0.3090 Ha in area. The site slopes from the west to the east towards Fenwick Crescent. The lot is within an existing residential area. There are no stormwater treatment measures provided for this stand alone lot.

Figure1– Aerial View of 17 Fenwick from maps.six.nsw.gov.au. Approximate boundary adjustment shown

Figure 2 – Existing site conditions, site works have been undertaken for earlier stages of construction

Figure 3 – Existing site conditions

Figure 4 – Discharge point into the existing stormwater main

2. Proposed Developments

SITE CHARACTERISTICS	
Site Location:	17 Fenwick Crescent Goulburn
Drinking Water Catchment:	8 - Mulwaree River
Rainfall & PET Zone:	1
Affected Catchment Area:	0.309 Ha
Pre Development Site gradient:	1-2%
Post Development Site Gradient:	1-2%
Soil Landscape:	Clay Loam
Existing watercourses through the site?	No
Overland flow draining onto the site?	No
Soils suitable for infiltration?	Yes
Site sewered?	Yes
Pre Development Details	
Pre development characteristics:	The site was originally a large residential block & residence, initial stages of a residential unit development has been undertaken, with the next stages being part of a modified DA
Post Development Details	
Development characteristics:	An child care centre is proposed to be included in the next stage with boundaries adjusted for a stand also site. Roof area will total 1250 sq.m. with a further 850 sq.m. of impervious area

3. Catchment Details

The site slopes from the north west to the north east east towards Fenwick Crescent. Post development stormwater will discharge to the council stormwater system through an existing stormwater pit.

Catchment areas are based on flow paths to discharge point. Pre development as single treatment train & post development flows are through two bio retention basins.

Land use / Surface area	Total Area (Ha)
Pre Development	
Roof Areas	0.023
Overland Flow	0.286
Total	0.309
Post Development	Total
Childcare Roof	0.12
Waste Enclosure & Store Roof	0.005
Pavement	0.085
Overland flow	0.099
Total	0.309

4. MUSIC Parameters & Additional Water Quality Issues

The site is located in the Mulwaree River Catchment & so rainfall data for Zone 1 was used for the meteorological template.

Default rainfall threshold values from Table 4.3 of Using MUSIC in Sydney's Drinking Water Catchment were used for Roofs, sealed roads & unsealed roads.

The dominant soil type would be described as Clay loam & the corresponding data was used for pervious area parameters from Table 4.4 of Using MUSIC in Sydney's Drinking Water Catchment.

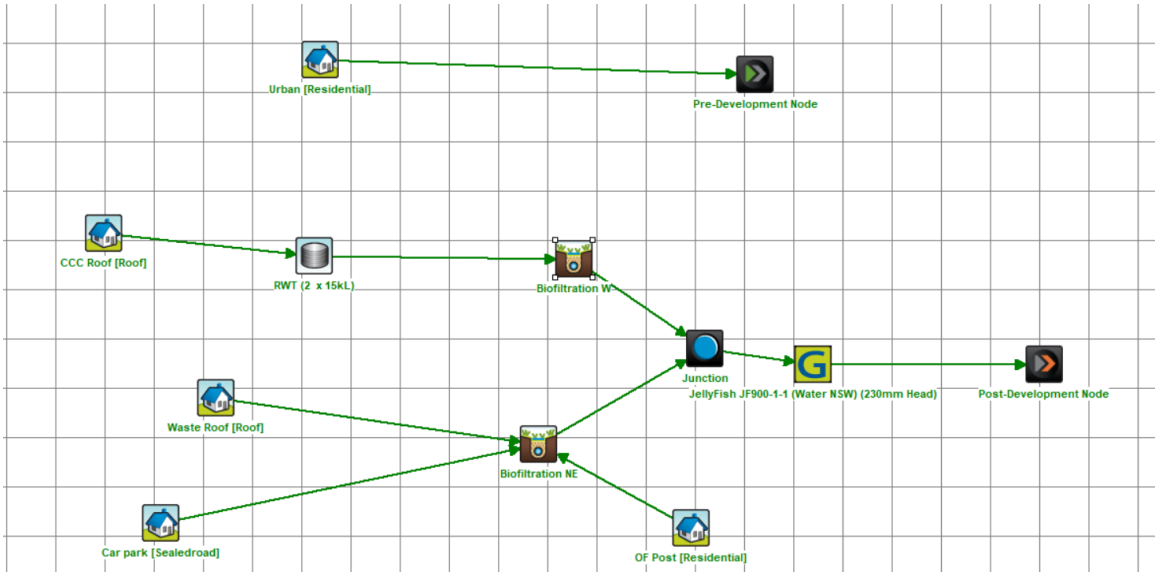
Stormwater pollutant parameters from Table 4.6 & 4.7 of Using MUSIC in Sydney's Drinking Water Catchment. were used for roofwater run off & sealed roads run off.

5. Proposed Treatment

This section should be read in conjunction with the attached drawings 01-36209 & 02-36209 issue A dated 27th October 2024

- Roofwater from the childcare centre will be piped to 3 x 10,000 litre water tanks, with harvested water to be re used for toilet flushing , external hose cocks & irrigation purposes including 164 sq.m. of bio retention area.
- Overflow from the rainwater tanks will be piped directly to a bio retention basin, with 40 sq.m. of filter material 400mm deep & 42 sq.m. of extended detention 200mm deep.
- Overland flows from the landscaped areas, driveway & parking will be graded to a further bio retention basin on the eastern boundary as sheet flow, basin to be built with 120 sq.m. of filter material 400mm deep & 122 sq.m. of extended detention 200mm deep.
- The discharge from the bio retention basins will be piped to a 'Jellyfish 900' stormwater filter by Ocean Protect & discharging through an on site detention tank to council's stormwater system.

6. Pre & Post Development Comparisons

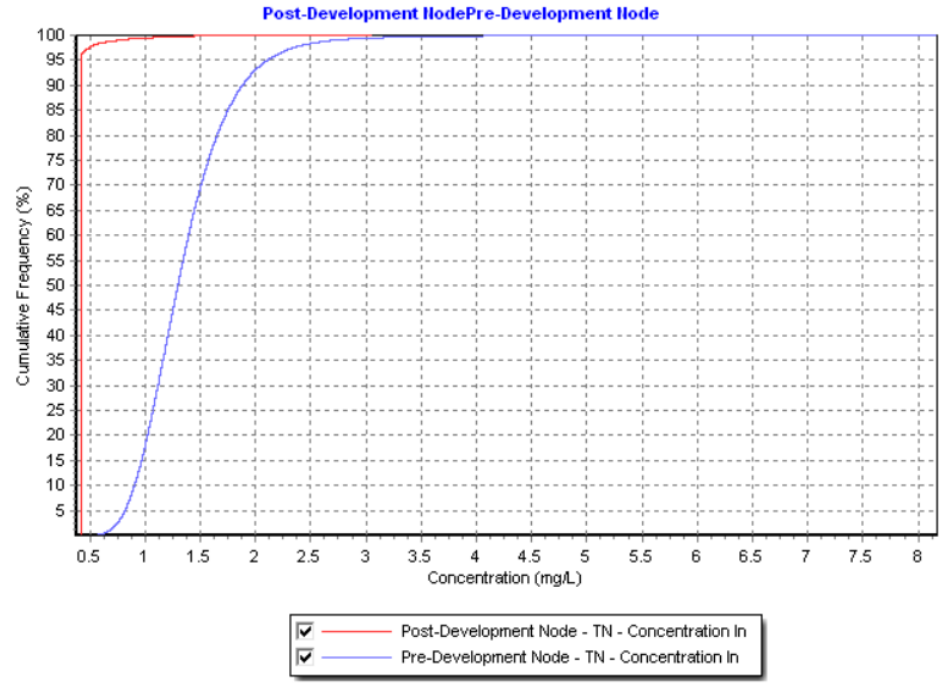


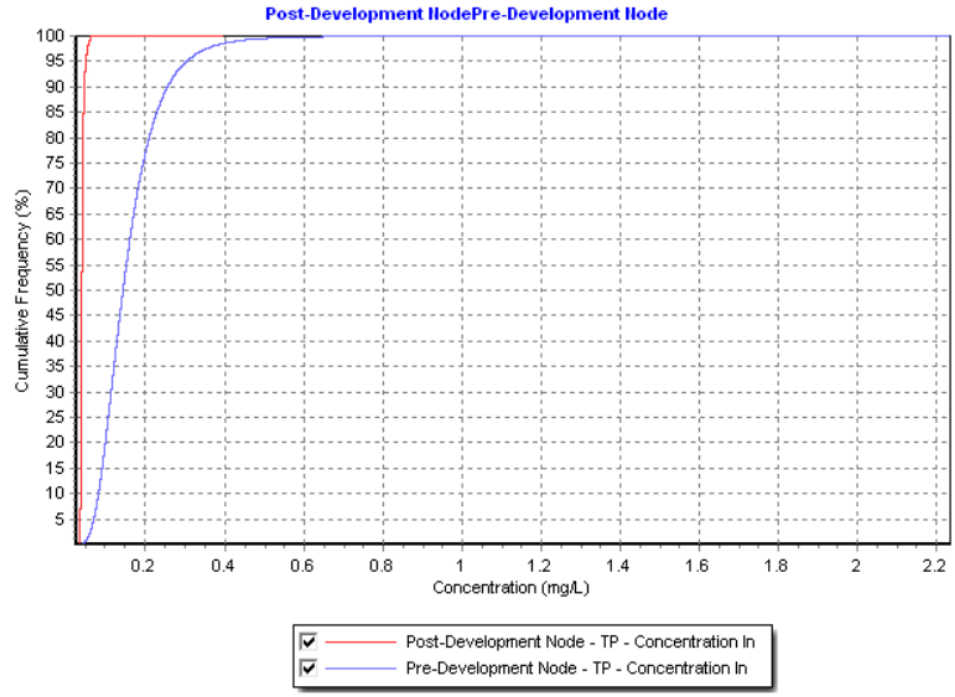
Results post development after modelling treatment procedures;

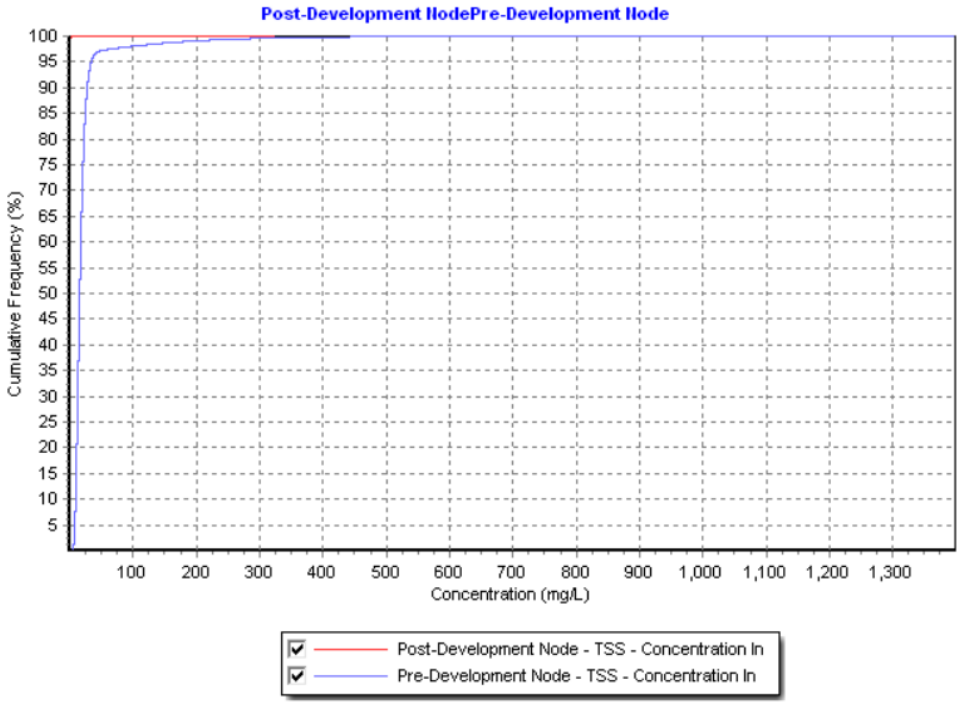
	Pre Development	Post Development	% reduction
Flow (ML/yr)	0.348	1.04	
Total Suspended Solids (kg/yr)	36.9	3.41	90
Total Phosphorus (kg/yr)	0.081	0.052	36
Total Nitrogen (kg/yr)	0.631	0.549	13
Gross Pollutants (kg/yr)	5.35	0.258	

The above results would suggest that the development with the proposed treatment would achieve a beneficial effect on the quality of water discharged from the site.

7. Cumulative Frequency Graphs




Post-Development NodePre-Development Node
Cumulative Frequency (%)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
Concentration (mg/L)
Post-Development Node - TP - Concentration In
Pre-Development Node - TP - Concentration In


Post-Development NodePre-Development Node
Cumulative Frequency (%)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
100
200
300
400
500
600
700
800
900
1,000
1,100
1,200
1,300
Concentration (mg/L)
Post-Development Node - TSS - Concentration In
Pre-Development Node - TSS - Concentration In