Memo

AFFLUX CONSULTING
STORMWATER MANAGEMENT SOLUTIONS

Memo

To: Glenn Kell

From: Chris Beardshaw

CC: Matt Brosnan

Date: 26-May-22

Re: 99 Bena Rd Korumburra

This memo outlines high level stormwater and drainage requirements for the parcel known as 99 Bena Rd Korumburra. The site is within South Gippsland Shire and West Gippsland CMA and as such will need to meet drainage and waterway requirements for both. Initial assessment in this memo includes:

- Existing flood conditions and existing overland flow paths
- Estimated water quality and quantity requirements
- Waterway offsets and requirements

The site has a combined internal and external catchment of 102 ha. The southern catchment is predominantly undeveloped farmland while the eastern catchment is largely standard density residential. The eastern external catchment is generally directed to the north away from the site. The north-east portion of the site also flows to the north and flows into a road crossing within the Petersen Street Reserve. The southern catchment of around 67 ha enters the site by way of an existing natural waterway. The site and its catchment location can be seen in Figure 2 below and Figure 2 overleaf. A proposed development plan can be seen in Figure 3.

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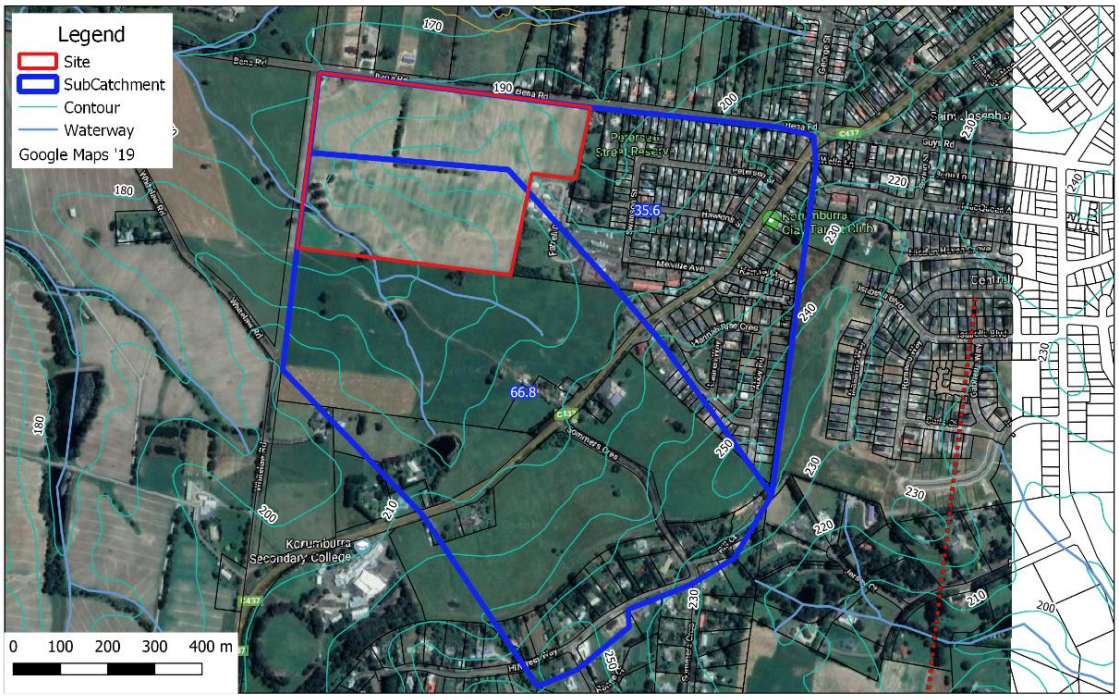

Figure 1. External and Internal contributing catchments

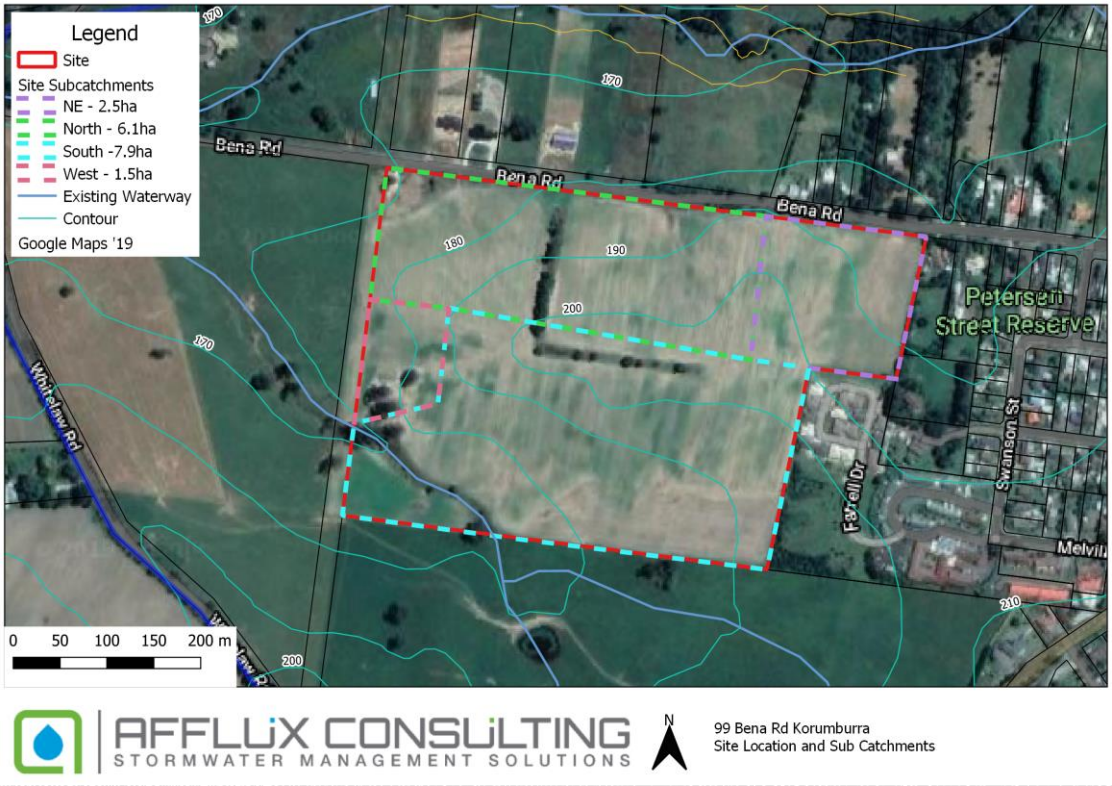

Figure 2 Site and Sub Catchments

Figure 3 Proposed Development Plan

Existing Flood Conditions

A 2d flood model was created using TUFLOW and ARR19 ensemble methods to estimate peak flood depths across the catchment for the suite of 1% AEP storms. Figure 4 below shows the estimated flood depths and flow paths across the site.

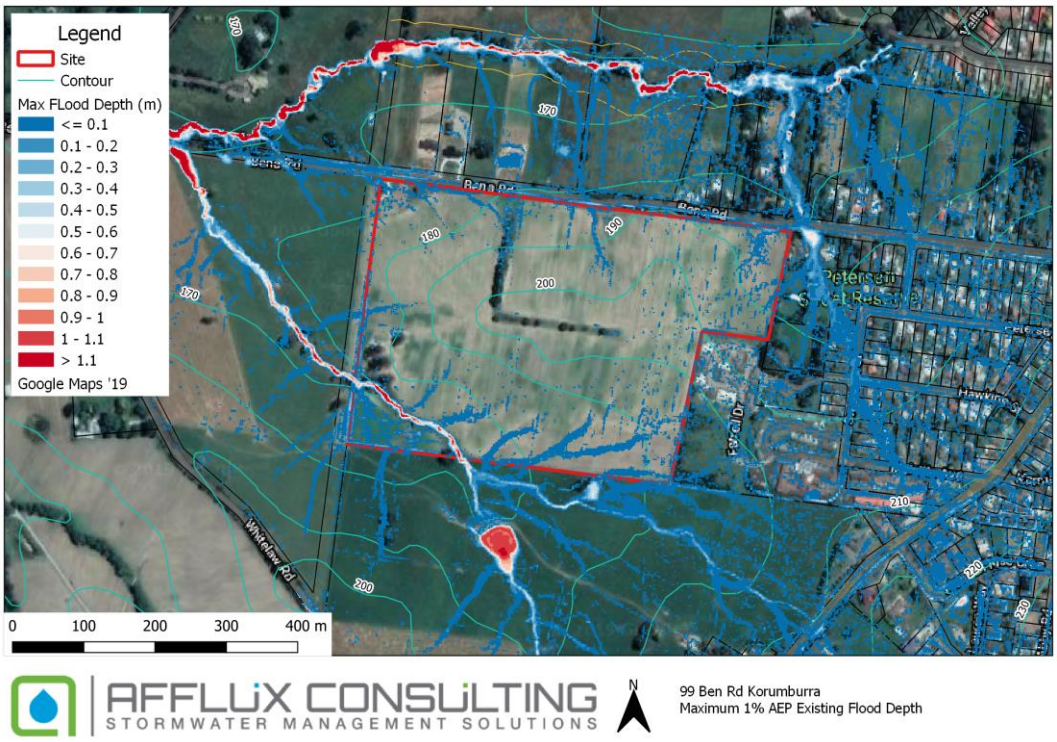

Figure 4 Maximum 1% AEP Flood Depth for Existing Conditions

Water Quality and Quantity Requirements

Initial concept level calculations were undertaken to understand stormwater treatment for the site. This included a brief MUSIC model as shown in Figure 5. Water treatment sizing's have been estimated and are summarised in Table 1 below. The critical design requirement is water quality as it is estimated that the wetland extended detention can be extended to provide the appropriate stormwater retention for the site at both wetland locations.

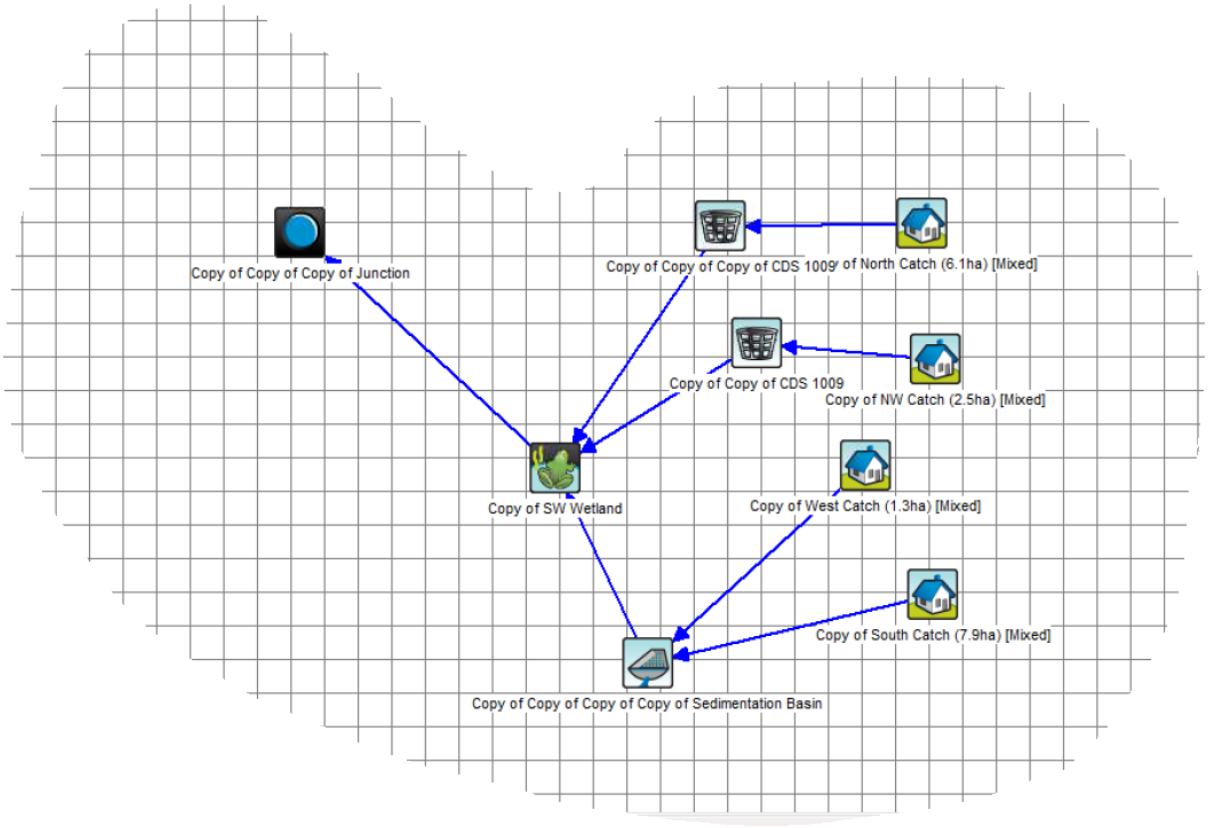

Figure 5 MUSIC Model Setup

Table 1 Summary Stormwater Treatment Requirements

Treatment	Size Requirement
NW Detention Storage	600m³
SW Wetland	6000m²
SW Detention Storage	800m³
NE GPT	Rocla CDS 1009

The waterway is considered a 2nd order stream according to the Strahler System (Figure 6), typically requiring a minimum 40m corridor (20m each side of waterway).

Figure 2. The Strahler System

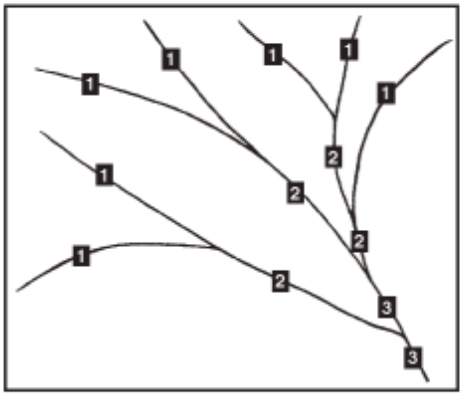

Table 1. Recommended riparian corridor (RC) widths

Watercourse type	**VRZ width** (each side of watercourse)	**Total RC width**
1st order	10 metres	20 m + channel width
2nd order	20 metres	40 m + channel width
3rd order	30 metres	60 m + channel width
4th order and greater (includes estuaries, wetlands and any parts of rivers influenced by tidal waters)	40 metres	80 m + channel width

Figure 6 Strahler System Corridor Requirements (DPI NSW)

Concept Plan

An initial drainage concept plan has been developed, including treatment sizes, waterway offsets and existing major flow paths, and is shown in Figure 7 below.

Considerations for the concept drainage plan have included:

- The topography of the site makes consolidating site discharge a significant challenge and as such, three discharge points have been recommended
- Separating catchments in this way has resulted in one large wetlands
- A GPT type unit will be required to treat gross pollutants for the north east and north west catchments
- Opportunity may exist to realign the waterway in the south west corner of the site, allowing the flat area to be used for the wetland in that location. This will be dependent on discussions with the CMA and an ecological assessment of the site. The concept plan below assumes an offline wetland layout which may be necessary pending results of the ecological report

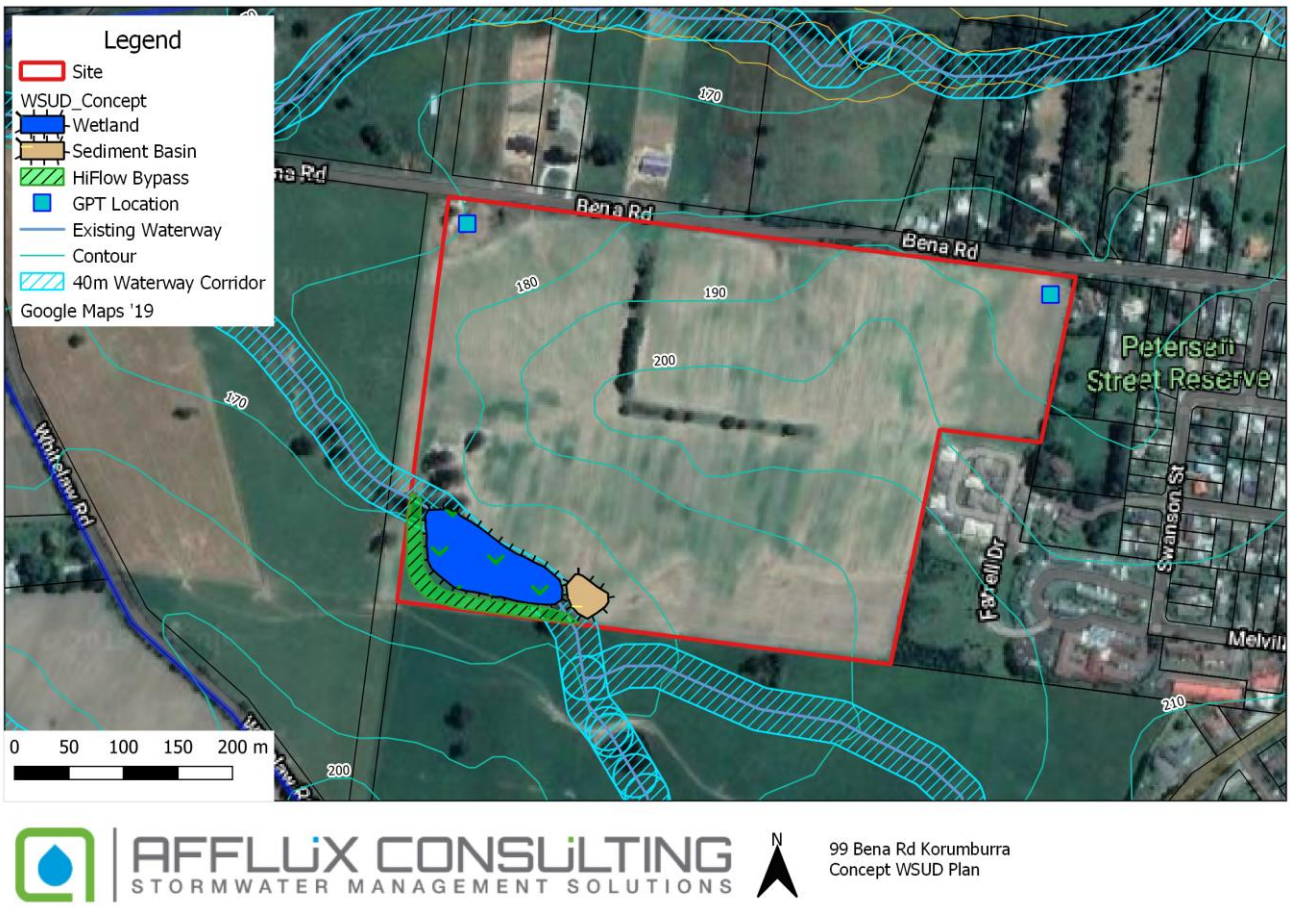

Figure 7 Indicative Alternative Drainage Concept Plan - Waterway Realignment